

Annual Report 2008-2009



**Indian Institute of Technology
Kharagpur**

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LIST OF THE MEMBERS OF IIT COUNCIL
(April 2008 – March 2009)

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 B. Muthuraman Chairman, BOG, IIT Kharagpur Kharagpur – 721 302	Member
(ii)	Delhi	3.	Dr. V. S. Ramamurthy Chairman, BOG, IIT Delhi Delhi – 110 016	Member
(iii)	Delhi	4.	Dr. V. S. Ramamurthy Chairman, BOG, IIT Delhi Delhi – 110 016	Member
(iv)	Madras	5.	Dr. R. Chidambaram 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. Damodar Acharya 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. Devang Khakhar 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. T. Tamasami 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.	Ms. Sushma Nath 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 Jainder Singh Secretary, Department of Information Technology Government of India, Ministry of Communication and Information Technology Electronics Niketan6, C.G.O. Complex New Delhi – 110 00	Member

(I)	Nominee of the All India Council for Technical Education (AICTE)	23.	Prof. R. A. Yadav Chairman, AICTE I.P. Estate, G. Sports Complex New Delhi – 110 00	Member
(J)	Nominees of the Visitor (Nominated for a period of	24.	Prof. C. N. R. Rao Chairman Scientific Advisory Council three years w.e.f. 06.09.2006) 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
(K)	Three members of Parliament (two from Lok Sabha and one from Rajya Sabha)	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
		29.	Shri Milind Deora Member of Parliament (Lok Sabha) 65, Lodhi Estate New Delhi – 110 003	Member
		30.	Shri Ananta Nayak Member of Parliament (Lok Sabha) 180, South Avenue New Delhi – 110 001	Member
(L)	Secretary to the Council	31.	Shri B. J. Panda Member of Parliament (Rajya Sabha) 2, Mahadev Road New Delhi – 110 001	Member
		32.	Shri Ashok Thakur Additional Secretary (HE) Department of Secondary & Higher Education Government of India Ministry of Human Resource Development Shastri Bhavan New, Delhi – 110 001	Secretary

BOARD OF GOVERNORS

#	Name and Address	Position
1.	Shri B. Muthuraman Chairman, BOG, IIT Kharagpur & Managing Director Tata Steel Limited Jamshedpur 831 001	Chairman
2.	Shri R. P. Agrawal Secretary, Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi -110 001	Member
3.	Prof. T. P. Singh Head of the Department (Bio-Physics) All India Institute of Medical Sciences (AIIMS) Ansari Nagar New Delhi 110 029	Member
4.	Dr. T. Ramasami Secretary, Department of Science and Technology Technology Bhawan New Mehrauli Road New Delhi 110 016	Member
5.	Prof. Prem Kumar Kalra Head, Department of Electrical Engineering Indian Institute of Technology Kanpur Kanpur 208 016	Member
6.	Shri Roopen Roy Managing Director Deloitte & Touche Consulting India Pvt. Ltd. Bengal Intelligent Park, Building Alpha, 1st Floor Plot No.A2, M2 & N2, BlockEP & GP, Sector-V, Salt lake Electronics Complex Kolkata 700 091	Member
7.	Dr. Dhruv Prasad Director, Department of Science & Technology Government of Bihar Patna 800 015	Member
8.	Prof. O. N. Mohanty Vice-Chancellor Bijupatnaik University of Technology, Rourkela Camp Techno Campus CET Ghatikia, Kalinganagar Bhubaneswar 751 003	Member

- | | | |
|-----|--|-----------|
| 9. | Shri R. S. Sharma
Principal Secretary
Department of Science & Technology
Government of Jharkhand
Nepal House Doranda
Ranchi 834 002 | Member |
| 10. | Prof. D. Acharya
Director
Indian Institute of Technology Kharagpur
Kharagpur 721 302 | Member |
| 11. | Prof. P. P. Chakrabarti
Department of Computer Science & Engineering
Indian Institute of Technology Kharagpur
Kharagpur 721 302 | Member |
| 12. | Prof. Sanat Kumar Roy
Department of Metallurgical & Materials Engineering
Indian Institute of Technology Kharagpur
Kharagpur 721 302 | Member |
| 13. | Dr. D. Gunasekaran
Registrar
Indian Institute of Technology Kharagpur
Kharagpur 721 302 | Secretary |

FINANCE COMMITTEE

#	Name and Address	Position
1.	Shri B. Muthuraman Chairman, BOG, IIT Kharagpur & Managing Director Tata Steel Limited Jamshedpur 831 001	Chairman
2.	Shri Sanat Kumar Ray Financial Adviser & Joint Secretary Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi 110 001	Chairman
3.	Joint Secretary (T) Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi 110 001	Member
4.	Shri Roopen Roy Managing Director Deloitte & Touche Consulting India Pvt. Ltd. Bengal Intelligent Park, Building Alpha, 1st Floor Plot No.A2, M2 & N2, BlockEP & GP, Sector-V, Salt lake Electronics Complex Kolkata 700 091	Member
5.	Prof. D. Acharya Director Indian Institute of Technology Kharagpur Kharagpur 721 302	Member
6.	Prof. P. P. Chakrabarti Department of Computer Science & Engineering Indian Institute of Technology Kharagpur Kharagpur 721 302	Member
7.	Dr. D. Gunasekaran Registrar Indian Institute of Technology Kharagpur Kharagpur 721 302	Secretary

BUILDING AND WORKS COMMITTEE

#	Name and Address	Position
1.	Prof. D. Acharya Director Indian Institute of Technology Kharagpur Kharagpur 721 302	Chairman
2.	Director (T) Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi 110 001	Chairman
3.	Shri D. K. Mitra Superintending Engineer & Circle Manager Midnapore Distribution Circle West Bengal State Electricity Distribution Co. Ltd. (WBSEDCL) 190, S. K. Bose Road Midnapore 721 101 Dist. : Paschim Medinipur	Member
4.	Superintending Engineer South Western Circle Public Works Department (PWD) Saheed Mangal Pandey Sarani Midnapore 721 101 Dist. : Paschim Medinipur	Member
5.	Head Department of Civil Engineering Indian Institute of Technology Kharagpur Kharagpur 721 302	Member
6.	Head Department of Electrical Engineering Indian Institute of Technology Kharagpur Kharagpur 721 302	Member
7.	Head Department of Architecture & Regional Planning Indian Institute of Technology Kharagpur Kharagpur 721 302	Member
8.	Dr. D. Gunasekaran Registrar Indian Institute of Technology Kharagpur Kharagpur 721 302	Secretary

LIST OF ADMINISTRATIVE HEADS

Director	Prof. Damodar Acharya		
Deputy Director	Prof. M. Chakraborty		
Registrar	Dr. D. Gunasekaran		
Deans			
Undergraduate Studies	Prof. S. K. Som		
Faculty & Planning	Prof. R. N. Datta		
Postgraduate Studies & Research	Prof. P. K. J. Mohapatra		
Sponsored Research & Industrial Consultancy	Prof. P. P. Chakrabarti		
Students' Affair	Prof. D. K. Tripathy	Upto	29.03.2009
	Prof. Souvik Bhattacharyya	From	30.03.2009
Continuing Education	Prof. Ajoy Chakraborty		
Alumni Affairs & International Relations	Prof. Amit Patra		
Vinod Gupta School of Management	Prof. Probir Kumar Gupta	Upto	12-06-2008
	Prof. S. Srinivasan	From	13-06-2008
Head of Departments			
Aerospace Engineering	Prof. Navtej Singh		
Agricultural & Food Engineering	Prof. B. C. Mal	Upto	31-08-2008
	Prof. Rajendra Singh	From	01-09-2008
Architecture & Regional Planning	Prof. Arif N. Merchant		
Biotechnology	Prof. A. K. Ghosh		
Chemical Engineering	Prof. Dibyendu Mukherjee	Upto	31-12-2008
	Prof. Amar Nath Samanta	From	01-01-2009
Chemistry	Prof. Amit Basak	Upto	31-05-2008
	Prof. P. K. Chattaraj	From	01-06-2008
Civil Engineering	Prof. S. P. Dasgupta	Upto	31-08-2008
	Prof. S. K. Bhattacharya	From	01-09-2008
Computer Science & Engineering	Prof. Indranil Sengupta		
Electrical Engineering	Prof. A. K. Sinha		
Electronics & Electrical Communication Engineering	Prof. Debasish Datta	Upto	14-04-2008
	Prof. Ajay Chakraborty	From	15-04-2008
Geology & Geophysics	Prof. A. K. Gupta		
Humanities & Social Sciences	Prof. D. Suar		
Industrial Engineering & Management	Prof. P. K. Ray		
Mathematics	Prof. A. R. Roy		
Mechanical Engineering	Prof. A. K. Chattopadhyay		
Metallurgical & Materials Engineering	Prof. N. Chakraborti		
Mining Engineering	Prof. J. Bhattacharyya		
Ocean Engineering & Naval Architecture	Prof. N. R. Mandal		
Physics & Meteorology	Prof. B. K. Mathur	Upto	31-08-2008
	Prof. R. N. P. Choudhary	From	01-09-2008
Head of Centres			
Centre for Educational Technology	Prof. T. K. Basu		
Centre for Oceans, Rivers, Atmosphere and Land Sciences	Prof. S. K. Satsangi	Upto	20-07-2008
	Prof. A. Chandrasekar	From	21-07-2008
Cryogenic Engineering	Prof. V. V. Rao		
Material Science	Prof. C. K. Das	Upto	07-05-2008
	Prof. Basudam Adhikari	From	08-05-2008

Reliability Engineering	Prof. R. B. Misra	Upto	31-08-2008
	Prof. V. N. Achutha Naikan	From	01-09-2008
Rubber Technology	Prof. T. K. Chaki		
Rural Development	Prof. P. B. S. Bhadoria		
Computer & Informatics	Prof. Prabir Kumar Biswas		
Administrative Computer Service Support Centre	Prof. Rajib Mall		

Head of Schools

G. S. Sanyal School of Telecommunication	Prof. S. Chakrabarti		
School of Information Technology	Prof. I. Sengupta		
School of Medical Science & Technology	Prof. A. K. Ray	Upto	03-03-2009
	Prof. Pranab Kumar Dutta	From	04-03-2009
Vinod Gupta School of Management	Prof. Probir Kumar Gupta	Upto	12-06-2008
	Prof. S. Srinivasan	From	13-06-2008
Rajiv Gandhi School of Intellectual Property Law	Prof. S. Tripathy		
Ranbir and Chitra Gupta School of Infrastructure Design and Management	Prof. K. S. Reddy		
School of Water Resources	Prof. S. N. Panda		

Chairmen & Vice-Chairmen

UG Admissions	Prof. A. K. Ghosh	Upto	31-07-2008
	Prof. A. N. Samanta	From	01-08-2008
Vice-Chairman, UG Admissions	Prof. A. N. Samanta	Upto	31-07-2008
	Prof. P. K. Dutta	From	01-08-2008
PG Admissions	Prof. Biswajit Maiti	Upto	01-07-2008
	Prof. O. P. Sha	From	30-06-2008
Vice-Chairman, PG Admissions	Prof. S. K. Barai	Upto	16-08-2008
	Prof. Somesh Kumar	From	15-08-2008
JAM	Prof. J. K. Ray		
Vice-Chairman, JAM	Prof. A. Chandrasekar		
	Prof. Krishna Kumar		
Central Library	Prof. S. Sahu		
Hall Management Committee	Prof. Jayanta Pal		
Chairman, CWISS	Prof. P. K. Das		
Central Research Facility	Prof. Indranil Manna		
IIT-Optel Fibre Optics R&D Centre	Prof. Indranil Manna		
Rajbhasha Vibhag	Prof. P. D. Srivastava		
Nehru Museum of Science & Technology	Prof. D. Sen		
Kalpana Chawla Space Technology Cell (KCSTC)	Prof. Somnath Sengupta		
Advanced Technology Development Centre (ATDC)	Prof. P. P. Chakrabarti		

Professors-in-Charge

Examinations	Prof. P. D. Srivastava
Training & Placement	Prof. B. K. Mathur
General Time Table	Prof. B. Mahanty
Convocation-2008	Prof. S. K. Som
Institute Information Cell	Prof. B. K. Mathur
President, Technology Students Gymkhana	Prof. Manish Bhattacharjee
Refrigeration & Air Conditioning	Prof. Sukanta Dash

Horticulture	Prof. S. C. Kundu		
Water Works	Prof. A. K. Gupta		
Civil Works (Construction and Maintenance)	Prof. S. K. Bhattacharya		
Electrical Works	Prof. Sabyasachi Sengupta	Upto	08.06.2008
	Prof. D. Das	From	09.06.2008
Telecommunication	Prof. R. V. Raja Kumar		
Institute Guest Houses	Prof. B. K. Sengupta		
Intellectual Property Right & Industrial Relation	Prof. S. Tripathy		

General

Librarian	Dr. B. Sutradhar		
Public Information Officer	Dr. D. Gunasekaran	Upto	01.02.2009
	Dr. Tapan Kumar Ghosal	From	02.02.2009
Head, B.C. Roy Technology Hospital	Dr. Nirmal Kumar Som		
Superintending Engineer (Civil)	Shri T. K. Mukherjee		
Executive Engineer (Civil)	Shri Subrat Roy		
	Shri Arun Rudra		
	Shri Avik Patra		
Executive Engineer (Electrical)	Shri Sabyasachi Ghosh		
	Shri Mahesh Kumar		
	Shri D.K. Chakraborty		
Security Officer	Shri U. P. Singh		

Deputy Registrars

Establishment Section	Shri Atul Prakash Trivedi
Academic Section	Shri Nalini Ranjan Maiti
Finance & Accounts Section	Dr. Tapan Kumar Ghosal
Estate Office	Shri B. K. Basu Roychowdhury

THE SENATE

Director (Chairman)

Prof. Damodar Acharya

Deputy Director

Prof. Madhusudan Chakraborty

Department of Aerospace Engineering

Prof. Amit Kumar Ghosh
Prof. Prosun Kumar Datta
Prof. Gautam Bandyopadhyay
Prof. Navtej Singh

Prof. Tarun Kumar Sarkar
Prof. Jayanta Kumar Ray
Prof. Pratim Kumar Chattaraj
Prof. Sujit Roy
Prof. Tanmaya Pathak
Prof. Tarasankar Pal
Prof. Amit Basak
Prof. Dipakranjan Mal
Prof. Debashis Ray
Prof. Manish Bhattacharjee
Prof. Suneel Kumar Srivastava

Department of Agricultural & Food Engineering

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

Department of Civil Engineering

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

Department of Architecture & Regional Planning

Prof. Rabindranath Datta
Prof. Biplab Kumar Sengupta
Prof. Uttam Kumar Banerjee
Prof. Arif Noman Merchant

Department of Computer Science & Engineering

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

Department of Biotechnology

Prof. Subhas Chandra Kundu
Prof. Debabrata Das
Prof. Satyahari Dey
Prof. Ananta Kumar Ghosh
Prof. Amit Kumar Das

Cryogenic Engineering Centre

Prof. Sunil Kumar Sarangi
Prof. Syamalendu Sekhar Bandyopadhyay
Prof. Tapas Kumar Dey
Prof. Vutukuru Vasudeva Rao
Prof. Kanchan Chowdhury

Department of Chemical Engineering

Prof. Dibyendu Mukherjee
Prof. Amar Nath Samanta
Prof. Sunando Dasgupta
Prof. Narayan Chandra Pradhan
Prof. Sirshendu De

Department of Chemistry

Prof. Panchanan Pramanik

Department of Electrical Engineering

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

Department of Electronics & Electrical Communication Engineering

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

Department of Geology & Geophysics

Prof. Sankar Kumar Nath
Prof. Biswajit Mishra
Prof. Anil Kumar Gupta
Prof. Debashish Sengupta
Prof. Abhijit Bhattacharya
Prof. Subhasish Tripathy
Prof. Anindya Sarkar
Prof. Subhasish Das

G. S. Sanyal School of Telecommunications

Prof. Saswat Chakraborti

Department of Humanities & Social Sciences

Prof. Bani Chatterjee
Prof. Partha Basu
Prof. Hare Ram Tewari
Prof. Manas Kumar Mandal

Prof. Damodar Suar
Prof. Anjali Gera Ray
Prof. Kailash Bihari Lal Srivastava
Prof. Suhita Chopra Chatterjee

Department of Industrial Engineering & Management

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

Materials Science Centre

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

Department of Mathematics

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

Department of Mechanical Engineering

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

Prof. Soumitra Paul
Prof. Manas Chandra Ray
Prof. Ashish Kumar Nath
Prof. Subhransu Roy
Prof. Dilip Kumar Pratihar
Prof. Suman Chakraborty
Prof. Anirvan Dasgupta

Department of Metallurgical & Materials Engineering

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

Department of Mining Engineering

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

Department of Ocean Engineering & Naval Architecture

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

Department of Physics & Meteorology

Prof. Sobhendu Kumar Ghatak

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

Reliability Engineering Centre

Prof. Ravindra Babu Mishra

Rubber Technology Centre

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

Vinod Gupta School of Management

Prof. Gautam Sinha
Prof. Kalyan Kumar Guin

Nominated Members

Dr. Bablu Sutradhar, Librarian
Prof. S. Srinivasan, Dean, VGSOM

Registrar (Secretary)

Dr. D. Gunasekaran

Students Representative

Sri Arnav (Roll No. : 05SI2012)
Sri Aashish Nawal (Roll No. : 05AG1002)
Sri Nitesh Chhatri (Roll No. : 07RE6010)
Sri Bal Govind Tiwari (Roll No.: 04PH9405)

DIRECTOR'S REPORT

IIT Kharagpur continued taking new strides towards emerging directions to further the growth and dissemination of scientific and technological knowledge during the year 2008-2009. Brief outlines of the major activities of the Institute during the year 2008-2009 are highlighted.

ACADEMIC PROGRAMMES

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

During the year 2008-2009, two new M. Tech. programmes, one in Infrastructure Design and Management and the other in Water Management were introduced. Also, two new five-year dual degree programmes, one in Engineering Entrepreneurship and the other in Financial Engineering, is being introduced. The Institute is introducing joint M.Sc.-Ph.D., joint M.S.-Ph.D. and joint M.Tech.-Ph.D. programmes in order to motivate young and aspiring students to join the Ph.D. programmes in large numbers that will accelerate the research activities.

Opening of the new Schools of Engineering Entrepreneurship, Bioscience, Energy, Quality Engineering Design and Manufacturing, and Nanoscience are also under active consideration.

The Institute has installed an interactive course management software system for uploading lecture notes, questions and answers that will help both the teachers and students in the teaching-learning process. For improving the quality of research, the Institute has already prepared documents on research policy, research ethics, maintenance of research data and records, and various guidelines for preparing research documents. It has put in place on-line research information system for both Ph.D. and MS students.

The Institute has prepared a perspective plan to address issues related to increase in students strength. Accordingly, all facilities and infrastructure are being upgraded. For the academic year 20092010, the Institute has increased its student intake by 30 percent of the base year figure of 20072008. The Institute shall also increase the student intake in the academic year 20102011.

The Institute is presently offering B.Tech. (Hons.) programmes in fifteen different branches of engineering, a B.Arch. (Hons.) programme in Architecture, thirty-five Dual Degree programmes, seven Integrated M.Sc. programmes, six two-year M.Sc. programmes, fifty-two postgraduate degree programmes leading to M.Tech., MCP, MBM, and MMST degrees besides an LLB degree and one postgraduate diploma. The curricula and syllabi of these programmes are constantly revised to meet the needs of the changing world with focus on quality and excellence. In the recent undergraduate curricula revision, Bioscience and Environmental Science as compulsory subjects have been included considering their importance.

CONVOCATION

Fifty-fourth Convocation of the Institute was held on 25th July 2008. Dr. Anil Kakodkar, Chairman of Atomic Energy Commission of India, was the Chief Guest. In the Convocation, 167 Ph.D., 37 MS, 611 M.Tech. 23 MCP, 121 MBA, 168 Dual Degree, 09 MMST, 76 PGDIT, 03 PGDMOM, 06 PGDRD, 12 PGDIPL, 11 PGDTNM, 99 PGDBA, 22 PGDST, 08 PGDM, 196 M.Sc 323 B.Tech. (Hons.) and 10 B.Arch. (Hons.) degrees were conferred. Shri Rithe Rahulkumar Jagdish, of the Department of Electronics and Electrical Communication Engineering was the recipient of President of India Gold Medal for the best academic performance among the outgoing B. Tech.(Hons.) and B.Arch.(Hons.) students. Shri Indrajit Mal of the Department of Metallurgical and Materials 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 Goparaju Sreechakra 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 Kumar Puspesh of the Department of Computer Science and Engineering. Shri Arjun Sengupta of the Department of Chemistry 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 Girish Gokuldasan of the Department of Computer Science and Engineering was the recipient of The Director's Gold Medal for the best academic performance among the students completing M.Tech. and MCP courses.

In the fifty-fourth Convocation, the Senate and the Board of Governors of the Institute conferred the highest honour, Doctor of Science (Honoris Causa), on Dr. A. P. J. Abdul Kalam, Dr. Asit K. Biswas, Lord S. K. Bhattacharya, Dr. Anil Kakodkar and Shri Brijmohan Lall Munjal. Dr. A. P. J. Abdul Kalam is conferred for providing outstanding leadership in guiding the Nation towards all-round progress with particular emphasis on science, technology and human resource development, Dr. Asit K. Biswas is awarded for his pioneering contribution to management of water resources, Lord S. K. Bhattacharya is awarded for his remarkable innovations in the field of manufacturing science, Dr. Anil Kakodkar is conferred for his extra-ordinary contribution and leadership to nuclear reactor technology and Shri Brijmohan Lall Munjal is awarded for his unparalleled contribution to the economic growth through manufacturing of affordable two-wheelers in the Country.

In the Convocation, to recognize the significant contributions of eminent individuals, alumni and well-wishers, the Senate and the Board of Governors of the Institute conferred Distinguished Alumnus Awards. The awards were conferred on Dr. Anil K. Malhotra, Regional Energy Adviser for Asia Region in the World Bank; Dr. Duvvuri Subbarao, Finance Secretary and Secretary, Department of Economic Affairs, Government of India; Dr. Pradip K. Roy, Founder and CTO, Neopad Technologies Corporation and Shri Santanu Mohapatra, eminent Music Composer and Director.

RESEARCH AND DEVELOPMENT ACTIVITIES

The Institute, besides producing world-class graduates, has also proven to be a knowledge powerhouse of global reckoning and gained the confidence of industrial houses, both domestic and international. The various academic departments, centers, schools and research programs work across traditional academic boundaries to promote research and teaching that is interdisciplinary, collaborative and groundbreaking. The researchers and the educators of the Institute find innovative answers to society's needs, focusing particularly on energy and environment, health and well-being, infrastructure and information management. IIT Kharagpur benefits greatly from the Institute's longstanding ties with government agencies, foundations and corporate partners.

Over the years IIT Kharagpur has gained special expertise in advanced chip design and CAD for VLSI and MEMS including in areas like formal verification where it works hand in hand with international organizations. The areas of software development, planning, management and ERP are core capabilities of the Institute. The large gamut of specialized software technologies developed in the Institute include power management software used by Power Grid Corporation, telemedicine software, communication empowerment software for physically challenged, software for medical measurements, and tools for security and biometric authentication. Other important software packages developed include bond-graph based technology used 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. Research work is also going on for development of MEMS based accelerometers for aerospace applications and design automation of analog VLSI. A Mission Project for development of Virtual Labs involving premier Institutes of the nation has been initiated this year.

The Institute has a long-standing focus on Life Sciences research with special emphasis in medical science and technology. Artificial heart development program is undergoing phase II, a unique male contraceptive, RISUG, is undergoing the third phase of trials and research work on development of a medical expert system is also going on. Interdisciplinary research is being carried out in areas of non-invasive measurements, advanced image processing, medical implants, protein structure analysis and drug design, orthopedic biomechanics and brain research. Green technology routes have produced unique protocols for insect resistant cotton, jute, bio-hydrogen, separation and purification of anti-carcinogenic components from green tea leaves. Research in biotechnology has resulted in a number of high quality enzymatic processes for a variety of food technologies. Research work is being carried out on high pressure processing on high-value perishable commodities, development of novel nano-biocomposite osteogenic matrices for cell-based bone

tissue engineering, production of pure variety disease-free potato seeds through in-vitro culture technique and design and development of non-invasive blood glucose measuring system.

The major research initiatives in nanotechnology and nano-materials include unique microstructures prepared from gelcast ceramics, nano-composites, nano-wires, semiconductors and metal alloys. The MEMS group has made significant contributions to national research programs of ISRO and DRDO by development of advanced accelerometers, gyros, micro-valves, etc. The area of micro-fluidics and bio-nanomechs has developed new techniques for DNA hybridization and micro-scale cooling for electronic components. The Institute has special expertise in advanced plasma technologies and plasma based materials that are being used for advanced research for industrial, strategic and biomedical areas. The Institute has been recognized with a special research program in microfabrication and fabronics with support from Indo-US Science & Technology Forum.

The vibrant energy research programs at IIT Kharagpur also include fuel cell based systems and energy materials, production of renewable hydrogen combined with Carbon dioxide capture to address global warming and energy production. The current ongoing research activities in mechanical sciences include thermal engineering, CFD, motion and vibration dynamics, robotics, and robot development. The Institute has developed state-of-the-art cutting tools comparable to the best available worldwide. Prototype vehicle development activities include development of a large autonomous underwater vehicle, fault-tolerant micro-aero vehicle, hovercraft and electric vehicles.

Industry-academia partnership at IIT Kharagpur is thriving with industrial organisations forming partnerships in joint research projects, acquiring technologies developed in the Institute, and seeking consultancy supports from the Institute. Some of the major research initiatives in recent years include Steel Technology Center, major R&D Centers in Energy Sector in collaboration with DVC, Tea Engineering Research Center, Vodafone-Essar-IIT Kharagpur Centre of Excellence in Telecommunications, National Program in Marine Hydrodynamics, 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), and National Agriculture Innovation Programme.

INFRASTRUCTURE DEVELOPMENT

In order to cope with the rapid advances in science and technology, the infrastructure and experimental facilities require constant modernization. During the last year, several new scientific equipment have been acquired and installed and new facilities created in the Departments, Centers and Schools. A Molecular Beam Epitaxy System has been set up in the Advanced Technology Development Centre for carrying out research in the field of micro electronics; a Direct Metal Laser Sintering based Rapid Prototyping Machine has been set up in the Department of Mechanical Engineering for carrying out research in the field of fabrication of metal prototypes and biomedical implants; SMPS SQUID Magnetometer is being set up in the Central Research Facility for carrying out research in the field of magnetic materials, and a Bench Top Triple Quadrupole MS/MS System has been set up in the Department of Biotechnology for carrying out research in the field of plant biotechnology.

The continuously growing campus needs constant revamping and augmentation of facilities. To this end, the Institute has taken several actions. Two new Halls of Residence for boys of 2,000 capacity each are being constructed. Construction for one has started and the other will start soon. Construction of new students' blocks in two existing Halls of Residence and construction of one additional floor in three existing Halls of Residence are nearing completion. Arrangements have been made for the construction of Sir J. C. Ghosh Science Block and P.C. Roy Laboratory Block for Chemistry Department and Rubber Technology Centre. The construction for the new class room complex with 30 class rooms of 120 capacity each and 100 class rooms of 60 capacity each will start in next two months. The construction of 100-room guesthouse is on the verge of completion. The construction works for 63 A-type flats and 81 B-type flats are going on for augmenting faculty housing. Arrangements have been made for the construction of 64 2-BR type and 80 1-BR type of flats for staff housing. The extension programme for the Vikram Sarabhai Residential Complex is in the process. Keeping pace with the increased strength of students, different measures have been taken for augmentation of power supply system and revamping of the power distribution system. Some of these are: augmentation of the 33 kV substation to 17.6 MVA, doubling the capacities of all distribution substations and all overhead power lines are converted to underground cable lines. To meet the additional water demand from the increased student and faculty strength, the Institute has taken up several works that are in progress.

INTERNATIONAL COLLABORATION

Accelerated progress in many of the endeavors of the Institute are possible only through active collaboration. The Institute has several collaborations in different areas of research and development, faculty and student exchange programmes. Collaborations at different levels are going on with several universities and institutes of repute.

In the last year, the Institute has signed MOU for academic and research activities with UC Berkeley, USA, University of Rome, RWTH, Germany, Berlin Institute of Technology, Germany, University of Southampton, UK, Leibniz University, Germany, The University of Warwick, UK, University of Tokyo, Japan, Lulea University of Technology, Sweden, University of Utah, USA, University of Western Ontario, Canada, Politecnico di Milano, Italy, National University of Singapore. The Institute has entered into MOU on research and IPR creation with reputed industries including Microsoft, National Semiconductor and TOTAL.

SPONSORED RESEARCH AND INDUSTRIAL CONSULTANCY

IIT Kharagpur benefits greatly from the Institute's longstanding ties with government agencies, foundations and corporate partners. Many technology-intensive and industrial houses are increasingly forming partnerships in joint research projects, acquiring technologies developed in the Institute and seeking consultancy supports from the Institute. Collaborations are also going on with Intel, National Semiconductors, Synopsys, Microsoft, General Motors, Orrick, National Oceanic and Atmospheric Administration of USA, and Geological Survey of Japan, SHELL International & Exploration BV of The Netherlands, DAV Norway and Texas Instruments of USA. During the year 2008-2009, the Institute received from the Government, private and international funding agencies 167 research projects for a total value of Rs. 158 crores and 142 consultancy projects worth Rs. 13 crores aggregating to a total of 309 projects for Rs. 171 crores.

The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell under SRIC is responsible for the licensing and the transfer of technologies developed by faculty members, students and other researchers at IIT Kharagpur to the commercial sector. The technologies developed at IIT Kharagpur are showcased to an audience of small and medium scale industries (SME) during IndAc 2009 in Kolkata during March 2009 culminating in a number of technology transfers and licensing. IIT Kharagpur also has a long tradition of protecting inventions and has received numerous patents over the years.

STEP IIT KHARAGPUR

Innovation is a step towards of growth and its sustainability. Science and Technology Entrepreneurs Park (STEP), IIT Kharagpur is nodal center for innovation. It works towards translating some of the research outcomes of IIT to commercially viable products. STEP IIT Kharagpur provides a single-window facility for turning individuals with science and technology background into successful entrepreneurs. At present, twenty-five companies are under incubation programme at STEP IIT Kharagpur and its Gopali campus. A global venture laboratory, in collaboration with the Jyvaskyla University, Finland and the University of California Berkeley, has been initiated at STEP to further improve the skills of the budding entrepreneurs.

CONFERENCES, SYMPOSIA, SEMINARS AND WORKSHOPS

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

The Department of Architecture and Regional Planning organized the "36th IAHS World Congress on Housing Science" at Kolkata. An International Workshop on "Biomaterials for Tissue engineering and Biotechnological Applications" was organized by the Department of Biotechnology. The Department of Computer Science and Engineering has organized "5th International Conference on Distributed Computing & Internet Technology", "International Conference on Contemporary Computing" and "International Conference on Information Technology". The Department also organized "International Summer School on NLP and Text Mining". "IEEE 2009 International Conference on Industrial Technology" has been organized by the Department of Electrical Engineering. The Department of Electronics and Electrical Communication

Engineering has organized “International Conference on Cryptology” and “International Conference on Industrial Information System”. The Department of Geology & Geophysics organized a symposium on “Indo-US Frontier of Science”. The Department also organized the Second meeting of Asian Current Research on Fluid Inclusions. The Materials Science Centre has organized the “International Conference of High-Tech Materials”. The Department of Mechanical Engineering has organized “Indo-US Workshop on Microfluidics and Fabronics”. The Department of Metallurgical & Materials Engineering has organized the “International Conference on Advanced Materials and Processing”. “9th International Conference on Vibration Problems” has been organized by the Centre for Theoretical Studies.

The Department of Agricultural and Food Engineering organized a National Meet of Tractor and Allied Machinery Manufacturers and a workshop on “Farm Implements and Machinery”. The Department of Chemical Engineering has organized a conference on “Plasma Technology for Biomedical Application”. Symposium on “Chemistry and Physics of Materials and Fluids” and the “Sixth National Symposium in Chemistry” have been organized by the Department of Chemistry. National Seminar on “Trans-historian Configurations : Colonial Past & Post Modern Futuresin USA and India” and a Workshop on “Industrial Relations in India” have been organized by the Department of Humanities and Social Sciences. National Workshop on “Some Recent Research Directions in Graph Theory” has been organized by the Department of Mathematics. A workshop on “Technology in Health Care: Prospects and Challenges” has been organized by the School of Medical Science and Technology. Rubber Technology Centre has organized the “India Rubber Expo 2009”.

CONTINUING EDUCATION PROGRAMME

The Continuing Education Programme constitutes an important activity of the Institute. Over the years, it has diversified in terms of coverage of disciplines, duration of programme, the level of the programmes, and the types of industry served. During the last one year, with AICTE support, twenty-one teachers from various engineering colleges have obtained their Doctoral degree and thirteen teachers their Master's degree. Seventeen teachers have enrolled for the Ph.D. programme, while eighteen teachers have taken advance admission to the Ph.D. programme. Ninety-six short-term courses, both on-campus as well as off-campus, have been conducted for professionals employed in industry and R&D organizations. Last year, 3,058 participants were awarded certificates on completion of the course works. The Institute also conducted 22 summer and winter courses under the staff development programme of AICTE, MHRD.

The CEP is in the process of starting part-time M.Tech. programmes in Computer Science and Engineering, Electronics and Electrical Communication Engineering and Electrical Engineering at its Kolkata and Bhubaneswar extension centres, primarily for faculty members of AICTE-sponsored engineering colleges. The CEP is also associated with the national mission on education through information and communication technology. IIT Kharagpur is the lead institute in the creation of virtual laboratories.

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 and were elected as Fellows of the National Science Academy and Indian National Academy of Engineering.

Prof. Sunando DasGupta of the Department of Chemical Engineering and Prof. Jayanta Mukhopadhyay of the Department of Computer Science and Engineering have been elected as Fellows of the Indian National Academy of Engineering. Prof. Suman Chakraborty and Prof. P. K. Das of the Department of Mechanical Engineering have also been elected as Fellows of the Indian National Academy of Engineering. Prof. Indranil Manna of the Department of Metallurgical and Materials Engineering has been awarded the INAE Visvesvarya Chair Professorship for the year 2009. Prof. S. K. Sen of the Advanced Laboratory for the Plant and Genetic Engineering has been invited to join as Fellow of the National Academy of Agricultural Sciences. Dr. Goutam Saha of the Department of Electronics and Electrical Communication Engineering won the prestigious “Innovators' Competition” for DST-Lockheed Martin India Innovation Growth Programme 2009.

Prof. Suman Chakraborty of the Department of Mechanical Engineering received the Scopus Young Scientist in Engineering Award for the year 2008. Prof. Sunando DasGupta of the Department of Chemical Engineering

has been awarded the IChE Award for the year 2008. He has also been appointed a Senior Associate of the Abdus Salam International Centre for Theoretical Physics, Italy. Prof. Jayanta Bhattacharya of the Department of Mining Engineering has received the John Dunn Medal for 2007-2008. Prof. Khanindra Pathak of the same Department has been awarded the Bala Tandon Gold Medal of MGMI for 2007-2008. Prof. Subir Kumar Mukhopadhyay and Dr. Debasis Deb of the Department of Mining Engineering received the Hindustan Zinc Gold Medals. Dr. Karabi Das of the Department of Metallurgical and Materials Engineering has been awarded the MRSI Medal for 2009. Prof. Abhijit Bhattacharya of the Department of Geology and Geophysics received the National Mineral Award. Dr. Sudip Misra of the School of Information Technology received the India Swarna Jayanti Puraskar 2008 from the National Academy of Sciences. Dr. Madan Kumar Jha of the Department of Agricultural and Food Engineering received the Shankar Memorial Award from the Indian Society of Agricultural Engineers. Dr. Debdeep Mukhopadhyay of the Department of Computer Science and Engineering has received the Techno-Inventor Award from Indian Semiconductor Association. Dr. Sanjeev Kumar Srivastava of the Department of Physics and Meteorology received the Young Physicist Award 2008 from The Indian Physical Society.

ALUMNI AFFAIRS

The alumni of the Institute have played a significant role in facilitating increased interaction of IIT Kharagpur in India and abroad. This year's Nina Saxena Excellence in Technology Award, instituted in memory of Dr. Nina Saxena, B.Tech. (Hons.), ECE 1992, for technical innovation was awarded to Dr. Subhash P. Andey, Scientist, Geo-Environment Management Division, NEERI, Nagpur. The New Year brought together the alumni of the Institute in the Sixth Annual Alumni Meet 2009. The Meet was organized for the graduates of 1959 and 1984. During the year, several alumni including the 1966/1971 Class of Architecture Students visited the Institute. Prof. Lord Sushantha Kumar Bhattacharyya, Director, Warwick Management Group, Warwick was the Chief Guest on 18th August 2008, the Institute Foundation Day. Sri Ranbir Singh Gupta, with whose bequest the Ranbir and Chitra Gupta School of Infrastructure Design and Management was created and Dr. Prabhakant Sinha, Educator, entrepreneur and thought leader also visited the Institute.

TRAINING AND PLACEMENT

The Training and Placement Section of the Institute is actively engaged in forging synergistic relationships between the Institute and various industrial organizations and employers of technical and scientific manpower. During 2008/2009, 135 companies and organizations visited the campus for taking placement interviews. In addition, 14 others preferred to have telephonic interview, video conference or called the students for interviews to their offices. This year the placement undergraduate students has been 78%, while that of the postgraduate students has been 49%. Harnessing student power has been very fruitful and students effectively ensured that placement programmes were run continuously as per schedule during the placement process. A total of 103 companies have offered summer training to the students of the Institute, and 48 of them provided financial assistance. Last year 400 students of the Institute have taken summer training in countries outside India. A Deferred Placement Programme exists in the Institute to boost entrepreneurship amongst graduating students. The idea behind such a programme is to encourage students to take up entrepreneurial ventures while simultaneously offering them a safety net in case the venture does not take off.

STUDENTS' AFFAIRS

In pursuit of excellence and giving life a meaningful direction, Technology Students Gymkhana of IIT Kharagpur works towards personality development of IIT students by infusing in them a spirit of constructive 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 2008/2009 was also full of activities and achievements and proved to be matching the high standards of organizational and leadership capabilities of the students of the Institute.

The 44th Inter-IIT Sports Meet began with Inter-IIT Aquatic Meet, which was held during October 6 to 9, 2008 at IIT Madras. IIT Kharagpur students secured 3rd position in Swimming. The second phase, which included all other games, was held from December 11 to 17, 2008. IIT Kharagpur students secured Silver Medals in Badminton, Athletics, Basketball and Men's Table Tennis. The Inter-Hall Aquatic Competitions were held in August 2008 and the Inter-Hall Athletics Meet was held from 14th to 15th November 2008.

This year, Technology Students' Gymkhana organized SHAURYA, an Inter-College Sports Meet, from 31st October to 3rd November 2008 in which Basketball, Tennis, Volleyball, Hockey and Table Tennis competitions were held. St. Xaviers, Ranchi, KIIT Bhubaneswar, Marine Engineering College, Kolkata, NIIT Rourkela, and IIT Kharagpur took part in SHAURYA.

The Annual Socio-Cultural Festival, SPRING FEST-2009, celebrated its golden jubilee during January 22 to 25, 2009. This year, Spring Fest witnessed overwhelming participation from various prestigious colleges across the Country including international participants from New Zealand, Belgium, Netherlands, Tunisia, Brazil and Poland. Students took part in a complete new genre of competitive events like Youth Flick quiz, Fusion Fiesta, SF Karaoke and Twisted Grades. Maestros like Krishna Kumar, Pandit Chitresh Das, Grammy Award winner Jason Samuels, Pandit Vakil's Rhythm Riders and Led Zepplica a California based Rock Band captivated the audience.

KSHITIJ the annual Techno-Management Fest was organized from 29th January to 1st February 2009. Around 5,000 students from various colleges of India and abroad took part in various competitive events like Business Plan, Advertisement Designing, Case Studies, Paper Presentations, Computer Programming, and Robotics. Students came up with innovative designs for the Kharagpur Railway Station, as a part of the 'The Grand Central' event. Presence of stalwarts from scientific, technical and managerial domains like Mr. Prahlad Kakkar, Mr. Philip Emeagwali, the Father of Internet, Nobel Laureate Kurt Wuthrich, Prof. Chandra Lalwani from Hull University, Pioneer S. K. Shivkumar, Prof. Chandra Wickramasinghe, Emmy Award winner Jeremy Bristow NASA's Christopher McKay were the star attractions of the Fest. Technical Exhibitions and Workshops on Forensic Sciences, Financial Risk Management, Mind Reading Machines and Solar Robotics were also held during the fest.

This year, eight Institute Blues and five Orders of Merit have been awarded to the outgoing students for their outstanding achievements in sports and games, social, cultural, and technological activities.

PART - I

DEPARTMENTS, CENTRES AND SCHOOLS

DEPARTMENTS, CENTRES AND SCHOOLS

IIT Kharagpur is a wholly residential Institute with a large campus spread over an area of approximately 600 hectares. It has a student population of approximately 6700. The sanctioned faculty strength of the Institute is 511. As per faculty : students ratio of 1 : 10, the faculty strength has to be increased to 670.

The Institute has 19 Departments, 7 Centres and 7 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 Educational Technology, Centre for Oceans, Rivers, Atmosphere and Land Sciences, Cryogenic Engineering, Materials Science, Reliability Engineering, Rubber Technology and Rural Development.

Schools

G. S. Sanyal School of Telecommunications, Rajiv Gandhi School of Intellectual Property Law, School of Information Technology, Ranbir and Chitra Gupta School of Infrastructure Design and Management, School of Medical Science and Technology, School of Water Resources and Vinod Gupta School of Management.

COURSES OFFERED BY DEPARTMENTS, CENTRES AND SCHOOLS

Faculty Strength 511
as on 31.03.2009

Aerospace Engineering	13
B.Tech. (Hons.) - Aerospace Engineering	
Dual Degree - Aerospace Engineering	
Dual Degree - Aerospace Engineering / MBA	
M. Tech. - Aerospace Engineering	
Ph.D	
Agricultural and Food Engineering	34
B.Tech. (Hons.) - Agricultural & Food Engineering	
Dual Degree - Agricultural & Food Engineering / Farm Machinery & Power	
Dual Degree - Agricultural & Food Engineering / Soil and Water Conservation Engineering	
Dual Degree - Agricultural & Food Engineering / Dairy & Food Engineering	
Dual Degree - Agricultural & Food Engineering / Water Resources Development & Management	
Dual Degree - Agricultural & Food Engineering / Aqua Cultural Engineering	
Dual Degree - Agricultural & Food Engineering / Agricultural Systems & Management	
Dual Degree - Agricultural & Food Engineering / Post Harvest Engineering	
Dual Degree - Agricultural & Food Engineering / MBA	
M. Tech. - Farm Machinery & Power	
M. Tech. - Soil and Water Conservation Engineering	
M. Tech. - Dairy and Food Engineering	
M. Tech. - Applied Botany	
M. Tech. - Water Resources Development & Management	
M. Tech. - Aqua Cultural Engineering	
M. Tech. - Agricultural Systems & Management	
M. Tech. - Post Harvest Engineering	
Ph.D.	
Architecture and Regional Planning	15
B.Arch.(Hons.)	
MCP	
Ph.D.	
Biotechnology	11
B.Tech.(Hons.) - Biotechnology & Biochemical Engineering	
Dual Degree - Biotechnology & Biochemical Engineering	
Dual Degree - Biotechnology & Biochemical Engineering / MBA	
M. Tech. - Biotechnology and Biochemical Engineering	
Ph.D.	
Chemical Engineering	18
B.Tech.(Hons.) - Chemical Engineering	
Dual Degree - Chemical Engineering	
Dual Degree - Chemical Engineering / MBA	
M. Tech. - Chemical Engineering	
Ph.D.	

Chemistry **29**

M.Sc. - Industrial Chemistry
M.Sc. (2 yr) - Chemistry (up to 2008 admissions)
M.Sc.- Ph.D. Dual Degree in Chemistry (with effect from 2009 admissions)
Ph.D.

Civil Engineering **30**

B.Tech. (Hons.) - Civil Engineering
Dual Degree - Civil Engineering / Hydraulics & Water Resources Engineering
Dual Degree - Civil Engineering / Transportation Engineering
Dual Degree - Civil Engineering / Geotechnical Engineering
Dual Degree - Civil Engineering / Structural Engineering
Dual Degree - Civil Engineering / Environmental Engineering
Dual Degree - Civil Engineering / MBA
Dual Degree - Civil Engineering / Infrastructural Civil Engineering
M. Tech. - Hydraulics & Water Resources Engineering
M. Tech. - Transportation Engineering
M. Tech. - Environmental Engineering & Management
M. Tech. - Geotechnical Engineering
M. Tech. - Structural Engineering
Ph.D.

Computer Science and Engineering **21**

B.Tech.(Hons.) - Computer Science & Engineering
Dual Degree - Computer Sc. & Engineering / Computer & Information Technology
Dual Degree - Computer Sc. & Engineering / MBA
M. Tech. - Computer Science and Engineering
Ph.D.

Electrical Engineering **29**

B.Tech. (Hons.) - Electrical Engineering
B.Tech. (Hons.) - Energy Engineering
B.Tech. (Hons.) - Instrumentation Engineering
Dual Degree - Electrical Engineering / Machine Drives & Power Electronics
Dual Degree - Electrical Engineering / Control System Engineering
Dual Degree - Electrical Engineering / Power System Engineering
Dual Degree - Electrical Engineering / Instrumentation Engineering
Dual Degree - Energy Engineering / Machine Drives & Power Electronics
Dual Degree - Energy Engineering / Power System Engineering
Dual Degree - Instrumentation Engineering / Control Systems Engineering
Dual Degree - Electrical Engineering / MBA
Dual Degree - Energy Engineering / MBA
Dual Degree - Instrumentation Engineering / MBA
M. Tech. - Machine Drives & Power Electronics
M. Tech. - Control System Engineering
M. Tech. - Power System Engineering
M. Tech. - Instrumentation
Ph.D.

Electronics and Electrical Communication Engineering **29**

B.Tech.(Hons.) - Electronics & Electrical Communication Engineering
Dual Degree - Electronics & Electrical Communication Engineering /
Fibre Optics and Lightwave Engineering

Dual Degree - Electronics & Electrical Communication Engineering / Microelectronics & VLSI Design
 Dual Degree - Electronics & Electrical Communication Engineering / RF and Microwave Engineering
 Dual Degree - Electronics & Electrical Communication Engineering / Visual Information & Embedded System
 Dual Degree - Electronics & Electrical Communication Engineering / Telecommunications System Engineering
 Dual Degree - Electronics & Electrical Communication Engineering / MBA
 M. Tech. - Microelectronics & VLSI Design
 M. Tech. - RF and Microwave Engineering
 M. Tech. - Telecommunication Systems Engineering
 M. Tech. - Visual Information and Embedded Systems Engineering
 Ph.D.

Geology and Geophysics **23**

M.Sc. - Exploration Geophysics
 M.Sc. - Applied Geology
 M.Sc.(2 yr) - Geophysics (upto 2008 admissions)
 M.Sc.(2 yr) - Geological Sciences (upto 2008 admissions)
 M.Sc.- Ph.D. Dual Degree. in Geophysics (with effect from 2009 admissions)
 M.Sc.- Ph.D. Dual Degree in Geological Sciences (with effect from 2009 admissions)
 M. Tech. - Earth & Environmental Sciences
 M. Tech. - Computational Seismology
 Ph.D.

Humanities and Social Sciences **20**

M.Sc. - Economics
 M. Tech. - Human Resources Development & Management
 Ph.D.

Industrial Engineering and Management **13**

B.Tech. (Hons.) - Industrial Engineering
 Dual Degree - Industrial Engineering / Industrial Engineering & Management
 Dual Degree - Industrial Engineering / MBA
 M. Tech. - Industrial Engineering & Management
 Ph.D.

Mathematics **26**

M.Sc. - Mathematics & Computing
 M.Sc. - Statistics and Informatics (upto 2008 admissions)
 M.Sc.(2 yr) - Mathematics (upto 2008 admissions)
 M.Sc.(2 yr) - Statistics and Informatics (upto 2008 admissions)
 M.Sc.- Ph.D. Dual Degree - Mathematics (with effect from 2009 admissions)
 M. Tech. - Computer Science & Data Processing
 Ph.D.

Mechanical Engineering **41**

B.Tech.(Hons.) - Mechanical Engineering
 B.Tech. (Hons.) - Manufacturing Science & Engineering
 Dual Degree - Mechanical Engineering / Manufacturing Science and Engineering
 Dual Degree - Mechanical Engineering / Thermal Science and Engineering
 Dual Degree - Mechanical Engineering / Mechanical Systems Design
 Dual Degree - Mechanical Engineering / Mechanical Systems, Dynamics & Control

Dual Degree - Manufacturing Sc. & Engineering / Industrial Engineering & Management	
Dual Degree - Mechanical Engineering / MBA	
Dual Degree - Manufacturing Science & Engineering/ MBA	
M. Tech. - Manufacturing Science & Engineering	
M. Tech. - Thermal Science and Engineering	
M. Tech. - Mechanical Systems Design	
M. Tech. - Mechanical Systems Dynamics & Control	
Ph.D.	
Metallurgical & Materials Engineering	25
B.Tech. (Hons.) - Metallurgical and Materials Engineering	
Dual Degree - Metallurgical & Materials Engineering / Metallurgical Engineering	
Dual Degree - Metallurgical & Materials Engineering / MBA	
M. Tech. - Metallurgical & Materials Engineering	
Ph.D.	
Postgraduate Diploma in Steel Technology	
Mining Engineering	12
B.Tech. (Hons.) - Mining Engineering	
Dual Degree - Mining Engineering / Mining Engineering	
Dual Degree - Mining Engineering / Safety Engineering and Disaster Management	
Dual Degree - Mining Engineering / MBA	
M. Tech. - Mining Engineering	
Ph.D.	
Ocean Engineering and Naval Architecture	09
B.Tech. (Hons.) - Ocean Engineering and Naval Architecture	
Dual Degree - Ocean Engineering & Naval Architecture	
Dual Degree - MBA	
M. Tech. - Ocean Engineering & Naval Architecture	
Ph.D.	
Physics and Meteorology	30
M.Sc. - Physics	
M.Sc.(2 yr) - Physics (upto 2008 admissions)	
M.Sc.- Ph.D. Dual Degree in Physics (with effect from 2009 admissions)	
M. Tech. - Solid State Technology	
Ph.D.	
Centre for Educational Technology	03
M. Tech. - Media and Sound Engineering	
Ph.D.	
Centre for Oceans, Rivers, Atmosphere and Land Sciences	05
M. Tech. - Earth System Science and Technology	
Ph.D.	
Cryogenic Engineering	10
M. Tech. - Cryogenic Engineering	
Ph.D.	

Materials Science	10
M. Tech. - Materials Science & Engineering Ph.D.	
Reliability Engineering Centre	03
M. Tech. - Reliability Engineering Ph.D.	
Rubber Technology	09
M. Tech. - Rubber Technology Ph.D.	
Rural Development	04
Ph.D.	
G. S. Sanyal School of Telecommunications	02
Postgraduate Diploma in Telecommunications Networking Planning and Management Ph.D.	
Rajiv Gandhi School of Intellectual Property Law	08
LLB - Intellectual Property Rights Ph.D. Postgraduate Diploma in Intellectual Property Law	
School of Information Technology	07
M. Tech. - Information Technology Ph.D.	
School of Infrastructure Design & Management	
M. Tech. - Infrastructure Design and Management Ph.D.	
School of Medical Science & Technology	09
Masters in Medical Science & Technology M. Tech. - Medical Imaging and Image Analysis Ph.D.	
School of Water Resources	
M. Tech. - Water Management Ph.D.	
Vinod Gupta School of Management	13
MBA Ph.D.	

DEPARTMENT OF AEROSPACE ENGINEERING

HEAD : Professor Navtej Singh

FACULTY

Professors

Bandyopadhyay, Gautam	Ph.D. (IIT Kharagpur), Experimental and Computational Aerodynamics
Datta, Prosun Kumar	Ph.D. (Georgia Tech), Aerospace Structures
Ghosh, Amit Kumar	Ph.D. (IIT Madras), Aerodynamics & Propulsion
Singh, Navtej	Ph.D. (IIT Kharagpur), Aerodynamics and Computational Fluid Mechanics

Associate Professors

Laha, Manas Kumar	Ph.D. (IIT Kharagpur), Aerodynamics, Flight mechanics
Maiti, Dipak K	Ph.D. (IIT Kharagpur), Aerospace Structures, Composite & Smart Structures, Structural Dynamics & Aeroelasticity, Design & Development of MR fluid damper & Landing Gear Dynamics
Rao, Tummala Venkateswara	Ph.D. (IISc., Bangalore), Propulsion, Aerodynamics, Combustion
Singh, Bhrigu Nath	Ph.D. (IIT Kanpur), Aerospace Structures, Smart Structures, Composite and Sandwich Structures, Probabilistic Mechanics : Uncertainty Quantification in Aircraft Analysis and Design, Deterministic and Random Vibration, Application of Functionally Graded Materials (FGMs) in Aerospace Structures
Sinha Mahapatra, Kalyan Prasad	Ph.D. (IIT Kharagpur), Computational Fluid Dynamics (CFD), Aeroacoustics, Flow-induced vibration, Reactive flows

Assistant Professors

Ghosh, Anup	Ph.D. (IIT Kharagpur), Aerospace Structures, Composite Structures, Micro Air Vehicle
Pradhan, Suresh Chandra	Ph.D. (IIT Kanpur), Aerospace structures, smart structures, optimisation, FEM, FGM, Nanomechanics, Nonlocal elasticity theory
Roy, Arnab	Ph.D. (IIT Kharagpur), Aerodynamics
Sinha, Manoranjan	Ph.D. (IIT Kanpur), Neural Networks, Flight Dynamics, System Identification, Controls, Vibration Control

Brief Description of on-going activities

Department is involved in various research activities in different fields namely; Composite & Smart Structures Structural Dynamics & Aeroelasticity Design & Development of MR-fluid damper. Analysis of aerospace Structures using DQM, DTFM, FEM Nanomaterials and nanomechanics. Development of reconfigurable autonomous air vehicle. Lunar gravity modeling, topography modeling and orbit determination for the Chandrayaan-I. Fault tolerant and reconfigurable architecture development for the automotive. Real time system identification, system identification using neural sensitivity analysis. Fault detection and identification for aircraft. Low Reynolds number airfoils for micro air vehicles. Analysis of High Reynolds number three dimensional flows. Supersonic and hypersonic flows for various configurations. Development of micro-aerial vehicles

Thrust Areas

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

Lectures by Visiting Experts

1. Topic1 by Prof. Yoshi Sugiyama (Department of Mechanical and Space Engineering, Faculty of Science and Technology, Ryukoku University, Japan.)

Doctoral and MS Degrees Awarded

1. M. Pandit : An Improved plate model for static, vibration and buckling response of sandwich laminates having random material properties (Ph.D.)
2. Haraprasad Roy : Study of Dynamics of Viscoelastic Rotors- A Finite Element Approach (Ph.D.)
3. Sintu Singh : Large Eddy Simulation of the wakes of rigid and elastic cylinders at low speeds (Ph.D.)
4. Santanu Mitra : Finite element analysis of liquid sloshing in rigid and elastic containers with internal components and flow-induced vibration (Ph.D.)

Member - Editorial Board

1. Bandyopadhyay, Gautam (2005) *Member, Editorial Board*
- Journal of Aerospace Sciences and Technologies, India
2. Datta, Prosun Kumar (2008) *Editorial Board*
- Int.J.of Korean Society of Aerospace Engineering
3. Datta, Prosun Kumar (2008) *Editorial Board*
- International J. of Structural Stability and Dynamica
4. Ghosh, Amit Kumar (2005) *Member of International Editorial Board*
- Journal of Wind & Engineering
5. Pradhan, Suresh Chandra (2008) *Member, Editorial Board of Journal*
- International Journal of Vehicle Structures Design Analysis and Optimisation (IJVSDAO)
6. Pradhan, Suresh Chandra (2008) *Member, Editorial Board of Journal*
- International Journal of Emerging Technologies and Applications in Engineering Technology and Science

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A Study of Wind Movements during Downburst in a Thunderstorm	DST, New Delhi	Rs. 19.62 Lakhs
2.	Aerodynamic Investigation of Smart Flying Wing MAV	Asian Office of Aerospace R&D, Japan,	Rs. 9.35 Lakhs
3.	Aeroelastic Analysis of a Lifting Surface Employing Active Fiber Composite Under Hygro-Thermal Environment	Aeronautics R&D Board,	Rs. 8.96 Lakhs
4.	Aeroelastic Tailoring of a Composite Lifting Surface Using Smart Structures Concept	SRIC IIT-Kharagpur	Rs. 3.00 Lakhs
5.	Axisymmetric and Non-Axisymmetric, subsonic and supersonic jet aerodynamics/aeroacoustics using the three-dimensional navier-stokes/euler coupled simul	Aeronautical Research & Development Board,	Rs. 3.44 Lakhs

6.	Boeing University Relations, IIT Kharagpur-Campus Engagement Plan	Boeing Co., USA,	Rs. 14.40 Lakhs
7.	Centre of Excellence for Composite Structures Technology Phase II (FCX)	ARDB,	Rs. 75.90 Lakhs
8.	Development of a three-dimensional unsteady implicit hypersonic viscous turbulent flow solver on an unstructured grid	DRDL,	Rs. 9.77 Lakhs
9.	Dynamic Characteristics of thermally post-buckled composite panels embedded with SMA Fibers	DRDO, ER&IP New Delhi	Rs. 8.52 Lakhs
10.	Dynamic Instability Behaviour of Aerospace Structures under Follower Loading	AR&DB,	Rs. 7.00 Lakhs
11.	Experimental and numerical investigation of flow past two dimensional arbitrary body geometries at subsonic and supersonic speeds	ISIRD, SRIC, IIT Kharagpur	Rs. 3.00 Lakhs
12.	Finite element analysis of the FGM cone nozzle	ISIRD, SRIC, IIT Kharagpur	Rs. 2.10 Lakhs
13.	FIST Program, Department of Aerospace Engineering (FAE)	DST, New Delhi,	Rs. 105.00 Lakhs
14.	Intelligent Flight Control System	ISIRD, SRIC, IIT Kharagpur	Rs. 3.00 Lakhs
15.	Intelligent Hybrid Flight Control Design	AR&DB,	Rs. 6.00 Lakhs
16.	LES Simulation of High Speed Reacting Flow in Scramjet Combustion Flowfield	DRDL, Hyderabad,	Rs. 9.75 Lakhs
17.	Least square finite element analysis of adhesively bonded joint	AR&DB Structures panel DRDO,	Rs. 4.45 Lakhs
18.	Lunar Gravity Model and Topography Determination Using Ground Based Observations and Laser Altimetry Data	ISAC, Bangalore (ISRO)	Rs. 8.00 Lakhs
19.	Non-linear response of piezoelectric laminated composite panels under different loading conditions with uncertain system properties	SRIC, IIT Kharagpur	Rs. 1.64 Lakhs
20.	Nonlinear vibration study of smart composite plate with random system properties in random hygrothermal environments	ARDB, New Delhi,	Rs. 8.00 Lakhs
21.	Numerical and Experimental Investigation of Low Reynolds Number Flow past Airfoils for Flying Wing Micro Air Vehicle	AR&DB,	Rs. 8.95 Lakhs
22.	Reconfigurable Autonomous Air Vehicle	Technology Information, Forecasting and Assessment Council (TIFAC)	Rs. 10.00 Lakhs
23.	Reconfigurable Flight Control Design	ER&IPR (DRDO),	Rs. 9.89 Lakhs
24.	Research Activity in Computational Fluid Dynamics	M/S Hypercomp Inc. California, USA,	Rs. 6.40 Lakhs
25.	Setting up of AR&DB's associate centre for CFD at IIT Kharagpur	Aeronautical Research & Development Board,	Rs. 23.20 Lakhs
26.	Studies on Initiation and Propagation of Damage in Smart Composite Plates and Shells	SRIC	Rs. 2.80 Lakhs

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|-----|---|--|----------------|
| 27. | Three dimensional unstructured grid generation for viscous flow computation about complex configuration using computational geometric technique | Defence Research & Development Laboratory, | Rs. 9.20 Lakhs |
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Consultancy Projects

- | | | | |
|----|--------------------------------|----------|----------------|
| 1. | Selection Process Examinations | Airlines | Rs. 1.25 Lakhs |
|----|--------------------------------|----------|----------------|

Visits Abroad by Faculty Members

- | | | | |
|----|-------------------------|---|--|
| 1. | Singh, Bhriugu Nath | - | Presented the research paper in the International Conference (ICTAM 2008) (University of Adelaide, Australia) August 25-29, 2008 |
| 2. | Pradhan, Suresh Chandra | - | participate in international conference (Singapore) one week |
| 3. | Roy, Arnab | - | Recipient of DAAD Fellow Research Scientist Award in 2008; visit was for Research and collaboration (Shock Wave Laboratory, RWTH Aachen, Germany) 2 months |
| 4. | Singh, Navtej | - | Part of an Indian Delegation to participate in the CRIAQ Research Forum and the associated events (Montreal, Canada) 13-04-2008 to 20-04-2008 |

Invited Lectures by Faculty Members

- | | |
|----|---|
| 1. | Analysis of Laminated Sandwich Plate using an Improved Higher order Zigzag Theory by Singh, Bhriugu Nath (Dept. of Ocean Engineering and Naval Architecture, IIT Kharagpur) |
| 2. | FE analysis of Laminated Sandwich Plates by Singh, Bhriugu Nath (MNNIT, Allahabad, India) |
| 3. | Advanced Composites and Smart Structures by Maiti, Dipak K (NIT, Rourkela) |
| 4. | Numerical Investigation of Low Reynolds Number Flow Past Airfoils for Flying Wing MAV by Roy, Arnab (INDUS-MAV Workshop, NAL and ADE Bangalore) |

Short-Term Courses, Training Programmes and Workshops organized

- | | | |
|----|--|---------------------------|
| 1. | Academic Programme for HAL Trainees | (28.07.2008 - 30.11.08) |
| 2. | Aerospace Engineering Programme for Aerospace Undergraduate Students of Chosun University, Korea | (June 23 - July 02, 2008) |
| 3. | HAL Design Program for Aircraft Engineering, Avionics and Manufacturing | (January to April 2008) |

DEPARTMENT OF AGRICULTURAL & FOOD ENGINEERING

HEAD : Professor Rajendra Singh

FACULTY

Professors

Bal, Satish	Ph.D. (IIT Kharagpur), Food Process Engineering, Post Harvest Engineering
Banerjee, Rintu	Ph.D. (IIT Kharagpur), Microbial, Food and Environmental Biotechnology
Bhadoria, P B Singh	Ph.D. (IIT Kharagpur), Plant Nutrition and Rural Development
Das, Hrishikes	MS (Umass Amherst, USA), Food and Dairy Engineering
Das, Susanta Kumar	Ph.D. (IIT Kharagpur), Mechanised Food Processing
Datta, Ashis Kumar	Ph.D. (Pennsylvania), Dairy and Food Process Engineering
Ghosh, Bijoy Chandra	Ph.D. (IIT Kharagpur), Soilless culture, Organic farming, Tea production and processing, Agronomy of medicinal and aromatic plants
Goswami, Tridib Kumar	Ph.D. (IIT Kharagpur), Food processing and preservation, cryo freezing, transportation and grinding, potato cold storage, CA and MA storage of fruits and vegetables
Mal, Bimal Chandra	Ph.D. (IIT Kharagpur), Aquacultural Engineering, Soil and Water Conservation Engineering
Mishra, Hari Niwas	Ph.D. (IIT Kharagpur), Food Science and Technology, Health Foods and Nutraceuticals, Novel Food Processing Technologies
Panda, Rabindra Kumar	Ph.D. (IARI, Delhi), Soil and Water Engineering, Water Management
Panda, Sudhindra Nath	Ph.D. (PAU, Ludhiana), Water Management, Rainwater Conservation and Recycling
Pandey, Keshaw Prasad	Ph.D. (IIT Kharagpur), Tractor power systems, Traction modeling, Precision agriculture
Prasad, Suresh	Ph.D. (IIT Kharagpur), Post Harvest Process and Food Engineering, Microwave Applications in Food Processing
Raghuwanshi, Narendra Singh	Ph.D. (California), Water Management, Hydrological Modelling
Singh, Rajendra	Ph.D. (IIT Kharagpur), Hydrological Modelling, Irrigation System Management
Tewari, Virendra Kumar	Ph.D. (IIT Kharagpur), Tractor System Design, Ergonomics and Industrial Safety
Tiwari, Kamlesh Narayan	Ph.D. (IARI, Delhi), Land and Water Resources Engineering and Management, Pressurized Irrigation, RS and GIS Application in Hydrology and Watershed Management

Associate Professors

Das, Bhabani Sankar	Ph.D. (Kansas), Soil Science, Soil Physics and Soil Hydrology
Dutta Gupta, Snehasish	Ph.D. (Kalyani University), Plant Biotechnology
Jha, Madan Kumar	Ph.D. (Japan), Groundwater Management using RS and GIS, Basin-wide Groundwater Modeling, Inverse Modeling for Aquifer Parameter Estimation, Subsurface Flow and Transport Modeling, Integrated Water Resources Management

Majumdar, Gautam Chandra	Ph.D. (IIT Kharagpur), Post Harvest Engineering, Food Engineering, Agri. Systems Management
Mallick, Nirupama	Ph.D. (BHU, Varanasi), Algal Biotechnology, Stress Physiology
Mitra, Adinpunya	Ph.D. (East Anglia, UK), Applied Botany, Natural Product Biotechnology (Plant Phenolics), Metabolic Phytochemistry & Molecular Biology
Mitra, Arunabha	Ph.D. (Calcutta University), Ecology and Environmental Pollution, Waste Utilization in Aquaculture, Chemical-free Farming, Mind and Consciousness, Stress Management and Control
Raheman, Hifjur	Ph.D. (Bangkok), Development of combi-implements, Production and utilisation of biodiesel for green electricity generation
Thomas, E V	Ph.D. (IIT Kharagpur), Farm Machinery and Power, Tea Processing Machinery

Assistant Professors

Chatterjee, Chandranath	Ph.D (IIT Kharagpur), Flood Forecasting, Design Flood Estimation, Flood Inundation Modeling and Hazard Assessment, Remote Sensing and GIS Applications in Surface Water Hydrology, Hydrological Modeling
Das, Madhusweta	Ph.D. (Jadavpur University), Macromolecular Science and Engineering
Guha, Proshanta	Ph.D. (IIT Kharagpur), Agronomy, Post-harvest Technology, Forest and Wasteland Management, Weed and Water Management
Mishra, Ashok	Ph.D. (IIT Kharagpur), Watershed-Water resources development and management, Climate forecast applications, Crop yield modeling
Mukherjee, Chanchal Kumar	MS (New Jersey), Fisheries and Aquacultural Engineering
Shrivastava, Shanker Lal	Ph.D. (IIT Kharagpur), Post Harvest Engineering / Dairy & Food Engineering
Srinivasa Rao, Pavuluri	Ph.D. (IIT Kharagpur), Post Harvest Engineering, Aquacultural Engineering, High Pressure Processing of High Value Commodities, Processing of Medicinal Crops, Recirculatory Aquaculture Systems
Srivastav, Prem Prakash	Ph.D. (IIT Kharagpur), Food Science and Technology
Swain, Dillip Kumar	Ph.D. (IIT Kharagpur), Agronomy for sustainable agriculture, Climatic risk assessment on crops, Crop modeling and simulation

Senior Lecturer

Moulick, Sanjib	Ph.D. (IIT Kharagpur), Water quality modeling and management, Biofiltration technology, Aeration system, Recirculating aquaculture system
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Senior Scientific Officer

Singh, Manindra Nath	Ph.D. (BHU, Varanasi), Entomology, Grain Storage, Plant Protection
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Emeritus Professor, SRIC

Prof. Satish Bal	Ph.D., Food Process Engineering, Post Harvest Engineering
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Emeritus Professor

Prof. Suresh Prasadz

Ph.D., Food Process Engineering, Post Harvest Engineering

Prof. Hrishikes Das

MS (Umass Amherst, USA), Food and Dairy Engineering

Prof. P. K. Chattopadhyay

Ph.D., Agricultural and Food Engineering

Faculty Resignation

Dr. Nandita Kar

Scientific Officer

Brief Description of on-going activities :

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

Thrust Areas

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

New Acquisitions

1. UV-Vis Spectrophotometer, UV-1800, Shimadzu, Japan
2. Halogen Moisture Analyzer
3. UV detector for HPLC - Thermo Fisher, Germany
4. DS-5 HYDROLAD, Datalogger for measurement of temp, pH, DO, ammonia, barometric pressure, HACH

International Collaborations

1. Technical University of Braunschweig, Germany

2. Department of Geoinformatics, Geohydrology and Modeling, Friedrich-Schiller-University, Jena, Germany
3. Yamaguchi University, Japan
4. Biosystems Engineering Department, College of Agriculture, Sam Ginn College of Engineering, Auburn University, USA
5. Institute of Water Resources Management, Hydrology and Agricultural Hydraulic Engineering, Leibniz University Hannover, Germany
6. ALTERRA-Centre for Water and Climate, Wageningen University, The Netherlands

Lectures by Visiting Experts

1. Cut off strategy for surface irrigation using sensor based cellular communication system and inverse solution modeling --response surface methodology *by* Mr. Rajat Saha (Department of Biological and Agricultural Engineering, University of California, Davis, USA)
2. Bioretention technology for environmental management *by* Dr. Surya Pandey (Waikato Institute of Technology, Hamilton, New Zealand)
3. Water networks *by* Prof. Iven Mareels (Dean of the Melbourne School of Engineering, Australia)
4. Australias water resources *by* Prof. H.M.Malano (Civil Engineering Department, University of Melbourne, Australia)
5. An overview of second and third generation biofuels *by* Dr.G.S. Murthy (Sustainable Technologies Laboratory, Oregon State University, Oregon, USA)
6. Extrusion processing-An advanced technology for transformation of ---expanded microstructures *by* Dr. Sajid Alavi (Dep. of Grain Science and Industry, Kansas State University, Manhattan, USA)
7. Harmonizing economics and environmental uses in Krishna basin, India *by* Dr. Brian Davidson (Civil Engineering Department, University of Melbourne, Australia)

Doctoral and MS Degrees Awarded

1. Jippu Jacob : Design and Performance of Hexagonal Flighted Trommels for Size Classification (Ph.D.)
2. Krishna Narayan Dewangan : Work Stress Investigations on Hand Tractor Operators (Ph.D.)
3. P.I. Lakhichand : Development of Cereal Based Ready-To-Eat Snack Food (Ph.D.)
4. Yashwant Prabhakar Khandetod : A Study on Vibration Assisted Drying of Parboiled Paddy (Ph.D.)
5. Bhabatarini Panda : Accumulation of Polyhydroxy alkanates in a Unicellular Cyanobacterium *Synchocystis* sp. PCC 6803 (Ph.D.)
6. P. Anand Kumar : Quality Evaluation of Paddy / Rice by Digital Image Processing (Ph.D.)
7. P. K. Nema : Modelling and Simulation of Fouling in Helical Tube Ultra High Temperature (UHT) Milk Sterilizer (Ph.D.)
8. Aditi Bhadra : Development and Application of an Integrated Reservoir-based Canal Irrigation Model (Ph.D.)
9. Akhilesh Kumar Singh : Accumulation of a Novel Short-Chain-Long-Chain-Length Polyhydroxyalkanoate Co-Polymer In a Sludge-Isolated *Pseudomonas aeruginosa* MTCC 7925 (Ph.D.)
10. Sudhamoy Mondal : Biochemical Characterization of Induced Defence in Tomato against *Fusarium oxysporum* F. Sp. *Lycopers* (Ph.D.)
11. Brijesh Srivastava : Experimental Studies on Bleaching (Adsorption Process) Crude Sunflower Oil Using Adsorbents Made from Industrial Wastes (Ph.D.)
12. Chandra Shekhar Sahay : Development of a Power Tiller Operated Oscillatory Tillage Implement for North Eastern Hilly Region of India (Ph.D.)
13. Soumen Palit : Comparative Assessment of Organic and Inorganic Sources of Fertilizer on Productivity and Quality of Tea (Ph.D.)

14. Moumita Chakraborty : Phytochemistry of Phenylpropanoid-derivatives from Mesocarp Tissues and Endosperm Cell Cultures of *Cocos nucifera* (Ph.D.)
15. Jatindra Kumar Sahu : Process and Machinery Development for Production of Sandesh An Indian Dairy Product (Ph.D.)
16. Parag Prakash Sutar : Combined Osmotic and Microwave Vacuum Dehydration of Carrots (Ph.D.)
17. Annapurna Kumari : Production, Immobilization and Application of Lipases in Organic Synthesis (Ph.D.)
18. Ranjan Kumar Nanda : Tanin Chemistry of *Terminalia chebula* and *Caesalpinia digyna*: Evaluation of Bioactive Potential (Ph.D.)
19. Arnab Bandyopadhyay : Temporal and Spatial Trends of Reference Evapotranspiration in Agro-Ecological Regions of India (Ph.D.)

Fellow - Professional Bodies

1. Jha, Madan Kumar (2008) *Awarded* - Indian Water Resources Society (IWRS), Roorkee, India

Member - Editorial Board

1. Banerjee, Rintu (2009) *Editorial Board Member of The Open Systems Biology Journal, 2009*
- The Open Systems Biology Journal, 2009
2. Banerjee, Rintu (2005) *Editorial Board*
- Bioresource Technology
3. Bhadoria, P B Singh (2006) *Editorial Board Member*
- International Journal of Agricultural Research
4. Bhadoria, P B Singh (2006) *Editorial Board Member*
- Asian Journal of Earth Sciences
5. Das, Hrishikes (2005) *Editor*
- Journal of Food Science Technology
6. Dutta Gupta, Snehasish (2007) *Editorial Board Member*
- International Journal of Agricultural Research
7. Dutta Gupta, Snehasish (2008) *Editorial Board Member*
- Functional Plant Science and Biotechnology
8. Dutta Gupta, Snehasish (2008) *Editorial Board Member*
- Asian and Australian Journal of Plant Science and Biotechnology
9. Goswami, Tridib Kumar (2006) *Member*
- Journal of Applied Sciences Research (International)
10. Goswami, Tridib Kumar (2006) *Member of the Editorial Board*
- Food Processing Technology
11. Jha, Madan Kumar (2008) *Associate Editor*
- International Agricultural Engineering Journal
12. Mishra, Hari Niwas (2008) *Member Editorial Board*
- J Food Science & Technology
13. Mishra, Hari Niwas (2008) *Member, Editorial Board*
- Fresh Produce
14. Mishra, Hari Niwas (2008) *Member Editorial Board*
- Indian Food Industry
15. Mishra, Hari Niwas (2008) *Member, Editorial Board*
- Food
16. Mishra, Hari Niwas (2008) *Member, Editorial Board*
- Indian Food Packer
17. Mishra, Hari Niwas (2009) *Guest Editor, Special Issue on Tea & Tea Products*
- Fresh Produce
18. Mishra, Hari Niwas (2009) *Guest Editor, Special Issue on RTE Health Foods, Snacks & Energy Drinks*
- Food

19. Mitra, Arunabha (2008) *Editor*
- Journal of Aquaculture in the Tropics
20. Raghuvanshi, Narendra Singh (2006) *Advisory Editorial Board*
- Irrigation Science

Awards & Honours

1. Jha, Madan Kumar (2009) *"K.C. Das Memorial Award", The Institution of Engineers (India), Orissa State Center, Bhubaneswar*
2. Jha, Madan Kumar (2008) *"Shankar Memorial Award", Indian Society of Agricultural Engineers (ISAE), New Delhi*
3. Mitra, Adinpunya (0) *Awarded Bilateral Exchange Fellowship of INSA (India) - DFG (Germany)*
4. Mitra, Adinpunya (0) *Awarded Commonwealth Scholarship in United Kingdom for doctoral research*
5. Mitra, Adinpunya (2008) *Awarded DAAD Scholarship for University Academics in Germany*
6. Mitra, Adinpunya (0) *Awarded Young Scientist Research Grant from International Foundation for Science (IFS), Sweden*
7. Mitra, Adinpunya (0) *Awarded Young Scientist Travel Fellowship from XVII-International Botanical Congress, Austria*
8. Panda, Sudhindra Nath (2009) *Institution Award by The Institution of Engineers (India), Orissa State Centre, Bhubaneswar*
9. Goswami, Tridib Kumar (2008) *Received best paper award in ISAE -2008.*

Fellowships

1. Jha, Madan Kumar (2009) *JSPS Invitation Fellowship (Long-Term)*
2. Mitra, Adinpunya (2008) *DAAD Scholarship for University Academics*
3. Panda, Sudhindra Nath (2008) *DAAD Fellowship on Disaster Management*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	AICRP on Ergonomics & Safety in Agriculture (ESA)	ICAR, New Delhi	Rs 194.10 Lakhs
2.	AICRP on Farm Implements & Machinery (FIM)	ICAR, New Delhi	Rs 95.91 Lakhs
3.	All India Coordinated Research Project on Post Harvest Technology	(Indian Council of Agricultural Research (ICAR), New Delhi	Rs 300.00 Lakhs
4.	Analysis of Climate Change and its Impact on Flood and Drought in a River Basin	Sponsor Research and Industrial Consultancy (SRIC), IIT Kharagpur	Rs. 3.15 Lakhs
5.	Application of Image Processing Technology for Quality Assessment of Food Material	Ministry of Food Processing Industries, New Delhi,	Rs. 39.50 Lakhs
6.	Assessment of non-point source pollution of soil & water resources using the AVSWAT model in an agricultural watershed in Eastern India	DST, India and DFG, Germany	Rs. 4.70 Lakhs
7.	BioCO ₂ : An integrated multidisciplinary project using solar energy for production of renewable hydrogen combined with CO ₂ capture, to address global wa	Indo-Norwegian-Sweedish Collaborative Research Project,	Rs. 0.00 Lakhs
8.	Biodiversity characterization at landscape level using satellite remote sensing and GIS for state of J & K (Kargil district and part of Leh (Ladakh)).	National Remote Sensing Agency (NRSA)	Rs 2.80 Lakhs

#	Title of the Project	Sponsor(s)	Amount
9.	Biodiversity characterization at landscape level using satellite remote sensing and GIS for state of U.P. (except Vindhyan districts).	National Remote Sensing Agency (NRSA)	Rs. 19.29 Lakhs
10.	Biosoftening of Stem	ITC,	Rs. 37.00 Lakhs
11.	cDNA cloning and functional expression of a p-hydroxybenzaldehyde dehydrogenase from hairy roots of <i>Daucus carota</i>	CSIR, New Delhi	Rs. 5.56 Lakhs
12.	Cost-effective PLA production and its applications	DBT, New Delhi,	Rs. 21.76 Lakhs
13.	Design and Development of a Novel Low Cost Gravity Aeration System	DST, New Delhi,	Rs. 23.89 Lakhs
14.	Design optimum size of rainwater harvesting and recycling structure for diversified cropping system in rainfed upland ecosystem of eastern India	CSIR	Rs. 7.76 Lakhs
15.	Development of an automatic vegetable transplanter with technology for paper pot seedlings	Council of Scientific and Industrial Research	Rs. 12.94 Lakhs
16.	Development of combined tillage implement for improving performance of tractor-implement combination	CSIR	Rs. 9.82 Lakhs
17.	Development of criteria and indications for sustainable forest management in Sunderban mangrove forest under joint forest management	CSIR, New Delhi	Rs. 3.00 Lakhs
18.	Development of process technology for invitroenzymatic detoxification of food infected with aflatoxin B1 using horse radish peroxidase enzyme	Department of Science & Technology, New Delhi	Rs. 5.26 Lakhs
19.	Development of process technology for manufacture of cereal-fruit based extruded snack foods	ISIRD, SRIC, IIT Kharagpur	Rs. 3.00 Lakhs
20.	Development of Prototype for Semi-continuous Production of Paneer	National Dairy Development Board, Anand	Rs. 5.25 Lakhs
21.	Development of ready to eat snacks from low value under utilized marine fishes	ISIRD,	Rs. 2.40 Lakhs
22.	Development of Recirculatory Aquaculture System based on Bioremediation and Integrated Bioplastic Production	Department of Biotechnology,	Rs. 26.37 Lakhs
23.	Development of starch based products from <i>Curcuma leucorrhiza</i> (Palo) (All India Coordinated Research Project on Post Harvest Technology,	ICAR, New Delhi	Rs. 0.00 Lakhs
24.	Development of Technology for Enzymatic Treatment of Rice	Indian Council of Agricultural Research	Rs. 18.00 Lakhs
25.	Development of technology for production of ready-to-eat health foods / snacks and energy drinks	Ministry of Food Processing Industries, Govt. of India, New Delhi	Rs. 29.00 Lakhs
26.	Development of Volatile Compound Based Biosensor 2008 onwards 15.5	DST, New Delhi	Rs. 11.80 Lakhs
27.	Distributed hydrological modeling to analyse sediment and nutrient status of Brahmani-Baitrani delta	SAC, Ahmedabad (ISRO),	Rs. 20.83 Lakhs
28.	Distributed Hydrological Modelling to Analyse Sediment and Nutrient Status of Brahmani-Baitarani Delta	SAC, Ahmedabad	Rs. 20.18 Lakhs
29.	DST-FIST Project for Strengthening Teaching and Research in WRDM	DST	Rs. 78.00 Lakhs
30.	Elucidating fragrant methoxybenzaldehyde biosynthesis in hairy / normal root cultures of <i>Hemidesmus indicus</i>	BRNS	Rs. 21.66 Lakhs

#	Title of the Project	Sponsor(s)	Amount
31.	Enhancing research capacity for undertaking Masters & Doctoral Programmes in Food Science & Technology	Department of Biotechnology, Government of India, New Delhi,	Rs.838.00 Lakhs
32.	Evaluation of competitive diffusive mass transfer and degradation kinetics of lignin, humic substances and xenobiotic compounds in agroresidues and li	MHRD	Rs. 10.00 Lakhs
33.	Experimental Agrometeorological Advisory Service Unit (AAS)	Department of Science & Technology, New Delhi,	Rs. 0.00 Lakhs
34.	FIST Project in Water Resources Development & Management,	DST	Rs. 78.00 Lakhs
35.	Flood Hazard Mapping & Flood Risk Zoning for a River Reach	ISIRD, SRIC, IIT Kharagpur,	Rs. 3.00 Lakhs
36.	Flood risk modelling using satellite remote sensing data for optimal crop planning	Space Application Center, Ahmedabad,	Rs. 10.78 Lakhs
37.	Food Testing Laboratory	MOFPI, New Delhi,	Rs.220.00 Lakhs
38.	Fully Biodegradable Starch Based Film for Making Carry Bag and Edible Food Packaging	Ministry of Environment and Forest	Rs. 10.07 Lakhs
39.	Geo-spatial resources management with computer simulation of flood inundation for Mayurakshi and Ajoy river basins using RS and GIS	DST, New Delhi	Rs. 13.77 Lakhs
40.	Hydrological modeling of a watershed to evaluate impacts of watershed structures on surface flow & groundwater recharge	DST, New Delhi	Rs. 19.33 Lakhs
41.	Identification, Quantification and Control of Non point source pollution of water resource in Agril Lands	Ministry of Water Resources, Govt. of India,	Rs. 57.80 Lakhs
42.	Imaging photosynthesis of the micropropagated plants	DST-JSPS	Rs. 4.50 Lakhs
43.	Impact Assessment of NREGA in 2-Districts of West Bengal (IAW)	Ministry of Rural Development	Rs. 7.00 Lakhs
44.	Impact of climate change on rice yield of West Bengal: A field experiment and simulation study	SRIC, IIT, Kharagpur	Rs. 2.60 Lakhs
45.	Land use land cover (LULC) dynamics in relation to human dimension and climate in Mahanadi river basin, Orissa	National Remote Sensing Centre (NRSC)	Rs. 12.80 Lakhs
46.	Low-cost production of [P(3HB-co-3HV)] co-polymer from cyanobacteria and exploring its biomedical applications	CSIR, New Delhi	Rs. 11.50 Lakhs
47.	Mechanised Food Engineering	IIT Kharagpur	Rs. 5.00 Lakhs
48.	Microwave Assisted Hot Air and Vacuum Drying of Fruits and Spices	Ministry of Food Processing Industries Govt. of India, New Delhi	Rs. 29.00 Lakhs
49.	Modeling the performance of a few major cropping systems in eastern India in the light of projected climate change	National Agricultural Innovation Project, ICAR, New Delhi	Rs. 38.77 Lakhs
50.	National Vegetation Carbon Pool Assessment	Sponsored by Indian Institute of Remote Sensing, Dept. of Space, Dehradun,	Rs. 10.00 Lakhs
51.	Precision Farming Development Centre	National Committee on Plasticulture Application in Horticulture, Min. of Agriculture, Govt. of India,	Rs. 50.00 Lakhs

#	Title of the Project	Sponsor(s)	Amount
52.	Precision Farming Technologies Based on Microprocessor and Decision Support Systems for Enhancing Input Application Efficiency in Production Ag.	ICAR, NAIP, New Delhi,	Rs. 46.49 Lakhs
53.	Process development and enrichment of vermicompost and its assessment in tea rhizosphere grown at two different altitudesc	NTRF, Tea Board, Kolkata,	Rs. 10.63 Lakhs
54.	Processing and value Addition to Basmati Rice	L.T. Overseas Limited	Rs. 1.00 Lakhs
55.	Processing of Kinnow, apple, pomegranate juice	ICAR, New Delhi	Rs. 19.68 Lakhs
56.	Production and performance evaluation of biodiesel from tree based oils (with high free fatty acids) and their mixtures	Petroleum Conservation Research Association, Ministry of Petroleum & Natural Gas, Govt. of India	Rs.11.62 Lakhs
57.	Proposed Framework For Implementing Work Package, 5 Consisting of Intervention Analysis At IIT, Kharagpur	International Water management Institute, Sri Lanka	Rs. 10.00 Lakhs
58.	Purification and characterization of glycosidic conjugates from Bryophyllum pinnatum for their anti diabetic, antioxidant and anti-tyrosinse activity	CSIR	Rs. 1.52 Lakhs
59.	Rapid control atmosphere storage of fruits	Ministry of Food Processing Industries	Rs. 48.00 Lakhs
60.	Rural Technolgy action group RuTAG	PSA, GOI	Rs. 30.00 Lakhs
61.	Screening of aloe vera germplasms for cosmetic gel and micropropagation of elite clones	Department of Science & Technology,	Rs. 15.00 Lakhs
62.	Simulation of regional salt and water balance in an irrigated area of semi-arid region	DST-DAAD	Rs. 3.85 Lakhs
63.	Standardization of Process Parameters in Tea	Tea Board, Kolkata	Rs.366.00 Lakhs
64.	Standardization of process parameters in withering, maceration, rolling, fermentation and drying of tea	Tea Board, Govt. of India, Kolkata,	Rs.366.96 Lakhs
65.	Standardization of process parameters in withering, maceration, rolling, fermentation and drying of tea	Tea Board, Govt. of India, Kolkata	Rs.366.96 Lakhs
66.	Studies on Cryogenic Grinding for Retention of Flavour and Medicinal Properties of Some Important Indian Spices	(NAIP, ICAR (World Bank funded project),	Rs. 90.10 Lakhs
67.	Studies on High Pressure Processing (HPP) of High Value Perishable Commodities	National Agricultural Innovation Project, ICAR, New Delhi	Rs.464.87 Lakhs
68.	Study of Boundary Layer Characteristics during occurrence of Severe Thunderstorm	Department of Science and Technology	Rs. 46.00 Lakhs
69.	Tagatose : a low calorie sweetener	Ministry of Food Processing Industry	Rs. 69.50 Lakhs
70.	Techno-Economic Feasibility of Integrated Aquaculture Options within Irrigation Systems	Indian Council of Agricultural Research	Rs. 31.03 Lakhs

Consultancy Projects

#	Title of the Project	Sponsor(s)	Amount
1.	250 Kg tannery grade enzyme	Networks Export Pvt. Ltd.,	Rs. 2.00 Lakhs
2.	Aquatic Survey of Noamundi Iron Mine	The Tata Iron and Steel Company Ltd.	Rs. 3.00 Lakhs

3.	Assessment of Rice Mill Capacity	Rice Millers of Midnapur District,	Rs. 1.25 Lakhs
4.	Construction of Periphery Road in the Bharatiya Reserve Bank Note Mudran Pvt. Limited, Salboni	Bharatiya Reserve Bank Note Mudran Pvt. Limited, Salboni,	Rs. 10.00 Lakhs
5.	Cultivation and preservation of betel leaf	Amritashya Enterprises, Durgachak, Haldia, District: East Midnapore	Rs. 0.22 Lakhs
6.	Documentation & recommendation on adaptation of coping strategies for climate variability in Bolangir, Nuapada, Kalahandi and Bargarh Dist. of Orissa.	Western Orissa Rural Livelihoods Project (WORLP), Siripur, Bhubaneswar,	Rs. 1.20 Lakhs
7.	Educational and Design Software	Various	Rs. 0.00 Lakhs
8.	Evaluation of central sector schemes on oilseeds, pulses, oilpalm and maize	Agricultural Finance Corporation, New Delhi	Rs. 0.50 Lakhs
9.	Evaluation of probable maximum flood for Nagarjun Sagar Dam	Irrigat and CAD, AP	Rs. 28.00 Lakhs
10.	Evaluation study on activities of soil conservation department DVC	DVC, Hazaribagh,	Rs. 31.50 Lakhs
11.	Feasibility study and design of a radial collector well system for South Eastern Railway Kharagpur	S.E. Railway, Kharagpur,	Rs. 2.00 Lakhs
12.	Intervention analysis of the IGB basin focal project	IWMI, SriLanka	Rs. 0.00 Lakhs
13.	Milling quality & rice mill performance evaluation	Maa Tara Rice Mill, Chandrakona,	Rs. 0.05 Lakhs
14.	NREGA Work Evaluation for East Midnapore & Jhargram districts, W.B.	Ministry of Rural Development (MoRD)	Rs. 7.00 Lakhs Rs. 0.05 Lakhs
15.	Performance Evaluation	Midnapore Rice Mill	
16.	Probable maximum flood estimation for Nagarjunasagar Dam	SE, N.S. Dam Circle, Govt. of A.P.	Rs. 29.10 Lakhs
17.	Rain water Harvesting at Bharatiya Reserve Bank Note Mudran Pvt. Limited, Salboni campus, Salboni	Bharatiya Reserve Bank Note Mudran Pvt. Limited, Salboni,	Rs. 5.60 Lakhs
18.	Rainwater Harvesting	Guali Iron Ore Mines, Keonjhar, Orissa,	Rs. 2.81 Lakhs
19.	Rainwater harvesting at aluminium refinery, NALCO, Damanjodi	National Aluminium Company, Damanjodi,	Rs. 4.15 Lakhs
20.	Rainwater Harvesting at NALCO, Damunjodi, Orissa	NALCO, Orissa,	Rs. 4.30 Lakhs
21.	Rainwater Harvesting at UAL Bengal Campus	UAL, Bengal,	Rs. 1.12 Lakhs
22.	Rooftop Rainwater Harvesting	Nuagaon Iron Ore Mines, Keonjhar, Orissa,	Rs. 1.69 Lakhs
23.	Soil and Water Quality Management of Tata Steel	The Tata Iron and Steel Company Limited, Jamshedpur,	Rs. 5.29 Lakhs
24.	Solution for elimination of vegetation growth on the Buildings	JUSCO, Sakchi Boulevard Road Northern Town, Bistupu, Jamshedpur,	Rs. 0.22 Lakhs
25.	Study of Effect of Mining Activities on Surrounding Water Quality	Tata Steel, Noamundi,	Rs. 9.70 Lakhs
26.	Testing of Rice Mills in Midnapore District	Midnapore Rice Miller's Assn., Midnapore,	Rs. 0.50 Lakhs

27.	Testing the efficacy of controlled-release fertilizer multigro for different crops	Haifa Chemicals Ltd.	Rs. 14.50 Lakhs
28.	Utilization of unused and barren land	(Unitech Paper mills (PVT). LTD, 53A, Rafi Ahmed Kidwai Road, 3rd floor, Kolkata-700016	Rs. 0.02 Lakhs

Technology Transferred

1.	ASMA - Developing of training software for Sabai Grass based Product Development :		Rs. 4.00 Lakh
2.	Progressive Farmers, Entrepreneurs - Microirrigation and Protected Cultivation Technology :		Rs. 0.00 Lakh
3.	Potters of Lodhasuli (WB) - Paddle operated Potter's Whee :		Rs. 0.50 Lakh
4.	SODA, Orissa - Sal Leaves Plate & Sabai Grass Rope Making Machines :		Rs. 1.10 Lakh
5.	Midnapore Cult. & Welfare Assoc. (WB) - Sisal Leaf Fibre Making :		Rs. 0.10 Lakh
6.	Midnapore Cult. & Welfare Assoc. (WB) - Sugarcane Juice preservation :		Rs. 0.01 Lakh
7.	R K Mission, Belurmath (WB) - Sustainable Agril. with Low Cost :		Rs. 0.53 Lakh

Patents (filed / granted)

1. A Crustless Bread Baking Oven
2. A system for extraction of essential oil from plants/parts thereof bearing essential oil
3. Development of an integrated reservoir based canal irrigation model
4. Digital Slip Meter for 2-wheeled Drive Tractors
5. Improved Design of Pumping System for Hand Pumps
6. IRCIM Integrated Reservoir Based Canal Irrigation Model
7. Novel technique for production of soluble green tea powder and granules
8. Paddle operated Potter's Wheel
9. Process for Fish Scale Protein Concentrate as Adhesive
10. Process technology for manufacture of dahi (curd) powder
11. Rain Harvester : User-friendly software package for the planning, design and analysis of rainwater harvesting systems
12. Sensor for Automated Micro-irrigation System

Visits Abroad by Faculty Members

1.	Mitra, Adinpunya	Research stay (Technical University of Braunschweig, Germany) May 19 to July 16
2.	Ghosh, Bijoy Chandra	Participated in International Conference on Agricultural and Biological Engineering (Rhode Island) July 2008, 4 days
3.	Raghuwanshi, Narendra Singh	To co-author a book (University of Guelph) May 18-July18
4.	Dutta Gupta, Snehasish	Collaborative Project (Yamaguchi University) May 31 June 30, 2008
5.	Panda, Rabindra Kumar	For Oral Presentation of a Paper (Asian Institute of Technology, Bangkok) January 5-8, 2009
6.	Swain, Dillip Kumar	Participated in Second International Symposium on Food and water Sustainability in Asia 2008 (Macau, China) October 68, 2008
7.	Singh, Rajendra	Co-authoring a text book (University of Guelph, Canada) May 18 - July 18
8.	Panda, Sudhindra Nath	Disaster Management Programme under DAAD Fellowship (Leibniz University Hannover, Germany) May 626, 2008

9. Panda, Sudhindra Nath To present a paper in the ASABE Annual International Meeting (Providence, Rhode Island, USA) June 29 July 2, 2008
10. Mishra, Hari Niwas To attend Bilateral Meeting on Indo-Danish Education & Research Collaboration (Danish Agency of Science Technology & Innovation, Copenhagen) May 4-7
11. Mishra, Hari Niwas Member of Indian Delegation for interacting with Danish companies, Copenhagen University and DTU (Copenhagen, Denmark) November 9-12

Invited Lectures by Faculty Members

1. Hydrological measurements *by* Raghuwanshi, Narendra Singh (Hazaribagh)
2. Theoretical concepts of GIS *by* Raghuwanshi, Narendra Singh (DVC, Hazaribagh)
3. Decision support system for management and operation in canal command. *by* Raghuwanshi, Narendra Singh (Jabalpur)
4. Furrow irrigation modeling: Present and future *by* Raghuwanshi, Narendra Singh (Delhi)
5. Methodology for Rural Development *by* Bhadoria, P B Singh (Kolaghat, Engineering Collage)
6. Rural Technology Action Group *by* Bhadoria, P B Singh (Kalyani)
7. Wireless Sensor for Monitoring Micro Weather & for Management of Inputs in Precision Agriculture *by* Panda, Rabindra Kumar (Indian Institute of Management, Calcutta)
8. Development of roaster for ready to eat foods *by* Srivastav, Prem Prakash (NERIST, Nirjuli, Itanagar, Arunachal Pradesh)
9. Active and intelligent food packaging *by* Srivastav, Prem Prakash (NERIST, Nirjuli, Itanagar, Arunachal Pradesh)
10. Cold chain development in horticultural produce in India *by* Srivastav, Prem Prakash (NERIST, Nirjuli, Itanagar, Arunachal Pradesh)
11. Development of air recirculatory tray dryer for fruits and vegetables *by* Srivastav, Prem Prakash (NERIST, Nirjuli, Itanagar, Arunachal Pradesh)
12. Cost-Effective Methods for Sustainable Groundwater Management *by* Jha, Madan Kumar (New Delhi)
13. Development of an integrated reservoir based canal irrigation model *by* Singh, Rajendra (IIT Madras (DAAD-IIT Alumni Meet))
14. Drainage Planning - Optimization and Modelling Tools *by* Singh, Rajendra (State Water resources Agency, Lucknow)
15. Hydrological research at IIT Kharagpur *by* Singh, Rajendra (IIT Delhi (DST initiative on e-Hydrology))
16. Reservoir sedimentation survey *by* Chatterjee, Chandranath (DVC, Hazaribag)
17. Application of remote sensing and GIS in watershed and flood management *by* Chatterjee, Chandranath (DVC, Hazaribag)
18. Research and development activities related to Farm Machinery & Power in IIT Kharagpur *by* Raheman, Hifjur (M/s John Deere, Pune)
19. Production, processing and marketing of Betel leaf *by* Guha, Proshanta (TSR & TBK Degree & PG College, Visakhapatnam)
20. Role of Agril Engineering in the Sustainable Development of Indian Aquaculture for Food Security *by* Mal, Bimal Chandra (Rajendra Agricultural University, Pusa)
21. Techno-economic Feasibility of Integrated Agri-aquacultureA Case Study. *by* Mal, Bimal Chandra (Shillong, Indian Science congress)
22. Post Harvest Handling and Processing Tchnologies for Perishable Foods *by* Prasad, Suresh (G B Pant University if Agriculture and Technology, Pantnagar)
23. Innovations in Drying Technologies for Food Processing *by* Prasad, Suresh (Anand Agricultural University, Anand, Gujrat)

24. Reservoir Sedimentation and Treatment Plan in Upper DVC by Tiwari, Kamlesh Narayan (Soil Conservation Department, DVC, Hazaribagh, Jharkhand)
25. Fertigation and Chemigation by Tiwari, Kamlesh Narayan (IARI, New Delhi)
26. Automation in Microirrigation by Tiwari, Kamlesh Narayan (PFDC, UAS, GKVK, Bangalore)
27. Application of Remote Sensing in Land and Water Resources Management by Tiwari, Kamlesh Narayan (Institution of Engineers, IIT Kharagpur Local Centre, Kharagpur)
28. Automation in Protected Cultivation by Tiwari, Kamlesh Narayan (Precision Farming Development Centre, IIT Kharagpur)
29. Indo-US Bilateral Workshop on Post Harvest Technology, Cold Chain Management and Food Safety Issue by Prasad, Suresh (Amity University, Noida, Delhi)
30. Process and machinery development for production of Indian dairy foods by Das, Hrishikes (Panjim, Goa)
31. Food processing experimentation and drawing meaningful conclusions and Vacuum drying of foods by Das, Hrishikes (NERIST, Arunachal Pradesh)
32. Principles of food preservation by Das, Hrishikes (Kendriya Vidyalaya, IIT Kharagpur)
33. Vehicle Integration (06 Lectures) by Pandey, Keshaw Prasad (Mahindra & Mahindra Ltd Mumbai)
34. Tractor Design Trends in India by Pandey, Keshaw Prasad (IIT Kharagpur)

Books Published

1. Murty, V.V.N. and Jha, M.K.: Land and Water Management Engineering *published by* Kalyani Publishers, New Delhi (2009)

Seminars, Conferences and Workshops Organised

1. Efficient Rural Technology
2. Launching Workshop of NAIP Projects on HPP of High Value Perishables
3. National Meet on Tractor and Allied Machinery Manufacturers (TAMM-2008)
4. RuTAG NGOs
5. Workshop of Farm Implements and Machinery (FIM)

Short-Term Courses, Training Programmes and Workshops organized

1. Awareness on Plasticulture Technology (April 27, 2008)
2. Engineering & Management in Fisheries & Aquaculture (April 29 May 09)
3. Engineering Orientation Course for Fishery & Aquaculture Scientists Officers & Teachers (September 02-12)
4. Engineering Orientation Course for Fishery & Aquaculture Scientists, Officers and Teachers (September 02-12, 2008)
5. Greenhouse Technology for nursery management (August 28-29, 2008)
6. Industrial Safety Engineering for TATA Steel Officials (12.5.08-8.8.08)
7. Micro irrigation for Horticultural Crops (August 1920, 2008)
8. Micro-irrigation and greenhouse technology (December 0203, 2008)
9. National Resources Planning for Rural Livelihood in Murshidabad District, West Bengal (4 Days)
10. Precision Farming in Horticulture (November 1819, 2008)
11. Precision Farming Technology (December 29-30, 2008)
12. Precision Farming Technology for Floriculture (September 08-09, 2008)
13. Pressurized Irrigation (September 2324, 2008)
14. Protected Cultivation Technology (July 17-18, 2008)
15. Sprinkler and Micro Irrigation (July 2930, 2008)
16. Trainers Training Programme on Modern Rice Mill Operation & Maintenance (2 weeks)
17. Training Program on - 'Natural Resources Planning for Rural Livelihood in Murshidabad District, West Bengal (November 10-14, 2008)

DEPARTMENT OF ARCHITECTURE & REGIONAL PLANNING

HEAD : Professor Arif Noman Merchant

FACULTY

Professors

Banerjee, Uttam Kumar	Ph.D. (IIT Kharagpur)
Datta, Rabindranath	Ph.D. (IIT Kharagpur), Urban Planning, Transportation Planning
Merchant, Arif N	Ph.D. (Cincinnati, USA), Urban Design, City Planning, GIS in Planning
Sen Gupta, Biplab Kanti	MCP (IIT Kharagpur), Urban and Regional Planning, Architectural Design for Institutional Buildings

Associate Professors

Barman, Jaydip	Ph.D. (IIT Kharagpur), Urban Design, Urban Conservation, Planning for Tourism and Outdoor Recreation, Product Design, Barrier-free Environmental Design, Architectural and Interior Design
Basu, Sanghamitra	Ph.D. (IIT Kharagpur), Urban Conservation, Land Use Land Cover Dynamics
Chattopadhyay, Subrata	Ph.D. (IIT Kharagpur), Housing
George, Abraham	Ph.D. (Calicut University), Architectural Design and Interiors, Heritage Studies and Preservation Documentation, Architectural Pedagogy and Spatial Communication, Ergonomics and Product Design, Green Buildings, Landscape Design and Built form Studies
Sen, Joy	Ph.D. (IIT Kharagpur), Regional Infrastructure Planning and Settlement Dynamics, Architectural Heritage Studies, Community Livability Studies
Sen, Somnath	Ph.D. (IIT Kharagpur), Water Sensitive Urban Planning and Environmental Planning

Assistant Professors

Ahmed, Mokaddes Ali	Ph.D. (IIT Kharagpur)
Chakraborty, Banhi	Ph.D. (IIT Kharagpur), Planning and Technology Transfer
Dutta, Joydeep	MUP (Illinois), Graphic Design and Visual Communication, Decision Modelling for Retail Location
Majumdar, Tapan Kumar	MCP (IIT Kharagpur), Working environment in industries
Mazumder, Tarak Nath	Ph.D. (IIT Kharagpur), City Planning
Pandit, Debapratim	Ph.D. (University of Tokyo), Environmental Systems, Land Use and Transportation Planning, Transit Planning, GIS and Remote Sensing, Urban and Regional Planning, Real Estate Development
Paul, Saikat Kumar	MCP (IIT Kharagpur), Computer Application in Built Environment, GIS and Remote Sensing in Planning, Urban and Regional Planning, Architectural Design, Environmental Planning

Faculty Appointments

Dr. Abraham George	Associate Professor
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Faculty Resignation

Dr. Joydeep Dutta	Assistant Professor
Dr. Mokaddes Ali Ahmed	Assistant Professor

Brief Description of on-going activities

1. Building Science and Environmental Planning (Design Simulation and Intelligent Architecture, Building Automation and Management Systems, Sustainable Development, Energy Efficient Design, Appropriate Technologies, Spatial Environmental Planning, Eco-sensitive and Green Architecture)
2. Art and Architecture (Indian Traditional Architecture and Heritage studies, Vernacular Architecture, Design, Visual Communication, Visual Simulation, Product design and Industrial design)
3. Infrastructure and Spatial Planning (Transportation Planning, Traffic Engineering and Management, Hazards and Disaster Mitigation and Management, Urban Design, Eco-tourism, Recreation and Landscape Planning, Conservation and Preservation Studies, Housing and Shelter, Social Infrastructure)
4. Urban Information System and Planning (Urban Development Management and Finance, Advanced Planning Informatics, Geographical Information Systems, Decision support systems and Expert systems, Urban Settlement and Systems Dynamics)

Thrust Areas

1. Urban information system
2. Energy efficient building design

New Acquisitions

1. 10 licenses of DesignBuilder and EnergyPlus Building Energy simulation software from USAID ECO-III project

Lectures by Visiting Experts

1. Care Retirement Community Design by Shekhar Bhushan (SB-Architecture, P.C., Inc, Denver Colorado)

Doctoral and MS Degrees Awarded

1. Maiti Maitreyi Development Approach of a Metropolitan Fringe in Transition : Kolkata Metropolis (Ph.D.)

Fellow - Professional Bodies

1. Datta, Rabindranath (1998) Fellow - Institute of Town Planners India
2. Barman, Jaydip (2008) Jury Member of the Evaluation board for the overseas scholarship applicants - The Paul Foundation - Apeejay Surendra Group
3. Sen Gupta, Biplab Kanti (2000) Member - Institute of Town Planner
4. Sen, Somnath (2007) Nominated Fellow - Institute of Town Planners, India

Member - Editorial Board

1. Chattopadhyay, Subrata (2009) Associate Editor
- International Journal for Housing Science and its Applications
2. Dutta, Joydeep (2008) Guest Editor, Issue on Indian Architecture : The Green Heritage
- Electronic Journal of Indian Culture & Society
3. George, Abraham (2009) Reviewer - ICFAI Journal of Architecture
4. Sen Gupta, Biplab Kanti (2007)
Member of the Editorial Board - Spatio - Economic Development Record
5. Sen Gupta, Biplab Kanti (2007) Member of Editorial Board - ABACUS

6. Sen, Joy (2008) Committee Member & Editor-in-charge - ITPI Newsletter of WBRC-ITPI

Awards & Honours

1. Chattopadhyay, Subrata (2008) Plaque of Recognition presented by President IAHS for conducting 37th IAHS World Congress in India and contribution to the field of housing

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Development of Women Technology Park in Nayagram, Tribal Block, Paschim Medinipur, WB	Department of Science and Technology, New Delhi,	Rs. 24.71 Lakhs
2.	Environmental Impact of Coal Mines Closer and Ecological Rehabilitation of Mining Area of India and Romania	Department of Science and Technology, New Delhi,	Rs. 5.18 Lakhs
3.	Historical Evolution of India - An AV documentation (III Workshops completed between Feb 07 - July 08)	R.K.M. Institute of Culture, Gol Park,	Rs. 3.00 Lakhs
4.	National Programme for Capacity Building of Architects for Earthquake Risk Management	Ministry of Home Affairs, New Delhi,	Rs. 25.45 Lakhs
5.	Study of Ancillary Industry of POSCO-India	POSCO Research Institute	Rs. 21.00 Lakhs
6.	Technology Development and Transfer for Selected Medicinal Plants : Approach through T&D and Ex-situcultivation	National Medicinal Plants Board, New Delhi	Rs. 15.00 Lakhs

Consultancy Projects

1.	A Concept plan for Proposed Campus of Aliah University at Kolkata	Aliah University at Kolkata, Government of West Bengal	Rs. 0.35 Lakhs
2.	Administrative Office Building of Bankura Zilla Parishad	Bankura Zilla Parishad, West Bengal	Rs. 7.50 Lakhs
3.	Advisory Services for Development of New Campus for RGIIM, Shillong	Rajiv Gandhi Indian Institute of Management, Shillong,	Rs. 1.12 Lakhs
4.	Annexe Building of IIT Extension Centre, Salt Lake City, Kolkata	IIT Kharagpur,	Rs. 7.50 Lakhs
5.	Architectural Design and Drawing of Chawk Bazar Market Complex	Chairperson Bankura Municipality,	Rs. 5.00 Lakhs
6.	Architectural Design for New Academic Complex at Bankura Unnayani Institute of Engineering	Bankura Unnayani Institute of Engineering Subhankar Nagar, Pohabagan, Bankura,	Rs. 8.97 Lakhs
7.	Architectural Design of the proposed School of Medical Science & Technology and Rubber Technology Centre	IIT Kharagpur	Rs. 4.50 Lakhs
8.	Bus Stand at Khatra	Khatra Panchayat Samity, Bankura, West Bengal,	Rs. 2.50 Lakhs
9.	City Development Plan	Haldia Development Authority	Rs. 20.00 Lakhs
10.	City Development Plan for Burdwan Planning Area	Bardhaman Development Authority,	Rs. 11.20 Lakhs

11.	Concept Plan for City Centre, Midnapur-Kharagpur	MKDA,	Rs. 2.50 Lakhs
12.	Ecocity : Environmental Development Project of Vrindavan (GTZ) (ASEM) Germany,	Central Pollution Control Board, New Delhi,	Rs. 8.00 Lakhs
13.	Establishment of Indian Institute of Corporate Affairs	Ministry of Corporate Affairs,	Rs.160.70 Lakhs
14.	Interior Design of Auditorium of Bankura Zilla Parishad	Bankura Zilla Parishad	Rs. 20.00 Lakhs
15.	Mobility Improvement Plan	Haldia Development Authority,	Rs. 15.50 Lakhs
16.	Perspective Plan - Vision 2030 & Comprehensive Development Plan for Bhubaneswar Cuttack Urban Complex	Orissa Housing & Urban Development Department	Rs.169.00 Lakhs
17.	Perspective Plan for Asansol Durgapur Planning Area Vision-2025 and Perspective Plan for Bardhaman	ADDA,	Rs. 27.55 Lakhs
18.	Perspective Plan for Midnapore-Kharagpur Planning Area	Midnapore-Kharagpur Development Authority	Rs. 18.08 Lakhs
19.	Preparation of Aizawl master Plan	Aizawl Development Authority	Rs. 70.00 Lakhs
20.	Preparation of City Development Plan for Bardhaman Planning Area	Burdwan Development Authority	Rs. 11.23 Lakhs
21.	Preparation of Concept Note & EOI for establishment of Biotechnology Park at Kharagpur	West Bengal Industrial Dev. Corporation Ltd.,	Rs. 26.45 Lakhs
22.	Rani Laxmi Bai Girls Hostel At I.I.T Kharagpur	I.I.T Kharagpur	Rs. 18.00 Lakhs
23.	Vikram Sarabhai Residential Complex at IIT Kharagpur	SRIC, IIT Kharagpur	Rs. 9.60 Lakhs

Visits Abroad by Faculty Members

1.	Chattopadhyay, Subrata	Expert Adviser (Sri Lanka) May 28-30 (sufficing Saturday and Sunday)
2.	Sen, Somnath	Invited speaker in the SCJ symposium on "Water Resource Management in Asia" (Tokyo, Japan) 4 days
3.	Sen, Somnath	Paper Presenter in 11th International Conference on "Urban Drainage" (Edinburgh, Scotland) 5 days
4.	Sen, Joy	paper in 8th Int. Conference on "Eco-Balance" and Visiting Lecture at IR3S, University of Tokyo (Tokyo, Japan) 5 days
5.	Sen Gupta, Biplab Kanti	DST Project on "Env. Impact of Coal Mine Closer and Rehabilitation of Mininig Areas" (IRJ) (Visited Petrosan University, Romania) 15 Days
6.	Basu, Sanghamitra	Conference (Germany) 15-17 February

Invited Lectures by Faculty Members

1.	Water management to water sensitive planning - a contemporary approach for sustainable urban dev. by Sen, Somnath (Science Council of Japan Symposium, Tokyo)
2.	Macro-micro systems approach to Sustainability Studies : a involutory - evolutionary perspective by Sen, Joy (Center for Sustainability Studies (IR3S) in The University of Tokyo at Japan)
3.	Role of Interior Lighting and Functional Graphics in Interior Design by Barman, Jaydip (J&N school of Interior Design)
4.	Functional Graphics in Built Environment by Barman, Jaydip (Department of Design, Indian Institute of Technology, Guwahati)
5.	Sustainable Land Use Plan & Good Governance by Sen Gupta, Biplab Kanti (Port Blair, Andaman)
6.	Health facility Planning by Sen Gupta, Biplab Kanti (BIT Meshra)

Books Published

1. Chattopadhyay, S. New Essays on Inclusive Housing published by Macmillan, India Ltd (2009)
2. Joy Sen (2008) ISBN 81-902768-4-0 Principles of Indian Architecture - a timeline study of her contributions to global patterns of civilization published by CYGNUS Kolkata (2008)
3. Prof. B. K. Sengupta Readers Volume on History in Human Settlements published by Institute of Town Planners, India (2008)

Seminars, Conferences and Workshops Organised

1. 36th IAHS World Congress on Housing Science
2. XXXVI IAHS World Congress on Housing Science

DEPARTMENT OF BIOTECHNOLOGY

HEAD : Professor Ananta Kumar Ghosh

FACULTY

Professors

Das, Amit Kumar	Ph.D. (Calcutta University), Structural Biology and Protein Chemistry, Crystallographic study of M.tuberculosis and S.aureus proteins
Das, Debabrata	Ph.D. (IIT Delhi), Biochemical Engineering, Biohydrogen Production Technology, Environmental Biotechnology, Microbial Fuel Cell
Dey, Satyahari	Ph.D. (IIT Kharagpur), Bioprospecting, Metabolomics, Molecular farming
Ghosh, Ananta Kumar	Ph.D. (Calcutta University), Molecular virology, Recombinant DNA technology
Kundu, Subhas Chandra	Ph.D. (BHU, Varanasi), Molecular genetics, silk biomaterials, cell based tissue engineering

Associate Professors

Ghosh, Sudip Kumar	Ph.D. (Kalyani University), Molecular and Cellular Parasitology and Nanobiotechnology
Maiti, Tapas Kumar	Ph.D. (Kalyani University), Mushroom derived glucan as Biological response Modifiers, Lectin and lectin derived peptides in cancer therapy, Skin and Bone tissue engineering, Biomicrofluidics and Biochip development

Assistant Professors

Ghosh, Anindya Sundar	Ph.D. (Calcutta University), Microbial genetics, Antimicrobial chemotherapy
Maiti, Mrinal Kumar	Ph.D. (Calcutta University), Plant Molecular Biology, Transgenic Plants, Metabolic Engineering, Biotechnology
Sar, Pinaki	Ph.D. (BHU, Varanasi), Environmental Microbiology and Biotechnology
Sen, Ramkrishna	Ph.D. (IIT Madras), Probiotics and Nutraceuticals

Faculty Appointments

Dr. Mrinal Kumar Maiti	Assistant Professor
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Brief Description 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* and *S.aureus* 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. Molecular analysis of cyovirus infecting tasar silkworm
14. Phytomedicine and molecular farming
15. Development of silk (fibroin and sericin) based Biomaterials and cell based tissue (skin and bone) engineering
16. Development of low fat content transgenic oilseed plant
17. Biomicrofluidics and Biochip development
18. Microbial fuel cell

Thrust Areas

1. Healthcare Biotechnology (Prospecting novel therapeutics / diagnostics molecules for tuberculosis, cancer)
2. Bio-energy (Production of bio-diesel, bio-ethanol and bio-hydrogen)
3. Bioremediation, Biomaterials and Tissue engineering

New Acquisitions

1. Liquid Scintillation counter, Carbondioxide incubator, Microtome, Laboratory Microscope, cold centrifuge, Ice making machine, Laminar flow cabinet, vertical autoclave, COD analyzer, UPS, UV-Vis spectrophotometer, Gel apparatus, Microcentrifuge.

International Collaborations

1. Prof. S. C. Kundu has two collaborative projects on silk protein for developing drug delivery system and cell based tissue engineering with the University of New South Wales, Australia and Tufts University, USA.
2. Prof. A. K. Das has initiated a collaborative project on *M. tuberculosis* with EMBL, Hamburg, Germany.
3. Prof. D. Das has initiated a multidisciplinary project on renewable hydrogen production with Norweign foreign ministry, Norway.

Lectures by Visiting Experts

1. Structural diversity and generation of ligand specificity. A case study involving plant lectins. *by Prof. M. Vijayan (Indian Institute of Sciences, Bangalore)*
2. Recombinant Antibodies: Playing with magic bullets *by Dr. Biplab Bose (Department of Biochemistry, All India Institutes of Medical Sciences, New Delhi)*
3. Tasar sericulture in India *by Dr. N. Suryanarayana (Director, CTR&TI, Ranchi)*
4. Biopolymer control release of molecules *by Dr. G. R. Castro (National University deLaPlanta, Argentina)*
5. Bone remodelling: Concerted action of osteoblast and osteoclast *by Dr. Prajjal Sinha (University of Texas Health Science Centre, USA)*
6. Hepatitis C virus related pathogenesis *by Dr. Ratna Roy (St. Louis University, USA)*
7. Hypertension and glucose homeostasis; Insight from gene targeted mice and human genomics *by Dr. Sushil Mahato (University of California San Diego, USA)*
8. Polymeric Biomaterilas: Tailoring systems for drug delivery *by Dr. Laura Poole-Warren (University of NewSouth Wales, Australia)*
9. Application of luminex technology in molecular diagnosis *by Dr. Kakoli Bandopadhyay (Centre for Disease Control and Prevention, Atlanta, USA)*

10. Absence of *Drosophila melanogaster* GSTS-1 protein results massive muscle degeneration and flightless fly. *by* Dr. Ashis Mondal (University of Arkansas Medical Sciences, USA)
11. Langmuir-Blodgett Technique: an useful tool to study protein-lipid interaction *by* Dr. Prabir K. Pal (Apex Instrument Co. Kolkata, India)
12. Role of Sharp-1 in skeletal muscle regeneration *by* Dr. Sujata Chatterjee (Mount Senai School of Medicine)
13. Bacillus probiotics and vaccines *by* Dr. Simon Cutting (Royal Holloway University of London, UK)
14. Role of intracellular cAMP in resistance against macrophage oxidative damage in *Leishmania donovani* *by* Dr. Pijush K. Das (Indian Institute of Chemical Biology, Jadavpur, Kolkata)
15. Regulation of 15-hydroxygenase expression in human blood monocytes *by* Dr. Ashis Bhattacharya (Lerner Research Institute, Cleveland Clinic Foundation, USA)
16. Role of bacterial cell surface molecule in cellular physiology and infection *by* Dr. Raja Biswas (University of Tubingen)
17. Electrospun fibre architecture as modulators of cellular response in tissue engineering *by* Prof. Sankha Bhowmick (University of Massachusetts Dartmouth, N. Dartmouth, USA)
18. The other side of Maillard reaction *by* Dr. Ashis Biswas (Cleveland Clinic Foundation, Cleveland, USA)
19. Targeting Parasitism: Staying one step ahead of microbes *by* Dr. Vishal Trivedi (Tufts New England Medical centre, Boston, USA)
20. 3D cell culture and tissue engineering principles to understand pathological mechanism *by* Dr. Sourabh Ghosh (Indian Institute of Technology, Delhi)
21. Biochemical studies on regulators of GTPase cycle of Rab GTPase *by* Dr. Sunanda Datta (Max Plank Institute, Dresden, Germany)
22. Embryonic stem cell and bacterial artificial chromosome: Tools for the analysis of mutation in the human disease related genes *by* Dr. Kajal Biswas (National Cancer Institute at Fredrick, Maryland, USA)
23. Structure determination of a DapD from mycobacterium tuberculosis *by* Ms. Linda Schuldt (EMBL, Hamburg, Germany)
24. Novel Bioactive inhibitors of proprotein convertase Furin as potential therapeutic agents. *by* Dr. Ajay Basak (Ottawa Health Research Centre, Canada)
25. A tale of Two IF proteins-In health and Disease *by* Dr. kaushik Sengupta (Northwestern University)
26. Structural and Functional analysis of the Herpes Simplex Virus triplex protein VP19C *by* Dr. Alakesh Bera (Texas A&M University, USA)

Doctoral and MS Degrees Awarded

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| 1. | Tumpa Dutta | Purification and characterization of Fe-hydrogenase from <i>Enterobacter cloacae</i> IIT-BT08 (Ph.D.) |
| 2. | Srirupa Das | Genetic dissection of the molecular mechanism operating in cytoplasmic male sterile indica rice with wild abortive cytoplasm (Ph.D.) |
| 3. | Dibyarupa Pal | Cloning and chracterization of genes responsible for activation and inactivation of the drug metronidazole in <i>Entamaeba histolytica</i> (Ph.D.) |
| 4. | Chitragada Acharya | Development and characterization of fibroin protein based cell culture matrices from <i>antheraea mylitta</i> and <i>Bombyx mori</i> silkworms (Ph.D.) |
| 5. | Rupesh Das | Molecular characterization of sericine from tropical tasar silkworm, <i>antheraea mylitta</i> and its protection against oxidative stress (Ph.D.) |
| 6. | Sampurna Sattar | Molecular characterization of a novel vegetative insecticidal protein from <i>Bacillus thuringiensis</i> effective against sap sucking insect pest (Ph.D.) |
| 7. | HariHara Surya Kumar Potula | Cloning , in planta expression and characterization of bioactive human fibroblast growth factor 8b.(Ph.D.) |

Fellow - Professional Bodies

1. Das, Debabrata (0) *Nominated* - INAE
2. Kundu, Subhas Chandra (2007) *Nominated* - West Bengal Academy of Science and Technology
3. Das, Debabrata (0) *Nominated* - TWAS2009

Member - Editorial Board

1. Das, Debabrata (2008) *Guest Editor (WBT2008)* - International Journal of Hydrogen Energy
2. Das, Debabrata (2008) *Member* - Indian Journal of Biotechnology
3. Das, Debabrata (2008) *Member* - Biotechnology for Biofuels
4. Das, Debabrata (2008) *Member* - International Journal of Hydrogen Energy
5. Das, Debabrata (2008) *Member* - International Journal of BioSciences and Technology
6. Sen, Ramkrishna (2008) *Honourary Member* - International Journal of Bioscience & Technology (Online)

Awards & Honours

1. Sar, Pinaki (2007) *BOYSCAST Fellowship (DST) to carry our advance research at Rice University, Houston, USA for one year*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A study of microscale transport processes leading to the development of cooling strategy for electronic componenets	DIT	Rs. 89.75 Lakhs
2.	Amelioration of hydrogen production from sewage sludge using <i>Enterobacter cloacae</i> IIT-BT 08	DBT, GOI	Rs. 14.03 Lakhs
3.	Analysis of microbial community structure present in urenum mine area, Jadugoda	Department of Atomic Energy	Rs. 27.55 Lakhs
4.	Assessment of microbial diversity and community structure and their role in arsenic transformation and mobilization	Department of Biotechnology	Rs. 29.15 Lakhs
5.	Baseline survey of microbial community structure present in uranium mine areas of UCIL, Jaduguda, Jharkhand	Department of Atomic Energy,	Rs. 46.65 Lakhs
6.	Biocatalytic production of biodiesel	DST (India)-CNPq (Brazil),	Rs. 1.89 Lakhs
7.	BioCO ₂ : An integrated multidisciplinary project using solar energy for production of renewable hydrogen combined with CO ₂ capture, to address global	Norwegian Foreign Ministry, Norway,	Rs. 300.00 Lakhs
8.	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>	Department of Science & Technology and National Science Foundation (USA)	Rs. 5.25 Lakhs
9.	Bioinformatics SUB-DIC Programme (DIC)	DBT, New Delhi	Rs. 10.00 Lakhs
10.	Bioprocess Development & Optimization for the Production and Characterization of a Biosurfactant of Marine Origin for Commercial & Health-care Applica	Department of Biotechnology (DBT)	Rs. 35.16 Lakhs

11.	Bioprocess Development and Optimization for the Production of an Anti-tumor Biosurfactant	SRIC, IIT, Kharagpur,	Rs. 3.00 Lakhs
12.	Bioprocess Development, Optimization and Bioreactor Strategies for theLaboratory Scale Manufacture of Nutraceutical Formulations	Council of Scientific & Industrial Research (CSIR)	Rs. 13.00 Lakhs
13.	Bioremediation of nuclear wastes: removal of radionuclides / metals and degradation of organic contaminants	Department of Atomic Energy,	Rs. 10.00 Lakhs
14.	Biosynthetic silk hydrogel extracellular matrix analogues for mammalian cell support and drug delivery (IAB)	DBT, New Delhi	Rs. 45.42 Lakhs
15.	Biotechnology based value addition of jatropha and neem leaves, oilcakes and oil	NOVOD, ICAR,	Rs. 9.70 Lakhs
16.	Cell culture inside the microfluidic channels with extended air-water interface	DBT	Rs. 0.00 Lakhs
17.	Characterization of silk protein sericin from Indian tropical tasar silkworms (TSM)	DST, New Delhi	Rs. 23.18 Lakhs
18.	Characterization of two histidine kinases and their cognate response regulator involved in signal Transduction system of Mycobacterium tuberculosis	DBT, GOI	Rs. 23.68 Lakhs
19.	Cloning and characterization of a fungal protease inhibitor from the hemolymph of tasar silkworm <i>Antheraea mylitta</i>	ICMR	Rs. 18.00 Lakhs
20.	Comparative and evolutionary dynamics of repetitive DNA in Indian tropical tasar silkworm -TTS	CSIR, New Delhi	Rs. 13.00 Lakhs
21.	Continuous hydrogen production in a photo bioreactor using spent medium of dark fermentation process	DRDO	Rs. 21.72 Lakhs
22.	Crystal structure determination of a α -Carbonic anhydrase (mCA) from Mycobacterium tuberculosis	DST, GOI	Rs. 19.88 Lakhs
23.	Crystal structure determination of hypothetical secretory proteins from M. tuberculosis	DBT, GOI	Rs. 26.01 Lakhs
24.	Design and Development of Microbial Fuel Cell	BRNS	Rs. 13.17 Lakhs
25.	Development of novel nano-composite osteogenic matrices for cell based bone tissue engineering-DRDO (P.I.) [1.7.08-30.6.11]	DRDO	Rs. 21.60 Lakhs
26.	Development of durable water-repellant jute geotextiles with natural eco-friendly additive for application in erosion control in river banks and other	JMDC	Rs. 170.00 Lakhs
27.	Development of ecofriendly/biodegradable rigid jute based composites	JMDC	Rs. 0.00 Lakhs
28.	Development of herbal skin-nourishing gel	TePP, DSIR	Rs. 5.20 Lakhs
29.	Development of silk proteins based biomaterials (SPB)	DBT, New Delhi	Rs. 56.00 Lakhs
30.	Establishment of an in vivo Method for Detection of O-antigens in Gram-Negative Bacteria	Department of Biotechnology, Govt. of India.,	Rs. 21.03 Lakhs
31.	Establishment of Center of Bioprospecting in IIT Kharagpur	DBT	Rs. 66.50 Lakhs
32.	Exchange Travel visits program on biofuel and healthcare biotech between University of California, Berkeley and IIT Kharagpur	IUSSTF	Rs. 29.24 Lakhs

33.	Exploring the immunomodulatory potential of mushroom glucan / proteoglucan as Biological response modifier in cancer therapy	DST,	Rs .24.49 Lakhs)
34.	Expression optimization and partial purification of soluble penicillin-binding protein 6 and fusion proteins of PBP 5 and 6 from E. coli	SRIC, IIT, Kharagpur	Rs. 3.00 Lakhs
35.	Extraction characterisation and optimised production of a natural dye from Amaranthus for commercial applications	DBT	Rs. 24.40 Lakhs
36.	Functional characterization of soluble penicillin-binding protein 6 of E. coli	DST, GOI	Rs. 21.38 Lakhs
37.	Generation and Cataloguing of Bast-fibre Developmental Stage-specific EST library From Jute	DBT, GOI	Rs. 36.45 Lakhs
38.	Genetic Engineering of Lignin Biosynthetic Pathway in Sorghum	(Nagarjuna Fertilizers and Chemicals Limited, India,	Rs. 37.00 Lakhs
39.	High throughput Glycomics with Lectin microarray (P.I.)	DBT	Rs. 38.46 Lakhs
40.	Indo-US Joint Centre on Silk protein matrix for cell based tissue engineering (SPM)	IUSSTF, New Delhi,	Rs. 50.33 Lakhs
41.	Maximization of gaseous energy recovery by simultaneous hydrogen production and biomethanation	DBT, GOI,	Rs. 21.55 Lakhs
42.	Metabolic engineering of fatty acid biosynthesis to develop nutritionally improved Brassica seed oil	DBT, GOI,	Rs. 47.21 Lakhs
43.	Metabolic engineering of gibberellins signal transduction pathway for increasing the yield potential of indigenous aromatic rice cultivar	DST, GOI,	Rs. 26.35 Lakhs
44.	Microbial removal of heavy metals and radionuclides from industrial wastes	DST, GOI,	Rs. 7.57 Lakhs
45.	Microorganism based bioremediation of heavy metals and radionuclides containing wastes : understanding the mechanism and process development	CSIR	Rs. 13.46 Lakhs
46.	Molecular analysis of Antheraea mylitta cytoplasmic polyhedrosis virus genome segment 1 and 2.	DST	Rs. 19.74 Lakhs
47.	Molecular Analysis of genome segments 6 of Antheraea mylitta cypovirus.	CSIR,	Rs. 14.00 Lakhs
48.	Molecular approach for monitoring drug resistant malaria parasite in the malaria endemic zone in West Bengal	DST,	Rs. 6.36 Lakhs
49.	Molecular characterization of microbial strains relevant to bioremediation	ISIRD, SRIC, IIT, Kharagpur	Rs. 3.00 Lakhs
50.	Molecular epidemiology and identification of immunodominant antigen of Entamoeba in amoebic patients	ICMR, India,	Rs. 20.00 Lakhs
51.	Molecular tools for exploitation of heterosis, yield and oil quality in sesame	NAIP-ICAR, GOI	Rs. 395.51 Lakhs
52.	Optimisation of human fibroblast growth factors (diagnostic) production in recombinant plant cells in bioreactor	MHRD,	Rs. 15.00 Lakhs
53.	Recombinant DNA for development of a male-sterility system in jute	DBT, GOI,	Rs. 37.25 Lakhs
54.	Reconstruction of Epidermal and Dermal cells of skin in collagen three Dimensional Scaffold for Skin Tissue Engineering	DBT	Rs. 23.92 Lakhs

55.	Role of Penicillin-binding proteins and O-antigens in the development of beta-lactam antibiotic resistance in Gram negative bacteria	ICMR	Rs. 15.00 Lakhs
56.	Scale-up studies on production of hydrogen from Enterobacter cloacae IIT-BT 08	Ministry of Non-Conventional Energy Sources	Rs. 24.90 Lakhs
57.	Selection aided molecular marker system for improvement of tasar silkworm <i>Antheraea mylitta drury</i> .	Ministry of Textiles, Govt. of India,	Rs. 12.00 Lakhs
58.	Silencing of gene expression in protozoan parasite <i>Entamoeba histolytica</i> by RNAi	CSIR,	Rs. 14.00 Lakhs
59.	Studies on magnetic nanoparticle assisted hyperthermia activation of enediynes in cancer cells	DBT, Govt. of India,	Rs. 29.61 Lakhs
60.	Studies on the immunomodulatory properties of Aloe vera gel and its products	DARL, Pithoragarh,	Rs. 9.97 Lakhs
61.	Synthesis characterization and application of surface functionalized magnetic metal nano-particles for bioseparation and diagnostics	DBT,	Rs. 60.72 Lakhs
62.	Synthesis characterization and application of surface functionalized magnetic metal nano-particles for bioseparation and diagnostics	DBT, GOI,	Rs. 60.72 Lakhs
63.	Targeted gene integration in rice and cotton	NAIP-ICAR, GOI	Rs. 83.27 Lakhs
64.	Technology development & transfer for selected medicinal plants: approach through R&D and ex-situ cultivation	National Medicinal Plant Board	Rs. 15.00 Lakhs
65.	Understanding the signalling mechanism from the crystal structures of the two component system proteins and protein phosphatases of <i>Mycobacterium tuberculosis</i>	DBT, GOI,	Rs. 292.80 Lakhs

Consultancy Projects

1.	Biocatalyst based continuous production of biodiesel	(PfP Technology LLC., Houston, Texas, USA,	Rs. 10.80 Lakhs
2.	Establishment of Biotechnology Park Kharagpur : Concept Paper	WBIDC	Rs. 24.00 Lakhs
3.	Herbal / bioproduct development: preparation of preliminary report	B Singha & Co,	Rs.10000.00 Lakhs

Patents (filed / granted)

1. A process for biological production of hydrogen
2. A biofuel additive for diesel engines
3. A Continuous process for the production of ethanol from starchy materials
4. A kit for semi-quantification of CRP in whole blood and process related for manufacture of the same
5. An antihyperglycemic exopolysaccharide (EPS) isolated from *Bacillus coagulans* RK-02 and a process for the preparation thereof

Visits Abroad by Faculty Members

1.	Kundu, Subhas Chandra	To deliver invited Lecture in conference (Melbourne, Australia) 31/03/08-3/04/08
2.	Kundu, Subhas Chandra	Research work on silk proteins and to deliver invited lectures. (University of California, San Diego; Tufts University, Boston; Virginia Commonwealth University, USA) May 16, 2008 to June 18, 2008

3. Kundu, Subhas Chandra To deliver keynote address in conference (University of New South Wales, Sydney Australia) January 2025
4. Ghosh, Sudip Kumar Paper Presentation (Marine Biology Laboratory, Woods Hole, Massachusetts, USA) 5 days
5. Ghosh, Sudip Kumar Visiting Faculty on Sabbatical Leave and Vacation Leave (Department on Molecular and Cell Biology, Boston University, Boston, USA) 1 year and 1 month
6. Sen, Ramkrishna To present a technical paper and chair a session in WORLDCOMP-2008 (Las Vegas, Nevada, USA) July 14-17
7. Sen, Ramkrishna To discuss and develop a consultancy project with the client, PFP Technology LLC., Texas, USA (Houston, Texas, USA) July 18-19
8. Sen, Ramkrishna Visited University of Purdue, University of California @ Davis & Berkeley for IIT-KGP Biofuel Center (USA (Chicago, Purdue, UC Davis and UC Berkeley), February 21 - March 02
9. Maiti, Tapas Kumar Presenting paper (Italy, Bologna) 7 days
10. Das, Amit Kumar Indo-German Collaboration Project (EMBL, Germany) June 2-22
11. Das, Amit Kumar IIT-Berkeley Collaboration (UC Berkeley) July 5-11
12. Sar, Pinaki As a BOYSCAST fellow (Department of Biochemistry and Cell Biology, Rice University, Houston, USA) May 2007 to May 2008
13. Das, Debabrata Collaborative research work under the DST-NSF programme (University of Miami, Florida, USA) November 28 to December 27, 2008
14. Dey, Satyahari Institutional partnership (UC Berkeley) July 05-13
15. Das, Debabrata Collaborative research work under DST-NSF programme (University of Miami, Florida) May 14 to July 14, 2008

Invited Lectures by Faculty Members

1. Microbial biofuel - An alternative source of energy *by* Sen, Ramkrishna (Belur Math R K Mission Vidyamandira)
2. Environmental Bioremediation - A Biosurfactant based Approach *by* Sen, Ramkrishna (West Bengal University of Technology, Kolkata)
3. Management and Mitigation of Hazardous Industrial Wastes *by* Sen, Ramkrishna (Confederation of Indian Industries (CII), Haldia Zonal Office)
4. Nutraceuticals - New generation health boosters *by* Sen, Ramkrishna (Biotechnology Research Society of India (BRSI), Osmania University, Hyderabad)
5. A Biofuel in need is a biofuel indeed *by* Sen, Ramkrishna (Institution of Engineers (India), IIT Kharagpur Chapter)
6. Biosurfactants: Jack of all trades - Master of Some *by* Sen, Ramkrishna (Calcutta University)
7. Therapeutic and Environmental Applications of Microbial surfactants *by* Sen, Ramkrishna (Central Institute of Fisheries Education (CIFE), Mumbai)
8. Non-mulberry silk fibroin protein as biomaterials *by* Kundu, Subhas Chandra (Melbourne, Australia)
9. Self assembled silk sericin/poloxamer nanoparticles as nanocarriers of hydrophobic and hydrophilic d *by* Kundu, Subhas Chandra (Sydney, Australia)
10. Natural biopolymers from silkworm *by* Kundu, Subhas Chandra (San Diego, University of California)
11. Silk protein matrices for potential uses in Biomedical and tissue engineering applications *by* Kundu, Subhas Chandra (Virginia Commonwealth University, USA)
12. Bacteria like Enzymes of Giardia, Entamoeba and Trichomonas activate and inactivate metronidazole *by* Ghosh, Sudip Kumar (Molecular Parasitology Meeting, Woods Hole, Massachusetts, USA)
13. Giardia, Entamoeba and Trichomonas activate (nitroreductases) and inactivate (NIMs) metronidazole *by* Ghosh, Sudip Kumar (77th Annual Meeting of Society of Biological Chemists (India) at IIT Madras, Chennai)

14. Biological Databases and their uses in Bioinformatics *by* Ghosh, Sudip Kumar (Department of Microbiology, Vidyasagar University, Midnapur (W))
15. Introduction to Bioinformatics and EST database *by* Ghosh, Sudip Kumar (Bioinformatics Centre, Vidyasagar University, Midnapur (W))
16. Biology of Drug activation and encystation in Entamoeba, the protozoan parasite *by* Ghosh, Sudip Kumar (Department of Chemistry, NIT Rourkela)
17. Biotechnology and Human Welfare (Keynote Address) *by* Ghosh, Sudip Kumar (Department of Zoology, Govt. Autonomous College, Rourkela)
18. Prospects of endogenous peptide in cancer. *by* Maiti, Tapas Kumar (New Delhi)
19. Bioinformatics Workshop: Sequence alignment *by* Das, Amit Kumar (IIT Kharagpur)
20. Protein structure and drug design *by* Das, Amit Kumar (Vidyasagar University)
21. Molecular analysis of cypovirus infecting tasar silkworm *by* Ghosh, Ananta Kumar (Vidyasagar University)
22. "Improvement of hydrogen production from sewage sludge using microbial consortium" *by* Das, Debabrata (Mussorie (Indo-France Workshop on Biohydrogen Production))
23. Biohydrogen Production Processes: Present state of art *by* Das, Debabrata (NIT Surathkal)
24. Recent progresses on the Biohydrogen Production Processes *by* Das, Debabrata (University of Florida, USA)
25. Biohydrogen production as a sustainable future energy resource *by* Das, Debabrata (University of Miami, USA)

Seminars, Conferences and Workshops Organised

1. Bioinformatics in genomics and proteomics
2. Inception Workshop on "BioCO₂: An integrated multidisciplinary project using solar production"
3. International Workshop on Biomaterials for Tissue engineering and Biotechnological Applications
4. National Innovation Day

DEPARTMENT OF CHEMICAL ENGINEERING

HEAD : Professor Amar Nath Samanta

FACULTY

Professors

Das, Gargi	Ph.D. (IIT Kharagpur), Multiphase Flow, CFD Simulation, Two phase Instrumentation
DasGupta, Sunando	Ph.D. (RPI, USA), Microscale Transport Process, Membrane Separation
De, Sirshendu	Ph.D. (IIT Kanpur), Membrane Separation, Transport Phenomena, Mathematical Modeling
Mukherjee, Dibyendu	Ph.D. (IIT Kharagpur), Multi Phase Flow, Column Flotation, Modeling and Simulation
Pradhan, Narayan Chandra	Ph.D. (UDCT Bombay), Mass Transfer Operations, Reaction Engineering, Petroleum Refining, Petrochemical Technology, Separation Technology
Saha, Ranajit Kumar	Ph.D. (IIT Kharagpur), Fuel Processing and Combustion, Pyrolysis and Combustion of Coal and Biomass, High Velocity Gas-Solid Fluidization, Steam Reforming Reactions and Gas Separation Membranes
Samanta, Amar Nath	Ph.D. (IIT Kharagpur), Nonlinear Process Control, Process Dynamics and Control

Associate Professors

Basu, Jayanta Kumar	Ph.D. (IIT Kharagpur), Reaction Engineering, Adsorption and Separation Science, Waste Water Treatment
Chakraborty, Sudipto	Ph.D. (IIT Kharagpur), Real-Time Process Modelling and Simulation, CFD and Heat Transfer
Ganguly, Saibal	Ph.D. (IIT Kanpur), Refinery, Petrochemicals, Polymer, Coal, Real-Time Simulation, Control, Optimization
Kundu, Gautam	Ph.D. (IIT Kharagpur), Multiphase Operations, Mineral Beneficiation
Meikap, Bhim Charan	Ph.D. (IIT Kharagpur), Pollution Prevention and Control, Environmental Pollution Control
Neogi, Sudarsan	Ph.D. (Ohio University, USA), PECVD, Surface engineering for Biomedical Application, Thin Film Coatings
Neogi, Swati	Ph.D. (Ohio University, USA), Polymer matrix composite development, Development of Thermoset polymer matrix composite : material and manufacturing technologies, Modeling of RTM technology to optimize and to develop a scale-up methodology, Reliability and failure investigation, Development of biobased thermoset composite : material and manufacturing technology, Development nanoparticled filled resin : Characterization and effect of altered properties in ma, Manufacturing and characterization of Long Fiber Thermoplastic Composites, Modeling of LFTC, Manufacturing and characterization of Nanoparticle filled thermoplastic composite
Patwardhan, Anand Vinayak	Ph.D. (UDCT Mumbai), Green Technology, Mass Transfer Operations, Heterogeneous Reactions, Microchannel Reactors

Assistant Professors

Chakrabarty, Saikat	Ph.D. (University of Houston, USA), Biomedical Engineering, Biofuels, Chemical Reaction Engineering
Ganguly, Somenath	Ph.D. (University of Kansas, USA), Flow in thin channel and porous media, Hydrogel, Improved recovery of hydrocarbon
Jana, Amiya Kumar	Ph.D. (IIT Kharagpur), Nonlinear control, Modeling and simulation, Process intensification
Kar, Debdulal	Ph.D. (IIT Kharagpur), Fluidization Engineering, Mineral Beneficiation,
Ray, Subhabrata	M.Tech. (IIT Kharagpur), Petroleum Refining, Process Control
Sengupta, Sonali	Ph.D. (UDCT Mumbai), Heterogeneous and Homogeneous Catalysis, Reaction Engineering, Petroleum and Petrochemical Engineering

Scientific Officer

Brahma, Nitosh Kumar	Biomedical Engineering and Bact.-Pathogene, Biochemical Microbial Engineering and Biotechnolog, Nano-biotech and Biol. Env. Pollution Control, Organic and Bio-chemistry in CEP, Bioleaching and Nano-technology of Mineral
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Faculty Promotions

Dr. Bhim Charan Meikap	Associate Professor
Dr. Gargi Das	Professor

Faculty Re-employment (Upto 65 years age)

Dr. Ranajit Kumar Saha	Emeritus Professor
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Faculty Resignation

Dr. Anand Vinayak Patwardhan	Associate Professor
Dr. Somenath Ganguly	Associate Professor

Brief Description 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. Development of innovative catalysts from fly ash for organic chemical synthesis (alkylation, isomerisation etc.)
8. Plasma assisted surface modification for chemical engineering applications
9. Development & performance of novel bubble column scrubber/reactor for removal of SO₂ and fly ash
10. Technology of composite materials
11. Pattern Formation of Soft Materials utilizing Interfacial Instability
12. Microfluidics and fabronics for chemical engineering applications

13. 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. Nonlinear 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
11. Plasma treatment
12. Microfluidics and Fabronics

New Acquisitions

1. PLC Trainer Kit
2. Batch Distillation Equipment
3. Heat Transfer in Natural Convection
4. Heat Transfer Through Composite wall
5. Monolith Flow Reactor
6. Cloud & Pour Point Apparatus
7. Ambient Air Monitoring System
8. Spectrometer
9. P/I & I/P Converter
10. Heat Transfer Equipment
11. Distillation Analyzer
12. Research Microscope
13. UV-VIS Spectrometer

International Collaborations

1. Indo-Us Workshop on Microfluidics and Fabronics (Microfabrication) 2009, January 9-11, IIT Kharagpur, Jointly organized by Chemical and Mechanical Engineering Department of IIT Kharagpur as a part of the Indo-US Centre on Fabronics, Sponsored by Indo-US Science and Technology Forum, New Delhi, 2008-2011. Invited lectures by eminent scientists from IIT Kharagpur, IIT Kanpur, IISc. Bangalore, University of California, Irvine, USA, University of Illinois at Urbana-Champaign, USA, Northwestern University, USA, Nagoya Institute of Technology, Japan, Bengal Engineering and Science University, University of Missouri, USA.
2. IIT-Kharagpur has set-up faculty-to-faculty collaborations as well as an annual undergraduate student summer exchange program with the Energy Biosciences Institute at University of California at Berkeley (UCB). As a part of this endeavour, Dr. Saikat Chakraborty, who is the coordinator for the Bioenergy Center that is being established at IIT Kharagpur, has set up research collaborations on cellulose hydrolysis for bioethanol production with Prof. Alex Bell and Prof. Douglas Clark of the Department of Chemical Engineering, UCB. Dr. Saikat Chakraborty visited UCB from February 24-28, 2009 to further the collaborations, and delivered an invited lecture on Bioenergy Scenario in India and new Bioenergy Center of IIT Kharagpur at Energy Biosciences Institute of UCB on February 27, 2009.

Lectures by Visiting Experts

1. Hydroformilation of 1-octene using Rhodium Phosphide in a thermomorphic solvent system *by* Prof. Binay K. Dutta (University Petronas, Malaysia)
2. Development of SMC Composites *by* Mr. Prabir Guha (CSP Plastics, MI, U.S.A.)
3. Liquid transportation fuels from biomass and coal: A brief overview *by* Dr. Arun Basu (Gas Technology Institute, Chicago, IL, U.S.A.)

Doctoral and MS Degrees Awarded

1. Chandan Das Treatment of tannery effluent and removal of pollutants using micellar - enhanced ultrafiltration (Ph.D.)
2. Srikanta Dinda Studies in multiphase reactions (kinetics of reactive absorption of carbon dioxide with solutions of amines in aqueous and non-aqueous solvents: Epoxidation of vegetable oils) (Ph.D.)
3. Arun Kumar Jana Hydrodynamics of liquid-liquid two phase upflow through vertical pipeline (Ph.D.)
4. Tapas Kumar Mandal Some studies on liquid-liquid slug flow (Ph.D.)
5. Pinakpani Biswas Nonlinear control and estimation of chemical processes (Ph.D.)
6. Biswajit Sarkar Electric field enhanced ultrafiltration (Ph.D.)
7. Animes K. Golder Studies on electroremediation of aqueous effluents containing heavy metals (Ph.D.)
8. Mitali Das Hydrodynamic studies of gas-solid single and mixed particle systems in a circulating fluidized bed (Ph.D.)
9. B. Rajamohan Wet scrubbing of air pollutants from hot flue gases in a spray-cum bubble column scrubber (Ph.D.)
10. Saptarshi Majumdar Simulation studies on conducting thin film based drug delivery systems (Ph.D.)
11. S. Manigandan Formation and characterization of nano structure and nano-patterns of conducting polymer (MS)

Fellow - Professional Bodies

1. DasGupta, Sunando (2008) *Awarded* - Senior Associate, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy
2. DasGupta, Sunando (2009) *Nominated* - Fellow of Indian National Academy of Engineering (FNAE)
3. Mukherjee, Dibyendu (2006) *Nominated* - The Institution of Engineers (India)

Member - Editorial Board

1. Chakrabarty, Saikat (2008) *Honorary Editorial Board Member*
- International Journal of BioSciences and Technology
2. Chakrabarty, Saikat (2008) *Honorary Editorial Board Member*
- International Journal of Medical Sciences and Technology
3. DasGupta, Sunando (2008) *Associate Guest Editor*
- International Journal of Environment and Waste Management
4. De, Sirshendu (2008) *Editorial Board Member*
- International Journal of Environment and Engineering Sciences
5. De, Sirshendu (2008) *Editorial Board Member*
- International Journal of Environmental and Engineering
6. De, Sirshendu (2009) *Editorial Board Member*
- International Journal of Chemistry
7. De, Sirshendu (2008) *Editorial Board Member*
- International Journal of Environmental and Waste Management

8. De, Sirshendu (2008) *Guest Editor*
- International Journal of Environmental and Waste Management
9. Jana, Amiya Kumar (2008) *Editorial Board Member*
- International Journal of Biosciences and Technology
10. Meikap, Bhim Charan (2007) *Editorial Board Member*
- Research Journal of Environmental Sciences
11. Meikap, Bhim Charan (2008) *Editor-in-Chief*
- International Journal of Environmental Pollution Control and Management
12. Meikap, Bhim Charan (2008) *Guest Editor*
- Special Issue of " International Journal of Environmental and Waste Management"
13. Meikap, Bhim Charan (2008) *Editorial Advisory Board Member*
- The Open Chemical Engineering Journal
14. Meikap, Bhim Charan (2008) *Editorial Board Member*
- International Journal of Bio-Sciences and Technology

Awards & Honours

1. DasGupta, Sunando (2008) *Herdillia Award for Excellence in Basic Research in Chemical Engineering by Indian Institute of Chemical Engineers*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A study of Microscale transport processes leading to the development of a cooling strategy for electronics components	Department of Information Technology	Rs. 89.76 Lakhs
2.	Abatement of Dust, SO ₂ and NO _x by Wet Scrubbing Process	Ministry of Human Resource Development	Rs. 8.00 Lakhs
3.	Ammonia Production By Using Urea For Flue Gas Conditioning	National Thermal Power Corporation (NTPC), New Delhi,	Rs. 65.00 Lakhs
4.	Bio Gas development & training Centre.	Ministry of New & Renewable Energy	Rs. 6.00 Lakhs
5.	CFD and experimental study of multi-phase systems (solid-liquid and gasliquid)	IIT Kharagpur - ISIRD,	Rs. 3.00 Lakhs
6.	Composite Applications Laboratory	TIFAC, DST, New Delhi,	Rs.346.20 Lakhs
7.	Computational fluid dynamics modeling and flow visualization of a gas liquid mixture through a nozzle and subsequent spray	MHRD, Govt. of India,	Rs. 9.00 Lakhs
8.	Design of bench scale unit for chemical beneficiation	Tata Steel	Rs. 15.00 Lakhs
9.	Design, Analysis and Control of Internally Heat Integrated Distillation Columns	DST,	Rs. 0.00 Lakhs
10.	Development of Catalysts for Petroleum Refining from Flyash	MHRD,	Rs. 5.00 Lakhs
11.	Development and application of ceramic foam supported catalysts in petrochemical industries	(Council of Scientific and Industrial Research	Rs. 8.04 Lakhs
12.	Development and characterization of a high efficiency wet scrubber with internals for air pollution control	IIT Kharagpur	Rs. 3.00 Lakhs
13.	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,	Rs. 11.60 Lakhs
14.	Development of low cost household filter for arsenic and other pollutant free drinking water using modified laterite	Department of Science and Technology	Rs. 20.40 Lakhs

15.	Development of new regeneration process with the chemical leaching circuit to upgrade high ash Indian coal	Tata Steel Jamshedpur	Rs. 13.00 Lakhs
16.	Development of sensors for gas-liquid and liquid-liquid two phase flow	MHRD	Rs. 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 a	DST, Under the Fast Track Scheme for Young Scientists	Rs. 7.32 Lakhs
18.	Flux enhancement and fouling reduction during effluent (leather & dye) treatment using membrane separation	Department of Science & Technology,	Rs. 22.00 Lakhs
19.	Formation of ordered meso patterns using interfacial instability and dewetting polymers	DST,	Rs. 20.00 Lakhs
20.	Hydrodynamics Studies on Micro Bubble Generators	M/s Tata Steel, Jamshedpur,	Rs. 4.62 Lakhs
21.	Indo-US Centre on Fabronics	Indo-US Science and Technology Forum,	Rs.495.00 Lakhs
22.	Investigations on oil-water core-annular flow through experiments and theoretical analysis for the production and processing of heavy oils	IIT, Kharagpur, under the Mission Project	Rs. 1.00 Lakhs
23.	Micellar enhanced ultrafiltration for removal of organic and inorganic pollutants from aqueous streams	DST, Govt. of India	Rs. 10.00 Lakhs
24.	Nonlinear State Estimation and Control of a Heterogeneously Catalyzed Reactor	ISIRD	Rs. 0.00 Lakhs
25.	Performance Evaluation of Bag Filters in the Sponge Iron Plants in Orissa-Field Investigation (State Pollution Control Board, Orissa	Ministry of Environment & Forest, Govt. of Orissa	Rs. 32.00 Lakhs
26.	Performance Evaluation of Bag Filters in the Sponge Iron Plants in Orissa-Field Investigation Phase-II (PEO) (State Pollution Control Board, Orissa	Ministry of Environment & Forest, Govt. of Orissa	Rs. 19.00 Lakhs
27.	Performance Evaluation of bag Filters System Installed at Sponge Iron Plants of Orissa (Phases I and II)	State Pollution Control Board, Orissa	Rs. 43.48 Lakhs
28.	Performance study of a hydrocyclone	Tata Steel, Jamshedpur	Rs. 8.00 Lakhs
29.	Process development and engineering analysis of greener routes for commercially important organic diisocyanates, and epoxidised non-edible oils	Sponsored Research & Industrial Consultancy, I.I.T., Kharagpur,	Rs. 3.00 Lakhs
30.	Removal of Toxic Dyes from Industrial Effluent using a Copmbination of Adsorption and Membrane Separation Process	MHRD	Rs. 8.00 Lakhs
31.	Setting up a research and devlopment centre for Damodar Valley Corporation at Kolkata (Phase-I)	Damodar Valley Corn. Kolkata-700054	Rs.2132.70 Lakhs
32.	Steel Technology Centre	DST,	Rs.2025.00 Lakhs
33.	Studies in Reforming of Metnae to Syn Gas in Mini & Micro-reactor for Production of Hydrogen	Ministry of Chemical & Fertilizer	Rs. 50.00 Lakhs
34.	Studies on Effective Use of Microwave Energy for Green Mineral Beneficiation and Pipe Line Slurry Transport	CSIR, New Delhi	Rs. 13.30 Lakhs
35.	Studies on in-situ Reaction and Separation of Steam Reforming Product Mixtures in Membrane Reactor	Ministry of Chemicals & Fertilizer	Rs. 71.53 Lakhs
36.	Studies on Industrially Important Reactions of Aromatics, Alcohols and Alkenes on Large Pore Molecular Sieve Catalysts	IIT Kharagpur	Rs. 3.00 Lakhs

37.	Surfactant based separation processes for the treatment of industrial effluent	MHRD	Rs. 13.00 Lakhs
38.	Synthesis & Characterization of Semiconducting Polymers	ISIRD grant, SRIC, IIT, Khagagpur,	Rs. 3.00 Lakhs
39.	Synthesis & Engineering of Advanced Materials Using RF Plasma for Chemical, Microelectronic, Biochemical and Biomedical Applications	DST	Rs. 58.13 Lakhs
40.	Upgradation of Coal Fines in a Column Flotation Cell	CSIR, New Delhi	Rs. 6.13 Lakhs
41.	Utilization of Hydrogen Sulphide for the Production of Value-Added Chemicals	Council of Scientific and Industrial Research	Rs. 11.96 Lakhs
42.	Water lubricated transport of heavy oils experimentation and theory	DST	Rs. 19.00 Lakhs

Consultancy Projects

1.	Analysis of Blast Furnace Gases	M/s. Tata Metalik Limited, Kharagpur,	Rs. 0.11 Lakhs
2.	Establishment of Composite Development Center (CDC) to develop and evaluate the components for railway application	Research, Development, Standards Organisation, Ministry of Railway, India	Rs. 7.42 Lakhs
3.	Behavior of coating on optical fiber performance	Sterlite Optical Technologies	Rs. 0.30 Lakhs
4.	Consultancy input for Data Acquisition and Control at Tata Steel	Tata Steel	Rs. 2.00 Lakhs
5.	Consultancy Input for design and optimization & evaluation of Technoeconomics	Tata Steel Jamshedpur,	Rs. 9.17 Lakhs
6.	Consultancy Input for design of operator station with structured database for pilot unit	Tata Steel Jamshedpur,	Rs. 6.25 Lakhs
7.	Consultancy input for upgradation of Indian Coal at Tata Steel	Tata Steel	Rs. 9.00 Lakhs
8.	Consultancy Input on Design and Hydrodynamics Studies of Micro Bubble Generator	M/s Tata Steel, Jamshedpur	Rs. 2.50 Lakhs
9.	Design and development of a mathematical model for ultra fast cooling of steel strips	Tata Steel, Jamshedpur	Rs. 5.61 Lakhs
10.	Design of an industrial scale hydrocyclone	Tata Steel, Jamshedpur	Rs. 6.56 Lakhs
11.	Design of bubble column with external bubble generator	Tata Steel, Jamshedpur	Rs. 6.00 Lakhs
12.	Design verification and critical analysis of bag filters installed at sponge iron plant in Orissa	Orissa State Pollution Control Board,	Rs. 11.00 Lakhs
13.	Design Verification of Bag Filters installed at various Sponge Iron Plants in Orissa	State Pollution Control Board, Orissa, Bhubaneswar,	Rs. 11.82 Lakhs
14.	Design, material development and process Improvement of Optical Fiber cable	Sterlite Technologies Limited, Ind,	Rs. 4.80 Lakhs
15.	Development of mixing model for alloy dissolution in steel ladles	Tata Steel, Jamshedpur	Rs. 4.00 Lakhs
16.	Development Of Software For Design Of Two Phase Flow System With Simple Geometries	Tata Iron and Steel Company Limited, Jamshedpur	Rs. 2.12 Lakhs
17.	Development of Synthetic Resins	Suparna Chemicals Limited, Mumbai,	Rs. 4.00 Lakhs
18.	Exploratory Work on Dry Beneficiation of Iron Ore and Coal Fines	Tata Steel,	Rs. 2.97 Lakhs
19.	Feasibility Study on Calcium Reduction in Ground and Blowdown Water of Thermal Power Stations Using Zeolite to be Synthesized from Lignite Fly Ash	Neyveli Lignite Corporation Limited,	Rs. 19.00 Lakhs

20.	Lime Calcination project at TISCO	TISCO	Rs. 2.00 Lakhs
21.	Optical fiber cable design & process	Sterlite Optical Fiber Technologies Limited,	Rs. 0.30 Lakhs
22.	Performance Evaluation of Bag Filters System of Sponge Iron Plants in Orissa (Phases I and II)	State Pollution Control Board, Orissa,	Rs. 19.10 Lakhs
23.	Real Time Simulator and expert GUI for Blast Furnaces	NML Jamshedpur	Rs. 40.00 Lakhs
24.	Scoping Study for development of Chemical Leaching pilot plant for Tata Steel	Tata Steel Jamshedpur	Rs. 3.00 Lakhs
25.	Technical Support and guidance to Improve Quality of Lead Acid Battery	Bright Solar,	Rs. 0.25 Lakhs
26.	Testing & prototype manufacture of composite products	Various Organizations	Rs. 5.00 Lakhs
27.	Training Programme on Pultrusion Technology with Introduction to other Fabrication Method	ZOOM Developers	Rs. 0.44 Lakhs

Technology Transferred

1.	Rangpur Tea Association Ltd., Alipurduar - Extraction and purification of polyphenol from green tea leaves :		Rs. 15.00 Lakh
2.	M/s Trimurti Industries Ltd., Assam - Production of Polyphenol powder from green tea leaves :		Rs. 40.00 Lakh
3.	M/s Trimurti Industries Limited - Technology for extraction of polyphenol from green tea leaves :		Rs. 40.00 Lakh

Patents (filed / granted)

1. A method for suppressing air core in hydrocyclones and dense medium cyclones with Tata Steel
2. A Modified Multi-Stage Bubble Column for Versatile, High Efficiency Gas-liquid /Gas-Liquid-Solid Contacting, in the name of IIT, Kharagpur
3. An online device for in-situ measurement of low gas flow rates
4. Development of high capacity and cost effective arsenic adsorbent using modified laterite
5. Electric field assisted membrane separation of pectin
6. Implantable Device having Antimicrobial Coating and a Method of Manufacturing the same
7. Membrane based water-extraction of polyphenols from green tea leaves
8. Optical Probe for Multiphase Flow
9. Production of organic fertilizer from tannery effluent
10. Vaginal Microencapsulated Effervescent Contraceptive and its delivery system

Visits Abroad by Faculty Members

- | | | |
|----|---------------------|---|
| 1. | Neogi, Sudarsan | Meeting and Technical discussion for Adhesion Research (International Adhesion Society Meeting at Savannah, USA) 4 days |
| 2. | Chakrabarty, Saikat | To attend International Symposium on Chemical Reaction Engineering (ISCRE) - 20 (Kyoto, Japan) September 6-11, 2008 |
| 3. | Chakrabarty, Saikat | To initiate Institute collaborations with the Biofuels Centers of these universities (University of California at Berkeley, University of California at Davis, Purdue University) Feb 21 to Mar 2, 2009 |
| 4. | Samanta, Amar Nath | To attend IFAC Congress (Seoul, South Korea) 7 days |

Invited Lectures by Faculty Members

1. Pollution Control in Sponge Iron Plants of Orissa by Meikap, Bhim Charan (State Pollution Control Board, Orissa, Bhubaneswar)
2. Hazardous Waste Treatment Technologies and Management by Meikap, Bhim Charan (Confederation of Indian Industries, Haldia Regional Office, held at Tata Metalicks)

DEPARTMENT OF CHEMISTRY

HEAD : Professor Pratim Kumar Chattaraj

FACULTY

Professors

Basak, Amit	Ph.D. (Calcutta), D.Phil. (Oxon), Design and Synthesis of Novel Eneidyne as DNA Cleaving Agents, Artificial peptide cleaving agents, Asymmetric synthesis, Polyphenols, Enzyme inhibition approach to drug design
Bhattacharjee, Manish	Ph.D. (NEHU), Inorganic
Chattaraj, Pratim Kumar	Ph.D. (IIT Bombay), Density functional theory, Chemical reactivity, ab initio calculations, Quantum chaos, Aromaticity in metal clusters
Mal, Dipak Ranjan	Ph.D. (Missouri), Organic synthesis
Pal, Tarasankar	Ph.D. (Burdwan University), D.Sc. (Visva Bharati University), Nanoparticle catalysis spectroscopy micellar chemistry environmental chemistry
Pathak, Tanmaya	Ph.D. (Uppsala Sweden), Modification of nucleosides and carbohydrates
Pramanik, P	Ph.D. (IIT Kharagpur), Nanoscience and technology, Solid-state chemistry
Ray, Debashis	Ph.D. (Jadavpur University), Synthesis spectroscopic and magnetic characterizations of paramagnetic cluster complexes, Metallacrown complexes using ketooxime ligands, Catecholase activity of aqua bridged dicopper complexes, Non-hydrothermal route of synthesis of MOFs
Ray, Jayanta Kumar	Ph.D. (Calcutta University), Synthesis of Carbocyclic and Heterocyclic Compounds
Roy, Sujit	Ph.D. (IIT Kanpur), Organometallic Chemistry, Homogeneous Catalysis
Sarkar, Nilmoni	Ph.D. (Jadavpur University), Chemical dynamics in organized assemblies and ionic liquids
Sarkar, Tarun Kumar	Ph.D. (Calcutta University), Synthetic organic and organometallic chemistry
Srivastava, Suneel Kumar	Ph.D. (IIT Kharagpur), Inorganic Materials and Polymer Nanocomposites

Associate Professors

Bandyopadhyay, Sanjoy	Ph.D. (IISc., Bangalore), Molecular modeling and simulations of soft condensed matter, Hydration properties of biomolecules, Protein folding, Protein-DNA complexes and protein-protein association, Self-assembled surfactant films at interfaces
Biradha, Kumar	Ph.D. (Hyderabad), Supramoleuclar Chemistry, Crystal Engineering, Coordination Polymers, Metal-Organic Frameworks, Structural Chemistry, Porous Materials, Polymorphism
Dasgupta, Swagata	Ph.D. (RPI New York), Protein Chemistry : Protein ligand binding, Protein Structure Analysis
Dey, Joykrishna	Ph.D. (Kanpur), Molecular Self-Assembly Drug Delivery and Enantioseparations

Hajra, Saumen	Ph.D. (Pune University), Asymmetric catalysis and synthesis, Organocatalysis, Asymmetric synthesis of biologically important natural and unnatural compounds, Stereoselective syntheses of paraconic acids, lignans, sesquiterpene lactones etc., Asymmetric synthesis of dopamine D1 agonists
Maiti, Mrinal Mohan	Ph.D. (IIT Kharagpur)
Raj, C Retna	Ph.D. (M.K University, Madurai), Optical and Electrochemical Biosensors, Inorganic Nanomaterials, Electrocatalysis
Taraphder, Srabani	Ph.D. (IISc., Bangalore), Theoretical Physical Chemistry, Computer simulation studies on protein dynamics

Assistant Professors

Dhara, Dibakar	Ph.D. (Osmania University, Hyderabad), Polymer Chemistry
Halder, Mintu	Ph.D. (IACS, Kolkata), Spectroscopy, Spin-chemistry, Chemical Education
Mahanty (Pathak), Amita	Ph.D. (IIT Kharagpur), Synthesis and Characterization of Nanostructured Materials (MoS ₂ , WS ₂ , other sulfides, oxides)
Mani, Ganesan	Organometallics and Catalysis
Nag, Ahindra	Ph.D. (Jadavpur University), Bioorganic
Nanda, Samik	Ph.D. (IICT, Hyderabad), Organic synthesis, Biocatalysis
Rajakumar Ananthakrishnan	Ph.D. (M.K. University, Madurai), Analytical Chemistry, Inorganic Chemistry, Environmental Chemistry
Singh, N D Pradeep	Ph.D. (Madras University), Synthesis of new photoremovable protecting groups, Functional group photolithography and its applications, Photochemistry of secondary plant metabolites, Solid state photochemistry

Faculty Appointments

Dr. Ananthakrishnan Rajakumar	Assistant Professor
Dr. Dibakar Dhara	Assistant Professor

Faculty Promotions

Dr. Nilmoni Sarkar	Professor
Dr. C Retna Raj	Associate Professor
Dr. Kumar Biradha	Associate Professor

Brief Description of on-going activities

The department is actively pursuing research embracing both basic and applied aspects of chemistry. Currently, the department is handling over 40 sponsored projects from various agencies. The department is equipped with various sophisticated instruments: Bruker-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 JASCO DIP 370 digital polarimeter, Spex Fluorolog 3 fluorimeter, and a Perkin Elmer C, H, N Analyzer. Active research in synthetic chemistry is underway on the design and synthesis of novel enediynes as DNA cleaving agents, on the total synthesis of bioactive natural products such as anthracyclines, angucyclines, furocoumarins, indole alkaloids, furoterpenes, lactams and heterocyclic quinonoids. Enzyme mediated synthesis and a substrate analog approach to determine the active site of enzymes is being studied as is the enzyme inhibition approach to drug design. Isolation and characterization of an angiogenic protein is in progress with an aim to determine the specificity by studying several dinucleotide substrates. Supramolecular chemistry relating to thia azarenes and redox switchable receptors is in progress. Development of highly selective and green methodologies based on organometallic, radical and chiron approaches. In the area of catalysis, micellar, zeolite, and bimetallic catalysts are being developed. In the field of Bioinorganic chemistry, research is being pursued on

electron transfer processes with emphasis in dioxygen chemistry. Active research is also underway in the areas of crystal engineering and electroanalytical chemistry. Notable research on various aspects of nanochemistry involve development of metal nanoparticles, nanocrystalline ferrites, ceramics and composites. Materials for high temperature and superconducting applications and solar energy conversion is also underway. Catalysis involving photoactivation techniques and micelle stabilized nanoparticles are currently being investigated to solve environmental pollution related problems. Investigation of solution properties of a number of polymers using a variety of tools is in progress. Studies are also being conducted on the aggregation behavior of polyelectrolytes and block copolymers in aqueous media. Capillary electrophoresis is being employed for the chiral separation of drugs. Photophysical studies of different organic molecules in pure solution and organized assemblies are being investigated using fluorescence spectroscopy. Theoretical physical chemistry in the department includes studies relating to density functional theory, chemical reactivity, ab initio calculations, quantum chaos; chemical reaction dynamics in liquids and biological macromolecules, molecular modeling and computer simulation studies of complex biological systems such as: membranes, proteins etc. Protein structure analysis on the loop regions in proteins is also underway.

Thrust Areas

1. Biomimics
2. Transition Metal Cluster Complexes
3. Structural Coordination Chemistry
4. Ferromagnetic Metal Complexes
5. Drug Design
6. Chemical and Electrochemical Sensors
7. Molecular Modeling
8. Protein Folding & Enzymatic Catalysis
9. Spectroscopy of Assemblies
10. Green Chemistry; Nanochemistry
11. Catalysis.

Lectures by Visiting Experts

1. From Porous Capsules to Encapsulation Chemistry: Perspectives of Chemistry Under Confined Conditions *by* Dr. Sanjit Konar (Universitat Bielefeld, Fakultat fur Chemie, Bielefeld, Germany)
2. Exchange-Coupled Polynuclear Compounds: Phosphonae an Old Ligand with New Faces *by* Dr. Sumit Khanra (Department of Chemistry, University of Glasgow, UK)
3. Metal Nanorod Arrays: New Solutions for Classical Problems *by* Prof. Pushan Ayyub (Dept. of Condensed Matter Physics & Material Sciences, Tata Institute of Fundamental Research, Mumbai)
4. Conducting Polyselenophenes: Novel Type of Organic Electronic Materials *by* Dr. Asit Patra (Department of Organic Chemistry, Weizmann Institute of Science, Israel)
5. Polymers, Amphiphiles & Polyelectrolyte Multilayer (PEM) In Applied Biotechnology *by* Dr. Kaushik Mukherjee (Department of Chemistry, MIT, USA)
6. Chemistry through electrostatic Viewglasses *by* Prof. S. R. Gadre (Department of Chemistry, University of Pune)
7. Modifications of natural Aminoglycosides in the search for antibiotic or antiviral agents *by* Prof. Jean-Luc Decout (Department of Molecular Pharmacology, University of Grenoble/CNRS, France)
8. Quantum Chemistry in the Age of the Second Coming of Plastics *by* Prof. S. Ramasesha (Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore)
9. Tailored Electroceramics: Role of Nanoscience and Crystallographic Structure *by* Dr. A. K. Tyagi (Head, Solid State Chemistry Section, Chemistry Division, Bhabha Atomic Research Centre, Mumbai)
10. Cationic Amphiphiles: Promising Carriers of Genetic Materials in GeneTherapy *by* Dr. Arabinda Chaudhuri (IICT, Hyderabad)

11. Total Synthesis of Natural Products and Natural Product-like Molecules from amino acids and their Pharmacological Evaluation *by* Dr. Gautam Panda (Medicinal and Process Chemistry Division, Central Drug Research Institute, Lucknow)
12. Laser Spectroscopic Investigation on the Binding of Biomolecular Complexes Using *by* Dr. Chayan Kanti Nandi (Institut für Physikalische und Theoretische Chemie, J. W. Goethe Universität, Frankfurt Am Main, Germany)
13. DNA-methylation and Cancer Epigenetics: A Role for Ras-MAPK Signaling Originating from Plasmamembrane Lipid Raft *by* Dr. Samir Kumar Patra (Department of Experimental Medicine , University of Parma, Parma, ITALY)
14. 3d-4f Heterometallic Trinuclear Compounds: A New Family of Single-Molecule Magnets. *by* Prof. V. Chandrasekhar (Lalit Kapoor Chair Professor & Head, Department of Chemistry,)
15. Understanding the Ionic Liquids by Studing Photo-induced Processes in these Media *by* Prof. Anunay Samanta (Department Of Chemistry, University of Hyderabad)
16. Stoichiometric application of p-organoiron complexes to organic synthesis *by* Dr. Subhabrata Chaudhury (Medical College of Wisconsin, USA)
17. The Other Side of Maillard Reaction *by* Dr. Ashis Biswas (Department of Pathobiology, Cleveland Clinic Foundation, Cleveland, OH, USA)
18. Structure-Property studies in Cobaloximes *by* Prof. B. D. Gupta (Department of Chemistry, IIT Kanpur)
19. CrSi₂ - Thermoelectric Material for High Temperature Applications? *by* Prof. Arun M. Umarji (Materials Research Centre, Indian Institute of Science, Bangalore)
20. New Methods for Chiral Discrimination and Asymmetric Control Utilizing the Cooperative Effect of Dynamic and Axial Chiralities *by* Dr. Kalluri V.S. Ranganath (Institute for Materials Chemistry and Engineering, Kyushu University, Fukuoka, Japan)
21. Towards Development of Novel Strategies for Synthesis of Heterocyclic Compounds using the Baylis-Hillman Adduct *by* Prof. D Basavaiah (School of Chemistry, Central University of Hyderabad)
22. HSAB and Ore Genesis: A Tentative Approach *by* Prof. J L Vignerresse (Universite Henri Poincare, Nancy, France)
23. Materials for Tomorrow *by* Prof. J M Saiter (Laboratoire D'Etudes et de Caracterisation des Amorphes, Rouen, France)
24. Dr. J.C. Ghosh Memorial Lecture - Molecular and Cellular Approaches to Understand and Treat Some Diseases of the Eye *by* Prof. D. Balasubramanian (L.V. Prasad Eye Institute, Hyderabad)
25. National Chemistry Week Celebration and Inauguration of CRSI Local Chapter - Glimpses into the Magical World of Chemistry *by* Prof. B.M. Deb (IISER, Kolkata)

Doctoral and MS Degrees Awarded

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| 1. | Arjun Ghosh | Physicochemical Characterization, Self-assembly Formation, and Enantioselectivity of N-(2-Hydroxyalkyl)-L-amino Acid Amphiphiles (Ph.D.) |
| 2. | Sagar Pal | Synthesis, Characterization, Flocculation and Rheological Characteristics Polysaccharides (Ph.D.) |
| 3. | Sudip Nath | Synthesis, characterization, spectroscopic and catalytic aspects of nanoparticles (Ph.D.) |
| 4. | Manindranath Bera | Studies on mono-, di- and tetranuclear complexes of 3d transition elements: synthetsi and bioinorganic model aspects (Ph.D.) |
| 5. | Subhas Chandra Ghosh | Synthesis of beta lactams, lactam based peptidomimetics (Ph.D.) |
| 6. | Sumita Roy | Synthesis, Characterization and Self Assembly Studies of Some Selected N-Acylamino Acid surfactants and Corresponding Polysoaps in Water (Ph.D) |
| 7. | Kalyan Sundar Ghosh | Inhibition Studies of Ribonuclease A and Angiogenin: Interactions of the Inhibitors with Serum Albumin (Ph.D.) |
| 8. | Susmita Behera | Electroanalytical Applications of Self-Assembled Monolayer of Organosulfur Compounds (Ph.D.) |

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| 9. | Manishabrata Bhowmick | Asymmetric Halohydrination, Haloazidation and Epoxidation of alpha,beta -Unsaturated Carboxylic Acids and Chlorination of Silyl Enol Ethers (Ph.D.) |
| 10. | Debashree Mandal | Design, synthesis and characterization of polynuclear 3d transition metal complexes supported by multidentate ligands (Ph.D.) |
| 11. | Sanjoy Kumar Maji | Aqueous Solutions by Adsorption on Laterite Soil (Ph.D.) |
| 12. | Debesh Ranjan Roy | Some studies on bonding, reactivity, aromaticity and toxicity A conceptual DFT approach (Ph.D.) |
| 13. | Anindya Hazra | Silicon in Synthesis: Synthesis of Necine Bases (+/-)-Macronecine and (+/-)-Supinidine and an Approach to Benzoisoquinoline Alkaloid Chrysanthone A (Ph.D.) |
| 14. | Abhijit Tarafdar | Syntheses and Characterizations of Mesoporous Materials Using Non-Alkoxide Precursors (Ph.D.) |
| 15. | Soumya Kanti Biswas | Nanocrystalline Mixed Metal Oxides in Gas Sensors and Pigments (Ph.D.) |

Fellow - Professional Bodies

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| 1. | Chattaraj, Pratim Kumar (2009) | Fellow: Indian National Science Academy, New Delhi |
| 2. | Chattaraj, Pratim Kumar (2009) | Fellow: Indian Academy of Sciences, Bangalore |
| 3. | Chattaraj, Pratim Kumar (2009) | Council Member: Chemical Research Society of India |
| 4. | Ray, Jayanta Kumar (2008) | <i>Awarded</i> - West Bengal Academy of Science and Technology |
| 5. | Basak, Amit (2006) | <i>Awarded</i> - Academy of Sciences, Bangalore |
| 6. | Pal, Tarasankar (2007) | <i>Awarded</i> - The National Academy of Sciences, India |
| 7. | Roy, Sujit (2008) | <i>Elected</i> - Indian Academy of Sciences |
| 8. | Basak, Amit (0) | <i>Nominated</i> - National Academy of Sciences |
| 9. | Basak, Amit (0) | <i>Nominated</i> - Indian National Science Academy |

Member - Editorial Board

1. Basak, Amit (2007) *Editorial Advisory Board Member* - Chemical Communications
2. Biradha, Kumar (2008) *Editorial Board Member* - New Journal of Chemistry
3. Biradha, Kumar (2008) *Advisory Board Member* - The Open Inorganic Chemistry Journal
4. Chattaraj, Pratim Kumar (2009) *Member, Editorial Board* - Journal of Assam Science Society, Assam
5. Chattaraj, Pratim Kumar (2009) *Member, Editorial Board* - Journal of Molecular Structure: THEOCHEM
6. Chattaraj, Pratim Kumar (2009) *Member, Editorial Board* - Canadian Journal of Pure & Applied Science
7. Dasgupta, Swagata (5) *Editorial Board Member* - Protein and Peptide Letters
8. Mal, Dipak Ranjan (2008) *Member, editorial board* - Research Letters in Organic Chemistry
9. Nag, Ahindra (2008) *Editorial Member* Open Chemical Engineering Journal
10. Pal, Tarasankar (2002) *Editorial Advisory Board* - ChemTracts Inorganic
11. Pathak, Tanmaya (2009) *Member of the Editorial Board* - Carbohydrate Research
12. Pramanik, P (2005) *Member of national committee* - Indian Journal of Chemistry, Section A
13. Roy, Sujit (2009) *Member, Editorial Board* - Journal of Chemical Sciences
14. Srivastava, Suneel Kumar (2009) *Associate Editor* - Nanoscience and Nanotechnology Letters
15. Srivastava, Suneel Kumar (2008) *Advisory Committee Member* - Recent Patents on Nanotechnology

Awards & Honours

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| 1. | Chattaraj, Pratim Kumar (2009) | <i>Elected member, Nomination Council for the Infosys Prize</i> |
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2. Sarkar, Tarun Kumar (2009) *P. C. Dutta Memorial Lecture Award*
3. Taraphder, Srabani (2008) *Recent publication in J. Phys. Chem. B, 112, 13597 (2008) highlighted in Nature India, Oct. 2008, doi:10.1038/nindia.2008.301*
4. Chattaraj, Pratim Kumar (2008) *Top-cited Author Awards from Elsevier (for two of our Bioorg. Med. Chem. Papers). Many papers have become hot/most-cited/most-accessed/cover articles.*

Fellowships

1. Singh, N D Pradeep (2009) *The Royal Society, India-UK Science Network*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A conceptual DFT approach towards metal toxicity	BRNS, Mumbai	Rs. 7.00 Lakhs
2.	Application of high resolution NMR spectroscopy in complex chemical and biochemical systems	DST	Rs. 198.00 Lakhs
3.	Application of nanoparticles for delivery of drug to drug resistant bacteria and oral squamous carcinoma cell line.	DBT	Rs. 15.00 Lakhs
4.	Assessment of biological activity and toxicity : An in Silico investigation based on the combined quantum mechanics and molecular dynamics study	CSIR, New Delhi	Rs. 12.00 Lakhs
5.	Asymmetric Methods for the Synthesis of Substituted Butyrolactones: Enantioselective Synthesis of Biologically Active Compounds	CSIR, New Delhi	Rs. 10.50 Lakhs
6.	Biotechnology based value-addition to leaves, oilseeds & cakes of neem and Jatropha	NOVAD	Rs. 10.00 Lakhs
7.	Carbon nanotube supported electrocatalyst for fuel cells and metal air battery applications	DRDO	Rs. 34.96 Lakhs
8.	Catalyst Designing and its Application in Organic Synthesis	ISIRD, SRIC, IIT KGP	Rs. 5.00 Lakhs
9.	Catalytic and Enantioselective 1,2-Halo-Nucleophilic Addition Reactions of Alkenes	DST, New Delhi	Rs. 23.12 Lakhs
10.	Characterization of Micelles, Reverse Micelles in Room temperature ionic liquids (RTILs) using Dynamic Light Scattering, Fluorescence Spectroscopy and	DST	Rs. 38.55 Lakhs
11.	Combinatorial biocatalysis: Generation of compound libraries based on small molecule scaffold, taking the lead from nature	DST, ISIRD (IIT-KGP)	Rs. 20.00 Lakhs
12.	Cooperative Bimetallic Catalysis	DST,	Rs. 31.00 Lakhs
13.	Crystal Engineering Studies on Derivatives Containing 2° Amide and Pyridine Functional Groups: Design and Applications	CSIR	Rs. 11.46 Lakhs
14.	Design of 'anion recognition' short peptide motifs: an approach towards designing 'model scaffolds' for binding	DBT Multi Institutional	Rs. 3.20 Lakhs
15.	Design of Organic-Inorganic Hybrid Materials with Porous and/or Chiral Properties	DST	Rs. 18.72 Lakhs
16.	Design, Synthesis and Characterization of Lipophilic Polyelectrolyte Gels	DST, New Delhi	Rs. 20.40 Lakhs
17.	Design, Synthesis and Reactivity of Azobenzene-Based Peptide and DNA Cleaving Agents	CSIR	Rs. 16.00 Lakhs

18.	Development and characterization of nanofillers in for polymer composites	MHRD	Rs. 20.00 Lakhs
19.	Development and characterization of organic polymer-inorganic materials nanocomposites	CSIR	Rs. 6.60 Lakhs
20.	Development and characterization of semiconducting thin films of layer transition metal dichalcogenides		Rs. 10.46 Lakhs
21.	Development of nanorods, nanotubes and mesoporous metal oxide gas sensors,	CSIR, New Delhi	Rs. 15.00 Lakhs
22.	Development of nanostructured transducer for amperometric and microgravimetric applications	DST	Rs. 31.43 Lakhs
23.	Development and characterization of semiconducting nano tubes and nanorods for thermoelectric applications	DST	Rs. 17.00 Lakhs
24.	Early Transition Metal Catalysts for Aqueous Medium	DST	Rs. 24.00 Lakhs
25.	Electrophoresis of Polyethylene Glycol Copolymers	SRIC, IIT Kharagpur	Rs. 3.00 Lakhs
26.	Enantioseparation of Drugs and Small Organic Molecules by Electrokinetic Capillary Chromatography Using Vesicles as Pseudo-stationary Phase.	CSIR, New Delhi	Rs. 7.50 Lakhs
27.	Epoxy-reinforced inorganic material filled organic polymer composites in tribological applications	DRDO	Rs. 24.60 Lakhs
28.	Generation & reactivity of bimetallic tin-transition metal complexes	CSIR	Rs. 3.00 Lakhs
29.	Hyperthermia on Eneidyne	DBT,	Rs. 36.00 Lakhs
30.	Interaction of dietary polyphenols and their copper complexes with human serum albumin	DST	Rs. 29.00 Lakhs
31.	Interactions between Water-Soluble Hydrophobically Modified Polymers and Surfactants : Rheology, Fluorescence Probe, and Calorimetric Studies.	BRNS, DAE	Rs. 14.90 Lakhs
32.	Investigations on development and characterization of new layer type ternary and quaternary chalcogenides with ZnIn ₂ S ₄ IIIa and a FeGa ₂ S ₄ structures	CSIR	Rs. 8.68 Lakhs
33.	Investigations on development and characterization of polyolefinic elastmer nanocomposites	CSIR	Rs. 14.36 Lakhs
34.	Isolation of phosphatase from Mycobacterium and development of inhibitors	DBT	Rs.300.00 Lakhs
35.	Magnetic Field Effect on Radical-pair Recombination in Chemical and Bio-chemical Systems : An Optical Spectroscopic Study	DST	Rs. 15.70 Lakhs
36.	Mono-, Di- and Bisvinyl Sulfone-Modified Carbohydrates as Versatile Synthons: A New "Chiron Approach" to Heterocycles, Carbocycles, Sugar Cluster	DST	Rs. 21.72 Lakhs
37.	New functional group photolithography methods to pattern self assembled monolayers	DST	Rs. 19.00 Lakhs
38.	New photoremovable protecting groups for SAM systems	SRIC, IIT Kharagpur	Rs. 5.00 Lakhs
39.	Olefin polymerizations by organolanthanide catalysts	CSIR, New Delhi	Rs. 15.00 Lakhs
40.	Organocatalytic and Enantioselective 1,2-Halofunctionalization of Alkenes	DST, New Delhi	Rs. 23.90 Lakhs
41.	Photoinduced electron and energy transfer of some organic molecules in biologically relevant organized media	DST	Rs. 38.50 Lakhs
42.	Physico-Chemical Characterization of Metal Based Drugs	DST	Rs. 20.00 Lakhs

43.	Physico-Chemical Properties of Ayurvedic Metal-Based Drug: A Case Study on Rasasindu	DST	Rs. 20.00 Lakhs
44.	Preparation and Tribological Properties of MoS ₂ -Graphite-Viton Nanocomposites	DST FAST-TRACK	Rs. 9.55 Lakhs
45.	Preparation of Stable Vesicles of Catanionic Surfactants. Characterization by Surface Tension, Fluorescence Probe, Light Scattering, and Microscopi	DST, New Delhi	Rs. 24.00 Lakhs
46.	Processing and Performance of Biodiesel	DST	Rs. 19.00 Lakhs
47.	Role of water in predicting the protein folding-unfolding pathways: Computer simulation studies	DST, New Delhi	Rs. 26.70 Lakhs
48.	Screening for hydroxynitrile lyase from cyanogenic plant species in Indian subcontinent: their application in asymmetric organic synthesis	IFS, Sweden; DBT, India	Rs. 15.00 Lakhs
49.	Simulation and fabrication of a CVD/CVI set up for Ceramic Matrix Composites in general and SiC reinforced Graphite Matrix composites in particular	DRDO	Rs. 13.60 Lakhs
50.	Size & shape controlled mono-& bimetallic nanoparticles synthesis for sensing org. & important biomolecules in diff.organized media	DST	Rs. 76.03 Lakhs
51.	Spectroscopic Study of Solvation dynamics and Photochemical reactions in solution and organized assemblies	CSIR	Rs. 6.36 Lakhs
52.	Spin-Chemistry of photo-generated Radical-pairs in Room Temperature Ionic Liquids (RTILs) and in organized molecular assemblies : Studies on some mo	CSIR, New Delhi	Rs. 10.00 Lakhs
53.	Studies on copper complexes of green tea polyphenols and and their effects on the activities of ribonuclease A and angiogenin	CSIR	Rs. 8.20 Lakhs
54.	Studies on the physico-chemical properties of surface water and bed sediment of the Kasai River in Paschim Medinapur District	ISIRD-SRIC-IITKGP	Rs. 3.00 Lakhs
55.	Study of ultrafast processes in ionic liquid containing micro hetero geneous media	CSIR	Rs. 10.46 Lakhs
56.	Synthesis and Biological Studies of Azido and Aminohepyranosyl Nucleosides and Aminohepyranose Containing Oligomers: Towards New Classes of Antivi	(IndoFrench Centre for the Promotion of Advanced Research	Rs. 35.00 Lakhs
57.	Synthesis and optical Properties of Metal Nanoparticles in aqueous and Non-aqueous Reverse Micelles and Investigation of solvent relaxation in Reverse	BRNS	Rs. 20.70 Lakhs
58.	Synthesis and structural characterization of organolanthanide complexes and their applications	DST, New Delhi	Rs. 39.00 Lakhs
59.	Synthesis of Inorganic Fullerene-type MoS ₂ and WS ₂ Nanoparticles and Study of their Lubrication Properties	ISIRD	Rs. 4.15 Lakhs
60.	Synthesis, Structure and Reactivity of Bimetallic Complexes by using M ⁿ alloligands	CSIR	Rs. 9.45 Lakhs
61.	Synthetic Approaches to Nine-member Eneidyne	CSIR	Rs. 10.00 Lakhs
62.	Synthetic studies towards fused and bioactive gamma lactam derivatives : conversion of gamma lactam carboxylic acids to N-aryl formylpyrroles and synthe	DST	Rs. 23.61 Lakhs
63.	Synthetic Studies Towards Sesquiterpenes through Palladium Catalysed Intramolecular Cyclisation Reactions	CSIR, New Delhi	Rs. 18.76 Lakhs

64.	Theoretical Modelling of the Role of Hydration in Proton Transfer Processes in Proteins	CSIR, New Delhi	Rs. 9.51 Lakhs
65.	Total synthesis of chlorocyclinones, PPARY Antagonists of Natural Origin	CSIR, New Delhi	Rs. 19.00 Lakhs
66.	Total Synthesis of Chrymutasins	DST, New Delhi	Rs. 23.00 Lakhs
67.	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	Rs. 19.20 Lakhs
68.	Ultracapacitor for Electric and Hybrid Electric Vehicles	DST, New Delhi	Rs. 43.09 Lakhs
69.	Upgrading Raman Spectrometer to Micro-Raman Spectrometer for Studies on Bio-materials	DRDO	Rs. 49.79 Lakhs
70.	Use of Allylsilanes in the Synthesis of Biologically Significant Benzoisoquinoline Alkaloid Chrysanthone A and Non-natural Conduiritol Analogues	CSIR, New Delhi	Rs. 12.62 Lakhs
71.	Use of Kinugasa Reaction for the Synthesis of Heterocycle-Enediyne Chimera	DST, New Delhi	Rs. 37.00 Lakhs
72.	White Biotechnology: Biocatalysis using enzymes and microorganisms, synthesis of fine chemicals and APIs.	CSIR, New Delhi	Rs. 11.50 Lakhs

Consultancy Projects

1.	Laboratory preparation of DIBOC	Suparna Chemicals Ltd, Mumbai,	Rs. 23.61 Lakhs
2.	Setting up a research and development centre for Damodar Valley Corporation at Kolkata (Phase-1)	Damodar Valley Corporation, Kolkata,	Rs. 0.00 Lakhs
3.	Synthesis of Nano-sized Ceramics	Bharat Heavy Electrical Limited	Rs. 5.00 Lakhs

Technology Transferred

1.	A technology for designing a chemical reactor for production of nanosized oxide ceramics has been completed with BHEL, Bangalore Ceramic Division.		Rs. 5.00 Lakh
2.	M/S Modi & Co. Jamshedpur - A technology for making snow-white aluminium phosphate useful for pigment industry :		Rs. 1.00 Lakh

Patents (filed / granted)

- Electrically Conductive Compositions and Method of Manufacture Thereof
- Polycarbonate Copolymer Composition and Method of Making
- Polycarbonate-Poly(alkylene oxide) Copolymer Compositions and Articles Formed Therefrom
- Polycarbonate-Poly(alkylene oxide) Copolymer Compositions and Articles Formed Therefrom
- Polycarbonates with Fluoroalkylene Carbonate End Groups
- Process of Making Polycarbonate Nanocomposites
- Radiation Stable Aromatic Carbonate Polymer Compositions
- Ultra Sensitive Simultaneous Electrochemical Determination of Arsenic, Mercury and Copper

Visits Abroad by Faculty Members

1.	Ray, Jayanta Kumar	Visiting Professor (University of LaCorunna, Spain) May-July
2.	Mani, Ganesan	Research collaboration (Department of Chemistry, National Univeristy of Singapore) one month
3.	Pal, Tarasankar	Visiting Professor (Taiwan) about 2 months
4.	Taraphder, Srabani	To initiate collaboration (Albert Einstein College of Medicine of the Yeshiva University, New York, USA) May 2-8

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| 5. | Taraphder, Srabani | To deliver an invited lecture (Department of Computer and Information Science, Indiana University-Purdue University, Indianapolis, USA) May 9-11 |
| 6. | Taraphder, Srabani | Scientific interaction and invited lecture (Laboratory of Chemical Physics, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, USA) May 12 |
| 7. | Biradha, Kumar | Editorial Board Meeting of New Journal of Chemistry (CNRS, Paris) March 10-13 |
| 8. | Biradha, Kumar | Chaired a Micro-symposium "MS7 : Water Clusters in Molecular Crystals, Coordination polymers, IUCR2008 (Osaka, Japan) August 23-31 |
| 9. | Dasgupta, Swagata | Collaborative Research (Visiting Professor, University of the Balearic Islands, Spain) May-July 2008 |
| 10. | Biradha, Kumar | Collaboration (National University of Singapore) May-15 to July 15 |
| 11. | Pathak, Tanmaya | Visiting Professor (Departement of Molecular Pharmacochimie, CNRS/Universite Joseph Fourier-Grenoble 1, France) One month |
| 12. | Chattaraj, Pratim Kumar | To deliver an Invited Talk (Los Alamos National Laboratory, New Mexico, USA) July 27-30 |

Invited Lectures by Faculty Members

1. Halovinyl aldehyde in Organic Synthesis *by* Ray, Jayanta Kumar (North Orissa University)
2. Halovinyl aldehydes in Organic Synthesis and Chemoselective Functional Group Transformations in Lac *by* Ray, Jayanta Kumar (University of Alicante, Spain)
3. f Element Complexes of Dipyrrolide and Monopyrrolide Ligands, and Neutral Cr(III) Catalysts.... *by* Mani, Ganesan (Department of Chemistry, National University of Singapore)
4. Dipyrrolide and 2,5-Dimethylpyrrolide Sm(II), Yb(II) Complexes: Dinitrogen Activation and Synthesis *by* Mani, Ganesan (Department of Chemistry, Western Michigan University, USA)
5. Dipyrrolide and 2,5-Dimethylpyrrolide Sm(II), Yb(II) Complexes: Dinitrogen Activation and Synthesis *by* Mani, Ganesan (Indian Institute of Technology, Chennai, India, March, 2005)
6. Dipyrrolide and 2,5-Dimethylpyrrolide Sm(II), Yb(II) Complexes: Dinitrogen Activation and Synthesis *by* Mani, Ganesan (Indian Institute of Science, Bangalore, India, March 22, 2005)
7. Dipyrrolide and 2,5-Dimethylpyrrolide Sm(II), Yb(II) Complexes: Dinitrogen Activation and Synthesis *by* Mani, Ganesan (University of Pondicherry, India, April, 2005)
8. Hauser annulation in the synthesis of aromatic and hydroaromatics polyketide *by* Mal, Dipak Ranjan (Indian Chemical Society at Kolkata)
9. The first total synthesis of euplectin, a natural product with an indeno[h]chromone motif *by* Mal, Dipak Ranjan (Kalyani University)
10. Water around biomolecules *by* Bandyopadhyay, Sanjoy (Center for Theoretical Studies, Indian Institute of technology, Kharagpur)
11. Biomolecular hydration: Computer simulation studies *by* Bandyopadhyay, Sanjoy (S. N. Bose National Centre for Basic Sciences, Kolkata)
12. Dynamics of biomolecular hydration *by* Bandyopadhyay, Sanjoy (Indian Institute of Science and Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore)
13. Design and Development of Nanoarchitected Biosensors *by* Raj, C Retna (North Orisa University, Baribada, Orisa)
14. Metal and Metal Oxide nanoparticles in Nanometer Length Scale *by* Pal, Tarasankar (Heritage Institute of Technology, Kolkata)
15. Metal Nanoparticles in Catalysis *by* Pal, Tarasankar (Charuchandra College, Kolkata)
16. Metal and Metal Oxide nanoparticles in Nanometer Length Scale *by* Pal, Tarasankar (University of Calcutta)
17. Metal Nanoparticles in Spectroscopy *by* Pal, Tarasankar (Allahabad University)
18. Oxide Nanoparticles as Thin Films *by* Pal, Tarasankar (PSG College, Coimbatore)
19. Metal Oxide Nanoparticles *by* Pal, Tarasankar (Bhabha Atomic Research Center, Mumbai)

20. Arsenic in Water *by* Pal, Tarasankar (Taiwan)
21. Identification of Proton Transfer Pathways in Proteins *by* Taraphder, Srabani (Department of Biophysics and of Biochemistry, Albert Einstein College of Medicine of the Yeshiva University, New York, USA)
22. Proton Transfer Pathways in Proteins *by* Taraphder, Srabani (Department of Computer and Information Science, Indiana University-Purdue University, Indianapolis, USA)
23. Identification of Proton Transfer Pathways in Proteins *by* Taraphder, Srabani (Laboratory of Chemical Physics, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, USA)
24. Nanoparticles for Environmental *by* Pal, Tarasankar (Bhilai Institute of Technology)
25. Asymmetric aldol reactions under normal and inverse addition modes of the reagents: Studies towards *by* Hajra, Saumen (NOST Symposium, Goa)
26. Never Ending Journey on Asymmetric 1,2-Halo-functionalizations and Aldol Reactions for the Synthesis *by* Hajra, Saumen (CRSI Symposium, IIT-Guwahati)
27. Asymmetric Synthesis Towards Butyrolactone Natural Products *by* Hajra, Saumen (North Bengal University, Siliguri)
28. Asymmetric Aziridoarylation and Aldol Reactions Towards Synthesis g-Butyrolactone Natural Products *a by* Hajra, Saumen (Indo-KOSEF (Korea) Symposium; National Chemical Laboratory, Pune)
29. Crystal engineering with molecules containing multiple amide functionalities: interference of haloge *by* Biradha, Kumar (Mysore, INDO-US symposium)
30. Crystal Engineering: Molecules to Supramolecules *by* Biradha, Kumar (COORG, Orange County)
31. Divinyl Sulfone-Modified Carbohydrates *by* Pathak, Tanmaya (Department of Organic Chemistry, Indian Institute of Science, Bangalore)
32. Synthetic Strategies for the Modification of Nucleosides *by* Pathak, Tanmaya (North Eastern Hill University, Shillong (96th Science Congress))
33. Synthesis of Biologically Relevant Modified Nucleosides *by* Pathak, Tanmaya (Department of Chemistry, University of Delhi)
34. Crystal Engineering: Molecules to Network Materials *by* Biradha, Kumar (University of Hyderabad)
35. Crystal Engineering in Assembling Molecules to Functional Supramolecular Architectures *by* Biradha, Kumar (University of Delhi)
36. Crystal Engineering: Molecules to Supramolecules *by* Biradha, Kumar (Indian Institute of Technology, Kharagpur)
37. Design and development of inhibitors for the ribonuclease family *by* Dasgupta, Swagata (University of the Balearic Islands, Spain.)
38. A Bohmian Analysis of the Possible Field Induced KAM-like Transitions in Anharmonic Oscillators *by* Chattaraj, Pratim Kumar (International Workshop on "Quantum Trajectories", Centre for Nonlinear Studies, Los Alamos National Laboratory, New Mexico, USA)
39. Aromaticity in Metal Clusters *by* Chattaraj, Pratim Kumar (International Symposium on "Clusters, Cluster Assemblies, and Nano-scale Materials", Harish-Chandra Research Institute, Allahabad, India)
40. Member, NOC and Chairman, Technical Session, *by* Chattaraj, Pratim Kumar ("Theoretical Chemistry Meeting-2009", IISc Bangalore)
41. Chemical Dynamics in Confined media and Ionic Liquids *by* Sarkar, Nilmoni (S. N. Bose National centre for basic Sciences, kolkata)
42. Chemical Dynamics in Organized assemblies and room temperature ionic liquids *by* Sarkar, Nilmoni (Vivekananda Mahavidyalaya, Burdwan)
43. Crystal Engineering in Assembling Molecules To Functional Supramolecules *by* Biradha, Kumar (ICES, 1, Jurang Island, Singapore)
44. Assembling Molecules To Functional Supramolecules *by* Biradha, Kumar (Department of Chemistry, National University of Singapore)
45. Molecular Assemblies and Metal Nanoarchitectures in the Development of Biomolecular Sensors *by* Raj, C Retna (IIT Kharagpur)
46. Studies on Self Quenching Diradical Generating Processes *by* Basak, Amit (Orange County Bangalore)

47. Science at the Nanoscale *by* Raj, C Retna (Scott Christian College, Nagercoil)
48. Studies towards expanding the scope of diradical generating processes *by* Basak, Amit (IIT Kanpur)
49. A new mandelonitrile lyase from prunus armeniaca: Asymmetric synthesis of cyanohydrins and enzymology *by* Nanda, Samik (BAMU, Aurangabad)
50. Promise of Nanoscience, Invited Talk for Refresher Course of Chemistry ,UGC ETCE-2008 *by* Pramanik, P (Smbalpur University, Department of Chemistry)
51. Promise of nanoscience in chemical technology (Invited Talk) *by* Pramanik, P (Institute of Engineers, Jamshedpur Chapter)
52. Nano-science: its impact on physics and chemistry, Workshop of Advanced Material-2008 (Invited Talk) *by* Pramanik, P (Manipur University, Imphal, Department of Physics)
53. Nano-biotechnology: A new promise (Invited Talk) *by* Pramanik, P (Manipur University, Imphal, Department of Biology)
54. Bifunctional Motifs and Chemoselective Transformations in Organic Synthesis *by* Ray, Jayanta Kumar (North Bengal University)
55. Soft chemistry for materials, Invited talk for Indo-Russia workshop on SHS of Materials: 2008 *by* Pramanik, P (Indian Institute of Science, Bangalore, Material Research Laboratory)
56. Chaired a session in the International Symposium on Material Chemistry (ISMC-2008) *by* Pramanik, P (Bhabaha Atomic Ressearch Centre, Trombay)
57. Palladium Catalysed Intramolecular Oxidative Cyclizations and C-H Activation: Novel protocol for Syn *by* Ray, Jayanta Kumar (KIITS, Bhubaneswar)
58. Magnetic nanoparticle and its use (Invited talk) and chaired a session *by* Pramanik, P (Sastra University, Tanjavur for Indo-Japan Workshop on Nano-Biotechnology-2009)
59. Promise of nanomaterials in biotechnology (Invited talk and chaired a session) *by* Pramanik, P (NIPER, Chandigar for National Workshop on nanobiotechnology-2009)
60. Nanomaterials in Biology (Invited talk), Workshop on Current trends in Chemistry-2009 *by* Pramanik, P (Biswa Bharati University)

Books Published

1. A.Nag Text Book of Agriculture biotechnology *published by* Prientice of India (2008)

Seminars, Conferences and Workshops Organised

1. Crystal Engineering and Noncovalent Interactions: Contemporary Themes and Futuristic Development
2. MS7 : Water Clusters in Molecular Crystals, coordination polymers and biological macromolecule
3. One-day Symposium on Chemistry and Physics of Materials and Fluids
4. Sir J. C. Ghosh Memorial Lecture
5. Sixth One Day National Symposium in Chemistry

DEPARTMENT OF CIVIL ENGINEERING

HEAD : Professor Sriman Kumar Bhattacharyya

FACULTY

Professors

Baidya, Dilip Kumar	Ph.D. (IISc Bangalore), Soil Dynamics, Pile Foundations, Machine Foundations
Bandyopadhyay, Janendra Nath Bhattacharyya, Sriman Kumar	Ph.D. (IIT Kharagpur), Shell Structures and Bridge Engineering Ph.D. (IIT Kharagpur), Fluid-structure Interactions; FRP-concrete Composite Systems; Structural Health Monitoring
Das Gupta, Shambhu Pada	Ph.D. (IIT Kanpur), Constitutive Modelling; Soil-structure Interacion; Foundation Dynamics
Dey, Subhasish	Ph.D. (IIT Kharagpur), Hydrodynamics, Turbulence, Sediment Transport
Dhang, Nirjhar	Ph.D. (IIT Kharagpur), Structural Dynamics and Control, Biomechanics
Ghosh, Deba Prasad	Ph.D. (IIT Kharagpur), Soil Anchors, Batter Piles, Vibration of pile Foundations
Ramachandra, Lingadahally	Ph.D. (IIT Madras), Stability of Structures, Analysis of Structures, Impact Response of Structures
Reddy, Kusam Sudhakar	Ph.D. (IIT Kharagpur), Pavement Engineering

Associate Professors

Barai, Sudhir Kumar	Ph.D. (IISc Bangalore), Soft Computing Applications, Structural Health Monitoring, Recycled Construction Materials, Genetic Expression Programming, Fracture in Concrete
Bhattacharya, Baidurya	Ph.D. (Johns Hopkins University), Computational materials science, Risk and reliability analyses of infrastructure systems
Desai, Venkappayya R	Ph.D. (Clemson University), Water Resources Engineering, Integrated Water Management, Hydrology, Hydropower Engineering
Ghangrekar, Makarand Madha	Ph.D. (IIT Bombay), Environmental Engineering, Water and Wastewater Treatment, Anaerobic treatment using UASB reactor, Microbial Fuel Cell
Gupta, Ashok Kumar	Ph.D. (IIT Bombay), Environmental Engineering
Maitra, Bhargab	Ph.D. (IIT Bombay), Transportation Planning, Traffic Engineering and Management
Maity, Damodar	Ph.D. (IIT Kharagpur), Seismic Analysis of Dam Considering Fluid-Structure-Soil Interaction, Seismic Control of Highrise Buildings Using TLCD, Health Monitoring of Structures, Cost Effective Housing, Structural Engineering
Roy, Debasis	Ph.D. (University of British Colombia), Ground Improvement, Geotechnical Earthquake Engineering, Site Characterization
Sen Gupta, Aniruddha	Ph.D. (Illinois University), Geotechnical Earthquake Engineering, Landslide Mitigation
Sen, Dhruvajyoti	Ph.D. (IIT Delhi), Hydraulics and Water Resources Engineering

Assistant Professors

Chakraborty, Sushanta	Ph.D. (IIT Kharagpur), Structural System Identification, Finite Element Model Updating, Fibre Reinforced Plastics Composite Structures, Modal Testing of Civil Engineering Structures
Deb, Arghya	Ph.D. (Princeton University), Modeling Failure and Damage in Concrete, Finite Element Analysis

Deb, Kousik	Ph.D. (IIT Kanpur), Soil-Structure Interaction, Ground Improvement, Numerical Modeling, Foundation / Embankment on Soft, Pile Foundation
Dhar, Anirban	Ph.D. (IIT Kanpur), Subsurface Hydrology, Hydroinformatic Systems, Environmental Fluid Mechanics, Water Resources Engineering
Goel, Sudha	Ph.D. (Johns Hopkins University), Environmental Engineering
Maity, Rajib	Ph.D. (IISc. Bangalore)
Pal, Anjali	Ph.D. (Calcutta University), Environmental Engineering and Science, Nanoscience and Nanotechnology, Analytical Chemistry
Reddy, M Amaranatha	Ph.D. (IIT Kharagpur), Transportation Engineering

Senior Lecturers

Hossain, Shaikh Jahangir	Ph.D. (IIT Kharagpur), Structural Mechanics, Continuum Mechanics, Composite Structures, Nonlinear Continuum Mechanics, Advanced Theories of Plates and Shells, Mixed-Hybrid Finite Element Method
Verma, Shubha	Ph.D. (IIT Bombay), Atmospheric aerosols transport modelling, Air pollution source characteristics, control measures, and climate impacts, Contaminant transport in water and mitigation measures, Environmental Impact Assessment, Sustainable Development, and Climate Change issues

Faculty Appointments

Dr. Rajib Maity	Assistant Professor
Dr. Kaushik Deb	Assistant Professor
Dr. Anirban Dhar	Assistant Professor (Visiting)

Faculty Promotions

Dr. Nirjhar Dhang	Professor
Dr. Dilip Kumar Baidya	Professor
Dr. Aniruddha Sen Gupta	Associate Professor
Dr. Debasish Roy	Associate Professor
Dr. Subha Verma	Assistant Professor
Dr. Arghya Deb	Assistant Professor

Faculty Re-employment (Upto 65 years age)

Dr. S. Majumdar	Professor
Dr. B. B. Pandey	Professor

Brief Description of on-going activities

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

2. **SE** : Recycled construction materials, Stability of plates and shells, Biomechanics, Reliability of bridge structures, Low cost housing, Seismic analysis of dams, Fluid-structure Interactions, Structural Health Monitoring, Finite Element Model updating
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 stabilisation, 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. **SE** : 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. Direct shear apparatus
2. Automated compaction machines (2)
3. Cyclic triaxial system
4. Gas chromatograph (GC)
5. UV-Vis spectrophotometer and sun photometer
6. Sediment Feeder
7. UTM 14 kN Pneumatic Asphalt testing system with Creep and ITS test facility
8. Corelok system for Volumetric analysis of aggregate and bituminous mix
9. Laser Doppler Vibrometer
10. Digital concrete test hammer
11. Ultrasonic Pulse Velocity meter

Lectures by Visiting Experts

1. Asset Management Strategies to Optimize Transportation Investment *by* 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)
2. Traffic Management in the German Region Frankfurt RheinMain *by* Prof. Manfred Boltze (Professor, Darmstadt University, Germany)
3. Smooth Finite Elements through Tensor-product and Triangular B- splines *by* Prof. Debasish Roy (Department of Civil Engineering, Indian Institute of Science, Bangalore)
4. Statistical Methods in Civil Engineering *by* Prof. Ashok Deshpande (Former Deputy Director, NEERI, Nagpur and Chair, Berkeley Initiative in Soft Computing)
5. Probabilistic Methods for Nonlinear Structural System Identification *by* Prof. C.S. Manohar (Civil Engineering Department, Indian Institute of Science, Bangalore)

Doctoral and MS Degrees Awarded

1. Dipanjana Maulik Sequential Analytical Solution for Modelling Water Quality in Tidal Rivers. (Ph.D.)

2. Ashok Kumar Mishra Drought Characterization and Forecasting-A Hybrid Approach. (Ph.D.)
3. Kakoli Karar Monitoring and characterization of ambient air quality in residential, commercial and industrial regions of an urban area (Ph.D.)
4. Anirban Mandal Experimental Investigation of Dynamic Response of Surface Foundation Resting on Layered soil System (Ph.D.)
5. Soumendra Nath Kuiry Development of Finite Volume Shallow Water Flow Models and Application to Floodplain Inundation (Ph.D.)
6. Rajkumar V. Raikar Characteristics of Flow over Gravel-Beds and Scour within Contractions (Ph.D.)
7. Umesh Kumar Dewangan Studies on Structural Damage Detection and Health Monitoring (Ph.D.)
8. Priyaranjan Pal Characterisation of liquid filled composite containers using meshless local Petrov Galerkin Method considering fluid-structure interaction (Ph.D.)
9. Debasish Bandyopadhyay Structural Health Monitoring using Statistical system identification technique from limited dynamic responses (Ph.D.)

Fellow - Professional Bodies

1. Pal, Anjali (2008) International Congress of Chemistry and Environment
2. Dey, Subhasish (2003) *Fellow* - Indian Society for Hydraulics
3. Dey, Subhasish (2002) *Fellow* - Institution of Engineers
4. Bandyopadhyay, Janendra Nath (1988) *Fellow (F011326)* - The Institution of Engineers (India).

Member - Editorial Board

1. Barai, Sudhir Kumar (2008) *Member*
- Journal of Information Technology in Construction
2. Bhattacharya, Baidurya (2008) *Editorial Board Member*
- International Journal of Engineering Under Uncertainty: Hazards, Assessment and Mitigation
3. Desai, Venkappayya R (2007) *Reviewer*
- Journal of earth system sciences
4. Desai, Venkappayya R (2006) *Reviewer*
- Journal of Water Resources Management
5. Desai, Venkappayya R (2007) *Reviewer*
- Indian Water Resources Society (IWRS) Journal
6. Dey, Subhasish (2009) *Associate Editor*
- Journal of Hydraulic Engineering, ASCE
7. Dey, Subhasish (2009) *Member of Editorial Board*
- Flow Measurement and Instrumentation
8. Dey, Subhasish (2009) *Associate Editor*
- Journal of Hydro-Environment Research
9. Dey, Subhasish (2009) *Associate Editor*
- Sedimentology
10. Dey, Subhasish (2004) *Member of Editorial Board*
- Water Management, ICE London
11. Dey, Subhasish (2009) *Associate Editor*
- International Journal of Sediment Research
12. Dey, Subhasish (2009) *Associate Editor*
- Journal of Numerical Mathematics and Stochastics
13. Dey, Subhasish (2009) *Member of Editorial Board*
- Engineering Applications of Computational Fluid Mechanics
14. Dey, Subhasish (2009) *Member of Editorial Board*
- KSCE Journal of Civil Engineering

15. Ghangrekar, Makarand Madha (2008) *Associate Editor*
- Renewable and Sustainable Energy (RSE)
16. Ghangrekar, Makarand Madha (2008) *Member*
- International Journal of Wastewater Treatment and Green Chemistry (IJWTGC)
17. Ghangrekar, Makarand Madha (2008) *Associate Editor*
- Transactions of Biosystems and Agricultural Engineering (BAE)
18. Gupta, Ashok Kumar (2008) *Co-Guest Editor*
- Int. J. of Environment and Waste Management (IJEWM), ISSN (Online):1478-9868 -ISSN (Print): 1478-9876
19. Gupta, Ashok Kumar (2008) *Editorial Advisory Board*
- Recent Patents on Chemical Engineering, ISSN: 1874-4788
20. Gupta, Ashok Kumar (2006) *Associate Editor*
- International Journal of Ecology and Development
21. Pal, Anjali (2008) *Co-Editor*
- Research Journal of Chemistry and Environment
22. Pal, Anjali (2007) *Editorial Advisory Board*
- Recent Patents on Nanotechnology
23. Roy, Debasis (2009) *Associate Editor* - Geomechanics and Engineering
- An International Journal
24. Roy, Debasis (2009) *Associate Editor*
- Transactions of Civil Engineering and Construction Management
25. Sen, Dhrubajyoti (2008) *Associate Editor*
- Australian Journal of Water Resources

Awards & Honours

1. Deb, Kousik (2008) *Best Paper Award, for the paper "Effect of Velocity and Mass of Air-Craft on Response of Rigid Pavement"*
2. Dey, Subhasish (2009) *Brahmaputra Chair Professor for Water Resources*
3. Deb, Kousik (2008) *Excellent Paper Award to Junior Individuals 2008 given by International Association for Computer Methods and Advances in Geomechanics, USA*
4. Ghangrekar, Makarand Madha (2008) *Receipt of the top reviewer award for the year 2008, by the Elsevier journal Bioresource Technology*

Fellowships

1. Barai, Sudhir Kumar (2008) *Erskine Visiting Fellowship: Visit to University of Canterbury, New Zealand May-June 2008*
2. Deb, Kousik (2008) *Selected for Endeavour Research Fellowship - 2008 to undertake a Postdoctoral Research programme in Australia*
3. Dhar, Anirban (2008) *Endeavour Research Fellowship (AUSTRALIA)*
4. Ghangrekar, Makarand Madha (2008) *Marie Curie Fellowship under 6th frame work programme of European Union*
5. Verma, Shubha (2008) *Young Scientist travel fellowship, NOAA, USA*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A multi-scale investigation of the strength and durability of carbon nanotube based nano-electrode arrays used as biological sensors	DBT	Rs. 19.00 Lakhs
2.	A study on The Effects of Layering on The Dynamic Response of Foundations	CSIR	Rs. 8.50 Lakhs

3.	Assessment of Microbial Diversity and Community Structure of Arsenic Contaminated Ground Water of West Bengal	Department of Biotechnology, New Delhi	Rs. 29.15 Lakhs
4.	Bridge scour estimation, measurement and protection and use of various time systems like TDR, TTS and SA	RDSO	Rs. 151.00 Lakhs
5.	Chemical and optical characteristics of aerosols over the Indo-Gangetic plain	Sponsored Research and Industrial Consultancy SRIC	Rs. 3.00 Lakhs
6.	Coupled sloshing Response in a stiffened composite container	Aeronautical Research & Development Board	Rs. 5.17 Lakhs
7.	Design of Stilling Basin under variable hydraulic conditions	Ministry of Water Resources, Government of India,	Rs. 19.50 Lakhs
8.	Development of durable, water-repellent jute geotextiles	Jute Manufacturer's Development Council	Rs. 168.72 Lakhs
9.	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,	Rs. 5.60 Lakhs
10.	Evaluation of Bituminous mixes using Bituminous Pavement Analyzer	SRIC, IIT Kharagpur	Rs. 5.00 Lakhs
11.	Exploratory investigation on development of damage mechanics based methodologies for lifing of aeroengine components	DMRL Hyderabad	Rs. 10.00 Lakhs
12.	First order seismic microzonation of Kolkata area	Ministry of Earth Sciences,	Rs. 62.10 Lakhs
13.	Joint Networked Centre Research Project on Highway and Airport Pavement Engineering	Indo-US Scientific Technology Forum (IUSSTF), New Delhi	Rs. 65.00 Lakhs
14.	Modeling & Monitoring of Landslide Hazard in Sikkim Himalayas	Department of Science & Technology, Govt of India,	Rs. 23.00 Lakhs
15.	Multi-scale modeling to study the role of atomic scale defects in CNT-based nanocomposites	DST	Rs. 20.50 Lakhs
16.	Multiscale modeling of small scale interfacial phenomena in carbon nanotube reinforced composites	SRIC	Rs. 3.00 Lakhs
17.	Production of bioenergy during wastewater treatment	Ministry of Environment and Forest, New Delhi	Rs. 13.22 Lakhs
18.	Recycled Aggregate based concrete (RAC)	UGC	Rs. 8.96 Lakhs
19.	Resource mapping / Flood analysis of Ajay and Mayurakshi rivers using RS/GIS	DST	Rs. 15.00 Lakhs
20.	Rural Roads Performance Study	National Rural Roads Development Agency (NRRDA)	Rs. 10.00 Lakhs
21.	Seasonal characteristics of submicron aerosols: Chemical composition, source identification, and climate impacts	DST	Rs. 13.50 Lakhs
22.	Seismic Evaluation of Aged Concrete Gravity Dams	IIT Kharagpur	Rs. 3.00 Lakhs
23.	Simulation studies of mechanical behaviour and failure of carbon nanotubes	DMRL, Hyderabad	Rs. 10.00 Lakhs
24.	Status of Landslide Problem in Sikkim	Department of Science and Technology, Govt. of India, New Delhi	Rs. 0.30 Lakhs
25.	Studying Failure and Debonding in concrete	SRIC, IIT Kharagpur (ISIRD grant)	Rs. 1.00 Lakhs

26.	Swaralipi : a system for scripting Tagore's musical notes and transcoding	Society for Natural Language Technology Research	Rs.	9.00 Lakhs
27.	Synthesis and characterization of mono and bimetallic nanoparticles on supported systems and their application for the degradation of organic pollutant	SRIC, IIT KGP (under ISIRD)	Rs.	5.00 Lakhs
28.	Theoretical & Experimental Investigation of Strain Localization in Cohesive Soils under Plane Strain Condition	DST, New Delhi	Rs.	13.00 Lakhs

Consultancy Projects

1.	Adequacy of measures taken by Rourkela Steel Plant regarding the sewage treatment system of Rourkela Steel Plant Township	Rourkela Steel Plant, SAIL, Rourkela	Rs.	8.08 Lakhs
2.	Assessment of MSE wall distress	NHAI	Rs.	4.50 Lakhs
3.	Assessment of Tunnel Distress	Hooghly Metcoke and Power Ltd.,	Rs.	9.00 Lakhs
4.	Assessment of Tunnel Distress	Hooghly Met Coke & Power Co.Ltd , Tata Centre 43, Jawaharlal Nehru Road Kolkata- 700 071	Rs.	9.55 Lakhs
5.	Bridge girder design review (BGDR)	ITD-CEMINDIA(JV	Rs.	1.12 Lakhs
6.	Characterisation of Sinter Matallics & Muck Dump Materials	Tata Steel Ltd, Jamshedpur,	Rs.	0.00 Lakhs
7.	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,	Rs.	5.00 Lakhs
8.	Checking of Launching scheme for Railway over bridges on NH-41 (CWHEC-HCIL	J.V	Rs.	3.50 Lakhs
9.	Checking of Structural Designs & Drawings of Lucknow Airport	S. Ghosh & Associates	Rs.	9.00 Lakhs
10.	Checking of the design of lighting masts	B. P. Projects, Kolkata	Rs.	1.50 Lakhs
11.	Checking of the Distressed water tank	Executive Engineer, P.H. Division-III, Bhubaneswar	Rs.	1.01 Lakhs
12.	Checking the Soundness of Civil Foundation Of LRP Crusher of Noamundi	Tata Steel Limited	Rs.	5.51 Lakhs
13.	City Development Plan for Haldia	Haldia Development Authority, Haldia,	Rs.	22.47 Lakhs
14.	Collapse of girders of Rushikulya Bridge	National Highways Authority of India, Berhampur, Orissa,	Rs.	4.00 Lakhs
15.	Collection & characterization of environmental quality for water, wastewater, air & soil	Various govt. and private agencies	Rs.	0.00 Lakhs
16.	Construction of Arterial Road & Backup Area Behind Berth No. 2 of Haldia Dock Complex	Kolkata Port Trust, Haldia Dock Complex	Rs.	0.00 Lakhs
17.	Construction of Girls' Hostel - Rani Laxmibai Hall of Residence	IIT Kharagpur	Rs.	17.60 Lakhs
18.	Construction of Rotary in front of Raj Bhavan Square, Bhubaneswar	Engineer-in-Chief (Ciivil), Bhubaneswar,	Rs.	0.63 Lakhs
19.	Cyclone Shelter at Orissa coast	PMO	Rs.	25.00 Lakhs
20.	Damage of deck slab in span P1-P2 of Kangsabati Bridge	National Highways Authority of India, Kolkata	Rs.	6.00 Lakhs

21.	Design checking of Road Over Bridges	IRCON International Ltd.	Rs.	6.07 Lakhs
22.	Design of Bituminous mix	Intercontinental Consultants and Technocrats Pvt Ltd,	Rs.	0.35 Lakhs
23.	Design of Coal Transportation Roads	Southeastern Coalfields Limited, Bilaspur	Rs.	6.75 Lakhs
24.	Design of Observatory Tower	Kalaikunda Airforce	Rs.	0.75 Lakhs
25.	Design of UASB reactor for bio-diesel wastewater treatment	Industrial Water Engineers, Malaysia.	Rs.	4.00 Lakhs
26.	Design of Water Tank	Kalaikunda Airforce	Rs.	0.60 Lakhs
27.	Development of reliability based criteria for containment design	BARC	Rs.	9.50 Lakhs
28.	Development of Software for the analysis of steel-cord pipe conveyor belt	Phoenix-Yule Ltd.	Rs.	2.20 Lakhs
29.	Drainage plan for Shantiniketan - Sriniketan	Shantiniketan - Sriniketan Development Authority,	Rs.	15.00 Lakhs
30.	Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the proposed Dwarakeswar Gandheswari Reservoir project (West Bengal)	Superintending Engineer, Investigations & Planning Circle, No. II, I & W directorate (Kolkata) Govt.,	Rs.	20.22 Lakhs
31.	Establishment of Indian Institute of Corporate Affairs (Infrastructure)	Ministry of Corporate Affairs, New Delhi,	Rs.	160.70 Lakhs
32.	Evaluation of CRMB samples for Strengthening of NH- 57 Road Works	M/s Span Consulatnats Pvt Ltd, Forbesganj, Bihar,	Rs.	0.60 Lakhs
33.	Evaluation of Milled Sample of Bituminous Mix	Consulting Engineering Services (India) Pvt Ltd,	Rs.	1.00 Lakhs)
34.	Evaluation of PMB for streghtening of NH-31 road work	PWD, Coochbehar. West Bengal,	Rs.	0.35 Lakhs
35.	Farakka Barrage Pond Stabilisation and Bagmari Canal Syphon Aqueduct Problem	Inland Waterways Authority of India,	Rs.	10.00 Lakhs
36.	Health Monitoring of a building Structure	West Bengal Housing Board, Kolkata,	Rs.	3.00 Lakhs
37.	Health monitoring of Factory building structure	Titagarh Wagons Ltd.	Rs.	4.00 Lakhs
38.	Improvement of Draiang Facilities at dock and adjoining area at haldia Dock Complex	Haldia Dock Complex, Haldia,	Rs.	20.50 Lakhs
39.	Improvement of Road Connectivity, Traffic Mobility and Safety in the Influence Area of Keventer Premises in Barasat	Keventer Fresh Limited, Kolkata,	Rs.	2.02 Lakhs
40.	Investigation of Rutting Failure on NH-2	Progressive Construction	Rs.	3.00 Lakhs
41.	Measures for Improving Traffic Mobility aound the Proposed Mixed Use Development at Rishra	Keventer Projects Limited, Kolkata,	Rs.	2.70 Lakhs
42.	MSE Wall Failure investigation and reconstruction at Kisanganj	NHAI, Siliguri,	Rs.	4.49 Lakhs
43.	Non-destructive testing at BRBNML, Salboni	Espace Planning Services Pvt. Ltd.,	Rs.	3.00 Lakhs
44.	Optimized properties of galvanized steel	Tata Steel	Rs.	.5.30 Lakhs
45.	Performance evaluation of UASB reactor treating molasses	MM Enviro Pvt. Ltd.	Rs.	0.50 Lakhs
46.	Preparation of Aizawl Master Plan	Aizawl Development Authority, New Capital Complex, Khatla, Aizawl, Mizoram,	Rs.	70.22 Lakhs

47.	Preparation of City Development Plan for Burdwan Planning Area (BDAP)	Burdwan Development Authority, Burdwan713101	Rs. 11.23 Lakhs
48.	Preparation of detailed project Report for periphery road	Bharatiya Note Mudran Ltd., Salboni	Rs. 10.00 Lakhs
49.	Preparation of Master Plan of Drainage System in Planning Area of Sriniketan Santiniketan Development Authority (SSDA)	Executive Officer, SSDA Bholpur,	Rs. 15.00 Lakhs
50.	Preparation of Perspective Plan- Vision 2030 and Comprehensive development Plan areas of Bhubaneswar and Cuttack development Authority	Housing and Urban Development Department Government of Orissa, Bhubaneswar,	Rs. 165.29 Lakhs
51.	Preparation of Storm Water drainage Master Plan for Haldia Municipal Area	Haldia development Authority Haldia,	Rs. 25.84 Lakhs
52.	Rainwater Harvesting in BRBNMPL Campus, Salboni	Bharatiya Reserve Bank Note Mudran (P) Ltd., Salboni,	Rs. 5.00 Lakhs
53.	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.,	Rs. 1.13 Lakhs
54.	Review of Bund Stability of the Existing Red Mud and Ash Ponds at Vedanta Aluminium Plant, Rayagoda	Pollution Control Board, Bhubaneswar, Orissa,	Rs. 0.00 Lakhs
55.	Scrutiny of Technical Proposals for Pradhan Mantri Gram Sadak Yojana work	NRRDA, Delhi	Rs. 5.50 Lakhs
56.	Seismic design parameters for Barmer - Salaya pipeline	L&T Gulf	Rs. 3.00 Lakhs
57.	Sewerage Master Plan for Haldia Municipal Area	Haldia Development Authority,	Rs. 22.06 Lakhs
58.	Software capabilities for reliability analysis of ship structures	Indian Register of Shipping,	Rs. 4.00 Lakhs
59.	Soil Test for Proposed BLLRO Office Building at Nayanjuli, Kharagpur	Govt. of West Bengal,	Rs. 0.00 Lakhs
60.	Stress Analysis of Steel Cord Reinforced Pipe Conveyor Belt (SCPC)	Phoenix Yule Limited, Kolkata-700020,	Rs. 0.00 Lakhs
61.	Structural Health monitoring of Factory building Client: Titagarh Wagon Ltd.	Titagarh Wagon Ltd., Kolkata,	Rs. 3.00 Lakhs
62.	Study of water supply distribution/storage and source availability for Darjeeling Municipality	District Magistrate, Darjeeling,	Rs. 4.82 Lakhs
63.	Sump model study for CW system pkg - NTPC	Kirloskar Brothers Ltd.	Rs. 9.00 Lakhs
64.	Sump model study for Dadri, Simhadri and Farakka CW pumps	WPIL Limited, Kolkata	Rs. 27.00 Lakhs
65.	Tecnical advice for pile load test and evaluation of pile load capacity	Ramsarup Lohh Udyog Ltd,	Rs. 1.45 Lakhs
66.	Testing & Evaluation of 100m Transmission Tower at AIR Kohima	(Webel Mediatronics Ltd	Rs. 4.07 Lakhs
67.	Testing of sub-grade water etc	Span Consultant Pvt Ltd	Rs. 0.40 Lakhs
68.	Traffic Study for Project- ITC East India, Kolkata	ITC Limited	Rs. 2.70 Lakhs
69.	Traffic Study for the Proposed Mixed Use Township Complex in Kasba Area, Kolkata	Bengal-NRI	Rs. 2.40 Lakhs
70.	Vetting of design and drawing of railway crossingstructure at chainage of 175-20 of right main canal and at chainage 244-00 of left main canal of Bhar	Chief Engineer, Water resources Department ranchi, Govt of Jharkhand	Rs. 4.00 Lakhs

71.	Vetting of Pavement Design for Tezpur Airfield	CE (AF), Shillong Zone, Elephant Falls Camp, Shillong	Rs. 1.50 Lakhs
72.	Vikram Sarabhai Residential Complex	IIT Kharagpur	Rs. 9.60 Lakhs

Visits Abroad by Faculty Members

1.	Bandyopadhyay, Janendra Nath	To present one paper at the Asian Conference on Mechanics and Functional Materials and Structures (Matsue, Japan) October 31 to November 3, 2008
2.	Dey, Subhasish	To offer a short-course (Università della Calabria, Italy) 5 days
3.	Dey, Subhasish	To offer a short-course (University of Florence, Italy) 4 days
4.	Dey, Subhasish	To offer a short-course (University of Oulu, Finland) 4 days
5.	Dey, Subhasish	To attend ICHE2008 (Nagoya University, Japan) 4 days
6.	Pal, Anjali	Research collaboration (Taiwan) May-June
7.	Gupta, Ashok Kumar	To develop research collaboration in the area of air quality (Texas A&M University Kingsville, Texas, USA) July 1-15
8.	Verma, Shubha	Conference (Annecy, France) 7 days
9.	Barai, Sudhir Kumar	To Avail Erskine Visiting Fellowship (University of Canterbury, Christchurch, NZ) 2 months
10.	Barai, Sudhir Kumar	To Present Invited Lecture and paper during EASEC-11 (National Taiwan University, Taiwan) 1 Week
11.	Barai, Sudhir Kumar	To Present the work (HP Labs, Palo Alto, USA) 4 days
12.	Ghangrekar, Makarand Madha	Marie Curie Fellowship (Newcastle upon Tyne, UK) September 24 to December 31

Invited Lectures by Faculty Members

1.	Parallel Neuro Models Applications in Structural Engineering Domain <i>by</i> Barai, Sudhir Kumar (National Taiwan University, Taipei, Taiwan)
2.	Monitoring and Analyses of Landslides in North-East India <i>by</i> Sen Gupta, Aniruddha (University of Manipur, Imphal)
3.	Bending Behaviour of Carbon Nanotubes,? Plenary Lecture <i>by</i> Bhattacharya, Baidurya (International Conference on Materials Discovery, University of Tlemcen, Oran, Algeria)
4.	Molecular dynamics simulation of solids: a case study on carbon nanotubes <i>by</i> Bhattacharya, Baidurya (AICTE/MHRD sponsored winter school on Nanoparticle-Science and Technology, National Institute of Technology, Durgapur)
5.	Molecular dynamics simulation of fracture: a look at carbon nanotubes <i>by</i> Bhattacharya, Baidurya (Indo US workshop on Materials Design: Measurement Modeling and Informatics, Bengal Engineering and Science University)
6.	Introduction to Partial Safety Factor in Engg. Design <i>by</i> Bhattacharya, Baidurya (5th Indo-German Theme Meeting on Structural Integrity of Pressure Retaining Components, Jadavpur University)
7.	Anionic surfactant adsorption on waste tire rubber granules <i>by</i> Pal, Anjali (Bhilai Institute of Technology, Bhilai Nagore)
8.	Liquefaction of soils and related issues <i>by</i> Roy, Debasis (Andhra University, Visakhapatnam)
9.	Geotechnical earthquake engineering activities <i>by</i> Roy, Debasis (IIT Madras)
10.	Geotechnical earthquake engineering <i>by</i> Roy, Debasis (Jadavpur University, Salt Lake Campus)
11.	Geotechnical issues - seismic design of bridges <i>by</i> Roy, Debasis (IIT Kanpur)
12.	Fluoride in Drinking water-A global perspective <i>by</i> Gupta, Ashok Kumar (Angul, Orissa)
13.	Solid Waste Management: A Recent Trends <i>by</i> Gupta, Ashok Kumar (NIT Durgapur)
14.	Parallel Neuro Models Applications in Structural Engineering Domain <i>by</i> Barai, Sudhir Kumar (University of Canterbury, Christchurch, New Zealand)
15.	Neuro Air Quality Predictors <i>by</i> Barai, Sudhir Kumar (Lincoln University, Christchurch, New Zealand)

16. Neural Networks and its Applications in Structural Engineering *by* Barai, Sudhir Kumar (SVNIT, Surat)
17. Fuzzy Logic and its Engineering Applications *by* Barai, Sudhir Kumar (IIT Kharagpur)
18. Microbial Fuel Cell *by* Ghangrekar, Makarand Madha (Birla Institute of Technology and Science (BITS) Pilani, Goa Campus)
19. Bio-energy recovery (methane and electricity) during wastewater treatment *by* Ghangrekar, Makarand Madha (New Delhi)
20. Wastewater treatment using microbial fuel cell *by* Ghangrekar, Makarand Madha (University of Newcastle upon Tyne, UK)
21. Bioenergy recovery during treatment of organic wastes *by* Ghangrekar, Makarand Madha (Govt. College of Engineering, Aurangabad)
22. Better management practices for floods and droughts *by* Desai, Venkappayya R (GBpant Univ. of Agriculture and Technology)
23. Recycled Aggregate as construction materials *by* Bhattacharyya, Sriman Kumar (Kolkata)
24. Concrete Mix design - A review *by* Bhattacharyya, Sriman Kumar (CET, Bhubaneswar)

Books Published

- | | | |
|----|---------------------------------------|--|
| 1. | Indrajit Chowdhury and S. P. Dasgupta | Dynamics of Structure and Foundation__ A unified Approach: 1. Fundamentals <i>published by</i> CRC Press/ Balkema;AK Leiden, The Netherlands (2008) |
| 2. | Indrajit Chowdhury and S. P. Dasgupta | Dynamics of Structure and Foundation__ A unified Approach: 2. Applications <i>published by</i> CRC Press/ Balkema;AK Leiden, The Netherlands. (2008) |
| 3. | J.N.Bandyopadhyay | Design of Concrete Structures <i>published by</i> Prentice-Hall of India Pvt. Ltd. (2008) |

Short-Term Courses, Training Programmes and Workshops organized

1. Application of Finite Element Technique in Engineering (3-7 December 2008)

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

HEAD : Professor Indranil Sengupta

FACULTY

Professors

Basu, Anupam	Ph.D. (IIT Kharagpur), Assistive Technology, Embedded Systems, Language Processing
Chakrabarti, Partha Pratim	Ph.D. (IIT Kharagpur), Artificial Intelligence, CAD for VLSI, Formal Verification
Dasgupta, Pallab	Ph.D. (IIT Kharagpur), Design Verification
Ghose, Sujoy	Ph.D. (IIT Kharagpur), Operating System, Networks, Algorithms
Kumar, Rajeev	Ph.D. (Sheffield), Programming Language & Software Engineering, Multiobjective Optimization & Evolutionary Computing, EDA & Embedded Systems, Multimedia Systems & Video Transcoding
Majumder, Arun Kumar	Ph.D. (Calutta), Ph.D. (Florida), Multimedia Systems, Medical Informatics and Telemedicine, Data Security, Design Automation
Mall, Rajib	Ph.D. (IISc. Bangalore), Software Engineering
Mukhopadhyay, Jayanta	Ph.D. (IIT Kharagpur), Image Processing, Medical Informatics, Multimedia Systems, Bio-informatics
Pal, Ajit	Ph.D. (Calcutta University), Low Power VLSI Circuits, Sensor Networks, Optical Communication
Pal, Sudebkumar Prasant	Ph.D. (IISc. Bangalore), Design and analysis of algorithms, Computational geometry, Graph theory and algorithms
Roychowdhury, Dipanwita	Ph.D. (IIT Kharagpur), Cryptography, VLSI Testing, Cellular Automataion
Sarkar, Dipankar	Ph.D. (IIT Kharagpur), Formal Verification of Circuits and Systems
Sarkar, Sudeshna	Ph.D. (IIT Kharagpur), Machine Learning, Text Mining, Natural Language Processing
Sengupta, Indranil	Ph.D. (Calcutta University), Cryptography and network security, VLSI design and testing

Associate Professors

Ganguly, Niloy	Ph.D. (BESU, Calcutta), Peer-to-peer Networks, Complex Network Theory, Social Networks Modelling
Gupta, Arobinda	Ph.D. (Iowa), Distributed Systems, Ad Hoc Networks
Mandal, Chittaranjan	Ph.D. (IIT Kharagpur), Formal Verification, VLSI Design

Assistant Professors

Bhowmick, Partha	Ph.D. (ISI, Kolkata), Digital geometry, Shape analysis, Pattern recognition
Das, Abhijit	Ph.D. (IISc. Bangalore), Cryptography, Computational Number Theory
Harit, Gaurav	Ph.D. (IIT, Delhi), Image Processing, Document Image Analysis, Pattern Recognition, Video analysis, Semantics in Multimedia
Mitra, Pabitra	Ph.D. (ISI Calcutta), Machine Learning, Infomation Retrieval

Mukhopadhyay, Debdeep

Ph.D. (IIT Kharagpur), Cryptography and Side Channel Analysis, VLSI of Cryptographic Algorithms, Cellular Automata

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

Faculty Appointments

Dr. Gaurav Harit

Assistant Professor

Dr. Partha Bhowmik

Assistant Professor

Dr. Debdeep Mukhopadhyay

Assistant Professor

New Academic Programmes

1. Joint M.Tech. + PhD program,
2. Joint M.S. + PhD program

Brief Description of on-going activities

Artificial Intelligence, Bioinformatics, Combinatorial and Computational Geometry, Computer Graphics, Computer Networks, Cryptography, Databases, Embedded Systems, Fault Tolerant Computing, Formal Verification, Image Processing and Computer Vision, Mobile Computing, Multimedia, Natural Language Processing, Object Oriented Design Tools, Parallel and Distributed Processing, Real Time Systems, Software Engineering, Speech Recognition and Synthesis, VLSI Design and CAD Tools, Quantum Information and Computation

Thrust Areas

1. Artificial Intelligence
2. Image Processing and Computer Vision
3. Natural Language Processing
4. VLSI Design and CAD tools

New Acquisitions

1. The laboratory for "Geometric, Combinatorial and Algebraic Computation" is a new thematic laboratory in CSE department.
2. Mridul Aanjaneya, Tromino Tilings of Domino-Deficient Rectangles, *Discrete Mathematics* (2008), doi:10.1016/j.disc.2008.01.040 (available at <http://arxiv.org/abs/cs/0606059>).

Lectures by Visiting Experts

1. Weathering the Storm in Cloud Computing by Vipin Chaudhary (University at Buffalo, SUNY)
2. Relation Learning from Text by Indrajit Bhattacharya (IBM India Research Lab)
3. Context Sensitive Software Model Checking by Dr. Swarat Chaudhuri (Pennsylvania State University)
4. NetPrints: Diagnosing Home Network Misconfigurations using Shared Knowledge by Ranjita Bhagwan (Microsoft)
5. Multimodal Systems in general by Dr. Prasenjit Dey (HP Labs India)
6. Designing a Virtual Information Telescope Using Mobile Phones and Social Participation by Romit Roy Choudhury (Duke University)
7. Polynomial hierarchy, Betti numbers and a real analogue of Toda's theorem by Saugata Basu (Department of Mathematics, Purdue University.)
8. A Two-Stage Constraint Based Dependency Parser for Free Word Order Language by Prof. Rajeev Sanghal (IIIT Hyderabad)

9. Information spreading in mobile agent systems: from myxobacterial collective motion to broadcasting and routing in Delay Tolerance Networks by Fernando Peruani (Institute of Complex System Paris, France)

Doctoral and MS Degrees Awarded

1. Manojit Chowdhury Computational Models of Real World Phonological Change (Ph.D.)
2. P. K. Singh Enhancing Solution Quality of Multiobjective Combinatorial Optimization with Hybridization of Evolutionary Algorithms (Ph.D.)
3. Prasenjit Basu Design Intent Verification by Formal Property Coverage (Ph.D.)
4. V. Pallavi Trajectory Analysis and Video Summarization with Application to Soccer Videos (Ph.D.)
5. Suchismita Roy SAT Based Solutions for Timing and Power Estimation in Gate Level Circuits (Ph.D.)
6. Abhishek Somani New Methods in Design Space Exploration and Optimization of Analog Circuits (Ph.D.)
7. Ashok Kumar Das Design and Analysis of Key Distribution Mechanisms in Wireless Sensor Networks (Ph.D.)
8. Sandip Aine New Approaches to Design and Control of Anytime Algorithms (Ph.D.)
9. T. Tuithung Motion Compensated JPEG 2000 : A New Video Codec (Ph.D.)
10. Bhaskar Pal Formal and Semi-formal Verification Methods with Constrained Random Testbenches (Ph.D.)
11. Ansuman Banerjee Formal Methods for Accelerating Formal, Semi-formal and Dynamic Property Verification through Novel Specification Styles (Ph.D.)
12. Monalisa Sharma Automatic Test Specification Generation for State-based System Testing (Ph.D.)
13. Samit Bhattacharya Models and Algorithms for Design of Scanning Keyboards (Ph.D.)
14. Santosh Biswas Failure Diagnosis of Fair Discrete Event System Models and Its Application to On-line Testing of Sequential VLSI Circuits (Ph.D.)
15. Anindyasundar Nandi Formal Methods for Test Plan Coverage and Debugging (MS)
16. Sayak Ray Formal Verification and Synthesis of Power Mode Scheduling Strategies (MS)
17. Soham C. Chakraborty Static Analysis and Optimization of Object Oriented Systems (MS)
18. Alok Bandyopadhyay (MS)

Fellow - Professional Bodies

1. Chakrabarti, Partha Pratim (0) *Awarded - INSA*
2. Chakrabarti, Partha Pratim (0) *Awarded - INAE*
3. Chakrabarti, Partha Pratim (0) *Awarded - IASc*
4. Chakrabarti, Partha Pratim (0) *Awarded - WBS&T Academy*
5. Kumar, Rajeev (2001) *Fellow - The Institute of Electronics & Telecommunication Engineers (IETE)*
6. Mukhopadhyay, Jayanta (2008) *Fellow - Indian National Academy of Engineering (INAE)*

Member - Editorial Board

1. Mukhopadhyay, Jayanta (2008) *Member of Editorial Board*
- International Journal of Biomedical Engineering and Consumer Health Informatics.
2. Mukhopadhyay, Jayanta (2008) *Member of Editorial Board*
- International Journal of Biomedical Imaging (IJBI)

Awards & Honours

- | | | |
|----|------------------------------|---|
| 1. | Sarkar, Dipankar (2009) | <i>EDA Software Contest at VLSI 2009</i> |
| 2. | Mukhopadhyay, Debdeep (2008) | <i>Indian Semiconductor Association TechnoInventor Award</i> |
| 3. | Mukhopadhyay, Debdeep (2009) | <i>Second Best Design Contest Award, 22nd VLSI Design Conference, New Delhi</i> |
| 4. | Mandal, Chittaranjan (2009) | <i>VLSI Design 2009 EDA Contest award (first place)</i> |

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A Novel Regression Test Selection Technique	General Motors	Rs. 0.00 Lakhs
2.	Advanced VLSI Consortium	Multiple (Consortium),	Rs. 100.00 Lakhs
3.	Approximate Search and Coverage Based Analysis	IBM Faculty Award	Rs. 3.00 Lakhs
4.	Authentication schemes for VANETs	General Motors India	Rs. 0.00 Lakhs
5.	Bengali Treebank	Central Institute of Indian Languages,	Rs. 26.00 Lakhs
6.	Building Delay Tolerant Peer-to-peer network	DIT	Rs. 55.00 Lakhs
7.	Combinatorial and Geometric Approaches to Digital Imaging Applications	SRIC, IIT Kharagpur	Rs. 1.35 Lakhs
8.	Cross Language Information Access	MCIT	Rs. 65.00 Lakhs
9.	Design and Analysis of an Efficient Cryptosystem for Safe Messaging over Vehicular Adhoc Network	General Motors, Bangalore,	Rs. 20.00 Lakhs
10.	Design and implementation of a cryptosystem resistant to vulnerabilities and side channel attacks	DIT, GOI	Rs. 138.00 Lakhs
11.	Design of a processor having an asynchronous ALU to counter side channel attack	ISRO	Rs. 0.50 Lakhs
12.	Design of an Indigenous Encryption Algorithm for SDH-16	Indian Telephone Industry, Bangalore	Rs. 40.00 Lakhs
13.	Design of Indigenous Encryption Algorithms for SDH-16	Indian Telephone Industry,	Rs. 40.00 Lakhs
14.	Designing robust and self-organised p2p system over peer-to-peer networks	Department of Science and Technology,	Rs. 20.00 Lakhs
15.	Developing robust and efficient services for open source Internet telephony over peer to peer network	DST-BMBF	Rs. 3.92 Lakhs
16.	Developing robust services for peer to peer networks	SRIC	Rs. 3.00 Lakhs
17.	Development of Cross-Lingual Information Access (CLIA) system	Ministry of Communications & Information Technology,	Rs. 61.51 Lakhs
18.	Development of Indian Language to Indian Language Machine Translation System (IL-IL MT)	Ministry of Communications & Information Technology,	Rs. 46.00 Lakhs
19.	Development of infrastructure for centre of excellence on information assurance	Headquarters Integrated Defense Staff, Ministry of Defence,	Rs. 50.00 Lakhs
20.	Development of Multimedia Hardware-Software system for the Education of Students with Cerebral Palsy and Communication	Ministry of Social Justice and Empowerment Gol,	Rs. 17.00 Lakhs
21.	Development of Spatio-Temporal Access Control Models	DST, GOI,	Rs. 16.18 Lakhs
22.	Distributed data synchronization algorithms (ASD)	Applied Research Works,	Rs. 2.16 Lakhs
23.	Enabling Research with ICT	National Institute of Mentally Handicapped, Hyderabad,	Rs. 5.00 Lakhs

24.	Encompression - Encryption in Compressed Domain (Pre-project)	(ISRO, Ahmedabad (STC, IIT Kharagpur	Rs. 2.00 Lakhs)
25.	Extending the scope of equivalence checking in complex embedded system design verification	DST	Rs. 20.00 Lakhs
26.	Fundamental research in information assurance	Headquarters Integrated Defense Staff, Ministry of Defense,	Rs. 48.10 Lakhs
27.	GM Collaborative Research Laboratory on ECS for Education	General Motors	Rs. 125.00 Lakhs
28.	High Level Synthesis and Verification of Digital Circuits	MHRD,	Rs. 6.00 Lakhs
29.	INAE Visveswarya Chair Professor Project	INAE,	Rs. 16.74 Lakhs
30.	Indian Language Machine Translation	MCIT	Rs. 45.00 Lakhs
31.	Information spreading in a system of mobile agents.	STIC-Asie	Rs. 0.00 Lakhs
32.	Investigation of Cryptanalytic Techniques	Headquarters, Integrated Defence Staff, Ministry of Defence,	Rs. 44.30 Lakhs
33.	Low Power Circuits and Systems	Intel Corporation, USA	Rs. 22.00 Lakhs
34.	Machine Learning for Cross Language Information Retrieval	IIT Kharagpur ISIRD	Rs. 3.00 Lakhs
35.	Multimedia Modeling of Dynamic Objects (MMD)	DST, GOI.	Rs. 18.00 Lakhs
36.	Nokia Mobile Phone Interface Verification	Kingston University & Nokia,	Rs. 4.50 Lakhs
37.	Shruti: A Vernacular Speech Recognition System	Media Lab Asia	Rs. 25.00 Lakhs
38.	Special Manpower Development Programme for VLSI Design and Related Software (SMDP-II)	Ministry of Information Technology, Govt. of India,	Rs. 90.00 Lakhs
39.	Spellchecker	Society for Natural Language Technology Research,	Rs. 18.00 Lakhs
40.	VLSI Design of Elliptic Curve Cryptosystem Tolerant against Power Attacks	IIT Kharagpur	Rs. 4.40 Lakhs
41.	Web Enabled Medical Information Access Using Handheld Devices in a Wireless Environment for Telemedicine Applications	Ministry of Information and Communication Technology, GOI,	Rs. 62.10 Lakhs

Consultancy Projects

1.	Advisor for Communications and Networking Plan	National Insurance Company,	Rs. 2.40 Lakhs
2.	Behavioral Modeling and Verification of Mixed-signal Circuits	National Semiconductor Corp, USA,	Rs. 27.00 Lakhs
3.	Benchmarking of Text Mining	Hague Centre for Strategic Studies,	Rs. 4.00 Lakhs
4.	Broadband Architecture Validation	Reliance Commtn,	Rs. 16.00 Lakhs
5.	Call Centre & Data Warehousing (CRMP)	WBSEB	Rs. 17.00 Lakhs
6.	Computerization of DVC (CDVC)	Damodar Valley Corporation,	Rs. 19.00 Lakhs
7.	Content Based Search in Satellite Image Repository	Defence Electronics Lab.,	Rs. 9.50 Lakhs
8.	Deployment of Telemedicine in Tripura	Ministry of Information Technology, Gov't of India, and WECS, Ltd. Kolkata,	Rs. 27.00 Lakhs

9.	Development of Telemedicine in West Bengal Govt. Hospitals	Ministry of Information Technology, Govt. of India and WEBEL, Kolkata,	Rs. 29.00 Lakhs
10.	External Network Consultant for West Bengal State Wide Area Network(WBSWAN) Expansion Project	Ministry of Information Technology, Gov't of India, and WEBEL Techn. Ltd. Kolkata,	Rs. 30.00 Lakhs
11.	Formal Design Intent Modeling and Verification of AMS Behaviors	Semiconductor Research Corporation (SRC),	Rs. 45.00 Lakhs
12.	Formal Methods for Component Based Design Validation	General Motors Collaborative Research Lab,	Rs. 23.00 Lakhs
13.	Formal Verification of Web Interfaces	Google Inc.	Rs. 20.00 Lakhs
14.	GM Collaborative Research Laboratory on Electronics, Controls and Software: Projects	General Motors	Rs.425.00 Lakhs
15.	Hindi Named Entity Recognition	Microsoft Research	Rs. 10.00 Lakhs
16.	HP-UX lan driver development, as project	Pursuit Software Inc.	Rs. 20.00 Lakhs
17.	Interlinking of JIS campuses	JIS Group, Kolkata	Rs. 1.00 Lakhs
18.	IT Consultancy (CITM)	UCO Bank	Rs. 5.00 Lakhs
19.	IT Implementation and Computerization of DVC	Damodar Valley Corporation,	Rs. 19.10 Lakhs
20.	Multimodal Participatory Tutoring System for Rural Schools	Media Lab Asia,	Rs. 24.00 Lakhs
21.	Named Entity Recognition	Microsoft Research Inc.,	Rs. 10.00 Lakhs
22.	Personalized content and commerce recommendations	Minekey Inc.	Rs. 62.00 Lakhs
23.	Sanyog: A Communication System for the Speech Impaired and Children with Cerebral Palsy Phase II	Media Lab Asia,	Rs. 72.00 Lakhs
24.	Setting up of Telemedicine Facilities in Tripura	Ministry of Information Technology, Govt. of India and WEBEL, Kolkata,	Rs. 27.00 Lakhs
25.	Shruti : Embedded Text to Speech Systems for Indian Languages Phase II	Media Lab Asia	Rs. 21.00 Lakhs
26.	Synthesis and Property Extraction from System Verilog Models	Synopsys India Pvt Ltd,	Rs. 26.00 Lakhs
27.	Technical Consultancy on IT Matters	UCO Bank	Rs. 1.00 Lakhs
28.	Telemedicine (DOTP)	WEBEL	Rs. 29.00 Lakhs
29.	Telemedicine (DTGH)	WEBEL	Rs. 29.00 Lakhs
30.	Telemedicine on Ophthalmology (TPLM)	WEBEL, Kolkata,	Rs. 3.00 Lakhs
31.	Telmedicine (SUTF)	WEBEL,	Rs. 36.00 Lakhs
32.	Training and Research Analysis	Infosys Ltd. Bangalore	Rs. 1.60 Lakhs
33.	W.B. State Wide Area Network (WANE)	WTL	Rs. 30.00 Lakhs
34.	Web Portal Development (WPDC)	WBSEDCL	Rs. 3.00 Lakhs
35.	Web portal Development Consutancy	West Bengal State Electricity Distribution Company Limited,	Rs. 3.00 Lakhs
36.	Zonal Data Warehouse and Online CRM Project of CRM	West Bengal State Electricity Board,	Rs. 7.00 Lakhs

Patents (filed / granted)

1. Low cost, portable, non-invasive, multi-parameter cardiac health assesment system for preventive cardiology, attachable to computer / PDA/ Cell-phone

Visits Abroad by Faculty Members

1. Majumder, Arun Kumar Interaction with Oracle Research and Development Team on Future technologies the Indian context. (Oracle Headquarters, Redwood Shores, California, USA) November 3-5, 2008
2. Mukhopadhyay, Jayanta Research Work (University of California, Santa Barbara) October 6-17
3. Mukhopadhyay, Jayanta Research Work (National University of Singapore) 26th May - 6th June
4. Sarkar, Sudeshna To attend ACL 2008 and present paper (Columbus, OH) June 12-19, 2008
5. Chakrabarti, Partha Pratim Indo-Brazil Joint Workshop (Rio De Janeiro, Brazil) June 24-26, 2008
6. Sengupta, Indranil Attend Microsoft Faculty Summit (Seattle, USA) July 28-30
7. Sengupta, Indranil Attend ICECC 2008 Conference (Rajshahi, Bangladesh) June 26-30
8. Kumar, Rajeev Participation (Session Chair, Paper & Tutorial Pr) in ACM Genetic & Evolutionary Comp. Conf. (GECCO) (Atlanta, USA) 1 week
9. Pal, Ajit To attend the Eleventh Euromicro conference on Digital System Design (DSD 2008) (Parma, Italy) September 3-6

Invited Lectures by Faculty Members

1. Trajectory Analysis of Broadcast Soccer Videos *by* Mukhopadhyay, Jayanta (National University of Singapore)
2. In the quest for good digital distances *by* Mukhopadhyay, Jayanta (IIT Kharagpur)
3. Named Entity Recognition - A study of features and methods *by* Sarkar, Sudeshna (Microsoft Research India)
4. Opinion Analysis *by* Sarkar, Sudeshna (IIT Bombay)
5. Machine Learning Methods for POS Tagging, Chunking, NER *by* Sarkar, Sudeshna (IIT Hyderabad)
6. Geometric data structures *by* Pal, Sudebkumar Prasant (BITS Pilani)
7. Link paths and reflection visibility problems *by* Pal, Sudebkumar Prasant (Fr. Conceicao Rodrigues College of Engineering, Bandra, Mumbai)
8. Coding, counting, cutset incomparability and coloring of labelled graphs and hypergraphs *by* Pal, Sudebkumar Prasant (IIT Kharagpur, Dept. of Mathematics, DST workshop on "Some research directions in Graph Theory")
9. Topics on VLSI System Design *by* Mandal, Chittaranjan (NIT Jamshedpur)
10. Evolutionary Multiobjective Combinatorial Optimization (EMCO) *by* Kumar, Rajeev (Int. Conference on Contemporary Computing, Jaypee Institute of Information Technology University (JIITU), Noida)
11. Object Oriented Software Engineering : Concepts and Practices *by* Kumar, Rajeev (Thapar University, Patiala)
12. Practical Aspects of Object Oriented Software Engineering *by* Kumar, Rajeev (National Institute of Technology (NIT), Rourkela)
13. Evolutionary Multiobjective Combinatorial Optimization *by* Kumar, Rajeev (A Specialized Tutorial in Genetic and Evolutionary Computing Conference (GECCO-08), 13 July 2008, Atlanta, Georgia)
14. Object Oriented Software Engineering for Trsuted Compuing *by* Kumar, Rajeev (NIT Durgapur in Nat. Conference of Software Engineering)

Books Published

1. Abhijit Das Programming, Data Structures and Algorithms *published by Prentice Hall of India* (0)
2. Abhijit Das Computational Number Theory *published by* Yet to decide (Document under preparation) (0)
3. Abhijit Das and C E Veni Madhavan Public-key Cryptography: Theory and Practice *published by Pearson Education, Asia* (2009)

Seminars, Conferences and Workshops Organised

1. 2nd India Software Engineering Conference (ISEC), 2009
2. 5th International Conference Distributed Computing & Internet Technology (IcDCIT)
3. AVLSI Consortium Annual Meet
4. AVLSI Consortium Half-Yearly Meet
5. Dynamics on and of complex networks
6. ICIIS 2008. CISE8 on Computational Electromagnetics, Computer Networks and Network T
7. ICISS 2009
8. Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)
9. INDOCRYPT 2008
10. International Conference Contemporary Computing (ICCC)
11. International Conference Information Technology (ICIT)
12. Intel Researchers Day
13. International Summer School on NLP and Text Mining
14. Silver Jubilee Research Promotion Workshop on "Introduction to geometric algorithms"
15. Sixth Indian Conference of Computer Vision, Graphics and Image Processing (ICVGIP)
16. Technology Summit : Challenges in Development of Next Generation Semiconductor-based Systems

Short-Term Courses, Training Programmes and Workshops organized

1. Advanced Application Security (April 7-17, 2008)
2. Information Security (September 13-23, 2008)

DEPARTMENT OF ELECTRICAL ENGINEERING

HEAD : Professor Avinash Kumar Sinha

FACULTY

Professors

Banerjee, Soumitro	Ph.D. (IIT Delhi), Nonlinear Dynamics
Barua, Alok	Ph.D. (IIT Kharagpur). Instrumentation Bioreactor Design and Control, VLSI
Basu, Tapan Kumar	Ph.D. (IIT Delhi), Power Systems, DSP, Speech Processing
Bhattacharya, Tapas Kumar	Ph.D. (IIT Kharagpur), Electrical Machines, Power Electronics, Linear Motors, Field Calculations
Das, Debapriya	Ph.D. (IIT Delhi), Electric Power Distribution Systems and Power System Operation and Control
Das, Sarit Kumar	Ph.D. (IIT Kharagpur), Control Systems
Dutta, Pranab Kumar	Ph.D. (IIT Kharagpur), Signal Processing, Biomedical Image Processing
Kishore, N K	Ph.D. (IISc. Bangalore), High Voltage and Insulation Engineering
Mohan, Bosukonda Murali	Ph.D. (IIT Kharagpur), Fuzzy Logic Applications in Systems & Control, Applications of Orthogonal Functions in Systems & Control
Mukhopadhyay, Siddhartha	Ph.D. (IIT Kharagpur), Dynamic Systems Estimation and Control, Industrial Automation, CAD of AMS Circuits
Pal, Jayanta	Ph.D. (IIT Roorkee), Controller Design, Fractional Order Systems, Reduced Order Modelling, Electrical Power Systems, Genetic Algorithm Applications, Neural Networks
Patra, Amit	Ph.D. (IIT Kharagpur), VLSI Design, DC-DC Power Converters, Fault Tolerant Control
Ray, Goshaidas	Ph.D. (IIT Delhi), Robust Stabilization, Time Delay System, Decentralized Control, and Intelligent Control
Sen Gupta, Sabyasachi	Ph.D. (IIT Kharagpur), Machine Drives and Power Electronics
Sen, Siddhartha	Ph.D. (IIT Kharagpur), MEMS Capacitive Accelerometer, Fractional Order Systems, Robust Control, Control of Space Vehicles
Sinha, Avinash Kumar	Ph.D. (Pilani), Power System

Associate Professors

Chakraborty, Chandan	Ph.D. (IIT Kharagpur), Electric Machines, Drives and Power Converters
Kastha, Debaprasad	Ph.D. (Tennessee), Wind Electrical Conversion Systems, Switched Mode Power Supplies, Electric Drives
Maka, Srinivasu	Ph.D. (IIT Kharagpur), Control Systems, Instrumentation Engineering, Biomedical Engineering
Poddar, Gautam	Ph.D. (IISc. Bangalore), Medium Voltage Converters and Control
Pradhan, Ashok Kumar	Ph.D. (Sambalpur University), Power System Relaying, Power System Monitoring using WAMS, Power System Measurements, Digital Signal Processing for Power System
Prasad, Dinkar	Ph.D. (IIT Kharagpur), Power Electronics, Machine Drives
Routray, Aurobinda	Ph.D. (Sambalpur University), Real Time Signal Processing, Fatigue Analysis of Human Drivers, Emotion Analysis, Statistical Signal Processing

Assistant Professors

Bajpai, Prabodh	Ph.D. (IIT Kanpur), Restructured Power System, Renewable Energy Systems
Biswas, Karabi	Ph.D. (IIT Kharagpur), Sensor design, MEMS, Fractional Order Systems
Chatterjee, Dheeman	Ph.D. (IIT Kanpur), Power System Dynamics and Stability, FACTS, Distributed Generation
Chattopadhyay, Souvik	Ph.D. (IISc. Bangalore), Digital Control of Power Converters
Deb, Alok Kanti	Ph.D. (IIT, Delhi), Control Systems, Computational Intelligence
Deb, Alok Kanti	Ph.D. (IIT Delhi), Control Systems, Computational Intelligence
Mukherjee, Anirban	Ph.D. (IIT Kharagpur), Computational Biology, Bioinformatics
Sahoo, Nirod Chandra	Ph.D. (University of Singapore), Power System Operation and Control, Applied Soft Computing

Faculty Appointments

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

Brief Description of on-going activities

From classical to modern, from milli watts to tens of kilo watts, from conventional to non-conventional, the electrical engineering department investigates these all. The range of investigation for this department is one of the broadest in this institute. The major on going activities are categorized as follows :

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

Thrust Areas

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

Lectures by Visiting Experts

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

Doctoral and MS Degrees Awarded

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|-----|-----------------------|--|
| 1. | Leena G | Design of Controllers for Multivariable Systems (Ph.D.) |
| 2. | Soumya Ranjan Mohanty | Detection and Classification of Transmission Line Faults (Ph.D.) |
| 3. | Suvajit Mukherjee | Medium Voltage Squirrel Cage Induction Motor Drives using Three-level Neutral Point Clamped Inverter Modules (Ph.D.) |
| 4. | Pradipta Patra | Design and On-Chip Implementation of a Single-Inductor Triple-output DC-DC Buck Converter(MS) |
| 5. | Karabi Biswas | Study on capacitive probes and MEMS accelerometers (Ph.D.) |
| 6. | Ardhendu Saha | Broadband light generation through nonlinear effect (Ph.D.) |
| 7. | Suvarun Dalapati | Power Converters based on Controlled Capacitor Charging Technique (Ph.D.) |
| 8. | H. N. Nagaraja | Integrated Magnetics for efficiency improvement of VRMs (Ph.D.) |
| 9. | Prabir Saha | Design of Low Phase Noise Low Power CMOS Quadrature Voltage Controlled Oscillator (MS) |
| 10. | Samrat Ray | A Hierarchical Approach to Resistance Extraction of Power Arrays (MS) |
| 11. | Rajarshi Paul | Design of a 20MHz Switching Voltage Regulator IC with a Precision Voltage Reference (MS) |
| 12. | Siddartha Swarnakar | Development of A Fault Tolerant BLDC drive for aerospace actuators (MS) |

Fellow - Professional Bodies

1. Mohan, Bosukonda Murali (2002) *Awarded* - The Institution of Engineers (India)

Member - Editorial Board

1. Banerjee, Soumitro (2006) *Editor*
- Prakriti (Bengali)
2. Banerjee, Soumitro (2006) *Member, Ed. Board*
- Breakthrough
3. Chakraborty, Chandan (2008) *Associate Editor (2008~)*
- IEEE Industrial Electronics Magazine
4. Chakraborty, Chandan (2008) *Member, Editorial Board (2008~)*
- IET Power Electronics
5. Chakraborty, Chandan (2008) *Member, Editorial Board (2008~)*
- Electric Machines & Power Systems

6. Chakraborty, Chandan (2008) *Guest Editor for a Special Issue in TIE*
- IEEE Transactions on Industrial Electronics
7. Chakraborty, Chandan (2007) *Associate Editor (2006~)*
- IEEE Transactions on Industrial Electronics
8. Mohan, Bosukonda Murali (2006) *Associate Editor*
- Int. J. Automation and Control
9. Mohan, Bosukonda Murali (2008) *Member of Editorial Board*
- Int. J. Mathematics and Engineering with Computers
10. Mukhopadhyay, Siddhartha (2007) *Member Editorial Board*
- Journal of Systems Science and Technology
11. Mukhopadhyay, Siddhartha (2007) *Honorary Editor, Controls*
- IETE Journal of research
12. Patra, Amit (2006) *Member, Editorial Advisory Committee*
- International Journal of Electrical Engineering Education
13. Pradhan, Ashok Kumar (2008) *Member, Editorial Board*
- International Journal of Power and Energy Conversion (IJPEC)
14. Sen, Siddhartha (2007) *Editor*
- Journal of Systems Science and Engineering
15. Sen, Siddhartha (2008) *Associated Editor*
- International Journal on Smart Sensing and Intelligent Systems
16. Sinha, Avinash Kumar (2007) *Member, Board of Advisors*
- The ICFAI Journal of Science and Technology

Fellowships

1. Biswas, Karabi (2008) *BOYSCAST*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Advanced Control and failure prognosis and diagnosis of industrial processes using data Fusion	DIT, Govt. of India	Rs. 58.92 Lakhs
2.	Analytical & Computational Evaluation of Various parameters involved in the design of SC Cables type to be used for Fusion Grade magnets	BRFS	Rs. 42.70 Lakhs
3.	Application of Chaos in DC/DC Converters for Reduction of EMI	ISRO	Rs. 8.60 Lakhs
4.	Artificial Heart Development Program	DST, New Delhi	Rs. 8.16 Lakhs
5.	Attitude control of launch vehicles	ISRO, IIT Kharagpur Cell	Rs. 3.00 Lakhs
6.	AVLSI Consortium	Multiple Organizations in India and Abroad	Rs. 150.00 Lakhs
7.	Cultural Dimension in Digital Multimedia Security Technology	EU-India Cross cultural program, New Delhi,	Rs. 35.00 Lakhs
8.	Design & Development of Spark Plasma Sintering facility for Nanomaterial Compaction	Ministry of Human Resources Development,	Rs. 20.00 Lakhs
9.	Design of an optimal control strategy for GSLV MK3	Indian Space Research Organization,	Rs. 2.00 Lakhs
10.	Development of Decision Support Tools for Secure Energy Management	Ministry of Power	Rs. 24.00 Lakhs
11.	Development of a Low Cost On-Line Distribution Monitoring Device with Wireless Local Loop Capability	Central Power Research Institute, Bangalore,	Rs. 25.44 Lakhs
12.	Development of an Autonomous Underwater Vehicle	DoD, Gol,	Rs. 267.00 Lakhs

13.	Development of an Economical Variable Speed Constant Frequency Generation System Suitable for Wind Power Generation	Central Power Research Institute, Bangalore,	Rs. 26.00 Lakhs
14.	Development of constant phase element based sensor for detecting adulterated milk	Department of Science and Technology, West Bengal,	Rs. 5.71 Lakhs
15.	Development of Decision Support Tools for Secure Energy Management	Central Power Research Institute, Bangalore,	Rs. 24.70 Lakhs
16.	Development of Embedded Diagnostics Algorithms for HVAC systems in automobiles	General Motors (USA)	Rs. 30.00 Lakhs
17.	Development of low cost on-linedistribution monitoring device with wireless local loop capability	Central Power Research Institute,	Rs. 25.00 Lakhs
18.	Development of MEMS based Capacitive Accelrometer	Department of Information Technology	Rs. 133.00 Lakhs
19.	Development of Microscopic Imaging System for Dynamic Study of Fundamental Organisms (Fungus).	SRIC, IIT Kharagpur	Rs. 3.00 Lakhs
20.	Development of on line Distribution monitoring device with WLL capability	CPRI, Bangalore	Rs. 25.00 Lakhs
21.	Development of Real Time Algorithms for Detection of Fatigue in Human Drivers (RTA)	Ministry of Information Technology,	Rs. 21.80 Lakhs
22.	Development of Roof fall prediction system for underground mines using wireless network	Coal india Limited	Rs. 216.98 Lakhs
23.	Development of Sesors for Gas-Liquid and Liquid-Liquid Flow	Ministry of Human Resource Development,	Rs. 14.00 Lakhs
24.	Development of the theory of nonsmooth bifurcations in hybrid dynamical systems	BRNS, DAE	Rs. 7.00 Lakhs
25.	Educational Component of General Motors Collaborative Research Laboratory	General Motors Corporation,	Rs. 125.00 Lakhs
26.	Full Spectrum Real Time Digital Simulator (TDS)	Centre for Development of Advanced Computing, Trivandrum,	Rs. 5.47 Lakhs
27.	Integrating Solar PV Cell with Fuel Cell	Voda Fone	Rs. 95.00 Lakhs
28.	Model Reference Adaptive System (MRAS) Based Speed Estimation of Doubly-Fed Induction Motor (DFIM) Drives Using Reactive Power	Nampet, DIT,	Rs. 15.00 Lakhs
29.	On-board Diagnostics of Automotive Engines	(GM-IIT Kharagpur Collaborative Research Laboratory,	Rs. 500.00 Lakhs
30.	Renewable Hybrid Energy Power Plant for Telecom station in Isolated Sites	Vodafone Essar-IIT Kgp. Center of Excellence in Telecommunications (VEICET),	Rs. 113.00 Lakhs
31.	Resolution Enhancement of Digital Pulse Width Modulators	Infineon Technologies AG, Austria,	Rs. 6.50 Lakhs
32.	Robust Control and Optimization of Power Output from Stand-Alone Wind Energy Conversion Systems for Isolated Telecom Base Stations	Vodafone Essar-IIT Kgp Center of Excellence in Telecommunications (VEICET),	Rs. 15.00 Lakhs
33.	Setting up a research and development center for Damodar Valley Corporation at Kolkata (Phase-I)	Damodar Valley Corporation,	Rs. 2132.70 Lakhs
34.	Setting up an Advanced facility for Research in Reliability Engineering	BARC, Mumbai	Rs. 150.00 Lakhs

35.	STATCOM with four arm configuration (TCO)	Centre for Development of Advanced Computing, Trivandrum, Govt. of India.,	Rs. 4.00 Lakhs
36.	Universal auxiliary converter for railways rolling stock	C-DAC, Trivandrum and Indian Railways,	Rs. 5.00 Lakhs
37.	Virtual HV Laboratory	MHRD	Rs. 50.00 Lakhs

Consultancy Projects

1.	Advanced Control and failure prognosis and diagnosis of industrial processes using data Fusion	DIT, Govt. of India KE Tex Prembazar	Rs. 58.92 Lakhs Rs. 0.20 Lakhs
2.	Assessment of Dielectric Properties	Kharagpur,	
3.	Behavioral Modeling and Top-Down Design of Switching Converter ICs	National Semiconductor Corporation, USA,	Rs. 50.00 Lakhs
4.	Behavioral modeling and Verification of Analog and Mixed Signal Designs	National Semiconductor Corporation, USA,	Rs. 50.00 Lakhs
5.	Bus Paralleling Controller with CAN Interface	Centre for Development of Advanced Computing, Trivandrum, Govt. of India.,	Rs. 1.50 Lakhs
6.	Design and Development of a Twenty MegaHertz Switcher	National Semiconductor Corporation	Rs. 17.00 Lakhs
7.	Development of a Substation Automation System Phase I (Monitoring)	DVC,	Rs. 25.70 Lakhs
8.	Development of Online Surface Inspection System for Hot Rolled flat Products.	RDCIS, SAIL,	Rs. 10.00 Lakhs
9.	Development of performance monitoring system for critical stand motors of Rail & Structural Mill, Bhilai Steel Plant	RDCIS, Ranchi,	Rs. 10.00 Lakhs
10.	Electronic paralleling of UPS System (PUPS)	Centre for Development of Advanced Computing (C-DAC), Trivandrum.,	Rs. 01.00 Lakhs
11.	Front end converter (FEER)	Signotron India Ltd.,	Rs. 1.00 Lakhs
12.	General Motors Collaborative Research Laboratory	General Motors India Science Laboratory,	Rs. 375.00 Lakhs
13.	GM-CRL on ECS	General Motors, USA,	Rs. 500.00 Lakhs
14.	Impulse Test on 2500 kVA 415/11 kV Transformer	Synergy Power Equipment Pvt. Ltd, Jamshedpur,	Rs. 0.35 Lakhs
15.	Impulse Test on 6.3 MVA, 33/11 KV Transformer	Marson's Limited,	Rs. 0.80 Lakhs
16.	Impulse Test on 630 kVA, 11/433 KV Transformer	A. P. Electricals Pvt. Ltd, Kolkata,	Rs. 0.35 Lakhs
17.	Process Monitoring of Rolling Process at RSM, BSP, SAIL	SAIL R&D, Ranchi,	Rs. 5.00 Lakhs
18.	Remedial Measures to Mitigate Voltage Dip Problem at CTPS Bus	Damodar Valley Corporation	Rs. 3.15 Lakhs
19.	Resonant Frequency Converters	Megatherm Electronics Pvt. Limited,	Rs. 4.00 Lakhs
20.	Sensorless Vector Controlled AC Drives	C-DAC, Trivandrum	Rs. 0.50 Lakhs
21.	Series compensator for six step inverter(SCSS)	Veeral Control Pvt. Ltd., India, Bhabha Atomic Research Centre (BARC), India,	Rs. 1.00 Lakhs

Patents (filed / granted)

1. A Control Scheme to Minimize the Dynamic Power Loss in an Unbalanced Voltage Regulator Module and its Method of Operation
2. A Fast Response Energy Efficient Current Control Scheme for a DC-DC Converter with a Free-wheeling Switch
3. Visible Wavelength Laser Diode Based Diameter Gauge

Visits Abroad by Faculty Members

1. Pradhan, Ashok Kumar To attend conference (IEEE Conference Pittsburgh, USA) one week
2. Barua, Alok Invited lectures and collaborative research (Ulsan, South Korea) June 3-6
3. Barua, Alok Collaborative research (Department of Electrical Engineering, Korea University) May 26 to July 18, 2008
4. Mohan, Bosukonda Murali Attending IFAC World Congress (Seoul, Korea) six days
5. Chakraborty, Chandan to attend IEEE IECON 2008 conference and to deliver lectures at two US universities (USA) November 3-15, 2008
6. Chakraborty, Chandan to attend IEEE ICIT 2009 (Australia) February 8-14, 2009
7. Banerjee, Soumitro Attending conferences and delivering invited talks (Seattle, Wisconsin, Urbana-Champaign, Boston, College Park (USA) and Newcastle, Aberdeen (UK), St. Petersburg (Russia)) May 15 to July 5

Invited Lectures by Faculty Members

1. Nonlinear phenomena in power electronics *by* Banerjee, Soumitro (University of Wisconsin, Madison, USA)
2. Nonlinear phenomena in power electronics *by* Banerjee, Soumitro (University of Illinois at Urbana-Champaign, USA)
3. On the Stability of periodic orbits in hybrid dynamical systems *by* Banerjee, Soumitro (North Eastern University, Boston, USA)
4. On the Stability of periodic orbits in hybrid dynamical systems *by* Banerjee, Soumitro (University of Maryland, College Park, USA)
5. Nonlinear Dynamics of Switched Dynamical Systems *by* Banerjee, Soumitro (University of Stuttgart, Germany)
6. Nonlinear Dynamics of Switched Dynamical Systems *by* Banerjee, Soumitro (University of Newcastle upon Tyne, UK)
7. Pade Approximation Techniques in System Reduction and Controller Design *by* Pal, Jayanta (XXXII National Systems Conference, IIT, Roorkee)
8. Development of a MEMS Sensor *by* Sen, Siddhartha (Visakhapatnam at National Symposium on Instrumentation (NSI-33))
9. Dynamic Control Allocation for Over-actuated Systems *by* Sen, Siddhartha (Thiruvanthapuram at COMPCON-08)
10. "Medium Voltage Converter" *by* Poddar, Gautam (NIT, Rourkela)
11. An introduction to control systems *by* Das, Sarit Kumar (DIAT, Pune)
12. Kalman Filtering & Robust Control at AICTE-MHRD Short Term Course, Oct 29 - Nov 11, 2008 *by* Deb, Alok Kanti (Dept of Electrical Engineering, NIT Rourkela)
13. MATLAB - The Language of Technical Computing *by* Deb, Alok Kanti (Vyas Engineering College for Girls, Jodhpur)
14. Learning Theory & Support Vector Machines, at Winter School on Machine Learning and Soft Computing *by* Deb, Alok Kanti (SVNIT, Surat)
15. Numerical Protection *by* Pradhan, Ashok Kumar (NIT Rourkela)
16. Power System Protection through Intelligent Electronic Devices *by* Pradhan, Ashok Kumar (Sillicon Institute, Bhubaneswar)

17. Fuzzy Clustering *by* Pradhan, Ashok Kumar (NIT Rourkela)
18. Kalman Filtering at AICTE-MHRD Short Term Course, Jun 9 - Jun 13, 2008 *by* Deb, Alok Kanti (Dept of Electrical Engineering, NIT Rourkela)
19. Orthogonal Functions in Systems and Control *by* Mohan, Bosukonda Murali (Aditya Institute of Technology & Management, Tekkali)
20. Fuzzy Control Fundamentals *by* Mohan, Bosukonda Murali (Aditya Institute of Technology & Management, Tekkali)
21. Decision Support Tools for Energy Management *by* Sinha, Avinash Kumar (Jadavpur University, Kolkata)
22. Power System Restructuring An Overview *by* Sinha, Avinash Kumar (National Institute of Technology, Durgapur.)
23. Speed sensorless control of induction motor drives: A model ref. adaptive controller based approach *by* Chakraborty, Chandan (Massachusetts Institute of Technology (MIT), USA)
24. Issues of Induction Motor Drives *by* Chakraborty, Chandan (North Carolina State University, USA)

Books Published

1. M. K. Ghosh, S. Sen, S. Mukhopadhyay (Eds.) Measurements and Instrumentation : Trends and Application *published by* Ane Books (2008)

Seminars, Conferences and Workshops Organised

1. Fractional order systems
2. IEEE 2009 International Conference on Industrial Technology(ICIT-2009)
3. IEEE R-10 Colloquium & Third ICIS
4. Sixth Annual Alumni Meet

Short-Term Courses, Training Programmes and Workshops organized

1. Distribution System Technology (One week)
2. Training on STATCOM and FPGA (2 days)

DEPARTMENT OF ELECTRONICS & ELECTRICAL COMMUNICATION ENGINEERING

HEAD : Professor Ajay Chakraborty

FACULTY

Professors

Bandyopadhyay, Kalyan Kumar	Ph.D. (Jadavpur University), Satellite Communication
Banerjee, Swapna	Ph.D. (IIT Kharagpur), VLSI Design for Signal Processing and Biomedical Instrumentation
Biswas, Dhruves	Ph.D. (Illinois, USA), RF/Ultra-high speed GaAs/InP on Si for High Performance (PAE, Linearity, Frequency) Electronics, Optimization of wide bandgap compound semiconductor heterostructure based RF front end devices
Biswas, Prabir Kumar	Ph.D. (IIT Kharagpur), Image Processing, Computer Vision, Automated Visual Inspection, Multimedia Network
Chakraborty, Ajoy	Ph.D. (IIT Kharagpur), Electromagnetics, Microwave Circuits, Antennas and Mathematical Techniques used in Electromagnet
Chakraborty, Mrityunjay	Ph.D. (IIT Delhi), Digital and Adaptive Signal Processing, VLSI DSP and Signal Processing for Wireless Communication
Dutta, Debasish	Ph.D. (IIT Kharagpur), Telecommunications
Gangopadhyay, Ranjan	Ph.D. (IIT Kharagpur), Wireless and Fibre Communication
Garg, Ramesh	Ph.D. (IIT Kanpur), Printed Antennas and Circuits
Maiti, Chinmay Kumar	Ph.D. (IIT Kharagpur), Microelectronics, Silicon Heterostructures, Technology CAD, Internet Laboratory, Development
Pathak, Sant Sharan	Ph.D. (IIT Delhi), Digital Communication
Rajakumar, Ratnam Varada	Ph.D. (IIT Kharagpur), Digital Signal Processing, Communication Systems, Detection and Estimation
Ray, Ajoy Kumar	Ph.D. (IIT Kharagpur), Image Processing and Computer Vision, Pattern Recognition in Medicine, Soft Computing
Sanyal, Subrata	Ph.D. (IIT Kharagpur), RF and Microwave and Wireless Engineering, EM Scattering, RF and Microwave Components
Sen Gupta, Somnath	Ph.D. (IIT Bombay), Video Processing and Multimedia Coding, Image Processing and Computer Vision

Associate Professors

Bhattacharyya, Tarun Kanti	Ph.D. (Jadavpur University), MEMS, RFIC, Analog VLSI, Thinfilms
Chakrabarti, Indrajit	Ph.D. (IIT Kharagpur), VLSI Design
Chattopadhyay, Santanu	Ph.D. (IIT Kharagpur), Logic Synthesis, Circuit Testing, Low Power Design and Test, System-on-Chip (SoC) Testing, Network-on-Chip (NoC) Design and Test
Dhar, Anindya Sundar	Ph.D. (IIT Kharagpur), VLSI Architecture Design
Mahapatra, Sudipta	Ph.D. (IIT Kharagpur), Parallel and Distributed Systems, Lossless Data Compression Hardware, Photonic Devices and Networks
Saha, Goutam	Ph.D. (IIT Kharagpur), Signal Processing, Pattern Recognition, Biometric Authentication from Speech, Biomedical Signal Processing related to Brain Heart and Lung

Assistant Professors

Bhattacharya, Amitabha	Ph.D. (IIT Kharagpur), RF & Microwave
Chakraborty, Paritosh Kumar	Ph.D. (IIT Kharagpur), Solid-State Semiconductor Physics
Datta, Raja	Ph.D. (IIT Kharagpur), Optical WDM Networks, Wireless Ad-hoc Networks, Computer Networking, Distributed Systems
Ghosh, Bratin	Ph.D. (University of Manitoba), Applied Electromagnetics
Halder, Achintya	Ph.D. (Georgia Tech., Atlanta), VLSI, RF Circuit Design, Application and Test, Analog VLSI Design and Test
Mandal, Pradip	Ph.D. (IISc. Bangalore), CAD for CMOS Analog VLSI, Analog Circuit Design
Mukhopadhyay, Sudipta	Ph.D. (IIT Kanpur), Medical Imaging, Biomedical Signal Processing, Image Processing, Image Compression, Multimedia
Roy, Rajarshi	Ph.D. (Brooklyn University), Telecommunication Systems / Networking, Queueing Theory / Optimization / Stochastics
Roy, Rajat	Ph.D. (University of Mumbai), Microwave Filter Analysis by Mode Matching, Slotted Waveguide Antenna Analysis by Numerical Methods
Varshney, Shailendra Kumar	Ph.D. (University of Delhi), Fiber Optics & Optical Communication, Photonic Crystal Fibers / Photonic Bandgap Fibers / Microstructured Optical Fibers, Nano-photonics, Fiber Sensors, Fiber Components and Devices

Scientific Officer

Sahoo, Ghanashyam	Ph.D. (Jadavpur University), EMI Effects on Electro Medical Devices, Exposer to Mobile Base Station Radiation, Microwave Antenna
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Faculty Appointments

Dr. Achintya Halder	Assistant Professor
Dr. Subhra Sekhar Das	Assistant Professor
Dr. Shailendra Kumar Varshney	Assistant Professor
Dr. Kalyan Kumar Bandyopadhyay	Professor (Contact)

Faculty Promotions

Dr. Goutam Saha	Associate Professor
Dr. Tarun Kanti Bhattacharya	Associate Professor
Dr. Sudipta Mahapatra	Associate Professor

Faculty Retirement

Dr. T. S. Lamba	Professor
Dr. S. K. Lahiri	Professor

Faculty Resignation

Dr. Jayadeva C. Goswami	Professor
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Brief Description of on-going activities

The following research activities are currently carried out in the department

1. Biomedical Instrumentation : Main thrust is towards the design and development of an embedded system-on-chip solution for an adaptive intelligent biomedical system. Already a low cost Doppler Ultrasonography system has been designed and presently attempt is being made towards design of an Ultrasound Imaging system. For this the architecture for the real time

- signal processing is being implemented in Xilinx FPGA. Also a non-invasive blood glucose monitor based on laser induced photo acoustic spectroscopy is under development. Another research interest is for early detection of oral cancer via image processing.
2. Analog / Mixed Signal Design : Currently the research group is engaged in designing an 8 bit 160 MSPS pipelined CMOS ADC and work is also going on the design of an ADC BiCMOS technology with enhanced performance.
 3. Communication Systems : Research is being carried out to design a QPSK demodulator and a 9-channel Transmultiplexer for Space application.
 4. Fibre Optics and Networking : The current research involves dispersion compensation of 40 Gb/s optical transmission system with optical phase conjugation and distributed Raman amplifier as well as with chirped fibre Bragg grating. In the optical networking area, innovative schemes have been developed for guaranteeing WDM network survivability and IP-over-WDM integrated routing. Work is in progress for development of efficient contention resolution schemes for packet switched optical networks and their analytical modelling.
 5. Development of a RISC DSP for Modems.
 6. Development of a dual standard baseband processor for 3G Wireless Systems.
 7. Data Compression : Work is being carried out for the design of parallel algorithms for lossless data compression and their implementation in high-speed programmable hardware.
 8. Joint Dispersion and nonlinearity compensation for WDM Transmission systems using Optical Phase conjugation and Distributed Raman Amplifier.
 9. EMI / EMC : Studies have been performed on different wire antennas (e.g dipole, inverted L, T, I, C-antennas) as Electromagnetic Interference (EMI) sensors. The Method of Moment based numerical technique has been used to evaluate the antenna factor of different wire antennas in different EMI test environments including Gigahertz Transverse Electromagnetic (GTEM) cell.
 10. Filters : Design, simulation and fabrication of lowpass Microstrip filters with cut-off frequency of 5.0GHz . Bandpass waveguide filters over X and Ku-band of frequencies. X-band filter has passband of 9.50GHz to 10.50GHz and Ku-band filter has passband of 13.90GHz to 14.60GHz.
 11. MCMT : Multiple Cavity Modeling Technique (MCMT) have been applied to study different waveguide based passive microwave circuits like waveguide diaphragms, filters, power dividers. The technique have also been applied successfully for the radiator problems lime widow radiators, Slot radiators both in transmitting and receiving mode.
 12. Development of block floating point based schemes for implementing adaptive filters in digital hardware
 13. Architectural optimization of algorithms for signal processing and wireless communication.
 14. Formulation of efficient algorithms for designing CMOS operational amplifiers.
 15. Automated Visual Inspection of Industrial Objects, VLSI Architecture for low bit rate Video Coding, Medical Image Processing, Gesture Recognition from Video Sequences, Face recognition, Content based Retrieval of Texture Images, Fuzzy Neural Network.
 16. Algorithm development for fault diagnosis in a distributed system.

Thrust Areas

1. MEMS & Semiconductor Technology
2. Broadband Communication Networks
3. VLSI Circuits and Systems
4. Design and Development of Embedded Systems for Computer Vision, Image, and Signal Processing

Doctoral and MS Degrees Awarded

- | | | |
|----|------------------|--|
| 1. | Prasant K. Sahu | Studies on Fiber Bragg Grating and Distributed Fiber-Optic sensors (Ph.D.) |
| 2. | Soumitra Debnath | Modelling, Analysis, and Performance Evaluation of Broadband Photonic Networks (Ph.D.) |

3. Saubarh Chaudhury Low power Logic Optimization and Synthesis (Ph.D.)
4. Sumanta Gupta Transmission Characteristics and Advanced Signal processing in an All Optical Link Using Differential Phase-Shift Keying Signalling (Ph.D.)
5. Siddarama R. Patil Design of Improved Performance Structured Irregular Low Density Parity Check Codes and Reduced Complexity Believe Propagation Decoders (Ph.D.)
6. Sameer S. M. Efficient Estimation Methods for Carrier Frequency Offset in OFDM, MIMO-OFDM and OFDMA Systems (Ph.D.)
7. Chandan Giri Test Infrastructure design for Power Aware System-On-Chip Testing (Ph.D.)
8. Santanu Dwari Design and Characterization of Compact, High Performance, Planar Couplers and Filters for RF and Wireless Applications (Ph.D.)
9. Sandipan Chakraborty Some Studies on Acoustic Feature Extraction, Feature Selection and Multi-level Fusion Strategies for Robust Text-Independent Speaker Identification (Ph.D.)
10. Debashis Dutta Low-power Analog Bipolar and CMOS-CCII based Circuits Design techniques and its application to Translinear filters (Ph.D.)
11. Mrinal Kanti Mandal Design and Characterization of High Performance, Planar, Passive, RF and Microwave Components (Ph.D.)
12. Rajarshi Mahapatra Studies on Link-Adaptive Wireless Communications (Ph.D.)
13. Priyanka Mondal Design and Analysis of Microwave Antennas and Passive Components for Wireless Communication (Ph.D.)
14. Nandedkar Abhijeet Vijay A Reflex Fuzzy Min Max Neural Network (Ph.D.)
15. Shaik Rafi Ahamed Efficient Finite Precision Realization of the Adaptive Decision Feedback Equalizer using Block Flating Point Arithmetic (Ph.D.)
16. V. S. Reddy Algorithm and Arhitecture for Motioin Estimation in Video Coding (Ph.D.)
17. Benudhar Sahu Synchronization in OFDM Based WLAN Systems and Cross Layer Interaction in Mobile AD HOC Networks (Ph.D.)
18. C. B. Ashesh Analysis and Design of Symmetric Coplanar Lines with Thick Conductors (Ph.D.)
19. Aruna Tripathy Error Performance and Complexity Analysis of Low Complexity Turbo Equalization (Ph.D.)
20. Ravi Shankar Prasad Design of High Speed Digital to Analog Converter (MS)
21. Anirban Das Lifting Based Architectures for Realizing 2 and 3 Dimensional Discrete Wavelet Transform (MS)
22. Arindrajit Ghosh Design of a Low Power 8-Bit 200-MSPS A/D Converter (MS)
23. Sanjoy Kumar Dey Design of an 8-bit 2.5 GSPS A/D Converter using 0.25 μ m Si/SiGe BiCMOS Technology (MS)
24. Bodhisatwa Mazumdar Design of Image Restoration and Embedded Block Coding Units for a PC Based Ultrasound Imaging System (MS)
25. Atanu Roy Electromagnetic Modeling of High Frequency Electronic System to Estimate EMI/EMC (MS)

Member - Editorial Board

1. Biswas, Prabir Kumar (2008) Member, Editorial Board
- International Journal on Medical Engineering and Informatics

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Analysis of Cavity Backed Microstrip Patch Antenna for Space Borne Phased Array Antenna	ISRO, IIT Kharagpur cell,	Rs. 10.00 Lakhs

2.	Analysis of Multilayered Planar Array Antenna using Aperture Coupled Patch Elements	ISRO, IIT Kharagpur cell,	Rs. 10.00 Lakhs
3.	APA	ISRO- IIT Cell	Rs. 4.00 Lakhs
4.	CMOS op-amp design automation in sub-micron technology	ISIRD, SRIC, IIT Kharagpur,	Rs. 3.00 Lakhs
5.	Complex Biomedical Signal Analysis	DST, India,	Rs. 6.50 Lakhs
6.	Content based Image Retrieval for medical Images	ISIRD,	Rs. 3.00 Lakhs
7.	Contoured beam synthesis for array antenna to obtain efficient footprint pattern with gain optimization	ISRO-IIT, Kharagpur Cell,	Rs. 2.50 Lakhs
8.	Convergent Switching	Santech Corp.,	Rs.100.00 Lakhs
9.	Coplanar waveguide feed to dielectric resonator antenna	ISRO, IIT Kharagpur Cell,	Rs. 8.06 Lakhs
10.	Design & Fabrication of high sensitivity micro machined Silicon tunneling accelerometer with micro-g resolution	ISRO, IIT Kharagpur Cell,	Rs. 10.00 Lakhs
11.	Design and analysis of metamaterials with application in miniaturization and improvement of antenna performance	ISRO, IIT Kharagpur Cell,	Rs. 8.53 Lakhs
12.	Design and Development of CMOS Based 8-bit, 250 to 500 MSPS Analog to Digital and Digital to Analog Converter	SAC, ISRO, Bangalore	Rs. 11.85 Lakhs
13.	Design and Development of Convergent Telecom Switch	Santech Communication Pvt. Ltd.,	Rs.200.00 Lakhs
14.	Design and Development of non-invasive blood glucose measuring system	Department of Information Technology, New Delhi,	Rs. 27.00 Lakhs
15.	Design and Development of secure routing protocols for Mobile Adhoc Networks (MANET)	SRIC, IIT KHARAGPUR,	Rs. 3.00 Lakhs
16.	Design and Development of Telecommunication Convergence Switch	SANTECH Private Limited,	Rs.100.00 Lakhs
17.	Design of high speed and /or low power adaptive decision feedback equalizers - an architectural optimization approach	DIT, New Delhi,	Rs. 30.40 Lakhs
18.	Development of a Lossless Compression System for Video Broadcasting	ISRO	Rs. 6.00 Lakhs
19.	Development of a Lung Sound Analyzer	Institute of Pulmocare and Research,	Rs. 7.00 Lakhs
20.	Development of a Medical Expert System for Screening and Diagnosis of Coronary Artery Diseases	VECC Kolkata, DAE, Govt. of India,	Rs. 43.20 Lakhs
21.	Development of Algorithm for Adaptive Antenna Array for Satellite Communication	ISRO-IIT, Kharagpur Cell,	Rs. 3.00 Lakhs
22.	Development of an AUV	Dept. of Ocean Development,	Rs. 600.00 Lakhs
23.	Development of MEMS based Accelerometers for Aerospace Application (NPMASS)	NPMASS, ADA, Bangalore,	Rs.470.00 Lakhs
24.	Development of Micromachined Inertial and Flow Sensors for Environmental and Biomedical Application	Indo-Italy (ITPAR) DST,	Rs.113.00 Lakhs
25.	Development of RF MEMS capacitive shunt switch in Application as phase shifters for satellite communication systems	ISRO - IIT Kharagpur Cell,	Rs. 8.00 Lakhs
26.	Development of robust speaker verification system to increase security in limited user environment	DST, India	Rs. 6.42 Lakhs

27.	Development of Roof fall prediction system in underground Mines using wireless Network (SUM)	CMPDIL, Ranchi	Rs.216.98 Lakhs
28.	Development of secure environment for sensitive information transaction in Mobile Ad-hoc Networks (MANET)	DIT, Govt. of India,	Rs. 54.48 Lakhs
29.	Development of Silicon Micromachined Accelerometer for Aircraft Motion Sensing	NPSM	Rs.212.00 Lakhs
30.	Development of Silicon Microsensors for Flow Measurement	MHRD	Rs. 7.00 Lakhs
31.	Development of software packages for waveguide-based microwave circuits	ISRO-IIT, Kharagpur Cell,	Rs. 8.00 Lakhs
32.	Development of Speaker Recognition Software for Telephone Speech	(ISRO, India	Rs. 7.00 Lakhs
33.	Development of speaker verification software for single to three registered user(s)	ISRO, India,	Rs. 10.90 Lakhs
34.	Development of Specific Software Modules for Realising Monopulse Slotted Array Antenna Using Non-Standard Wave guide at Ku-Band Along Sensitivity Anal	RCI, Hyderabad,	Rs. 22.90 Lakhs
35.	Development of speech database for speaker recognition application	ISIRD, IIT Kharagpur	Rs. 0.50 Lakhs
36.	Development of Traditional Tongue Based Diagnostic Software Through Grabbing and Processing of Tongue Images for Storage, Retrieval and Rule Generatio	DST, Govt. of India New Delhi	Rs. 6.02 Lakhs
37.	Development of Video Segmentation and Coding Algorithms and Architectures for Very Low Bitrate Applications	ISRO,	Rs. 10.50 Lakhs
38.	DSP & FPGA solution for SRI and Scan Conversion of USG system in DaVinci Platform	GE Medical Systems India Pvt. Ltd.,	Rs. 32.52 Lakhs
39.	Efficient testing for system-on-chip design - a new VLSI manufacturing paradigm	Department of Science & Technology, Govt. of India,	Rs. 9.40 Lakhs
40.	Electromagnetic modeling of High Frequency Electronic Systems to estimate Elctromagnetic Compatibility	DST, New Delhi	Rs. 15.96 Lakhs
41.	Embedded Software Solutions for Digital Base-band Transceivers (STC/EDT)	ISRO, Bangalore	Rs. 25.00 Lakhs
42.	Enabling Technologies for the design and implementation of next generation optical internet prototype based optical packet switching	DST	Rs .3.14 Lakhs
43.	Engineering enabling technologies for the design and implementation of a photonic network based on optical packet switching	MHRD	Rs. 13.00 Lakhs
44.	Establishment of Nation-wide Quality of Service Network Test-Bed.	Department of Information Technology, New Delhi,	Rs.136.00 Lakhs
45.	Feasibility Study of Anti-Jam GPS Receiver for GPS Guided Weapons	ARMREB, New Delhi	Rs. 9.70 Lakhs
46.	Feasibility study of microwave imaging for material resource exploitation in planetary mission	ISRO, IIT Kharagpur cell,	Rs. 1.44 Lakhs
47.	FIST Programme on Computer Networking	DST,	Rs.143.00 Lakhs
48.	Flexible EMI shielding materil from conductive rubber based composite	Aeronautics R&D Board, New Delhi,	Rs. 14.07 Lakhs
49.	FPGA based Automatic Speaker Recognition	Advanced VLSI Consortium,	Rs. 5.00 Lakhs

50.	FPGA based H.264 Codec	ISRO at SAC Ahmedabad,	Rs. 8.50 Lakhs
51.	FPGA-based design and development of H-264 codec (PGA)	ISRO, IIT Kharagpur Cell,	Rs. 4.80 Lakhs
52.	Gigahertz Transverse Electromagnetic Cell	Army Centre of Electromagnetics, Mhow,	Rs. 50.00 Lakhs
53.	Gigahertz Transverse Electromagnetic Cell	Army Center of Electromagnetics, Mhow,	Rs. 50.00 Lakhs
54.	High efficiency Solar cell using GaN /InGaN Multiple Junction Heterostructures for Space Applications	Indian Space Research Organization (ISRO),	Rs. 48.45 Lakhs
55.	Indo-US Joint Centre on Advanced and Futuristic Manufacturing	Indo-US Science & Technology Forum,	Rs. 5.60 Lakhs
56.	Investigation of the microstrip feed to the Dielectric Resonator Antenna	DST, New Delhi	Rs. 15.77 Lakhs
57.	Investigation of the Microstrip feed to the dielectric resonator antenna	DST, New Delhi	Rs. 15.77 Lakhs
58.	Investigations of CMOS Device Technologies for Strain-Engineered MOSFETs Using TCAD	MCIT New Delhi	Rs. 33.35 Lakhs
59.	Investigations of CMOS device technologies for strain-engineered MOSFETs using TCAD Technology, New Delhi, Rs.33.35 Lakhs)	Dept. of Information	
60.	Lossless Image Compression of Satellite Images	ISRO, IIT KGP cell	Rs. 0.50 Lakhs
61.	Medical image analysis and MEMS based flow sensor development (MIA)	Texas Instruments (India) Pvt Ltd,	Rs. 92.00 Lakhs
62.	MEMS based micropropulsion devices for micro satellite program	ISRO	Rs.123.00 Lakhs
63.	MEMS Based Micropropulsion Devices for Microsatellite Program	ISRO	Rs.122.96 Lakhs
64.	MEMS Technology for Micromachined Silicon Microsensors	DRDO	Rs. 51.00 Lakhs
65.	Metamorphic High Electron Mobility Transistor for Power Amplifier for C and X Band Transponder Applications	ISRO	Rs. 48.55 Lakhs
66.	Modeling and simulation of memory devices with high-k dielectrics	DST, Govt. of W.B.	Rs. 8.70 Lakhs
67.	Modeling and Simulation of Memory Devices With High-K Dielectrics	DST, Govt. of West Bengal,	Rs. 9.82 Lakhs
68.	Modeling of Software Simulation Tool for Designing of WDM Trans. System	DST, New Delhi	Rs. 10.53 Lakhs
69.	Modernisation of Fibre Optic System Laboratory for Undergraduate and Postgraduate Students	MHRD, New Delhi	Rs. 8.00 Lakhs
70.	Modernisation of Integrated Circuit and System Laboratory	MHRD, New Delhi)	Rs. 8.00 Lakhs
71.	MOSFET Modeling and Parameter Extraction	DRDO	Rs. 58.36 Lakhs
72.	MOSFET modeling and parameter extraction	DRDO, New Delhi	Rs. 56.60 Lakhs
73.	Nationally Coordinated Project on Telematics	Ministry of Human Resource Development,	Rs.137.00 Lakhs
74.	Network-on-Chip testing	ISIRD, IIT Kharagpur	Rs. 3.00 Lakhs
75.	Non-invasive blood glucose measuring system	Life Sciences Research Board, New Delhi,	Rs. 9.00 Lakhs
76.	Non-invasive blood-glucose measuring system	LSRB, New Delhi	Rs. 9.00 Lakhs

77.	Optimal solutions for the next generation wireless Internet access	Vodafone-Essar - Approved in Principle,	Rs. 48.72 Lakhs
78.	Segmentation and Interpretation of Mammogram images for early detection of breast cancer	BRNS, Dept of Atomic Energy	Rs. 0.00 Lakhs
79.	Setting up of Dielectric Measurement Facility (Hardware & software)	Armament Research & Development Establishment, Pune, DRDO,	Rs. 9.80 Lakhs
80.	Simulation on Electromagnetic Battlespace in a corps zone	Army Center of Electromagnetics, Mhow,	Rs. 50.00 Lakhs
81.	Simulation on Electromagnetic Battlespace in a corps zone	Army Centre of Electromagnetics, Mhow,	Rs. 50.00 Lakhs
82.	Special manpower development programme for VLSI design and related software (SMDP-II)	MCIT, Govt. of India,	Rs. 0.00 Lakhs
83.	Strategies for power reduction during VLSI circuit testing	Dept. of Information Technology, Govt. of India,	Rs. 54.05 Lakhs
84.	Studies on Com. Sys. Arch. For Software Radio	BEL, Bangalore	Rs. 30.00 Lakhs
85.	Technology CAD of nano-mosfets in hybrid orientation technology	DST, New Delhi	Rs. 18.53 Lakhs
86.	Technology CAD of nano-MOSFETs In Hybrid Orientation Technology	DST, New Delhi	Rs. 19.00 Lakhs
87.	Turbo and other important FEC Coding Schemes	ISRO Bangalore	Rs. 20.00 Lakhs
88.	Upgrading Facilities for MEMS design activities at National resource centre	NPMAS, ADA, Bangalore	Rs. 34.00 Lakhs

Consultancy Projects

1.	An R&D Plan for the Development of a Software Defined Radio	DEAL, Dehradun (DRDO),	Rs. 3.50 Lakhs
2.	Design & Processing of MEMS Microstructure for Mechanical Property Evaluation	DRDO, Hyderabad,	Rs. 10.00 Lakhs
3.	Design & processing of MEMS microstructure For mechanical property evaluation (PMMP)	DMRL, Hyderabad 500058,	Rs. 10.00 Lakhs
4.	Design of capacitive based accelerometer	DRDO	Rs. 10.00 Lakhs
5.	Design of RFIC modules	National Semiconductor Corporation, USA,	Rs. 60.00 Lakhs
6.	Development of ADC and Receiver for wireless applications	Si2 Microsystems	Rs. 80.00 Lakhs
7.	Development of Educational Complex (DOEC)	Tirupati Assets Pvt. Ltd, Kolkata,	Rs. 50.00 Lakhs
8.	Development of Fast Bipolar ASIC Chips	BARC	Rs. 12.00 Lakhs
9.	Development of Flow Sensors and Acoustic Sensors	BARC	Rs. 14.00 Lakhs
10.	Equalizer for LiteLink	National Semiconductor Corp. Ltd.,	Rs. 10.00 Lakhs
11.	Estimation for calibration of microwave attenuator	Asansol Engineering College,	Rs. 0.30 Lakhs
12.	Mast Clamp Current Probe (MCCP) Antenna	Naval EMC Centre, Mumbai,	Rs. 19.90 Lakhs
13.	Mast Clamp Current Probe Antenna (PCCM)	Naval EMC Centre, Mumbai,	Rs. 19.90 Lakhs
14.	Preparation of Vision/theme and feasibility report (VTFR)	Tirupati Assets Pvt. Ltd, Kolkata,	Rs. 15.00 Lakhs

15.	Real Time Image Processing Algorithm Development for Conveyor Belt Health Monitoring	Phoenix Conveyor Belt Systems GmbH, Germany	Rs. 22.00 Lakhs
16.	RF Fundamentals for Wireless Networks	WMNET serv Limited	Rs. 4.50 Lakhs
17.	RF Fundamentals for Wireless Networks (RFFW)	WMNETserv Limited, Bangalore,	Rs. 4.50 Lakhs
18.	Sync/ async to Ethernet Protocol Converter	ITR Chandipur	Rs. 5.00 Lakhs
19.	Techno economic feasibility analysis of a solar photovoltaic Fab in West Bengal		Rs. 0.00 Lakhs

Patents (filed / granted)

1. Dilute alloy assisted GaN epitaxial on silicon
2. Heterogeneous integration of III-V front end devices on Silicon
3. Systems and methods for testing integrated circuits

Visits Abroad by Faculty Members

1. Bandyopadhyay, Kalyan Kumar To discuss propagation study experiment in India with CNES, France and ONERA France (Toulouse, France) 3 days
2. Biswas, Prabir Kumar IEEE Sections Congress 2008 (Quebec, Canada) SerpSeptember 18-22, 2008
3. Saha, Goutam Visit to Canadian Universities for delivering Talk and Networking (Canada) August 3-11
4. Banerjee, Swapna To present a paper in the ISCAS 2008 conference (Seattle, Washington, USA) May 18-21, 2008
5. Chakraborty, Mrityunjoy Visiting Research Consultant (Nanyang Technological University, Singapore) one month
6. Chakraborty, Mrityunjoy To present paper and attend editorial board meeting at the IEEE ISCAS - 2008 (Seattle, USA) May 18-21
7. Biswas, Dhruves Conference (EBRF 2008 Conference, Helsinki, Finland) One week
8. Biswas, Dhruves Conference (8th IEEE Conference on Nanotechnology, Arlington, Texas USA) One week

Invited Lectures by Faculty Members

1. EMI/EMC by Chakraborty, Ajoy (Ambedkar Institute of Technology, Delhi)
2. EMI/EMC by Chakraborty, Ajoy (Andhra University College of Engineering, Visakhapatnam, A.P.)
3. EMI/EMC by Chakraborty, Ajoy (NSEC, Kolkata)
4. EMI/EMC by Chakraborty, Ajoy (National Institute of Technology, Warangal)
5. EMI/EMC by Chakraborty, Ajoy (DEAL, Dehradun)
6. EMI/EMC by Chakraborty, Ajoy (MNIT, Jaipur)
7. Basic Radar Principles by Bhattacharya, Amitabha (Interim Test Range, Balasore)
8. Wireless Channel Characterisation by Bhattacharya, Amitabha (KITS University, Bhubaneswar)
9. Emerging Technologies and their spectrum requirements by Bhattacharya, Amitabha (Army Centre for Electromagnetics, Mhow)
10. Recent Advances in EMI / EMC by Bhattacharya, Amitabha (NIT, Rourkela)
11. Confluence of Hardware & Software in present day technologies by Bhattacharya, Amitabha (CEM, Kolaghat)
12. Network-on-Chip - the next generation System-on-Chip by Chattopadhyay, Santanu (Bengal Engineering and Science University)
13. Recent advances in VLSI design by Chattopadhyay, Santanu (National Institute of Technology, Silchar)

14. Low power design and test (Tutorial) *by* Chattopadhyay, Santanu (VLSI Conference, New Delhi)
15. Optical fiber technologies : conventional to microstructure *by* Varshney, Shailendra Kumar (IIT Kharagpur, Kolkatta Extension Centre)
16. Advances in Video Processing *by* Sen Gupta, Somnath (Yeshwantrao Chavan College of Engineering, Nagpur)
17. Special topics in Neural Networks *by* Sen Gupta, Somnath (Srinidhi Institute of Science and Technology, Hyderabad, Andhra Pradesh)
18. Embedded Systems and VLSI Design *by* Banerjee, Swapna (Oriental Institute of Science and Technology, Bhopal)
19. Recent Trends in VLSI Design & Microelectronics *by* Banerjee, Swapna (Bengal Engineering & Science University, Howrah)
20. GSAT-4, a step towards Indian Advance Communications Satellite *by* Bandyopadhyay, Kalyan Kumar (Toulouse, France)
21. Modeling and Analysis of Optical Packet and Burst Switched Networks *by* Mahapatra, Sudipta (N. I. T. Rourkela)
22. Maxwells Equations and Waveguide Transmission *by* Bhattacharya, Amitabha (PIET, Rourkela)
23. Overview of WIMAX *by* Bhattacharya, Amitabha (PIET, Rourkela)
24. Microwave devices anaysis with S-parameters *by* Roy, Rajat (IIT kgp bhubaneshwar extension)
25. Evolution of Pattern Recognition *by* Biswas, Prabir Kumar (Aurangabad)
26. Fuzzy Min Max Neural Network for Pattern Recognition *by* Biswas, Prabir Kumar (Nagpur)
27. Bio-Nano activity at IIT Kharagpur *by* Saha, Goutam (University of Waterloo, Canada)
28. Bio-Nano activity at IIT Kharagpur *by* Saha, Goutam (Nano Quebec, Montreal, Canada)
29. Bio-Nano activity at IIT Kharagpur *by* Saha, Goutam (University of Alberta, Canada)
30. Embedded Systems and VLSI Design *by* Banerjee, Swapna (NIT, Durgapur)
31. Optimization of VLSI Architecture *by* Dhar, Anindya Sundar (Bengal Engineering and Science University, Sibpur)
32. Digital VLSI Design *by* Dhar, Anindya Sundar (Bengal Engineering and Science University, Sibpur)
33. A Block Floating Point Realization of the Adaptive Decision Feedback Equalizers *by* Chakraborty, Mrityunjoy (Nanyang Technological University, Singapore)
34. Multiplierless Adaptive Equalizers - a CORDIC Based Approach *by* Chakraborty, Mrityunjoy (Nanyang Technological University, Singapore)
35. Role of Education-Enterprise Model for developing growth ventures in differing economic contexts *by* Biswas, Dhruves (Helsinki, Finland)

Books Published

1. Ramesh Garg *Analytical & Computational Methods in Electromagnetics published by Artech House, USA (2008)*

Seminars, Conferences and Workshops Organised

1. 9th International Conference on Cryptology in India (INDOCRYPT 2008)
2. EBRF International Conference
3. Faculty Development Program (FDP)
4. IEEE International Conference on Industrial and Automation Systems (ICIIS)
5. INDAC 2009
6. Indian Conference on Computer Vision, Graphics and Image Processing
7. International Conference on Induatrial Information System
8. Short Course on C++ and JAVA
9. SIDBI skill Upgradation Programme for Grassroot entrepreneurs
10. Technology CAD for VLSI Design
11. Technology CAD for VLSI Design

12. Technology CAD for VLSI Design
13. Technology Entrepreneur Development Program (TEDP)
14. Technopreneur Promotion Program (TePP)
15. The IEEE Colloquium and the third IEEE International Conference on Industrial and Information System

Short-Term Courses, Training Programmes and Workshops organized

1. AICTE sponsored short course on Entrepreneurship (14 days)
2. AICTE sponsored short course on III-V compound semiconductor heterostructure (8 days)
3. AICTE Summer School on Image and Video Processing : Theory and Applications (30/05/08-11/06/08)
4. An Introduction to RF Techniques for Modern Communication System (July 1-6, 2008)
5. Embedded System Design (February 2-6, 2009)
6. Optical Communication Networks (June 22 to July 03)
7. Recent Advances in RF Techniques for Wireless Communication (July 7-12, 2008)
8. Recent Advances in RF Techniques for Wireless Communication (July 1-12, 2008))
9. RF and Microwave Fundamentals for Modern Electronics Systems (December 22 -28), 2008)
10. RF and Microwave Measurement Fundamentals for Modern Electronic Systems (June 09-22)
11. RF and Wireless ()
12. RF Fundamentals for Modern Wireless and Satellite Communication Systems (June 16-29, 2008)
13. VLSI Signal Processing (December 22-26, 2008)

DEPARTMENT OF GEOLOGY & GEOPHYSICS

HEAD : Professor Anil Kumar Gupta

FACULTY

Professors

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, Varanasi), Paleoclimatology, Paleoceanography, Marine Micropaleontology, Marine Geology, Gas Hydrates
Mishra, Biswajit	Ph.D. (IIT Kharagpur), Ore Geology and Metaorphic Petrology
Nath, Sankar Kumar	Ph.D. (IIT Kharagpur), Earthquake and Engineering Seismology, Seismic Hazard Assessment and Microzonation, Seismic Prospecting and Signal Processing, Geophysical Tomography, Computational Geophysics
Panigrahi, Mruganka Kumar	Ph.D. (IIT Kharagpur), Ore Geology, Crustal Fluids, Computer Applications
Sarkar, Anindya	Ph.D. (Gujrat University), Stable Isotope Geochemistry, Sedimentology, Hydrocarbon Exploration, Isotope Hydrology
Sen Gupta, Debashish	Ph.D. (PRL, Ahamdabad), Nuclear Geophysics and Environmental Radioactivity
Tripathy, Subhasish	Ph.D. (IIT Bombay), Environmental Geochemistry, Waste Characterization and Utilization

Associate Professors

Bhattacharya, Amit Kumar	Ph.D. (IIT Kharagpur)
Bhowmik, Santanu Kumar	Ph.D. (Jadavpur University), Metamorphic Petrology, Geochemistry, Igneous Petrology
Gupta, Saibal	Ph.D. (Cantab), Metamorphic Petrology, Structural Geology, Tectonics
Mamtani, Manish A	Ph.D. (MSU, Baroda), Structural Geology, Microtectonics
Pant, Naresh Chandra	Ph.D. (MLS University, Udaipur), Mineralogy, Petrology
Sharma, Shashi Prakash	Ph.D. (BHU, Varanasi), Electrical and EM Geophysics, Groundwater Investigation, Inverse Theory

Assistant Professors

Basu, Arindam	Ph.D. (The University of Hong Kong), Engineering Geology, Rock Mechanics
Dalai, Tarun K	Ph.D. (PRL, Ahmedabad), Low Temperature Geochemistry, Radiogenic Isotope Geochemistry, Paleoclimatology, Weathering of Organic Rich Sediments, Carbon Cycle and Trace Metal Budgets of Rivers
Mitra, Supriyo	Ph.D. (Cambridge University), Earthquake Seismology, Continental Tectonics
Mohanty, William Kumar	Ph.D. (Delhi University), Seismology, Gravity and Magnetic Methods of Prospecting
Raghavan Nair, Rajesh	Ph.D. (NGRI / Osmania University), Near Surface Geophysics and Elastic Thickness

Ray, Sanghamitra	Ph.D. (Calcutta University), Vertebrate Paleobiology and Gondwana sedimentation
Sanyal, Prasanta	Stable Isotope Geochemistry, Palaeoclimatology and Palaeoecology

Lecturer

Datta, Indira	Ph.D. (IIT Kharagpur), Remote Sensing, Analysis of Geological and Geophysical Data
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Senior Scientific Officer

Sengupta, Probal	Ph.D. (IIT Kharagpur), Seismology, Microzonation, Seismic Prospecting
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Faculty Promotions

Dr. Mruganka Kumar Panigrahi	Professor
Dr. William Kumar Mohanty	Associate Professor

Brief Description of on-going activities

1. Studies on Indian monsoon (both modern and ancient) and paleoclimate studies of the Indian subcontinent and paleoceanography of the Indian Ocean;
2. Tectonic evolution of craton mobile belt ensembles in parts of the Indian shield;
3. Emplacement mechanism, tectonic evolution and metallogenesis in Precambrian Granitoids in India;
4. Gold mineralization and gold potentials of the schist belts in Dharwar Craton, India;
5. Studies on Indian microvertebrates, Lithospheric structure across Himalaya, Deformation at Collisional boundaries, Isotopes in Himalayan foreland sediments;
6. Paleogene climate of Kutch, Rajasthan, Environment in ancient sedimentary basins in India;
7. Seismic Hazard assessment and microzonation in the NE India and metropolitan cities, Mechanical characterization of rock materials, Groundwater potential assessment and pollution by natural and anthropogenic causes;
8. Waste utilization and wasteland development;
9. Natural radiation hazard estimation.

Thrust Areas

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

New Acquisitions

1. Electron Probe Micro-Analyzer (EPMA)
2. Point Load Tester along with Brazilian Test Frame (includes continuous data acquisition facility for load and deformation)
3. Slake Durability Test Apparatus
4. System for Determining Rock Physical Properties (e.g. Effective and Total Porosities)

Lectures by Visiting Experts

1. by Padma Shri Dr. Ravi Bastia (Reliance Industries)
2. Heating of the Crust by Prof. R. N. Singh (NGRI, Hyderabad)
3. History of Oxygen Loss in Louisiana Coastal Waters - Clues from Tiny Shells by Prof. Barun K. Sen Gupta (Louisiana State University, USA)

4. Deformation Localization and Melt Generation in Geological Materials by Dr. Santanu Misra (ETH Zentrum, Switzerland)
5. The evolution of the Eastern Ghats Belt, India by Prof. Michael M. Raith (Bonn, Germany)
6. The Earths Changing Climate Through the Aeons: Insights for the Present by Prof. Vinod K. Gaur (Indian Institute of Astrophysics)

Doctoral and MS Degrees Awarded

1. Rajesh Kumar Naik The Late Archean/Early Proterozoic Granitoid Complex and Associated Cu-Mo Mineralization at Malanjkhand, Central India: Towards a Working Model of Ore Genesis (Ph.D.)
2. Shantanu Kumar Dutta Assessment of Geoenvironmental Degradation in Makum Coalfield, Assam, India (Ph.D.)
3. Jagatbikas Nanda Deformation, Metamorphism and Post-emplacement Tectonic Evolution of the Alkaline Complex at Koraput and Associated Granulites, Eastern Ghats Belt, India (Ph.D.)
4. Pritam Nasipuri Mechanism and Conditions of Emplacement of the Bolangir Anorthosite Pluton, Eastern Ghats Belt, India (Ph.D.)
5. Sukhen Majumder Fabric Development in the Malanjkhand Granite (Central India) and Its Relationship with Regional Tectonics (Ph.D.)
6. Dinesh Pandit A Comparative Study of the Paleoproterozoic Malanjkhand and Dongargarh Granitoids, Central India: Implications to Crustal Evolution and Metallogeny (Ph.D.)
7. Saikat Sengupta Stable Isotope and Geochemical Studies of Groundwater in parts of North 24 Parganas, West Bengal, India: Implications to Genesis and Mobilisation of Arsenic (Ph.D.)
8. Raj Kumar Singh Paleoceanographic Evolution of the Southeastern Indian Ocean during the Neogene: Proxy Records from ODP Hole 752A and 757B (Ph.D.)
9. Sanjit Kumar Pal A GIS Based Integrated Study of Remote Sensing and Gravity Data for Geological Appraisal of Parts of Singhbhum-Orissa Craton, India (Ph.D.)
10. Swapnendu Goon Mesoproterozoic Polyphase Metamorphism in the Chotanagpur Gnessic Complex, Eastern India: Evidence from the Bero-Saltora and Ranchi-Kolomda Areas (Ph.D.)
11. Lopamudra Saha High Pressure Re-metamorphism of Enclave-Type Granulites from the Aravalli-Delhi Mobile Belt, NW India and Its Regional Implications (Ph.D.)
12. M. Yanger Walling Seismic Hazard Assessment with Special Emphasis to the Microzonation of Talchir, Haldia and Kolkata (Ph.D.)
13. Soma De High Resolution Record of Monsoon Variability from Biogenic Sediments of the Maldives Ridge (ODP) (Ph.D.)

Fellow - Professional Bodies

1. Gupta, Anil Kumar (2006) Fellow - National Academy of Sciences, India
2. Gupta, Anil Kumar (2008) Fellow - Indian Academy of Sciences, Bangalore
3. Gupta, Anil Kumar (2008) Life Fellow - Indian Geophysical Union

Member - Editorial Board

1. Dalai, Tarun K (2008) Associate Editor
- Geochemical Journal
2. Mamtani, Manish A (2009) Editorial Board Member
- Journal of Geological Society of India

3. Mohanty, William Kumar (2008) Member of Editorial Board
- Prakriti Vikash
4. Mohanty, William Kumar (2007) Member of Editorial Board
- GEO-FACE
5. Panigrahi, Mruganka Kumar (2009) Member, Advisory Editorial Board
- Resource Geology
6. Pant, Naresh Chandra (2008) Associate Editor
- Indian Geoscience Journal (Previously known as Indian Minerals)
7. Sen Gupta, Debashish (2008) Member, Editorial
- Geospectrum

Awards & Honours

1. Dalai, Tarun K (2009) JSPS Invitation Fellowship

Fellowships

1. Mitra, Supriyo (2008) UK-India Education and Research Initiative (UKIERI) post doctoral Fellowship
2. Sanyal, Prasanta (2008) BOYSCAST fellowship

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	3-Dimensional imaging of the lithosphere and active deformation across Sikkim-Darjeeling Himalaya and a comparison with NW-Himalaya	Deep Continental Studies (DCS) - Department of Science and Technology (DST)	Rs. 55.50 Lakhs
2.	Application of Fractals and Chaotic Dynamics to Study Geodynamics of the Himalayan Earthquakes of North West India	ISIRD, SRIC IIT Kharagpur	Rs. 1.00 Lakhs
3.	Broadband Seismological Observatory at IIT Kharagpur for Seismotectonic Study of Bengal Basin (BBS)	Department of Science and Technology	Rs. 64.65 Lakhs
4.	Broadband seismometry in the north-east region with special emphasis to Guwahati for seismic hazard assessment	Department of Science and Technology, Government of India	Rs. 10.28 Lakhs
5.	Carbon isotope studies of graphite and coexisting carbonate in Eastern Ghat, Orissa: implication to the source of graphite and temperature of metamorp	SRIC/ISIRD	Rs. 3.00 Lakhs
6.	Chemical weathering of black shales: Implications for release of CO ₂ to atmosphere and trace metals to rivers	DST	Rs. 19.84 Lakhs
7.	Coastal sedimentary archives of Tsunami affected Eastern Indian Coast using high resolution Geophysical records	INCOIS, Hyderabad	Rs. 40.00 Lakhs
8.	Contrasting Styles Of Exhumation Of Monocyclic And Polycyclic Granulites From The Sausar Mobile Belt In Central India: Constraints From Metamorphic P-	DST,	Rs. 14.03 Lakhs
9.	Create Infrastructure Facilities and Additional Provisions needed for sustaining a 24-Month M.Tech. Programme in Computational Seismology	Department of Science and Technology (earlier) Now Ministry of Earth Sciences,	Rs. 175.36 Lakhs
10.	Establishment of Electron Probe Micro-Analyzer (EPMA)-National Facility at IIT Kharagpur	Department of Science & Technology, New Delhi,	Rs. 555.00 Lakhs

11.	Evaluation of Seismic Potential of Talcher area, Orissa.	SRIC, IIT, Kharagpur,	Rs. 2.40 Lakhs
12.	Evolution of the Indian summer monsoon during the Neogene: Suborbital to orbital changes	Department of Science & Technology, New Delhi,	Rs. 19.00 Lakhs
13.	FIST-II	DST Govt of India	Rs.260.00 Lakhs
14.	Genetic modeling of orogenic gold deposits in the Dharwar Craton: constraints from metamorphism, ore mineralogy and fluid evolution	DST, New Delhi,	Rs. 32.02 Lakhs
15.	Geochemical and fluid inclusion studies on the Malanjhand granitoid complex: Implications for ore genesis and crustal evolution	DST	Rs. 10.00 Lakhs
16.	Geophysical survey using gravity and magnetic methods in south Purulia shear zone	Department of Atomic Energy, Government of India,	Rs. 9.20 Lakhs
17.	Geophysical Survey using gravity and magnetic methods in south Purulia Shear Zone	Atomic Mineral Directorate, BRNS, Govt of India,	Rs. 19.50 Lakhs
18.	Global Seismic Monitoring by Broadband Seismological Observatory at IIT Kharagpur	Ministry of Earth Sciences,	Rs. 18.20 Lakhs
19.	Investigation of alteration of cosmic dust particles: Implications for interpretation of 187Os/188Os records in marine sediments and estimates for acc	Department of Space funded PLANEX Program, Physical Research Laboratory	Rs. 20.00 Lakhs
20.	Investigation of the basement structure of the Bengal Basin using Gravity and Seismic data	ISIRD, IIT Kharagpur	Rs. 3.00 Lakhs
21.	Investigation of the Deep Seismic Structure in the Foreland of the Himalayan Collision Zone in Eastern India.	ISIRD, SRIC	Rs. 2.80 Lakhs
22.	Isostatic compensation mechanisms of continental regimes based on application of wavelet	ISIRD, IIT Kharagpur	Rs. 3.00 Lakhs
23.	Measurement and Modeling of Radon Transport and distribution around tailing pond area and dwellings	BRNS, Department of Atomic Energy, Mumbai,	Rs. 30.00 Lakhs
24.	Mesozoic Gondwana vertebrates from Madhya Pradesh, India: an integrated study on paleobiology	Department of Science and Technology, New Delhi	Rs. 21.22 Lakhs
25.	Microzonation of Sikkim Region	Department of Science and Technology (earlier) Now Ministry of Earth Sciences,	Rs. 51.40 Lakhs
26.	National Capacity Building in Earthquake Engineering	Ministry of Home Affairs	Rs. 34.00 Lakhs
27.	National Facility on Stable Isotope Geochemistry, Indian Institute of Technology, Kharagpur	DST	Rs.256.00 Lakhs
28.	National Programme on Earthquake Engineering Education in India	Ministry of Human Resource Development (MHRD)	Rs. 83.60 Lakhs
29.	National Programme on Isotope Fingerprinting of Waters of India	DST	Rs. 10.20 Lakhs
30.	Natural radioactivity and radiation dosimetry in the high background radiation area along the southern coast of Orissa, India	BRNS, Department of Atomic Energy, Mumbai,	Rs. 12.20 Lakhs
31.	Orthonormalized tapers in the estimation of flexural rigidity of plates	DST	Rs. 14.00 Lakhs

32.	Predicting crack initiation stress by porosity and evaluating microstructural control on crack initiation: a study on granite	DST, New Delhi	Rs. 18.77 Lakhs
33.	Quantitative assessment of weathering grades of rock materials	ISIRD, IIT Kharagpur	Rs. 3.65 Lakhs
34.	Re-Os isotope systematics of organic-rich sediments of the Upper Vindhyan Supergroup: Chronology, interbasinal correlation and seawater records	SRIC (ISIRD), IIT,	Rs. 1.00 Lakhs
35.	Reconstruction of monsoonal rainfall from the late Quaternary Himalayan foreland sediments by Stable Isotope tracers: implications to climate forcing	DST, New Delhi	Rs. 11.00 Lakhs
36.	Rhenium-Osmium isotope systematics of organic-rich sediments of the Upper Vindhyan Supergroup: Chronology, interbasinal correlation and records of Osm	ISIRD, IIT Kharagpur	Rs. 0.00 Lakhs
37.	Seismic Hazard Assessment of Haldia, Bengal Basin Area	DST, New Delhi,	Rs. 3.12 Lakhs
38.	Spatial relationship between metallogenesis and geodynamic evolution of granite-greenstone ensembles of Eastern Dharwar craton from the perspectives o	Department of Science and Technology,	Rs. 11.00 Lakhs
39.	Spatio spectral localization of isostatic coherence anisotropy of 90 degree East ridge	Ministry of Earth Science,	Rs. 20.00 Lakhs
40.	Tectono-metamorphic evolution of the Higher Himalayan rocks of Western (Kemeng Corridor) and eastern Arunachal Pradesh: A comparative Study	DST	Rs. 7.42 Lakhs
41.	Tectonothermal evolution of polycyclic granulite enclaves in amphibolites from the Sandmata complex, Rajasthan : constraints from P-T evolution, petrog	DST	Rs. 13.01 Lakhs
42.	The exhumation factor in the genesis of inverted metamorphic sequences - an evaluation from structure, metamorphism, fluid inclusion and earthquakes i	DST	Rs. 14.00 Lakhs
43.	The relationship between anisotropy of magnetic susceptibility, strength anisotropy and microstructure in rocks devoid of mesoscopic foliations	DST, New Delhi	Rs. 19.55 Lakhs
44.	Utilization of Hyperspectral Data in Geological Investigations / Mapping for Mineral Exploration	Department of Space (SAC, Ahmedabad)	Rs. 11.44 Lakhs

Consultancy Projects

1.	Electrical resistivity survey for delineation of Limestone formation around Chaibasa - Jharkhand	Madras Cement	Rs. 2.50 Lakhs
2.	Ground Vibration study on Balagunda Iron and Manganese Mines in District Keonjhar, Orissa	Envomin Consultant (Pvt) Ltd,	Rs. 2.12 Lakhs
3.	In house training program on GPS applications to power system diagnostics	Tata Steel Ltd.,	Rs. 66120.00 Lakhs
4.	Laser Raman Microspectrometry Analysis	Industry, Academic and Governmental Organizations,	Rs. 2.50 Lakhs
5.	Magnetic Laboratory Maintenance Project (MLMP)	Various Government and Private agencies	Rs. 0.78 Lakhs
6.	Resistivity Survey for installation for deep tube-well at Kharikamathani	PHED , Govt of West Bengal.	Rs. 0.40 Lakhs
7.	Study of Ground Vibration for Putulipani Iron-ore Mines, District- Keonjhar, Orissa	M/s Gandhamardhan Sponge Industries (P) Ltd.,	Rs. 2.60 Lakhs

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| 8. | Study on Assessment Technologies for Storage of CO ₂ for Carbon Sequestration | NTPC Limited | Rs. 19.27 Lakhs |
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Visits Abroad by Faculty Members

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| 1. | Mitra, Adinpunya | Research stay (Technical University of Braunschweig, Germany) May 19 to July 16 |
| 1. | Mitra, Supriyo | UKIERI Fellowship (Cambridge University) One year |
| 2. | Gupta, Saibal | Representing Dept. of Geology & Geophysics, IIT Kharagpur. (Paris, France) March 1-5, 2009 |
| 3. | Raghavan Nair, Rajesh | IGC Conference (Norway) 5 days |
| 4. | Raghavan Nair, Rajesh | Conference (Singapore) 5 days |
| 5. | Sanyal, Prasanta | attending American Geophysical Union conference (Sanfrancisco, USA) 7 days |
| 6. | Mohanty, William Kumar | Collaborative Research (Department of Earth Sciences, University of Western Ontario, Canada) 21st June to 8th July 2008 |
| 7. | Sarkar, Anindya | To attend the joint Indo-US Organising committee meeting for Indo-US frontiers of Science Symposium (National Academy of Science, USA, Washington DC) 3 days |
| 8. | Sarkar, Anindya | To deliver an invited talk (Dept. of Earth & Env. Sc., Tsukuba University, Japan) 7 days |

Invited Lectures by Faculty Members

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| 1. | Earthquake Hazard in the Northeast India A Computer intensive Seismic Microzonation Approach.....
<i>by Nath, Sankar Kumar (Indian Statistical Institute, Kolkata (INAE Kolkata Chapter))</i> |
| 2. | Seismic Microzonation of Guwahati Region <i>by Nath, Sankar Kumar (First National Steering Committee Meeting-cum-workshop under the aegis of The Ministry of Earth Science, New Delhi at Salt lake City Extension Center, IIT Kharagpur)</i> |
| 3. | Natural Hazards and Mitigation <i>by Mohanty, William Kumar (National Institute of Technology, Rourkela)</i> |
| 4. | Isotope hydrology of arsenic contaminated aquifers from India: can the mass poisoning be abated?
<i>by Sarkar, Anindya (Tsukuba University, Japan)</i> |

Seminars, Conferences and Workshops Organised

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| 1. | Indian Frontiers of Science symposium |
| 2. | Indo-US frontier of Science symposium |
| 3. | Second meeting of Asian Current Research on Fluid Inclusions (ACROFI-2) |

Short-Term Courses, Training Programmes and Workshops organized

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| 1. | Capacity Building Programme on Geographical Indication and Design
Registration for Department of Tex | (23-27 March 2009) |
| 2. | DST-TIFAC Women Scientist Scheme in IPR | (2008-09) |

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

HEAD : Professor Damodar Suar

FACULTY

Professors

Basu, Partha	Ph.D. (Calcutta University), Applied Econometrics Foreign Investment Effectiveness of Marketing Expenditure
Chatterjee, Suhita Chopra	Ph.D. (Bombay), Sociology of Health and Illness / Medical Ethics
Chatterjee, Bani	Ph.D. (BHU, Varanasi), Economics
Giri, Vijai Nath	Ph.D. (IIT Kharagpur), Interpersonal / Organizational Communication
Roy, Anjali	Ph.D. (Bombay), Post-colonial Literatures and Theory, Culture and Media Studies, Postmodern Theory, Folklore and Orature
Srivastava, Kailash Bihari Lal	Ph.D. (IIT Kanpur), Organizational Behaviour and Human Resource Development and Management, Innovation and Knowledge Management
Suar, Damodar	Ph.D. (IIT Kharagpur), Social and Organisational Psychology, Neuropsychology
Tewari, Hare Ram	Ph.D. (IIT Kharagpur), Sociology

Associate Professors

Chakraborti, Chhanda	Ph.D. (University of Utah). Applied Ethics: Bioethics, Business Ethics, Philosophy of Logic, Philosophy of Mind : Cognition, Reasoning
Nayak, Narayan Chandra	Ph.D. (Utkal University), Social Sector Development, International Finance, Agricultural Economics
Patnaik, Priyadarshi	Ph.D. (Utkal University), Visual Culture and Communication, Translation of Medieval Oriya Texts, Indian Aesthetics, Media and Multimedia Studies, Nonverbal Communication

Assistant Professors

Behera, Bhagirath	Ph.D. (University of Bonn, Germany), Environmental and Natural Resource Economics
Chakraborty, Jayshree	Ph.D. (IIT Kanpur), Semantic and Pragmatic Studies in the Indian Languages, Language and Communication, Indian English Writings
Das, Saswat Samay	Ph.D. (Utkal University). Postmodern and Postcolonial Studies, Critical Thinking
Goswami, Kishor	Ph.D. (IIT Kharagpur), Food Security, Agricultural Economics, Poverty, Gender Studies
Komalesha, H. S.	Ph.D. (IIT Kharagpur), Indian English Literature, Translation
Mahakud, Jitendra	Ph.D. (IIT, Bombay), Corporate Finance, Financial Markets, and Banking, Investment Management, Financial Engineering
Mishra, Pulak	Ph.D. (Vidyasagar University), Industrial Economics, Public Economics, Economics of Rural Development
Murugan, Seema	Ph.D. (BHU), Communication Studies, American Literature, Dalit Literature
Pradhan, Rabindra Kumar	Ph.D. (Utkal University), Social and Organisational Psychology

Faculty Promotions

Dr. Vijai Nath Giri Professor

Faculty Resignation

Dr. Manas Kumar Mandal Professor
Dr. Trupti Mishra Assistant Professor

Brief Description of on-going activities

Research and Development on : Quantitative economics, Financial economics, Economics of growth, Industrial economics, Development economics, Environmental and resource economics, Developing world bioethics, Gender and trade, Financial institutions and markets, Sociology of health and medicine, Human resource development, Brain and behaviour, Interpersonal, intercultural and organizational communication, Visual aesthetics, Business ethics, corporate social responsibility.

Training on : Interpersonal communication, Recent trends in human resource development, Strategic management, Emotional intelligence, Logic and applications of logic.

Course development on : Economics, Human resource management, Philosophy

Thrust Areas

1. Development studies
2. Human resource management and ethics
3. Cultural studies and communication

Lectures by Visiting Experts

1. Science, technology and social inequality in India : A socio-historical perspective by Binay K Pattnaik (IIT Kanpur)
2. Violence of our lives by Sunrit Mullick (United States Educational Foundation in India, Kolkata)
3. Executive skills: Management and educational implications by J. P. Das (Department of Psychology, University of Toronto)
4. Edupreneurship by Sasi B Misra (EDII, Gandhinagar)
5. Does self help group participation lead to asset creation? by Ranjula Bali Swain (Uppsala University, Sweden)
6. Exchange rate pass-through and prices of tradables in India by Saikat Sinha Roy (Department of Economics, Jadavpur University)
7. Understanding applied ethics: Business, healthcare and law by Leslie P Francis (Department of Philosophy, University of Utah)
8. Applied philosophy by K Ramakrishna Rao (Indian Council of Philosophical Research, New Delhi)
9. Many-valued similarity and its logic applications by Esko Turunen (Tampere University, Finland)

Doctoral and MS Degrees Awarded

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|----|---------------------|---|
| 1. | Maiti Maitreyi | Development Approach of a Metropolitan Fringe in Transition : Kolkata Metropolis (Ph.D.) |
| 1. | Indiwar Misra | Assessment of functional laterality among left-, right-, and mixed-handers (Ph.D.) |
| 2. | Anathbandhu Patra | Gender relations in single- and dual-career families (Ph.D.) |
| 3. | Ujjwal Jana | Application of Rasa theory to Indian fiction in English: A study of three novels (Ph.D.) |
| 4. | Kakulavarapu Manasa | Exploring the dynamic process of knowledge management in knowledge intensive industry (Ph.D.) |
| 5. | Arti Sengupta | Impact of emotional intelligence and alexithymia on conflict resolution and managerial styles (Ph.D.) |

6. Mahua Verma (Mitra) Union effectiveness in Indian railways (Ph.D.)
7. Smriti Kumari Identification of potential ecotourism sites, sustainability assessment and management in geospatial environment (Ph.D.)
8. Tirumala Santra Leadership style, structure, and organizational effectiveness : The mediating role of computer-mediated and face-to-face communication (Ph.D.)
9. Shalini Dixit Variations in food security in West Bengal and Jharkhand: An empirical analysis (Ph.D.)

Fellow - Professional Bodies

1. Chakraborti, Chhanda (2008) Chairperson, National Committee for Curriculum Development in Applied Philosophy - Indian Council of Philosophical Research (ICPR)

Member - Editorial Board

1. Giri, Vijai Nath (2008) Member, Editorial Board
- Communication Theory
2. Giri, Vijai Nath (2008) Member Editorial Board
- Encyclopedia of Communication Theory
3. Goswami, Kishor (2007) Associate Editor (Volume II)
- International Journal of Interdisciplinary Social Sciences
4. Murugan, Seema (6) Member, Board of Editors
- TITIKSHA
5. Roy, Anjali (2007) Associate Editor
- International Journal of Diversity in Organizations
6. Srivastava, Kailash Bihari Lal (2008) Member, Editorial Board
- MID JOURNAL of Computer Application & Business Administration (MIDJCABA),
7. Srivastava, Kailash Bihari Lal (2009) Member, Editorial Advisory Board
- Journal of Contemporary research in Management
8. Suar, Damodar (2002) Associate Editor
- Psychological Studies

Awards & Honours

1. Suar, Damodar (2008) Bharat Jyoti Award
2. Chakraborti, Chhanda (2008) Career Biography selected in Marquis Whos Who 2009 Edition
3. Chakraborti, Chhanda (2009) Director Etudes Associe, Foundation Maison des Sciences de l'Homme, France

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Agro-Management Practices Adopted by Rubber Growers in Assam A Case Study	Rubber Research Institute of India	Rs. 0.00 Lakhs
2.	Animated Texts: Communicating in a Multimedia Environment	Indian Council of Social Sciences Research (ICSSR),	Rs. 3.80 Lakhs
3.	Appraisal of Process and Procedures of NREGA in Orissa	Ministry of Rural Development, Government of India, New Delhi	Rs. 7.00 Lakhs
4.	Bollywood's Transnational Flows	Indo-Canadian Shastri Institute	Rs. .6.00 Lakhs
5.	Cognition in context	Swedish Research Council, Sweden	Rs. 0.00 Lakhs

6.	Concept paper on disaster management	Defence Institute of Psychological Research, New Delhi	Rs. 4.86 Lakhs
7.	Demeanour Analysis	DIPR	Rs. 9.80 Lakhs
8.	Developing Corporate Governance Norm for SMEs	National Foundation for Corporate Governance, C/O - Confederation of Indian Industry	Rs. 6.50 Lakhs
9.	Economic Value Addition of Jatropha Based Products in Northeast India	National Oilseeds and Vegetable Oils Development (NOVOD) Board, Ministry of Agriculture	Rs. 12.05 Lakhs
10.	Gender and Trade in Silk Industry: A Study on Silk Workers in Sualkuchi in Assam	United Nations Development Programme (UNDP)	Rs. 2.64 Lakhs
11.	Impact of Globalization and Adoption of New Technology on Silk Industry in Assam: An Assessment from Gender Perspective	Department of Scientific and Industrial Research, New Delhi,	Rs. 6.83 Lakhs
12.	Intellectual Property Law and Competition Policy and Law in India	Competition Commission of India and The World Bank,	Rs. 6.30 Lakhs
13.	Techno-Economic Feasibility of Integrated Acquaculture Options within Irrigation Systems (TFI)	Indian Council of Agricultural Research (ICAR), New Delhi	Rs. 31.03 Lakhs
14.	Technology Adoption in Tea Industry with Special Reference to North East India	Department of Scientific and Industrial Research, New Delhi, India,	Rs. 6.50 Lakhs

Consultancy Projects

1.	Comprehensive Socio-Economic Survey for Pakri Barwadih Coal Mining Project	National Thermal Power Corporation Ltd. (NTPC),	Rs. 17.25 Lakhs
2.	Design of Course Content for Group Discussion and Personal Interview (GDPI)	Centre for Advanced Communication, STEP-IIT Kharagpur	Rs. 0.90 Lakhs
3.	Setting up of the Indian Institute of Corporate Affairs	Ministry of Corporate Affairs	Rs. 200.00 Lakhs

Visits Abroad by Faculty Members

1.	Chakraborti, Chhanda	Invited Discussion (UNESCO Bioethics Division, Paris, France) June 13
2.	Chakraborti, Chhanda	Collaborative Research (Dept of Philosophy Paris IV Sorbonne, Paris, France) June
3.	Chakraborti, Chhanda	Research data (Pasteur Institute, Paris, France) June 1221
4.	Chakraborti, Chhanda	Invited Project Discussion (Centre de Recherche "Droit, Sciences, Techniques" Université de Paris 1 Panthéon-Sorbonne) June 24
5.	Chakraborti, Chhanda	Seminar (College de France, Paris, France) June 10
6.	Goswami, Kishor	For presenting a paper (Turin, Italy) June 19-21
7.	Goswami, Kishor	For academic collaboration (Zlin, Czech Republic) June 22-27
8.	Srivastava, Kailash Bihari Lal	To present a paper in XXIX International Congress of Psychology (Berlin, Germany) July 20-25
9.	Suar, Damodar	Invited symposium of International Association of Psychology (Berlin, Germany) July 20-25

Invited Lectures by Faculty Members

1. Three Cheers and Three Curses - English in India *by* Komalesha, H. S. (Mandsaur Institute of Technology, Mandsaur)
2. Environmental CSR *by* Chakraborti, Chhanda (BITS Pilani)
3. Logic *by* Chakraborti, Chhanda (Dept of Mathematical Information Technology, University of Jyväskylä, Finland)
4. Human Reasoning *by* Chakraborti, Chhanda (Dept of Mathematical Information Technology, University of Jyväskylä, Finland)
5. Ethics in Practice *by* Chakraborti, Chhanda (Dept of Mathematical Information Technology, University of Jyväskylä, Finland)
6. The Need for Communication Studies in the English Classroom *by* Murugan, Seema (Seva Bharati Mahavidyalaya, P.O. Kapgari, Dt.: West Midnapore)
7. Technical Education in India and its Future *by* Chatterjee, Suhita Chopra (College of Engineering and Management. Kolaghat)
8. Sustainable Development: Issues and Dilemmas *by* Nayak, Narayan Chandra (Fakir Mohan University, Balasore, Orissa)
9. New Trends in Human Resource Management *by* Srivastava, Kailash Bihari Lal (South Eastern Railway)
10. Social initiative and CSR *by* Srivastava, Kailash Bihari Lal (BITS Pilani)
11. Disaster and its Impact: Development Issues and Dilemmas *by* Nayak, Narayan Chandra (U N College, Soro, Orissa)
12. Communication Skills for Teachers *by* Komalesha, H. S. (BIT Sindri)
13. Effective Presentation Skills *by* Komalesha, H. S. (IIT Kharagpur)
14. Introducing Narratology *by* Komalesha, H. S. (IIT Kharagpur)

Books Published

1. Eds. S. C. Chatterjee, P. Patnaik and V. Chariar Discourses on Aging and Dying *published by* Published by: SAGE (Los Angeles, London, New Delhi, Singapore), 2008). (2008)
2. H S Komalesha Issues of Identity in Indian English Fiction: A Close Reading of Canonical Indian English Novels *published by* Peter Lang, UK (2008)
3. H S Komalesha Anupama Niranjana *published by* Sahitya Akademi, New Delhi (2008)
4. Rabindra Kumar Pradhan & Purnima Mathur Emotional Intelligence: Perspectives in Organisations *published by* Academic Excellence, New Delhi (2008)
5. Seema Murugan Singh: The Fiction of Alice Walker A Study of Black Images *published by* Authors Press (2008)
6. Seema Murugan Singh: Writing It Right African American Experience in the Fiction of Ralph Ellison *published by* Cygnus (2009)

Seminars, Conferences and Workshops Organised

1. Industrial Relations in India
2. Recent trends in Organizational behaviour
3. National Seminar on Trans-historian Configurations: Colonial Past & post Modern Futures in USA and India
4. National Workshop on Curriculum Development in Applied Philosophy
5. One Day Workshop on Industrial Relations in India, 22 March 2009

Short-Term Courses, Training Programmes and Workshops organized

1. Emotional Intelligence: Optimising Human Performance at the Workplace (April 25-27, 2008)
2. Interpersonal Communication (February 17-22, 2009)
3. Linguistics and its Applications (December 27-29, 2008)
4. Literary theory: Theories of reading and writing (August 1-4)
5. Managing Stress at work (November 16-18, 2008)
6. Recent Trends in Human Resource management and development (July 7-18, 2008)
7. Soft Skills, Group Discussion and Personal Interview (June 5-8, 2008)
8. Winter School on Logic and Applications of Logic (LAAL 2009) Part I and Part II (Jan 5-16, 2009)

DEPARTMENT OF INDUSTRIAL ENGINEERING & MANAGEMENT

HEAD : Professor Pradip Kumar Ray

FACULTY

Professors

Acharya, Damodar	Ph.D. (IIT Kharagpur)
Banerjee, Rabindra Nath	PGDM (Edinburgh UK)
Mahanty, Biswajit	Ph.D. (IIT Kharagpur), System Analysis, Optimization, Information Systems, Project Management
Mohapatra, Pratap Kumar Jagadev	Ph.D. (IIT Kharagpur), Industrial Engineering and Management
Ray, Pradip Kumar	Ph.D. (IIT Kharagpur), Ergonomics / Human Factors Engineering, Quality Design and Control, Operations and Materials Management
Sahu, Sadananda	Ph.D. (IIT Kharagpur), Industrial Engineering and Management, Supply Chain Management
Srinivasan, S	Ph.D. (IIT Kharagpur), Financial Engineering, Engineering Economics and Costing

Associate Professors

Maiti, Jhareswar	Ph.D. (IIT Kharagpur), Risk Assessment and Safety Management, Ergonomics and Work System Design, Statistical Quality Control
Tiwari, Manoj Kumar	Manufacturing Systems, Supply Chain Management, AI Applications

Assistant Professors

Jenamani, Mamata	Ph.D. (IIT Kharagpur), E-Business, E-Auction, Recommender and Personalization systems
Sarmah, Sarada Prasad	Ph.D. (IIT Kharagpur), Supply Chain Management Inventory Management Logistics

Senior Lecturer

Nandy, Ayan	Ph.D. (IIM, Calcutta)
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Faculty Appointments

Dr. Jyoti Mukherjee	Professor
Dr. Ranjan Ghosh	Professor
Dr. T. P. Bagchi	Professor

Brief Description of on-going activities

Since its inception the department has been known across the nation for its excellent research potential and capability in the field of industrial engineering and related areas. As a matter of fact, pioneering research in the following areas of industrial engineering and management are being carried out :

1. Operations Management : Production Planning and Inventory Control, Facility Design and Layout, Logistics and Supply Chain Management, E-Business, Quality Engineering and Control,
2. Total Quality Management and Six Sigma Work System Design : Ergonomics / Human Factors Engineering, Occupational Safety and Health Management, and Probabilistic Risk Assessment.
3. Simulation and Soft Computing : Optimization and Heuristics, System Dynamics.

4. Operations Management Work System Design,
5. Ergonomics and Safety Engineering Quality Engineering Simulation and Soft Computing

Doctoral and MS Degrees Awarded

1. Preethi Upamaka Technology Diffusion Studies in Indian Research Organizations (Ph.D.)
2. N S Arunraj Modeling risk and risk-based maintenance in chemical process industry (Ph.D.)
3. Pradip Kumar Talapatra Studies on Total Quality Management in Indian Manufacturing Firms (Ph.D.)
4. Santanu Sinha Modelling Supply Chain Coordination under Diverse Settings (Ph.D.)

Fellow - Professional Bodies

1. Sahu, Sadananda (2000) Nominated - World Academy of Productivity Sciences

Member - Editorial Board

1. Mahanty, Biswajit (2007) Member of Editorial Board
- International Journal of System Dynamics and Policy Planning
2. Maiti, Jhareswar (2007) Reviewer
- The Institution of Engineers (India)
3. Maiti, Jhareswar (2007) Reviewer
- Journal of Hazardous Materials
4. Maiti, Jhareswar (2008) Reviewer
- Ergonomics
5. Mohapatra, Pratap Kumar Jagadev (2005) Member of the Editorial Board
- Journal of Advances in Management Research
6. Mohapatra, Pratap Kumar Jagadev (2005) Member of the Editorial Board
- System Dynamics Review
7. Mohapatra, Pratap Kumar Jagadev (2005) Member of the Editorial Board
- International Journal of System Dynamics and Policy Planning
8. Sahu, Sadananda (1997) Member, Editorial Board for the period 1997-2005
- International Journal of Production Research
9. Tiwari, Manoj Kumar (2009) Editorial Board Member
- International Journal of Production Research (IJPR)
10. Tiwari, Manoj Kumar (2009) Editorial Board Member
- Journal of Mathematics of Operational Research (IJMOR)
11. Tiwari, Manoj Kumar (2009) Editorial Board Member
- Robotics and Computer Integrated Manufacturing (RCIM)
12. Tiwari, Manoj Kumar (2009) Editorial Board Member
- Journal of Advances in Management Research (JAMR)
13. Tiwari, Manoj Kumar (2009) Associate Editor
- Journal of Intelligent Manufacturing (JIM)
14. Tiwari, Manoj Kumar (2009) Editorial Board Member
- International Journal of Advanced Manufacturing Technology (IJAMT)
15. Tiwari, Manoj Kumar (2009) Editorial Board Member
- International Journal of Computer Aided Engineering and Technology (IJCAET)
16. Tiwari, Manoj Kumar (2009) Associate Editor
- International Journal of System Science (IJSS)
17. Tiwari, Manoj Kumar (2009) Editorial Board Member
- International Journal of Decision Making in Manufacturing and Services

18. Tiwari, Manoj Kumar (2009) Editor (special issue on Advanced Metaheuristics for Integrated Supply Chain Management)
- International Journal of Production Research (IJPR)
19. Tiwari, Manoj Kumar (2009) Editorial Board Member
- Journal of Mechanical Engineering Science, (Proceedings the IMechE, Part C)
20. Tiwari, Manoj Kumar (2009) Editorial Board Member
- Applied Mathematical Sciences (AMS)
21. Tiwari, Manoj Kumar (2009) Editorial Board Member
- International Journal of Computer Integrated Manufacturing (IJCIM)
22. Tiwari, Manoj Kumar (2009) Editorial Board Member
- International Journal of Manufacturing Research (IJMR)

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Agent-Mediated Electronic Auctions and Negotiations	MHRD,	Rs. 18.00 Lakhs
2.	Automated negotiation and trust management in electronic market places	ISIRD, SRIC, IIT Kharagpur,	Rs. 3.00 Lakhs
3.	Development and Test of a Socio-technical Model for Assessing Occupational Risk of Injuries and Illnesses to Mine Workers	CSIR, New Delhi	Rs. 8.00 Lakhs
4.	Development and test of a sociotechnical model for assessing occupational risk of injuries to mine workers	CSIR	Rs. 7.64 Lakhs
5.	Development of decision support model for supply chain coordination	ISIRD, IIT Kharagpur	Rs. 3.00 Lakhs
6.	DST-sponsored FIST project for Development of Ergonomics Laboratory	DST	Rs. 45.00 Lakhs
7.	ERP System for the Institute (IER)	IIT Kharagpur	Rs. 51.00 Lakhs
8.	Exploring Trust, Fraud and Privacy issues in E-Business	Department of Science and Technology	Rs. 8.00 Lakhs
9.	FIST Program - 2005 on "Ergonomics and e-Business"	DST New Delhi	Rs. 60.00 Lakhs
10.	Hazard evaluation, risk assessment, and accident causation in mines - An application of multivariate statistical models and neural networks	DST, New Delhi	Rs. 6.00 Lakhs
11.	Productivity Management in Rice Production Activities - A Data Envelopment Analysis	ICAR	Rs. 13.64 Lakhs
12.	Technology adoption in Tea industry with special reference to NE India	DSIR, New Delhi	Rs. 6.50 Lakhs

Consultancy Projects

1.	Preparing the blue print of Institute to be known as IICA (Indian Institute of Corporate Affairs).	Ministry of Corporate Affairs New Delhi.,	Rs. 160.00 Lakhs
2.	Cyclone Shelter	Office of the Prime Minister,	Rs. 0.00 Lakhs
3.	Developing a Maturity Model to Transform 'Potential' Organizational Resources to Assets (based on AXELL) for Tata Consultancy Services Ltd.	Tata Consultancy Services Ltd., Tirupati Assets	Rs. 9.00 Lakhs Rs. 50.00 Lakhs
4.	Development of Educational Complex	Pvt Ltd., Kolkata,	
5.	Implementation of Lean Engineering Concepts	Indian Air Force	Rs. 56.00 Lakhs
6.	Manpower Study at Mines Division of IMFA LTD	IMFA Limited, Bhubaneswar,	Rs. 7.86 Lakhs
7.	Manpower Study for the Mines Division of IMFA Ltd, Bhubaneswar	IMFA Ltd, Bhubaneswar,	Rs. 8.00 Lakhs

8.	Pilot Project on Implementation of Lean Engineering Practices at 11BRD, AF	Indian Air Force, New Delhi,	Rs. 56.00 Lakhs
9.	Project on IICA	Ministry of Corporate Affairs,	Rs. 25.00 Lakhs
10.	Strategic Options Study for Rural Roads	Rural Works Department, Govt. of Orissa,	Rs. 8.00 Lakhs
11.	Studies on the norms in transit / handling and bed loss of ore during material handling in OMC operated mines	The Orissa Mining Corporation Limited, Bhubaneswar	Rs. 7.50 Lakhs
12.	Study on Ore Losses during Transit and Material Handling for OMC-operated Mines	OMC Ltd, Bhubaneswar	Rs. 7.50 Lakhs

Visits Abroad by Faculty Members

1. Sahu, Sadananda Visited School of Mechanical and Manufacturing Engineering, Visited Central Library (University of Loughborough) June-July 2008
2. Sahu, Sadananda Visit NTU and National Library of Singapore (Singapore) December 2008

Invited Lectures by Faculty Members

1. Development of SME as Ancillary and Downstream of Steel Industry in Orissa by Mahanty, Biswajit (Seminar organized by IPICOL, Orissa at Bhubaneswar)
2. Soft Computing Applications in Supply Chain Management. by Tiwari, Manoj Kumar (NIT Rourkela)
3. PSO and ABC algorithm on multi-objective optimization related to Supply Chain problems by Tiwari, Manoj Kumar (IIIT Gwalior)
4. Industrial Safety Management by Ray, Pradip Kumar (DRDO, Proof and Experimental Establishment, Chandipur, Balasore, Orissa)
5. Process Safety and Risk Assessment by Maiti, Jhareswar (Kolkata, CII Symposium)

Seminars, Conferences and Workshops Organised

1. 12-week duration Training Programme on Industrial Safety Engineering for Tata Steel Officials
2. Project Management Fundamentals
3. Short-Term Course on Project Management for Management/Engineer Trainees
4. Training Programme on Fundamentals of Lean Engineering Concepts for IAF Officials

Short-Term Courses, Training Programmes and Workshops organized

1. A 13-week Course on Industrial Safety Engineering for Tata Steel Officials (13 weeks)
2. Introduction to Lean Engineering Practices for IAF (2 weeks)
3. PLM/PDM (2 weeks)

DEPARTMENT OF MATHEMATICS

HEAD : Professor Akhil Ranjan Roy

FACULTY

Professors

Alam, Syed Samsul	Ph.D. (IIT Kharagpur), Statistics, Operations Research, Computer Applications
Bhattacharyya, Somnath	Ph.D. (IISc. Bangalore), Computational Fluid Dynamics, Micro- / nanofluidics Modeling
Biswal, Mahendra Prasad	Ph.D. (IIT Kharagpur), Multi-Objective Decision Making and Multi-Choice Programming
Goswami, Adrijit	Ph.D. (Jadavpur University), Operations Research, Theoretical Computer Science
Gupta, Dharmendra Kumar	Ph.D. (IIT Kharagpur), Numerical Analysis and Computer Science
Gupta, Umesh Chandra	Ph.D. (IIT Delhi), Queueing Theory
Jain, Vinay Kumar	Ph.D. (IIT Delhi), Complex Analysis (Extremal Problems and Zeros of Polynomials and Analytic Functions)
Kumar, Somesh	Ph.D. (IIT Kanpur), Statistical Decision Theory, Estimation Theory, Quantum Information and Computation, Statistical Data Analysis
Misra, Jagadis Chandra	Ph.D., D.Sc. (Calcutta), Mathematical Modelling, Biomechanics, Biomathematics, Mechanics of Fluids and Solids
Nanda, Sudarsan	Ph.D., D.Sc.(Sambalpur), Functional Analysis, Optimization, Fuzzy Logic
Roy, Akhil Ranjan	Ph.D. (IIT Kharagpur), Relativistic Cosmology, Fuzzy Optimization, Inventory Models, Bifurcation Theory
Sarkar, Anjan	Ph.D. (IIT Kharagpur), Statistics, Remotely Sensed Image Analysis.
Srivastava, Parmeshwary Dayal	Ph.D. (IIT Kanpur), Functional Analysis, Sequence Space, Cryptography

Associate Professors

Kumar, Pawan	Ph.D. (IIT Kanpur), Graph Theory, Compiler Design
Murthy, P V S N	Ph.D., Bio Fluid Mechanics, Non-Newtonian Fluid Transport in Porous Media
Pandey, Rajnikant	Ph.D., Singular Boundary Value Problems, Multipoint Boundary Value Problems, Theoretical Numerical Analysis
Raja Sekhar, G P	Ph.D. (Hyderabad University), Boundary Integral Methods for Viscous Flows, Mass Transfer in Porous Catalysts

Assistant Professors

Biswas, Debapriya	Ph.D. (Leeds University), Clifford Analysis
Chakraborty, Debjani	Ph.D. (IIT Kharagpur), Fuzzy Mathematics
Gayen, Rupanwita	Ph.D. (University of Calcutta), Linear Water Waves, Integral Equations
Ghoshal, Koeli	Ph.D. (Jadavpur University), Mathematical Modelling of Turbulence and Sediment Transport
Maity, Soumen	Ph.D. (ISI, Kolkata), Combinatorics, Cryptography, Fault-Tolerance in VLSI Architectures
Nahak, Chandal	Ph.D., Functional Analysis, Optimization, Fractional Calculus
Nanda, Asok Kumar	Ph.D. (Chandigarh), Entropy, Reliability, Statistics

Nelakanti, Gnaneshwar

Ph.D. (IIT Bombay), Spectral Approximation, Approximate Solution of Operator Equations, Inverse and Ill-posed Problems

Panda, Geetanjali

Ph.D., Optimization

Panigrahi, Pratima

Ph.D. (Bangalore), Combinatorics and Graph Theory

New Academic Programmes

1. M.Sc. - Ph.D.
2. M.Tech. - Ph.D.

Brief Description of on-going activities

Besides extensive research in the Thrust areas viz. Functional Analysis and Fluid Mechanics, significant contribution has also been made by the members of the faculty in other fields of research in the area of Clifford Analysis, Fuzzy Mathematics, Soft Algebra, Bio Mechanics, Chaos and Bifurcation in Nonlinear systems, Graph Theory, Integral Equations, Cryptography, Queueing Theory, Statistical Decision Theory, Statistical Data Analysis, Compiler Design, Combinatorics, Fractional Calculus, Optimization and Theoretical Computer Science. The Department has obtained the reports from the external experts of the peer review committee concerning its different academic programmes and is now awaiting finalization of the report to be submitted to the institute.

Thrust Areas

1. Functional Analysis, Fluid Mechanics

New Acquisitions

1. Updation of the computer lab by 15 new PCs, one server for running simulation programmes, one 15 KV UPS for the lab, one plotter, replacement of faculty old deskjet printer by laserjet printers, one Copier cum printer

International Collaborations

1. The Department has finalized one MoU with the Center of Industrial Mathematics, Department of Mathematics, University of Bremen, Germany, to enhance the research activities via students exchange programme.

Lectures by Visiting Experts

1. Eigenvalue expansion method for oscillatory Stokes flows 2) Oscillatory eddy structure in cylindrical container by Dr. Kidambi Rangachari (NAL Bangalore)
2. Computational Science and Engineering in Eindhoven by Mattheij, R.M.M. (Technische Universiteit Eindhoven Netherlands)
3. Image based navigation for autonomous vehicles by Dr Reiger Rupert (Project Co-ordinator of EADS (European Aeronautics and Defence Space company, N.V))
4. Front Propagation in a Noisy, Nonsmooth, Excitable Medium by Dr. Mohar Guha (University of Michigan, USA)
5. Estimation of a Population Size Through Capture-Mark-Recapture Method: A Comparison of Various Point and Internal Estimators by Dr. Nabendu Pal (University of Louisiana at Lafayette)

Doctoral and MS Degrees Awarded

1. Narmada Behera Optimality Conditions and Duality Results under Generalized Invexity in Banach Space (Ph.D.)
2. Jayanta Kumar Dash Deterministic Equivalent of Fuzzy Chance Constrained Programming Problems (Ph.D.)
3. Debasis Giri Cryptanalysis and improvement of protocols for digital signature (Ph.D.)
4. Ameeya Kumar Nayak Electroosmotic Flow in a charged micro- and nano channel and double diffusive convection in a cavity (Ph.D.)

5. Amit Kumar Verma Analytical Results for a class of Non-Linear Singular Boundary Value Problems (Ph.D.)
6. Santa Kumari Sunanda Generalized Hardy type Inequalities and Opial type Inequalities for Fractional Derivatives (Ph.D.)
7. Pradip Kumar Parida Study of some third order methods for Non-Linear Equations in Banach Spaces (Ph.D.)
8. S. Dhinakaran Unsteady flow and heat / mass transfer from solid / porous bodies - A numerical treatment (Ph.D.)

Member - Editorial Board

1. Alam, Syed Samsul (0) Member, Editorial Board
- Canadian Journal of Pure and applied Sciences
2. Biswal, Mahendra Prasad (2009) Reviewer
- Mathematical Reviews
3. Goswami, Adrijit (2008) Member, Editorial Board
- International Journal of Mathematics in Operational Research (IJMOR)
4. Kumar, Somesh (2006) Reviewer
- Naval Research Logistics
5. Kumar, Somesh (2005) Editor
- International Journal of Applied Mathematics and Statistics
6. Kumar, Somesh (2008) Editor
- Bulletin of Statistics and Economics
7. Kumar, Somesh (2008) Executive Editor
- International Journal of Mathematics and Computation
8. Kumar, Somesh (2008) Reviewer
- Journal of Combinatorics, Information & System Sciences
9. Kumar, Somesh (2008) Reviewer
- Communications in Statistics - Theory and Methods
10. Kumar, Somesh (2007) Reviewer
- Journal of Statistical Computation and Simulation
11. Kumar, Somesh (2006) Associate Editor
- Journal of Indian Society for Probability and Statistics
12. Kumar, Somesh (2006) Reviewer
- Journal of Multivariate Analysis
13. Kumar, Somesh (2006) Reviewer
- Journal of Statistical Planning and Inference
14. Kumar, Somesh (2007) Reviewer
- Journal of Applied Mathematics and Computing
15. Murthy, P V S N (2009) Editorial Advisory Board Member
- The Open Transport Phenomenon Journal : <http://www.bentham.org/open/totpj/>
16. Murthy, P V S N (2008) Member, Editorial Board
- International Journal of Mathematical Modeling Simulation and Application
17. Panigrahi, Pratima (2005) A member of the Editorial Board
- The Aligarh Bulletin of Mathematics

Awards & Honours

1. Chakraborty, Debjani (1997) ISCA Young Scientist Award in Mathematics

Fellowships

1. Raja Sekhar, G P (2008) Alexander von Humboldt Fellowship for Experienced Researchers

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A Class of Non-Smooth Optimization Problems under Non-Fuzzy and Fuzzy Environments	CSIR, New Delhi	Rs. 3.00 Lakhs
2.	Boundary Integral Work Bench for Viscous Flows through Porous Media	DST, Govt. of India	Rs. 9.00 Lakhs
3.	Classification of Hyperspectral remote sensing data to discriminate between crop condition variety and stage.	ISRO,	Rs. 7.48 Lakhs
4.	Continuous and periodic review inventory model in Fuzzy and/or Stochastic Environment	DST	Rs. 0.00 Lakhs
5.	Development and implementation of extended finite element method (X - FEM) for modelling cohesive discontinuities in rock mass	DST, New Delhi	Rs. 16.34 Lakhs
6.	Effects of Non-linearity and viscoelasticity of blood and wall tissues and magnetohydrodynamic.states(ENV)	CSIR, New Delhi	Rs. 10.00 Lakhs
7.	Electro-osmotic Flow and Mixing in a charged Micro and Nano-Channels: A Computational and Analytical Study	DST	Rs. 0.00 Lakhs
8.	FIST Program Department of Mathematics	DST	Rs. 21.00 Lakhs
9.	FIST program Department of Mathematics (FMA)	DST New Delhi	Rs. 22.00 Lakhs
10.	Flow perturbation and sediment suspension over sandy bedforms: Theoretical and experimental studies	DST	Rs. 1.26 Lakhs
11.	Inversion of Prospect + SAIL model for estimation of Biophysical parameters Using Hyperspectral Reflectance	SAC, ISRO,	Rs. 2.80 Lakhs
12.	Nonlinear Singular Boundary Value Problems Arising in Physiology	CSIR, New Delhi	Rs. 5.66 Lakhs
13.	Numerical Investigation of Convective Transport from Wavy Surfaces	DST, New Delhi	Rs. 2.14 Lakhs
14.	Numerical Investigation of Convective Transport in a non-Darcy Porous Media with focus on Second Order Effects	CSIR, New Delhi	Rs. 7.50 Lakhs
15.	On Stochastic Order Relations with Applications in Reliability	DST, New Delhi	Rs. 7.45 Lakhs
16.	Singularity Methods for Stokes Flows in Presence of Rigid / Porous Planar Interface	CSIR, Govt. of India	Rs. 7.00 Lakhs
17.	Studies on the Analysis of Global Approximate Newton Method	ISIRD, SRIC, IIT Kharagpur	Rs. 1.25 Lakhs
18.	Studies on the equilibrium problems under generalized convexity and generalized monotonicity in Banach space	CSIR	Rs. 7.00 Lakhs
19.	Unsteady flow separation using particle simulation approach	DST	Rs. 0.00 Lakhs
20.	Wall proximity on bluff body wake:3-D aspects	C.S.I.R.,	Rs. 8.00 Lakhs

Consultancy Projects

1.	Computerization of pension scheme	Coal Mines Pension Fund Organisation,	Rs. 40.00 Lakhs
2.	Data integration for Developing Management Information Systems	Bayer (India) Limited, Mumbai,	Rs. 2.00 Lakhs
3.	Development of software for Demand Forecasting	Bayer (India) Ltd., Mumbai,	Rs. 0.75 Lakhs

Visits Abroad by Faculty Members

1. Raja Sekhar, G P Alexander von Humboldt Fellowship for Experienced Researchers (Institute for Applied Analysis and Numerical Simulation, University of Stuttgart, Germany) One year
2. Bhattacharyya, Somnath invited talk and attending conference (TU- Darmstadt) July

Invited Lectures by Faculty Members

1. A survey on radio k-coloring of graphs *by* Panigrahi, Pratima (Kalasalingam University, Krisnankoil, Madurai, Tamilnadu)
2. Some variations of coloring of graphs *by* Panigrahi, Pratima (University of Calcutta)
3. On some combinatorial problems *by* Panigrahi, Pratima (Institute of Mathematics and Applications, Bhubaneswar)
4. Optimization in Constraint Networks *by* Gupta, Dharmendra Kumar (Manipur University)
5. Hydrodynamics and Solute Transfer due to a Sinking Marine Aggregates *by* Bhattacharyya, Somnath (National Institute of Oceanography, Goa)
6. Statistical Inference and Decision Theory *by* Kumar, Somesh (NIT, Jamshedpur)
7. Unconstrained Reformulation of Constrained Optimization Problems *by* Nahak, Chandal (BHU, Varanasi)
8. Fractional Calculus and Address as Chief Guest *by* Nanda, Sudarsan (Gauhati University, Guwahati)
9. Absolute Almost Convergence (Professor R Mohanty Memorial Lecture) *by* Nanda, Sudarsan (Institute of Mathematics and Applications, Bhabaneswar)

Books Published

1. S. Nanda Convex Analysis *published by* Kalyani Publishers (2009)
2. S. Nanda and N. R. Das Fuzzy Mathematical Concepts *published by* Narosa Publishing House (2009)

Seminars, Conferences and Workshops Organised

1. National Workshop on Some Recent Research Directions in Graph Theory.
2. Ramunajan Birth Day Celebration
3. The Indian Society of Theoretical and Applied Mechanics (ISTAM) An International Meet

DEPARTMENT OF MECHANICAL ENGINEERING

HEAD : Professor Ajay Kumar Chattopadhyay

FACULTY

Professors

Bhattacharyya, Ranjan	Ph.D. (Kentucky), Vibration, Dynamics of Rotors, Nonlinear Elasticity
Bhattacharyya, Sati Nath	Ph.D. (IIT Kharagpur), Fluid Mechanics
Bhattacharyya, Souvik	Ph.D. (Texas A&M), Thermal Sciences, Energy, Refrigeration, Heat Transfer
Brahma, Ranajit Kumar	Ph.D. (IIT Kharagpur), Gas Turbine and Heat Transfer
Chakraborty, Suman	Ph.D., Microfluidics, Micro-scale and Nano-scale Transport Processes including Biological Application, CFD
Chattopadhyay, Ajay Kumar	Ph.D. (Jadavpur University), Machining, Grinding, Surface Coating, Metal-Ceramic Joining
Das Gupta, Anirvan	Ph.D. (Kanpur), Dynamics, Vibration and Wave Propagation in Continuous Media, Fluid-structure Interaction
Das, Prasanta Kumar	Ph.D. (IIT Kharagpur), Thermal Engineering, Gas-liquid Two-phase Flow, Instrumentation, Hydrodynamics, CFD for Multiphase Flow, Nano Fluids, Thermo Hydraulics of Nuclear Reactors, Liquid-liquid Two-phase Flow, Experimental Thermo-fluid Science
Dash, Sukanta Kumar	Ph.D. (IIT Kharagpur), Computational Methods CFD and Heat Transfer
Datta, Gouranga Lal	Ph.D. (IIT Kharagpur)
Karmakar, Ranjit	Ph.D. (IIT Kharagpur), Vehicle Dynamics, Physical System Modelling
Maiti, Biswajit	Ph.D. (IIT Delhi), Two-phase Flow, Finite Element Analysis of Fluid Flow
Maiti, Rathindranath	Ph.D. (IIT Kharagpur), Fluid Drive and Mechanical Power Trans / Gearing
Mishra, Prasanta Kumar	Ph.D. (Jadavpur University), Manufacturing Science and Engineering (Nonconventional Manufacturing), Innovative Machine Design
Mohanty, Amiya Ranjan	Ph.D. (Kentucky), Noise Control, Condition Monitoring, Acoustical Materials, Machine Design, Vehicle Dynamics
Mukherjee, Amalendu	Ph.D. (IIT Kharagpur), System Dynamics and Controls
Nath, Ashish Kumar	Ph.D. (Bombay University), High Power Lasers, Laser Material Interaction and Processing
Paul, Soumitra	Ph.D. (IIT Kharagpur), Machining and Grinding, Cutting Tool Coating, Non-traditional Manufacturing
Pradhan, Brajabandhu	Ph.D. (IIT Kharagpur), Design Engineering, Fracture Mechanics, Mechanics of Composite Materials, Smart Structures, Functionally Graded Materials, Theoretical and Experimental Stress Analysis
Pratihari, Dilip Kumar	Ph.D. (IIT Kanpur), Robotics, Soft Computing, Manufacturing Science
Ray, Manas Chandra	Ph.D. (IIT Kharagpur), Smart Structures, Carbon Nanotube Reinforced Composites, Smart Functionally Graded Structures, Piezoelectric Composites, Vibrations and Control
Roy Chowdhury, Samar Kumar	Ph.D. (Birmingham), Tribology

Roy, Subhansu	Ph.D. (Penn. State), Heat Transfer, Laser Processing of Materials, Flow Visualisation
Satyamurty, V V	Ph.D. (IIT Kanpur), Numerical Heat Transfer and Fluid Dynamics, Flow and Heat Transfer in Porous Media, Solar Energy Thermal Systems, Meteorological Data Generation
Som, Sankar Kumar	Ph.D. (IIT Kharagpur), Thermal Science and Engineering, Thermal Science and Engineering

Associate Professors

Bhattacharyya, Kingshook	Ph.D. (IIT Kharagpur), Multibody Dynamics
Biswas, Kajal	Ph.D. (IIT Kharagpur), Manufacturing Science and Engineering
Chakraborty, Goutam	Ph.D. (IIT Kanpur), Nonlinear Dynamics, Mechanics of Advanced Materials, Vibration
Das, Manab Kumar	Ph.D. (IIT Kanpur), Fluid Mechanics and Heat Transfer
Kumar, Cheruvu Siva	Ph.D. (IIT Kharagpur), Robotics, Control Systems, Computer Networks
Moulic, Sandipan Ghosh	Ph.D. (Arizona), Theoretical and Computational Fluid Dynamics and Heat Transfer, Hydrodynamic Stability, Mixed Convection Boundary Layers, Non-Newtonian Flows, Spectral Methods in Fluid Dynamics
Pal, Surjya Kanta	Ph.D. (IIT Kharagpur), Manufacturing Process Modelling, Tool Condition Monitoring
Ramgopal, Maddali	Ph.D. (IIT Madras), Refrigeration and Airconditioning
Ray, Kumar	Ph.D. (IIT Kharagpur)
Roy Chowdhury, Asimava	Ph.D. (IIT Kharagpur), Laser Sintering, Computer Numerical Control (CNC), Fused Deposition Modeling (FDM), Direct Slicing and Curved Slicing for Rapid Prototyping, Rapid Prototyping (RP), Free Form Surface Machining by CNC, Non-conventional Manufacturing, Laser Coating, Laser Assisted Manufacturing
Saha, Partha	Ph.D. (IIT Kharagpur), Nonconventional Manufacturing, Rapid Prototyping, Laser Processing of Materials, Micro Manufacturing
Samantaray, Arun Kumar	Ph.D. (IIT Kharagpur), Fuel-Cell Control, Non-linear Mechanics, Systems and Control

Assistant Professors

Bandyopadhyay, Partha Pratim	Ph.D. (IIT Kharagpur), Surface Technology
Deb, Sankha	Ph.D. (University of Montreal, Canada), Computer Integrated Manufacturing, Computer-Aided Process Planning, Robotics, Intelligent Manufacturing Systems, Manufacturing Processes, Soft Computing Techniques in Manufacturing
Gupta, Sanjay	Ph.D. (Delft), Biomechanics
Racherla, Vikranth	Ph.D. (University of Pennsylvania), Behavior of Non-Linear Composites, Design and Synthesis of Smart Polymers, Design and Analysis of Biomedical Implants
Ramanujam, S	Ph.D. (IIT Kharagpur)
Sarangi, Mihir	Ph.D. (IIT Kharagpur), Machine Design, Tribology, Rotor Dynamics

Faculty Appointments

Dr. Ashish Kumar Nath	Professor
Dr. Vikranth Racherla	Assistant Professor
Dr. Sankha Deb	Assistant Professor

Faculty Promotions

Dr. Manas Chandra Ray	Professor
Dr. Subhransu Roy	Professor
Dr. Suman Chakraborty	Professor
Dr. Anirvan Das Gupta	Professor
Dr. Dilip Kumar Pratihar	Professor
Dr. Surjya Kanta Pal	Associate Professor
Dr. Partha Saha	Associate Professor
Dr. Arun Kumar Samantaray	Associate Professor
Dr. Kingshook Bhattacharyya	Associate Professor
Dr. Goutam Chakraborty	Associate Professor

Faculty Retirement

Dr. Gouranga Lal Dutta	Professor
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Brief Description 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 microscale transport processes, Transport Phenomena in Phase Change Problems
3. Laser materials Processing
4. CFD/Lattice Boltzmann Method in Complex Flows
5. Study of the Mulling 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: Modelling & Experimentation
10. High Pressure Cooling in Machining of Super Alloys
11. TiN hard coating by unbalanced magnetron using Physical Vapour Deposition Technique
12. Multi Layer TiN-MoS₂ coating on cutting tools by unbalanced magnetron technique
13. Machinability study of Inconel 718
14. Development of control strategies for autonomous underwater vehicles
15. Modelling 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. Softcomputing techniques used in conventional and nonconventional 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 di-oxide based heat pump systems

Thrust Areas

1. High Speed Machining, Grinding and Development of Cutting Tools / Grinding Wheel
2. Micro Manufacturing and Microscale Transport Processes
3. Bio-micro-fluidics and microscale transport processes

New Acquisitions

1. Three Universal Milling Machines
2. Electromechanical Testing Actuator (ZWICK UTM)
3. Mettler Electronic Analytical Balance

4. Gas Turbine
5. Steam Turbine
6. B&K Measuring Amplifier Vibration Meter
7. 4-Component Dynamometer for Cutting Force Measurement
8. Machine Fault Simulator Kit
9. Pinnacle Plus 5kW DC Pulsing Power Supply
10. High Precision Hydraulic Surface Grinding Machine

International Collaborations

1. Student exchange program with University of South California (USA)
2. Student exchange program with University of Erlangen (Germany)
3. Indo-South African Research Collaboration between IIT Kharagpur and Univ. Pretoria.
4. Research collaboration with Univ. Lille for development of process supervision software
5. UK-India Education and Research Initiative (UKIERI) Project in collaboration with Univ. Southampton
6. Research collaboration with Växjö University, Sweden
7. Indo-US Project/ DST-NSF Project with UIUC and UCI
8. DST-JSPS Project with University of Tokyo and Tokai University

Lectures by Visiting Experts

1. New Least square technique for Finite element modeling by Prof. J. N. Reddy (Professor of Texas A&M University, USA)
2. Drill Wear Monitoring based on Measured Instantaneous Angular Speed by P.S. Heyns (Professor, Dept. Mechanical Engineering, Univ. Pretoria, SA)
3. Fault Diagnosis of Feed Pumps in Urea Production Plants by Om Prakash Srivastava (Professor, Växjö University, Sweden)
4. Manufacturing research activities at GeorgiaTech by Prof Shreyes Melkote (Georgia Tech.)
5. Real-Time Path Planning for Automating Optical Tweezers based Particle Transport Operations by Prof. Ashis Gopal Banerjee (University of Maryland, College Park)
6. Transport Phenomena in Polymer Electrolyte Fuel Cells by Dr. Partha P. Mukherjee (Los Alamos National Laboratory)
7. Effect of the ambient acoustic fluid on the structural dynamics by Abhijit Sarkar (Indian Institute of Science, Bangalore)
8. Thermophysical exploration of the role of disaccharides in anhydrobiotic engineering of mammalian cells for long-term storage of tissue engineered consts. by Dr. Sankha Bhowmick (University of Massachusetts, Dartmouth)
9. Current Trends in Bioengineering Research by Dr. Andrew M.R. New (University of Southampton, UK)
10. Discussions on robotics and control by Prof. Mo Jamshidi (University of Texas)

Doctoral and MS Degrees Awarded

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|----|-----------------------|---|
| 1. | Santosh Kr. Sahu | Rewetting of hot surfaces by top flooding (Ph.D.) |
| 2. | J. Shivakumar | Geometrically Nonlinear Analysis of Smart Laminated Composite Structures Integrated with Distributed Piezoelectric Fiber Reinforced Composite Actuators (Ph.D.) |
| 3. | Promod Kr. Potowari | Surface Modification with Powder Metallurgy (P/M) Electrodes in Electrodischarge Machine (Ph.D.) |
| 4. | Manas Mohan Mahapatra | Thermomechanical Finite Element Analyses and Experimental Investigations on Angular Distortions and Weldment Characteristics of Arc Welded Joints (Ph.D.) |

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| 5. | Ramjee Repaka | Laminar Forced Convection with Viscous Dissipation in Hydrodynamically & Thermally Developing Flow between Parallel Plates at Unequal Temperatures (Ph.D.) |
| 6. | Pradip Kr. Talapatra | Studies on Total Quality Management In Indian Manufacturing Firms (Ph.D.) |
| 7. | Kona Mrunalini | Some Studies on parametric Instability and Control of Composite Structures Using Smart Layers (Ph.D.) |
| 8. | Gajendra Kr. Agarwal | Heat Transfer, Emission Characteristics, and Thermodynamic Exergy Balance of Impinging Flames on Plane and Curved Surfaces (Ph.D.) |
| 9. | Sargade Vikas Gulabrao | Development of High Performance Titanium Nitride Coated Carbide Inserts Using Closed-Field Unbalanced Magnetron Sputtering (Ph.D.) |
| 10. | Sharifuddin Mondal | Unknown Input State Estimators for Component Fault Detection & Isolation of Lumped Parameter Systems (Ph.D.) |
| 11. | Alok Kumar Nandy | Improvement in the Machinability of Ti-6Al-4V-Titanium Alloy by High Pressure Cooling (Ph.D.) |
| 12. | Karali Patra | Study on Different Strategies for Soft Computing based Drill Wear Monitoring using Multiple Sensors (Ph.D.) |
| 13. | P. Ramesh Babu | Thermoelastic Analyses of Interlaminar Delamination Growth Behaviour Emanating from Free and Pin-Loaded Holes In Laminated FRP Composites (Ph.D.) |
| 14. | D. S. Nagesh | Studies on Modeling of Bead Geometric Parameters in Welding Processes Using Design of Experiments, Artificial Neural Network and Genetic Algorithm (Ph.D.) |
| 15. | Neeraj Agrawal | Transcritical Carbon Dioxide Heat Pumps : Studies on Multistaging and Capillary Tube System (Ph.D.) |
| 16. | Kate Ramesh Prabhakar | Investigations on External and Internal Hydraulic Jumps (Ph.D.) |
| 17. | Amitava Ghosh | On Development and Performance Evaluation of Advanced Single Layer Brazed cBN Wheel (Ph.D.) |
| 18. | Arun Kumar Pradhan | Performance of Vertically / Obliquely Reinforced 1-3 Piezoelectric Composites for Active Control of Smart Laminated Composite Structures (Ph.D.) |
| 19. | Somnath Sarangi | Effect of Stress-softening of Rubber Strings (Ph.D.) |
| 20. | Sukhomay Pal | Development & Validation of Various Soft Computing based Models for Pulsed Gas Metal Arc Welding Process (Ph.D.) |
| 21. | Brajesh Tripathi | On Some Aspects of Room Airflow Simulations (Ph.D.) |

Fellow - Professional Bodies

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| 1. | Pratihari, Dilip Kumar (2008) | Awarded - Institution of Engineers (I) |
| 2. | Bhattacharyya, Souvik (2006) | Awarded - INAE Fellow |
| 3. | Pradhan, Brajabandhu (1990) | Awarded - Institution of Engineers |
| 4. | Chakraborty, Suman (2009) | Fellow - Indian National Academy of Engineering (INAE) |

Member - Editorial Board

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|----|---|
| 1. | Bhattacharyya, Souvik (2008) Member, Editorial Board
- Energy Conversion & Management |
| 2. | Bhattacharyya, Souvik (2008) Member, Editorial Board
- International Journal of Power & Energy Systems |
| 3. | Chakraborty, Goutam (2009) Member
- International Journal of Engineering Research and Technology |
| 4. | Chakraborty, Suman (2008) Member, Editorial Advisory Committee
- Open Thermodynamics Journal |

5. Chakraborty, Suman (2008) Editorial Board Member
- International Journal of Micro-Nano Scale Transport
6. Chakraborty, Suman (2009) Editorial Board Member
- International Journal of Micro and Nano Systems
7. Chattopadhyay, Ajay Kumar (2008) Member International Advisory Board
- International Journal of Manufacturing Technology and Research
8. Deb, Sankha (2008) Editorial Board Member
- Journal of Modern Manufacturing Technology
9. Gupta, Sanjay (2007) Editorial Board Member
- Indian Journal of Biomechanics
10. Mohanty, Amiya Ranjan (2008) Member, Technical Committee
- Proceedings of SIAT 2009
11. Mohanty, Amiya Ranjan (2007) Member, Editorial Board on Technical Acoustics
- Journal of the Acoustical Society of India
12. Paul, Soumitra (2006) Member
- International Journal of Abrasive Technology (<http://www.inderscience.com/ijat>)
13. Pratihari, Dilip Kumar (2008) Member of Editorial Board
- International Journal of Data Mining, Modelling and Management
14. Pratihari, Dilip Kumar (2008) Member of Editorial Board
- International Journal of Advanced Intelligence Paradigms
15. Ramgopal, Maddali (2009) Member, Editorial Advisory Board
- Buildings & Environment

Awards & Honours

1. Chattopadhyay, Ajay Kumar (2008) Best paper award in the 2nd International AIMTDR conference held in Dec 2008 at IIT Madras
2. Chakraborty, Suman (2008) Scopus Young Scientist Award in Engineering

Fellowships

1. Das, Prasanta Kumar (2009) FELLOW OF INAE

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	2D Laser Doppler Velocimetry and Phase Doppler Particle Analyser	MHRD - FIST Project	Rs. 120.00 Lakhs
2.	A Study Of Microscale Transport Processes Leading To The Development Of A Cooling Strategy For Electronic Components	DIT,	Rs .89.75 Lakhs
3.	Active structural acoustic control of smart structure using 1-3 piezoelectric composite materials.	Department of Science and Technology,	Rs. 16.33 Lakhs
4.	Advanced research in mechanical engineering system	DST FIST programme	Rs. 700.00 Lakhs
5.	An investigation of thermally sprayed cermet coatings for hard chrome replacement (HCR)	IIT Kharagpur	Rs. 5.00 Lakhs
6.	Application of genetic algorithm for minimization of machining time and CL-data file size in CNC machining of free form surface	MHRD, NEW Delhi	Rs. 7.00 Lakhs
7.	Biomechanical Analysis and Design of Orthopaedic Implant	Department of Biotechnology, Govt. of India, New Delhi,	Rs. 51.12 Lakhs
8.	Carbon dioxide based heat pump systems for simultaneous cooling and heating applications	MHRD, Government of India,	Rs .7.00 Lakhs

9.	Cell Culture inside Microfluidic Channels with Extended Air-water Interface	DBT	Rs. 17.40 Lakhs
10.	Composite Applications Laboratory	TIFAC, DST	Rs. 346.20 Lakhs
11.	Compression-Absorption systems for cooling and heating applications	ERD, CSIR	Rs. 7.35 Lakhs
12.	Compressor driven metal hydride cooling and heating systems	Ministry of Non-Conventional Energy Sources, Govt. of India,	Rs. 19.50 Lakhs
13.	Design and development of adaptive robot controller using soft computing	DST, New Delhi	Rs. 8.35 Lakhs
14.	Design and development of automobile for SAE Formula 1 international competition for students	SRIC	Rs. 10.00 Lakhs
15.	Development and Characterization of nanofluid for micro thermal heat transfer application in Advance satellites	ISRO	Rs. 4.33 Lakhs
16.	Development of an R&D centre at Kolkata	Damodar Valley Corporation	Rs. 1.00 Lakhs
17.	Development of Autonomous Underwater Vehicle	Department of Ocean Development	Rs. 697.00 Lakhs
18.	Development of Instrumentation for Liquid liquid and gas Liquid systems	MHRD	Rs. 14.00 Lakhs
19.	Development of sound proofing composite materials using jute products	JMDC	Rs. 32.26 Lakhs
20.	E-learning application on Grid Network	CDAC	Rs. 10.00 Lakhs
21.	EHD enhancement of natural convection heat transfer	CSIR	Rs. 10.00 Lakhs
22.	Establishment for an advanced research facility for EB welding and process development related to programs of interest to DAE	BRNS, DAE	Rs. 42.53 Lakhs
23.	Establishment of Nationwide QoS Testbed network	Ministry of Information Technology	Rs. 126.00 Lakhs
24.	Estimation of damping and analysis of damage effects in composite rotors	ARDB, New Delhi	Rs. 11.34 Lakhs
25.	Experimental and Theoretical Studies on DNA Hybridization in Microchannels with Electrokinetically Driven flow	DST	Rs. 4.38 Lakhs
26.	Feasibility Study of Gas Turbine Health Monitoring by Motor Current Signature Analysis	DRDO	Rs. 3.20 Lakhs
27.	Flow and Heat Transfer Modelling in a Thurst Chamber of a Rocket Engine	ISRO, Bangalore	Rs. 8.00 Lakhs
28.	High Power Laser Workstation With Fibre Laser (2kw) and CNC Work Station	MHRD - FIST Project	Rs. 201.00 Lakhs
29.	Indo-South African Project on "Machine Tool Vibration Monitoring"	DST (India) & NRF (South Africa),	Rs. 3.50 Lakhs
30.	Indo-US Center on Fabrionics	Indo-US Science and Technology Forum,	Rs. 0.00 Lakhs
31.	Intelligent Data Mining for Forward and Reverse Modeling of Manufacturing Processes	SERC	Rs. 15.00 Lakhs
32.	Kinematics of flows in diverse context	DST	Rs. 8.50 Lakhs
33.	Microfluidics and Microscale Transport Processes	SRIC	Rs. 6.00 Lakhs
34.	Multi-sensor Based Tool Condition Monitoring in Drilling	CSIR	Rs. 7.00 Lakhs
35.	National Grid Computing Project - GARUDA	IIT Kharagpur, CDAC and ERNET India,	Rs. 0.00 Lakhs

36.	Numerical Simulation of Turbulent Plane Offset Jet Flow and Conjugate Heat Transfer	Department of Science and Technology	Rs. 9.60 Lakhs
37.	On the Dynamics of Artificial Joints	IIT Kharagpur	Rs. 4.90 Lakhs
38.	Online component fault detection and isolation using diagnostic bond graphs	(Institute Scheme for Innovative Research and Development, IIT-Kharagpur,	Rs. 3.00 Lakhs
39.	Optofluidics on a CD	DST	Rs. 0.00 Lakhs
40.	Preclinical analysis and development of improved acetabular prostheses	British Council	Rs. 57.18 Lakhs
41.	Removal of Obsolence and Modernization of Refrigeration and Air Conditioning Laboratory	MHRD, Government of India,	Rs. 20.00 Lakhs
42.	Rural industrialization in West Bengal	KVIC	Rs. 60.00 Lakhs
43.	Soccer Robots: Small Sized League (SSR)	SRIC, IIT Kharagpur	Rs. 4.80 Lakhs
44.	Standardization of process parameters in withering, maceration, rolling, fermentation and drying of tea	Tea board, GOI	Rs. 366.96 Lakhs
45.	Steel Technology Centre	DST & Ministry of Steel	Rs. 200.00 Lakhs
46.	Studies on Application of Phase Change Materials in Domestic Frost-free refrigerators	ISIRD, IIT, Kharagpur	Rs. 0.50 Lakhs
47.	Study of tea rolling process with the aim of quantification and optimization of the process and subsequent development of new machinery	Tea Board	Rs. 40.00 Lakhs
48.	Surface Integrity in High Efficiency Grinding by Super-abrasive Wheels	MHRD	Rs. 25.00 Lakhs
49.	Transient Boiling and Counter Current Flow Phenomena during Direct in Bundle Emergency Coolant Injection	BARC	Rs. 42.00 Lakhs
50.	Turbulent Flow Computation of Two-Dimensional Incompressible Viscous Flow through a Cascade	Aeronautical Research Development Board	Rs. 12.61 Lakhs
51.	Visualization and optical diagnosis of two phase flow: bubbles and droplet distribution and dynamics pertaining to carry-over and carry-under phenomem	BARC	Rs. 35.76 Lakhs
52.	Water lubricated transport of heavy oils - experimentation and theory	DST	Rs. 19.00 Lakhs

Consultancy Projects

1.	Design parameters for beam blank SEN of JSPL caster	IFGL Refractories	Rs. 1.00 Lakhs
2.	Design parameters for the SEN of Hissar Steel	IFGL Refractoris	Rs. 1.25 Lakhs
3.	Determination of vortex height in a tundish for a grade change operation	IFGL Refractories	Rs. 0.60 Lakhs
4.	Air conditioning system of Netaji Indoor Stadium, Kolkata	PWD, Government of West Bengal	Rs. 0.80 Lakhs
5.	An Integrated Micro-Macro Solidification Algorithm for Direct Numerical Simulation of Large Scale Solidification Structures	General Motors (USA)	Rs. 23.58 Lakhs
6.	Characterization of surface roughness for pressure driven and/or electro-osmotic liquid flow in a micro-channel	DELPHI	Rs. 7.63 Lakhs
7.	Design of a tundish for lower wall stress of Bhilai Plant	IFGL Refractoris	Rs. 0.60 Lakhs
8.	Development of a fundamental model for characterizing solidification transport in the mushy region	General Motors, USA	Rs. 38.78 Lakhs
9.	Development of system for monitoring of slow speed running equipment.	RDCIS, SAIL RANCHI	Rs. 8.50 Lakhs
10.	Development of web and video courses on Refrigeration & Air Conditioning under NPTEL	MHRD, NPTEL	Rs. 0.00 Lakhs

11.	Experimental sample preparations by wire cut EDM (CEDM)	Various clients,	Rs. 0.87 Lakhs
12.	Feasibility Studies on the existing central air conditioning system at IIT Guwahati	IIT Guwahati	Rs. 2.50 Lakhs
13.	Finite Element analysis and Paper Machine Noise Control	Emami Paper Mills Limited,	Rs. 13.00 Lakhs
14.	Genetic Algorithms in hydrocyclones	TATA Steel, Jamshedpur	Rs. 0.00 Lakhs
15.	Manual For Cooling Tower water treatment	M.M.Aqua technologies	Rs. 1.25 Lakhs
16.	Material Processing by Nd-YAG laser (MPNL)	Various clients	Rs. 0.86 Lakhs
17.	Noise Reduction in Amorphous Metal Transformers	Vijai Electricals, Hyderabad,	Rs. 9.50 Lakhs
18.	Operational Speed Enhancement of Paper Mills by FEM	Emami Paper Mills Ltd.	Rs. 15.00 Lakhs
19.	Pressure drop characteristics of Y-type and Basket-type strainers	Sarojini Enterprises, 11 Subol Chandra Lane, Kolkata 700 009,	Rs. 0.51 Lakhs
20.	RTD study for Tisco-LD2 tundish, Sponsor	IFGL Refractories	Rs. 0.60 Lakhs
21.	Setting up a research and development centre for Damodar Valley Corporation at Kolkata (Phase-1)	Damodar Valley Corporation, Kolkata,	Rs.11000.00Lakhs
22.	Stress analysis of steel cord reinforced pipe conveyor belt(SCPC)	Phoenix Yule limited, Kolkata,	Rs. 2.24 Lakhs
23.	Technical Evaluation of Screw Chilling Unit	Blue Star, Kolkata	Rs. 1.20 Lakhs
24.	Technology Development of Liquid-Spring based Shock-Isolation System	Research and Development Establishment (Engineers), DRDO, Pune	Rs. 9.70 Lakhs

Patents (filed / granted)

1. A controlled Hip-Joint Simulator
2. A device for measuring the thermal conductivity of a fluid with dispersion of ultra-fine solid particles
3. A method for Curved-Layer fused deposition modeling and system to carry out such method
4. A method for measurement of velocity of two phase flow by capacitance sensors
5. A non-invasive instrumentation system for measurement of mass flow rate of bulk solid in a pneumatic conveying system
6. An improved conductivity probe system for measuring of a multi phase fluid flow particularly a two phase fluid flow
7. An improved probe design and circuitry for the measurement of bulk solid velocity by electrodynamic probe
8. Design and development of structured surface for the enhancement of boiling heat transfer
9. Optical probe for multiphase flow
10. Split Cam for an improved drive system such as two gear epicyclic drive similar to Harmonic Drive system.

Visits Abroad by Faculty Members

1. Samantaray, Arun Kumar Collaborative research (University of Lille, France) 2 months
2. Maiti, Rathindranath Invited Lecture and Technical Discussion (Institute for Fluid Power Drives and Controls (IFAS), RWTH Aachen University, Germany) September 28-29, 2008
3. Pal, Surjya Kanta Collaborative research (The University of Sheffield) 2 months (May-July)
4. Chakraborty, Suman Visiting Professor (Stanford University) May-July, 2008

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| 5. | Deb, Sankha | Invited as Visiting Professor (Department of Maths. and Industrial Engineering, Ecole Polytechnique de Montreal, Canada) June 2008 |
| 6. | Ray, Manas Chandra | To conduct a collaborative research on carbon nanotube reinforced composite (Massachusetts Institute of Technology, Cambridge, Massachusetts, USA) June 15-22 |
| 7. | Kumar, Cheruvu Siva | Establishing relationships under the VEICET project and also with IIT for further work in manufacturi (Univ, Surrey, TU Dresden, TU Eindhoven and Warwick Manufacturing Group) 8 days |
| 8. | Gupta, Sanjay | UKIERI research project (University of Southampton, UK) Six weeks |
| 9. | Gupta, Sanjay | UKIERI research project (University of Southampton, UK) One week |
| 10. | Bandyopadhyay, Partha Pratim | Research on Ti-Cr-Si-O coating (Swiss Federal Lab of Material Testing and Research) Mid May - Mid July, 2009 |
| 11. | Maiti, Rathindranath | Invited Lecture & Technical Discussion (Fluid Power Research Group (Mech. Engg.), Wroclaw Technical University, Poland) October 3, 2008 |

Invited Lectures by Faculty Members

1. Digital Signal Processing in NVH *by* Mohanty, Amiya Ranjan (NSTL Vishkapatnam)
2. Micro/Nano Manufacturing Science *by* Pal, Surjya Kanta (Indo-Japan Joint Seminar)
3. Introduction to vibration analysis *by* Bhattacharyya, Ranjan (DVC-IIT R&D Centre, Kolkata.)
4. Ballooning Motion of a Rubber String *by* Bhattacharyya, Ranjan (NIT Durgapur)
5. Intelligent and Integrated Computer-Aided Process Planning *by* Deb, Sankha (Department of Maths. and Industrial Engineering, Ecole Polytechnique de Montreal, Canada)
6. Bond graph modelling of thermometallurgical process on a runout table. *by* Karmakar, Ranjit (N.I.T Durgapur)
7. Green Refrigeration Technologies Challenges & Opportunities, *by* Ramgopal, Maddali (Institute of Engineers (KGP Chapter), IIT Kharagpur)
8. Natural refrigeration *by* Bhattacharyya, Souvik (Jadavpur University)
9. Bio-Microfluidics: Fundamentals and Applications *by* Chakraborty, Suman (NCL, Pune)
10. Bio-Microfluidics: Trends and Challenges *by* Chakraborty, Suman (ISI Kolkata)
11. Microfluidics: Present Trends and Future Challenges *by* Chakraborty, Suman (IIT Madras)
12. Multiscale analysis of Smart Fuzzy Fiber Reinforced Composites *by* Ray, Manas Chandra (ISTAM -2008, Osmania University, Hyderabad)
13. Analysis of failure mechanisms and design considerations of resurfaced femur *by* Gupta, Sanjay (Indian Arthroplasty Association Annual Conference (IAACON 2008), New Delhi)
14. Advancement in Superabrasive Grinding Wheel through Surface Coating *by* Chattopadhyay, Ajay Kumar (Jadavpur University)
15. Micro Machining *by* Chattopadhyay, Ajay Kumar (NITTTR Kolkata)
16. Motor Current Signature Analysis *by* Mohanty, Amiya Ranjan (INS Shvaji, Lonavla)
17. Analysis of the active contacts of ORBIT motor to examine its tribological & starting torque aspects *by* Maiti, Rathindranath (Institute for Fluid Power Drives and Controls (IFAS), RWTH Aachen University, Germany)
18. Understanding Design and Performance of Epitrochoid Generated 'GEROTOR' Class of Hydrostatic Units *by* Maiti, Rathindranath (Wroclaw University of Technology (Fluid Power Research Group), Poland)
19. Fluid Power Research and Education in India. *by* Maiti, Rathindranath (ICTET-08 Conference, G.H.Raisoni College of Engg., Nagpur University, Nagpur, India.)
20. Use of functionally graded materials in structural elements for improved crack growth resistance *by* Pradhan, Brajabandhu (National conference on CAMSCM, NERIST, Nirjuli, Arunachal Pradesh)

21. Composites, smart materials and concepts of light weight smart structures design *by* Pradhan, Brajabandhu (Department of Applied Mathematics, Univ. of Calcutta)
22. Impact-induced stress and deformation fields in laminated frp hybrid composites *by* Pradhan, Brajabandhu (B. N. M. Institute of Technology, Bangalore)
23. Concepts of light weight structures design *by* Pradhan, Brajabandhu (National Institute of Technology, Rourkela)
24. Use of FRP composites and Smart materials in design of Aircraft structures *by* Pradhan, Brajabandhu (Osmania University, Hyderabad)

Books Published

1. A.K. Samantaray, B. Ould bouamama Model-based Process Supervision *published by* Springer Verlag London Ltd. (2008)

Seminars, Conferences and Workshops Organised

1. Indo-US Workshop on Microfluidics and Fabrication
2. International Conference on Vibration Problems

Short-Term Courses, Training Programmes and Workshops organized

1. Course on PLM and PDM for DRDO (August 18-29, 2008)
2. Programme for HAL Engineer Trainee (Autumn Semester 2008-2009)

DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING

HEAD : Professor Nirupam Chakrabarti

FACULTY

Professors

Chakraborti, Nirupam	Ph.D. (University of Washington), Computational Materials Science, Genetic Algorithms, Process Metallurgy
Chakraborty, Madhusudan	Ph.D. (IIT Kharagpur), Solidification Processing, Scanning Electron Microscopy, Metal Matrix Composites, Ti - based alloys
Chatterjee, Uday Kumar	Ph.D. (IIT Kharagpur), Corrosion
Das, Karabi	Ph.D. (Wisconsin, USA), Metal Matrix Composites, Nanocomposites, Physical Metallurgy, Powder Metallurgy, Wear of Materials
Das, Siddhartha	Ph.D. (Illinois, USA), Nano Materials, Composite Materials, Surface Engineering, Physical Metallurgy, Electron Microscopy, Tribology, Failure Analysis
Dhindaw, Brij Kumar	Ph.D. (IIT Kharagpur), Composite Solidification Processing Phase Transformations
Godkhindi, Mahadev Malhar	Ph.D. (IIT Bombay), Powder Metallurgy , Ceramics
Manna, Indranil	Ph.D. (IIT Kharagpur), Physical Metallurgy, Phase Transition, Nanostructured Materials, Thermodynamic Modeling, Surface Engineering by Laser and Plasma
Mitra, Rahul	Ph.D. (Northwestern University), Materials for High Temperature Applications, Composite Materials, Nanocrystalline Materials, Thin Films, Mechanical Behavior of Materials, Transmission Electron Microscopy and Materials Characterization
Pabi, Shyamal Kumar	Ph.D. (IIT Kharagpur), Nanostructured Materials. Phase Transformation in Materials. Mathematical Modeling
Panigrahi, Sarat Chandra	Dr.Tech.Sc. (Krakow), Metal Casting Solidification Energy
Ray, Kalyan Kumar	Ph.D. (IIT Bombay), Mechanical Metallurgy, Physical Metallurgy, Fracture Mechanics, Nondestructive Evaluation, Structural Integrity, Failure Analysis, Advanced Structural Materials, Stereology, Modelling and Simulation, Metal Matrix and Ceramic Matrix Composites
Roy, Gour Gopal	Ph.D. (IIT Kanpur), Modeling and Simulations in Process Metallurgy, Alternative Routes of Ironmaking, Secondary Steelmaking, Phenomenological Modeling of Welding
Roy, Sanat Kumar	Ph.D. (IIT Kharagpur), Mineral Processing, Extractive Metallurgy, Environmental Degradation of Materials, Laser Processing of Materials, Nano-ceramics

Associate Professors

Acharya, Narendra Nath	Ph.D. (IIT Kharagpur), Particulate Tech. (metals, non-metals), Modelling (ANN & GA), Multimedia
Dutta Majumdar, Jyotsna	Ph.D. (IIT Kharagpur), Surface Engineering, Laser Materials Processing, Electron Beam Assisted Materials Processing, Biomaterials, Shape Memory Alloy, Environmental Degradation of Materials
Ghosh, Sudipto	Ph.D. (IIT Kanpur), Solidification, Deformation, Modeling

Sant, Sudhindra B

Ph.D. (Queen's University, Canada), Semiconductor Thin Films, Spintronics - Thin Films - Interfaces, Photovoltaics Thin Films - Large Scale, Phase-change Chalcogenide Thin Films, Thermoelectric Thin Films, Piezoelectric Thin Films and Creation of MEMS Devices, Metallization of Wide Band-gap Semiconductors, Structure of Interfaces in Bulk, Nanocrystalline Alloys Subjected to High Strain Rate Deformation

Singh, Shiv Brat

Ph.D. (Cambridge University, UK), Physical Metallurgy of Steel

Assistant Professors

Aich, Shampa

Ph.D. (University of VNL, USA), Rapid Solidification, Magnetic Materials, Bio Materials, Surface Modifications, Shape Memory Alloy, Core-Shell Nanostructures

Bhaduri, Amit

M.Tech. (IIT Kharagpur), Structure-Property Relationship

Biswas, Koushik

Ph.D. (University of Germany), Bio-ceramic, Modelling (Ab-initio/MD), Solid Oxide Fuel Cell, Zirconia & Alumina Ceramics, Tribology, MoSi₂-SiC-ZrO₂-Composites, Lithium Ion Battery, Electro-ceramics

Chakrabarti, D

Ph.D. (University of Birmingham, UK)

Datta, Bidyut Kanti

Ph.D. (IIT Kharagpur)

Kundu, Tarun Kumar

Ph.D. (Lulea University of Technology, Sweden), Extractive Metallurgy, Mineral Processing, Atomistic Simulation, Synthesis of Nanomaterials by Wet Chemical Route

Laha, Tapas

Ph.D. (Florida International University, Miami), Nanocomposites - Processing and Characterization, Interfacial Phenomena, Surface Engineering and Coating Technology, Corrosion and Electrochemical Studies

Tata Chair Professor

Basu, Samar

Ph.D. (IIT Kanpur)

Chair Professor

Ghosh, R. N.

Ph.D., Physical Metallurgy

Sen, P. K.

Ph.D., Process Metallurgy

Faculty Appointments

Dr. Sudhindra B. Sant

Associate Professor

Dr. Debalay Chakrabarti

Assistant Professor

Dr. Ranjan Dutta

Assistant Professor

Dr. Tapas Laha

Assistant Professor

Faculty Promotions

Dr. Karabi Das

Professor

Dr. Gour Gopal Roy

Professor

Dr. Rahul Mitra

Professor

Dr. Sudipto Ghosh

Associate Professor

Faculty Retirement

Dr. Uday Kumar Chatterjee

Professor

Faculty Resignation

Dr. Ranjan Dutta

Assistant Professor

Brief Description of on-going activities

The Research & Development Programme 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, developmental assignments and collaborative studies with outside organizations like educational institutes, R & D laboratories and industries in India and abroad and also as industrial consultancy. The Department has produced 20 B. Techs, 5 Dual Degree M. Techs, 21 M. Techs, 7 PhDs, and initiated/continued 18 consultancy and 42 sponsored/ collaborative projects during the academic year 2008-2009. 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 economically viable process routes to extract the metal values from the sea nodules using cheap sodium chloride as the electrolyte. Besides, 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. 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 of design and operating parameters for such high temperature process is an important issue, which 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. In the domain of Mechanical Metallurgy, a pioneering achievement has been the design and development of fatigue testing using rotating bending machine to study short, long and non-propagating crack behaviour in several steels. 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 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 ledeburite transformation. In addition, the detailed crystallography of Cr-rich M₂₃C₆ precipitates in quenched and aged austenitic stainless steels has been determined and the importance of localized residual stress developed due to quenching on the nucleation and growth of these precipitates has also been established. 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 Al₂O₃ reinforced Ni₃Al through reaction sintering route, reaction sintering of silicon carbide, recovery of copper from printed circuit etchant sludge and production of silicon carbide from fly ash silica. Work has also been initiated towards production and sintering behavior of nanocrystalline titanium powder, nanocrystalline ferritic and stainless steel powder. In addition, a method of consolidating elemental tungsten to bulk components for high temperature applications by sintering nanostructured powder at relatively low temperature of 1700 C has been developed. Research on Composite Materials hold a very prominent position in the department, and involves processing by casting, conventional and advanced powder metallurgy routes, such as reactive milling and sintering. Fundamental research is in progress in the direction of understanding the microstructure-property relationships, characteristics of matrix-reinforcement interfaces and mechanical behaviour. Research involves the development of in-situ Al-Al₂O₃, Al-MgAl₂O₄, Al-TiC and Al-TiB₂ composites by casting route and studies of mechanical properties. In addition, SiCp reinforced Al-Li/ Mg-Li alloy based metal matrix composites have been developed by infiltration technique, where the understanding of the particle engulfment and pushing during solidification processing has been applied. Significant progress has been made in studies on interface reaction kinetics and tailoring of interfaces to control formation of detrimental reaction products. Research on metal matrix composite materials also includes systems having age-hardenable Al-alloys and Zn-Al alloys as matrices, and reinforcements of varying sizes. 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-TiB₂ 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 areas of research in the department. Among several activities related to surface engineering, laser assisted surface modification, ion implantation and plasma spray deposition are the primary areas of active research interest. It has been demonstrated that laser surface alloying of the near 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 is initiated to exploit plasma assisted ion implantation for non-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

1. Biomaterials
2. Nanostructured Material
3. Nanocomposites
4. Virtual alloys
5. Laser Surface alloying
6. Plasma Ion Implantation
7. Thermally Sprayed Coating
8. Functionally Graded Materials
9. Intermetallics
10. In-Situ Composites
11. Solidification under microgravity
12. Synthesis of fine ceramics
13. Process Modeling
14. Special grade steels
15. Aluminium Packaging Alloys
16. Lithium Ion Battery

2. D. Roy Nano-intermetallic/ceramic dispersed Al based amorphous / nanocrystalline matrix composites (Ph.D.)
3. M.K. Chopkar Synthesis, characterization and modelling of nanofluid for advanced heat transfer application (Ph.D.)
4. R.K. Rana Some studies on copper containing interstitial free steels (Ph.D.)
5. S. Mula Aluminum based nanocomposites developed by mechanical alloying and non-contact ultrasonic casting (Ph.D.)
6. A. Biswas Surface treatment of Ti-6Al-4V for bio-implant application (Ph.D.)
7. S. S. Nayek Development of nanostructured intermetallics and composites by non equilibrium processing (Ph.D)

Fellow - Professional Bodies

1. Dhindaw, Brij Kumar (0) Fellow - Institution of Engineers India
2. Roy, Sanat Kumar (1990) Nominated - The Indian Institute of Metals
3. Roy, Sanat Kumar (1995) Nominated - The Institution of Engineers (India)
4. Roy, Sanat Kumar (1990) Nominated - The Electrochemical Society of India, Bangalore
5. Ray, Kalyan Kumar (2005) Nominated - Indian Institute of Metals

Member - Editorial Board

1. Chakraborti, Nirupam (2008) Member, Editorial Board
- Journal of Advanced Research in Evolutionary Algorithms
2. Chakraborti, Nirupam (0) Member, Editorial Board
- Materials & Manufacturing Processes
3. Chakraborti, Nirupam (0) Member, Editorial Board
- International Journal of Machining and Machinability of Materials
4. Chakraborty, Madhusudan (2006) Adviser
- Journal of the Institute of Indian Foundrymen
5. Dhindaw, Brij Kumar (2006) Member Editorial Board
- International Journal of Cast Metals Research
6. Dutta Majumdar, Jyotsna (2008) Member, Editorial Board
- Int. J. of Emerging Tech. and Appl. in Engg. Tech. and Sci.
7. Manna, Indranil (2006) MEMBER, BOARD OF EDITORS
- Computers, Materials and Continua: A new Tech Science Press journal, USA
8. Manna, Indranil (2006) DEPUTY MANAGING EDITOR
- METAL NEWS, A bi-monthly bulletin of the Indian Institute of Metals, Kolkata
9. Ray, Kalyan Kumar (2007) Advisory Member of the Editorial Board
- Transactions of the Indian Institute of Metals

Awards & Honours

1. Das, Karabi (2009) MRSI Medal by the Materials Research Society of India (2009)
2. Sant, Sudhindra B (2008) Ramanujan Fellowship
3. Mitra, Rahul (2009) Review for Metallurgical and Materials Transactions A selected among the top 20%

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Development & characterization of biocompatible low modulus titanium alloys for total joint replacement	CSIR	Rs. 11.96 Lakhs
2.	Development and Characterization of Nano-fluid for Micro-thermal Heat Transfer Applications in Advanced Satellite (DCN)	ISRO and KCSTC	Rs. 5.00 Lakhs

3.	Development and Characterization of Novel Nanocrystalline Metallic/Ceramic Based Hydrogen Sensor Materials (NNM)	MHRD, New Delhi	Rs. 15.00 Lakhs
4.	Development of Niobium Silicide Based Alloys and Composites for Elevated Temperature Applications	DRDO	Rs. 32.37 Lakhs
5.	Development of Coating on Marine Propeller for Improving Cavitation Erosion and Corrosion Resistance under Simulated Hydrodynamic Condition	Naval Research Board New Delhi	Rs. 38.48 Lakhs
6.	Development of ductile cast iron for spent fuel sub-assembly cask for PFBR	IGCAR, Kalpakkam	Rs. 32.68 Lakhs
7.	Development of High Energy Density Lithium	RCI, Hyderabad	Rs. 0.00 Lakhs
8.	Development of high temperature oxidation resistant tungsten based bulk refractory alloys through mechanical alloying route	DRDO,	Rs. 27.30 Lakhs
9.	Development of Molybdenum and Niobium silicide based alloys and composites for elevated temperature applications	DRDO	Rs. 32.41 Lakhs
10.	Development of multifunctional surface on Ti and its alloys for tailoring wear resistance and biocompatibility	CSIR	Rs. 10.00 Lakhs
11.	Development of nanocrystalline coating by combined plasma assisted implantation and deposition	DST	Rs. 53.00 Lakhs
12.	Development of New Metallic Coating for Low Carbon Steels	Tata Steel	Rs. 8.02 Lakhs
13.	Development of New Metallic Coating for Low Carbon Steels: Phase 2	Tata Steel	Rs. 2.50 Lakhs
14.	Development of niobium silicide based alloys & composites for elevated temperature applications	DRDO,	Rs. 32.41 Lakhs
15.	Development of Wear-resistant Cu-alloy with Nanocrystalline Ceramic Phase Dispersion by Mechanical Alloying for Electrical Contact and Component	International Copper Association, USA,	Rs. 12.00 Lakhs
16.	Development of high temperature oxidation resistant tungsten based bulk refractory alloys through mechanical alloying	DRDO,	Rs. 27.20 Lakhs
17.	Effect of cyclic oxidation and residual stresses on oxidation kinetics of molybdenum silicide based alloys and composites	DRDO, New Delhi	Rs. 22.95 Lakhs
18.	Effect of Rare Earth Additions on Oxidation Behaviour of Molybdenum and Niobium Silicide Based Alloys	DRDO	Rs. 14.31 Lakhs
19.	Establishment of an Advanced Research Facility for EB Welding and Process Development Related to Programs of Interest to DAE	Board of Research in Nuclear Sciences (BRNS) and Dept. of Atomic Energy, Gol,	Rs. 133.00 Lakhs
20.	Establishment of an Advanced Research Facility for EB Welding and Process Development Related to Programs of Interest to DAE	BRNS and DAE,	Rs. 133.00 Lakhs
21.	Evaluation of manganese Extraction from Ocean Nodules using a new approach	Ocean Development Board,	Rs. 0.00 Lakhs
22.	Evaluation of manganese nodules extraction processes for optimal performances : A new approach	Ministry of Earth Sciences, New Delhi	Rs. 17.25 Lakhs
23.	Feasibility study for extraction of vanadium and titanium from titanite-magnetite ore deposit of Maharashtra	Maharashtra state Mining Corporation,	Rs. 7.29 Lakhs

24.	Feasibility study for extraction of vanadium and titanium from titano-magnetite ore deposit of Maharashtra - part-I: Pre-feasibility study for vanadium	Maharashtra State Mining Corporation,	Rs. 7.00 Lakhs
25.	Forming and Coating Behaviour of TRIP Aided Steels	DST	Rs. 8.44 Lakhs
26.	Generation of semi-solid slurries through one step processing of liquid metal for rheoprocessing	National Materials Research Laboratory, DRDO, Ambarnath,	Rs. 9.92 Lakhs
27.	Grain Boundary Segregation, Precipitates Morphology and Surface Modification in Case of Complete and Incomplete Grain Boundary Wetting by a Second Sol	Department of Science and Technology, N. Delhi,	Rs. 12.00 Lakhs
28.	High Speed Laser Synthesis of Amorphous Surface Structure (LSH)	DST - NSF (USA)	Rs. 17.00 Lakhs
29.	High Strength TRIP-aided Steel for Automobiles	Tata Steel	Rs. 11.68 Lakhs
30.	Laser Assisted Fabrication of Compositionally Graded Component for Hip Joint and Femoral Replacement	Council of Scientific and Industrial Research	Rs. 18.00 Lakhs
31.	Life estimation and microstructural damage of irradiated and unirradiated Cu-Cr-Zr alloy	NFP-BRFST Ahmedabad,	Rs. 30.38 Lakhs
32.	Mathematical modeling of solidification behaviour of weld pool and oxidation characteristics of zones of weldment during laser welding of plain carbon	DST	Rs. 17.00 Lakhs
33.	Mechnosynthesis and mechanical thermal synthesis of in-situ aluminium based nanocomposites and their characterization	DST	Rs. 43.15 Lakhs
34.	Physico-Chemical Analysis of Metal Based Ayurvedic Bhasma Drugs by Sophisticated Modern Instrumental Methods	DST	Rs. 20.35 Lakhs
35.	Production of porous TiNi shape memory alloys from mechanically alloyed powders for biomedical applications - A Fast Track Research Scheme (PTS)	DST, New Delhi	Rs. 10.00 Lakhs
36.	Project Name : Development and characterization of nanomaterials as filler in polymer composites	MHRD	Rs. 0.00 Lakhs
37.	Semisolid Processing of Al-Mg base alloys under low convection conditions	CSIR	Rs. 10.71 Lakhs
38.	Silicon Carbide as high temperature MEMS and MOSFET devices.	ISRO- Kalpana Chawla Space Cell, IIT-KGP, ISIRD IIT KGP	Rs. 0.00 Lakhs
39.	Solvent extraction studies for high value metals by ionic liquids, in mixer-settler unit: Experimentation and molecular Modelling		Rs. 4.60 Lakhs
40.	Steel Technology Centre	Ministry of Steel, DST	Rs.2025.86 Lakhs
41.	Structure of Interfaces and Interfacial Reactions in Electronic Materials	IIT Kharagpur	Rs. 5.00 Lakhs
42.	Structure-Property Relations In Ceramic Composites For High Temperature Applications In Nose Cone Tiles In Hypersonic Vehicles	DRDL	Rs. 72.96 Lakhs
43.	Structure-property relations in ceramic composites for high temperature applications in nose cone tiles in hypersonic vehicles	DRDO	Rs. 72.96 Lakhs
44.	Surface Engineering of Ballbearing Steel by Plasma Ion Implantation	Tata Iron and Steel Company, Jamshedpur	Rs. 10.00 Lakhs
45.	Synthesis and Characterization of Al-based Nanocrystalline Composites	DST-KBN (Indo-Poland),	Rs. 4.50 Lakhs

46.	Synthesis and characterization of in-situ carbide reinforced austenitic manganese steel matrix composites	Naval Research Board	Rs. 27.92 Lakhs
47.	Synthesis and characterization of nanocrystalline ZrO ₂ -based electrolyte for solid oxide fuel cells	CSIR	Rs. 11.00 Lakhs
48.	Synthesis and Characterization of Nanostructured Materials for Functional and Structural Applications	DST	Rs.279.51 Lakhs
49.	Synthesis and properties of electrodeposited Nickel/Ceria nano composites	Indian Rare Earths Limited,	Rs. 27.81 Lakhs
50.	Synthesis and properties of electrodeposited nickel/zirconia nanocomposites	NRB	Rs. 48.28 Lakhs
51.	Synthesis and thermo mechanical characterization of MoSi ₂ -SiC-ZrO ₂ nano composite	ISIRD	Rs. 5.00 Lakhs
52.	Synthesis, development and in-vitro characterization of bio-inert Ytria/Ceria coated/stabilized zirconia and zirconia toughened alumina composites fo	Department of Bio-technology, New Delhi,	Rs. 29.60 Lakhs
53.	Thermal stress modeling and design of twin roll caster to obtain thin alloy sheet with extremely fine/amorphous structures	DST, Govt. of India	Rs. 37.53 Lakhs
54.	Thermo-mechanical MOdeling and Validation of Twi Roll Caster to obtain fully amorphous/nanostructure	Department of Science and Technology,	Rs. 37.53 Lakhs
55.	Versatile Nano Zirconia Production Facility at Indian Rare Earths Limited, OSCOM	Indian rare Earth Limited,	Rs. 45.00 Lakhs

Consultancy Projects

1.	Characterization of emulsion samples	Asian Paints Limited	Rs. 50.00 Lakhs
2.	Corrosion of reinforcement in concrete	M/s Shyam Steel, Kolkata	Rs. 0.10 Lakhs
3.	Development of air cooled microalloyed steel with improved toughness for forging applications	Ashok Leyland	Rs. 12.00 Lakhs
4.	Failure analysis of a gear box assembly shaft	Technovation Engineers Pvt Ltd,	Rs. 0.29 Lakhs
5.	Failure analysis of boiler tubes	Damodar Valley Corporation,	Rs. 0.70 Lakhs
6.	Failure Analysis of Sucker Rod, Seating Ring and Diffuser Support used in Petrochemical Industry	Lonestar Alpha Laboratories, Dubai	Rs. 0.60 Lakhs
7.	Failure analysis of welded pipeline	Essar Steel Limited	Rs. 0.30 Lakhs
8.	Fracture analysis of sucker rods	Lonestar Alpha Laboratories, Muscat,	Rs. 1.50 Lakhs
9.	Genetic Algorithms in Hydrocyclones	TATA STEEL,	Rs. 0.00 Lakhs
10.	Grain Refinement of Al Alloys (LM25; BS1490) for higher strength (Chill Casting - TF Condition)	NSTL, Vishkhapatnam	Rs. 3.50 Lakhs
11.	Hydrogen rich gas production from blast furnace gas	The Tata Iron & Steel Limited,	Rs. 3.86 Lakhs
12.	Noise reduction in amorphous metal transformers	Vijai Electricals Ltd.	Rs. 8.99 Lakhs
13.	Optimizing Properties of galvanized Steels	Tata Steel	Rs. 4.40 Lakhs
14.	Setting up a research and Development centre for Damodar Valley Corporation at Kolkata (Phase-I) (DCD)	Damodar Valley Corporation, Kolkata	Rs.2132.70 Lakhs
15.	Setting up of a R&D centre at Kolkata	Damodar Valley Corporation,	Rs.2100.00 Lakhs
16.	Strength and fracture behaviour of spot-welds in automotive steel sheets	Tata Steel	Rs. 17.83 Lakhs
17.	Structure- property correlation in free-cutting steel	Usha Beltron Ltd.	Rs. 4.00 Lakhs

18.	Testing of stainless steel wires	Usha Martin Ltd.	Rs. 0.13 Lakhs
19.	XRD analysis of materials	Tata Steel, Vidyasagar Univ, IACS, SNBCBS-Kolkata, ISM-Dhanbad, BIT-Mesra, NML-Jamshedpur and others,	Rs. 0.00 Lakhs

Visits Abroad by Faculty Members

1.	Chakraborti, Nirupam	Collaborative research (Abo Akademi University, Finland) 6 weeks
2.	Chakraborti, Nirupam	Collaborative research (Iowa State University, USA) 1 month
3.	Roy, Gour Gopal	Collaborative Research as Visiting Professor (Pennsylvania state University, USA) 9th June to 15th July
4.	Dhindaw, Brij Kumar	Visiting Professor (McMaster University, Hamilton, Ontario Canada) 15th May 2008 till 22nd July 2008
5.	Mitra, Rahul	Visiting Professor (University of Southern California) January 01 - May 15
6.	Das, Siddhartha	Guest Professor/Scientist (University of Ulm, Germany) June-July
7.	Singh, Shiv Brat	Collaborative work (University of Cambridge, UK) July 7-21
8.	Ray, Kalyan Kumar	To attend an International conference (Cairo, Egypt) May 27-29

Invited Lectures by Faculty Members

1. On the Formation of Aluminum-based Bulk Nanocomposites by Mechanical Alloying followed by Sintering *by* Pabi, Shyamal Kumar (BIT, Mesra)
2. Genetic Algorithms in Materials Science *by* Chakraborti, Nirupam (Oran, Algeria)
3. Sea Nodules Processing Status review *by* Sen, Prodip Kumar (Chennai, Indian representative for Ministry of Earth Sciences)
4. Mechanical properties of nanocrystalline materials *by* Mitra, Rahul (National Institute of Technology, Durgapur)
5. Application of transmission electron microscopy for characterization of nano-materials *by* Mitra, Rahul (S.N. Bose Institute for Basic Sciences)
6. Surface Nitriding of Ti-6Al-4V for Bio-implant Application *by* Dutta Majumdar, Jyotsna (National Aeronautical Laboratory Bangalore)
7. Laser Assisted Shaping of Materials *by* Dutta Majumdar, Jyotsna (Chandipur)
8. Development of TiN coating on AISI 316L Stainless Steel by Cathodic Arc Evaporation *by* Dutta Majumdar, Jyotsna (Puri)
9. Materials Issues in Wide Band-Gap Semiconductors *by* Sant, Sudhindra B (National Physical Laboratory, New Delhi)
10. Radial Forging : An Overview *by* Ray, Kalyan Kumar (National seminar on "Advances in Forging Technology", Jadavpur University, Kolkata, 27 March, 2009)
11. Monotonic and Cyclic Damage In Metallic Sheets *by* Ray, Kalyan Kumar (5th International Conference on Creep, Fatigue and Creep-Fatigue Interaction, at IGCAR, Kalpakkam 24-26 September, 2008)
12. Fracture Mechanics in Failure Analysis *by* Ray, Kalyan Kumar (National seminar on "Failure of Service Components in Integrated Steel Plants", Jamshedpur, 6th March 2009)
13. The vision of fracture toughness assessment of structural materials for quality control *by* Ray, Kalyan Kumar (13th International Conference on "Applied Mechanics and Mechanical Engineering", Cairo, Egypt, May 27-29, 2008.)
14. (1) Failure analysis of structural components; (2) Failure analysis: case studies *by* Ray, Kalyan Kumar (Invited lecture at short term course on "Failure Analysis" at GIET, Gunupur on 09 March, 2009)

Seminars, Conferences and Workshops Organised

1. COMPOSIT 2009
2. ICAMMP, International Conference on Advanced Materials and Processing
3. Materials Structures the Nabarro Legacy

DEPARTMENT OF MINING ENGINEERING

HEAD : Professor Jayanta Bhattacharya

FACULTY

Professors

Bhattacharya, Jayanta	Ph.D. (IIT Kharagpur), Environmental Engineering Reliability and Quality Engineering
Bhattacharjee, Ashis	Ph.D. (Penn-State), Health and Safety, Quality Control, Operations Research
Das, Samir Kumar	Ph.D. (ISM Dhanbad), Mines Safety, Strata Control and Rock Mechanics, Fly Ash Stowing, Mining Environment and Reclamation, Coal Mining, Mining Equipment, Surface Mining, Powered Roof Supports
Mukhopadhyay, Subir Kumar	Ph.D. (IIT Kharagpur), Open Pit Mining, Mine Planning and Design, Underground Metalliferous Mining, Mine and Mineral Economics Trade and Stockpiling, Mine Safety Legislation and Management, Small Scale Mining and Sustainable Development in Mining
Pathak, Khanindra	Ph.D. (London University), Surface Mining and Mine Closure Planning, Environmental Modelling and Management, RS-GIS Application, Mining Machinery, and Oil Well Drilling Technology
Rao, Karanam Uma Maheshwar	Ph.D. (IIT Kharagpur), Rock Mechanics, Underground Metal Mining Methods
Sastry, Bhamidipati Suryan	Ph.D. (Utah), Mine Ventilation; Surface and Subsurface Environment

Associate Professors

Deb, Debasis	Ph.D. (Alabama University, USA), Computer Assisted Mine Evaluation and Design, Artificial Intelligence, Beneficial Utilization of Fly Ash, Numerical Modelling (FEM, XFEM), GIS, Rock Mechanics and Ground Control
Modak, R N	M.E., M.Sc.(Engg.), Mine Surveying, Photogrammetry, Operations Research, Mineral Economics
Pal, Samir Kumar	Ph.D. (IIT Kharagpur), Blind Backfilling of Abandoned Mine Voids, Abrasion and Wear of OTR Tyres, Strata Monitoring and Subsidence Technology

Assistant Professors

Chakravarty, Debashish	Ph.D. (IIT Kharagpur), Numerical Modelling in Geomechanics and Blasting, Geoinformatics, GPS, GIS, Remote Sensing, GeoSpatial Imaging, Digital Photogrammetry; Laser and Radar Imaging, Advanced Surveying, Geodesy, Mine Automation and Virtual Reality Applications
Prusty, Basanta Kumar	Ph.D. (Southern Illinois), Coalbed Methane, Carbon Sequestration, Clean Coal Technology
Samanta, Biswajit	Ph.D. (IIT Kharagpur), Orebody Modeling and Geostatistics, Mine planning

Faculty Appointments

Dr. Basanta Kumar Prusty	Assistant Professor
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Brief Description of on-going activities

Environment and Safety Application of LCA, GIS and remote sensing for soil and water analysis as a part of mine closure planning; Experimental and computational fluid dynamics studies for shock loss determination in mine air flow; Biological and passive treatment of mine waste water; Investigation of soil and water contamination vis-à-vis land use changes near mining fields. Study of human behaviour related accidents in mines; Epidemiological investigations to identify possible risk factor of occupational injuries in mines; The statistical methods for assessing risk factors included logistical regression, loglinear modeling and structural equation modeling.

Rock Mechanics / Ground Control Finite element analysis for longwall strata control problems, and design of shield supports; Rock Joints and their influence on the stability of underground openings; Rock Mass characterization, Land reclamation and soil mechanics; Assessment of Fly ash composites as a substitute fill material for underground mine voids; Risk analysis for the safety management of coalmines; On the mechanics of rock fragmentation by drilling and cutting- studies on the linear cutting machine (LCM).

Mine Planning / Modeling Application of various grade estimation techniques namely kriging, cokriging, 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.

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. Personal Dust Sampler Kit
2. Quester III
3. DC Calc Micromanometer
4. 9545 A Velocicalc Velocitymeter
5. Hydrocarbon Gas Analyzer
6. B.G - 4 breathing apparatus
7. Furnace (Muffle)
8. Multicyclone
9. Micromine software
10. Bag Filter
11. Fine Balance
12. Soud Level meter
13. H.C. Gas detector,
14. Surveyor Stereovision system
15. Microstoric inclinometer
16. Mine Gas Analyzer
17. Flame Altomizer

International Collaborations

1. Memorandum of Understanding between M/s TOTAL, France and Indian Institute of Technology, Kharagpur for supporting a Chair Professorship position in Mining Engineering at IIT, Kharagpur

Lectures by Visiting Experts

1. Use of Photogrammetry for rock slope characterization, U/G supports, Oil Sands mining in Canada by Dr. Dwayne Tannant (Professor, Dept. of Mining Engg., Univ. of Alberta, Canada)
2. Surface Mining by Mr. U.K. Nag (DGM, L&T)
3. Groud Probe - Mining Technology by Dr. David Noon, (CEO & VP)
4. Mine Management at Damanjodi Mine by Mr. Anirudda Chakraborty (DGM, Mines, Nalco, Damanjodi, Orissa)

Doctoral and MS Degrees Awarded

1. D. P. Mishra Suitability of fly ash and pond ash for stowing in underground coal mines- an investigation (Ph.D.)
2. Gnananda Budi Investigation of the shear characteristics of rock samples (Ph.D.)
3. Kaushik Pal Speciality Elastomer Blends for Abrasion Resistant Tyre Tread of Dump-Trucks (Ph.D.)
4. Ravi Jade Prediction of Shock Losses in Mine Aerodynamics (Ph.D.)
5. Bijay Mihir Kunar An Epidemiological Study of Coal Miners Injuries (Ph.D.)
6. Vinayak N. Deshpande Monitoring and Analysis of Environmental Hotspot Zone around Korba Coalfield Area (MS)

Fellow - Professional Bodies

1. Bhattacharya, Jayanta (2008) Awarded - Indian National Academy of Engineering

Member - Editorial Board

1. Bhattacharya, Jayanta (2006) Editorial Board Member
- Mineral Resources Engineering
2. Bhattacharya, Jayanta (2006) Editorial Board Member
- Industrial Insider
3. Bhattacharya, Jayanta (2006) Editorial Board Member
- Mine, Metals and Fuels
4. Das, Samir Kumar (2008) Editorial board member
- Open Mineral Processing Journal
5. Deb, Debasis (2008) Editorial Board
- Journal of Scientific & Industrial Research
6. Mukhopadhyay, Subir Kumar (1999) Member Editorial Board
- Journal of The Mining Geological & Metallurgical Institute of India(Estd.2006) From 99-05, 07-till dt
7. Samanta, Biswajit (2008) Associate Editor
- Mining Engineering, and SME transactions

Awards & Honours

1. Das, Samir Kumar (2008) MGMI bronze medal for paper titled Compaction and consolidatibehavior of Fly ash and pond ash for stowing in underground mines
2. Pathak, Khanindra (2008) BalaTandon Gold Medal of MGMI
3. Chakravarty, Debashish (2008) Certificate of Merit from the Institution of Engineers India for one of the technical papers
4. Deb, Debasis (2008) Hindustan Zinc Gold Medal Award
5. Bhattacharya, Jayanta (2008) John Dunn Medal of Mining Geological and Metallurgical Institute of India

6. Mukhopadhyay, Subir Kumar (2008) The Hindustan Zinc Limited Prize (2008) (Gold Medal) for the work of "Stope Design below Abandoned Openpit Mine by 3D Numerical Modeling "

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Application of DGPS and High Precision Satellite Imagery for Subsidence Monitoring in Raniganj Area of ECL	CIL R&D	Rs.242.42 Lakhs
2.	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	Rs.242.42 Lakhs
3.	Automatic and Intelligent System for Fragmentation Determination in a Blasted Muck	IIT Kharagpur	Rs. 3.00 Lakhs
4.	Determination of rate of consolidation , flow rate, settlement and	TIFAC, under DST	Rs. 6.00 Lakhs
5.	Development and Implementation of Extended Finite Element Procedures (XFEM) for Cohesive Rock Joints	DST, New Delhi	Rs. 16.50 Lakhs
6.	Development of a mixed-culture bio-reactor for mine drainage treatment	Korea Institute of Geosciences and Mineral Resources, South Korea,	Rs. 9.00 Lakhs
7.	Development of Roof Fall Prediction System for Underground Mines using Wireless Network	Coal India Limited,	Rs.216.98 Lakhs
8.	Development of Roof Fall Prediction System for Underground Mines Using Wireless Network,	Coal India Limited (CIL), Kolkata, India,	Rs.220.00 Lakhs
9.	Development of RS-GIS based data base for Uranium Mining and Milling in West Khasi District,Meghalaya.	Board of Research in Nuclear Sciences,	Rs. 31.00 Lakhs
10.	Developmet of RS-GIS based database for Uranium Mining and Milling in the West Khasi Hills District, Meghalaya	BRNS, DAE, Govt. of India.,	Rs. 32.00 Lakhs
11.	Environmental Hotspot monitoring in Korba Area	Space Application Centre (SAC)	Rs. 16.00 Lakhs
12.	FIST Programme	Department of Science and Tehnology,	Rs. 32.00 Lakhs
13.	Indo Romanian R&D project on Environmental impact of coal mines closure and ecological rehabilitation of mining area of India and Romania	DST Govt. of India and Govt. of Romania	Rs. 5.18 Lakhs
14.	Integration of GPS and InSAR data for Accurate Ground Profile Determination	SHELL International & Exploration BV,	Rs. 40.00 Lakhs
15.	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	Rs.148.69 Lakhs
16.	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	Rs.148.69 Lakhs
17.	Investigation on Ensemble modeling approach by Multiple Neural Network using Negative correlation learning for orebody modeling	ISIRD	Rs. 3.00 Lakhs
18.	Model Studies on the Efficiency of Gravity Blind Backfilling Method and Evolution of a Pre-jamming Indication Parameter.	Ministry of Coal under Coal S&T Research Programme	Rs. 14.66 Lakhs

19.	Optimal Selection of Radial Basis function network for orebody modeling using multiobjective genetic algorithms	DST	Rs. 2.88 Lakhs
20.	Re-application of the S & T Project titled 'Model Studies on Gravity Blind Backfilling Method and Evaluation of a Pre-Jamming Indication Parameter' in	Ministry of Coal New Delhi,	Rs.395.18 Lakhs
21.	Remote Sensing and GIS Based data infrastructure for baseline environment for new uranium mining sites	BRNS, DAE, Govt. of India.,	Rs. 34.00 Lakhs
22.	Remote Sensing GIS based data infrastructure for baseline environment for new uranium mining sites	BRNS	Rs. 34.00 Lakhs
23.	Risk based mine production scheduling using conditional simulation and genetic algorithms for ore grade control	SERC, DST	Rs. 9.10 Lakhs
24.	Risk based Mine Scheduling using Conditional Simulation and Genetic Algorithms	DST	Rs. 9.17 Lakhs
25.	Studies in Mine Closure Planning ,Its Mehtodology and Implementation in Opencast and Underground Coal Mine	South Eastern CoalFields Limited	Rs. 9.69 Lakhs
26.	Technical Study for Stability of Old and Active OB Dumps in WCL for the Dimensional Optimization	CIL R&D Grant	Rs.359.00 Lakhs
27.	Upgradation of Laboratories	FIST-DST	Rs.200.00 Lakhs

Consultancy Projects

1.	Design and Stability Analysis of Crown / Sill Pillars below A Filled Stope	Hutti Gold Mines Ltd. A Govt. of Karnataka Ltd.,	Rs. 10.97 Lakhs
2.	Design and Stability Analysis of Crown / Sill Pillars below A Filled Stope	Hutti Gold Mines Ltd. A Govt. of Karnataka Ltd.,	Rs. 10.97 Lakhs
3.	Design and Stability Analysis of Stopes in North, South and North extension Blocks at Bangur chromite Mine, OMC	Orissa Mining Corporation (OMC),	Rs. 3.20 Lakhs
4.	Development of a Pit Optimization software	KIGAM, Korea	Rs. 4.50 Lakhs
5.	Development of Environmetal Control Measures for Fine Heaps	Gua Ore Mines, SAIL	Rs. 0.80 Lakhs
6.	Development of Image Processing Technique for Analyzing Rock Joints	Korea Institute of Geosciences and Mineral Resources (KIGAM), South Korea,	Rs. 10.00 Lakhs
7.	Effect of heightening on the stability aspects of TDF at Sukinda Chromite Mine	Tata Steel Limited,	Rs.250000.00Lakhs
8.	Effect of Proposed Heightening Scheme on the Stability Aspects of the TailingsDamat Sukinda Chromite Mines, Tata Steel	Tata Steel	Rs. 2.50 Lakhs
9.	Numerical Modelling and Stope Design at Bangur Underground Mine	Orissa Mining Corpn. Ltd. Govt. of Orissa Undertaking,	Rs. 3.18 Lakhs
10.	Numerical Modelling and Stope Design at Bangur Underground Mine	Orissa Mining Corpn. Ltd. Govt. of Orissa Undertaking,	Rs. 3.18 Lakhs
11.	Pit Optimization of Surface Coal Mine	Korea Institute of Geosciences and Mineral Resources (KIGAM), South Korea,	Rs. 4.50 Lakhs
12.	Rock mass characterization	Uranium Corporatin Of India Ltd,	Rs. 1.50 Lakhs

13.	Stability Ananlysis of Crown Pillars at Hutty Gold Mine	Hutty Gold Mine Limited	Rs. 11.00 Lakhs
14.	Stope Design and It's Stability Analysis, Narwapahar Mine, UCIL	Uranium Corporation of India Ltd., Govt. of India Enterprise.,	Rs. 2.85 Lakhs
15.	Stopes and Pillars Design at Narwapahar Mine (140mRL to 230mRL), UCIL	Uranium Corporation of India Ltd., Govt. of India Enterprise,	Rs. 3.15 Lakhs
16.	Stopes Design and Their Stability Analysis at Turamdih Mine	UCIL - Phase I, Client: Uranium Corporation of India Ltd., Govt. of India Enterprise,	Rs. 2.98 Lakhs
17.	Stopes Design and Their Stability Analysis at Turamdih Mine (UCIL - Phase I,	Uranium Corporation of India Ltd., Govt. of India Enterprise,	Rs. 2.98 Lakhs
18.	Studies on the stability of Underground mine openings and subsidence investigations at Tummallapali project of UCIL	Uranium Corporatin Of India Ltd,	Rs. 0.50 Lakhs
19.	Study of ground vibration for Balagunda Iron & Manganese Mines	Envimin Consultant Pvt Ltd,	Rs.219102.00 Lakhs
20.	Study of ground vibration for Gandhamadhan Sponge Industries	Putulipani Iron-Ore Mines,	Rs.262922.00 Lakhs
21.	Study on Assessment of Technologies for Storage of CO2 for Carbon Sequestration	NTPC	Rs. 19.00 Lakhs
22.	Study on Backfill Material Composed of Fly Ash / Bottom Ash and Mill Tailings of UCIL.	TATA Power Company Limited, Jamshedpur,	Rs. 4.98 Lakhs
23.	Technical Guidance in Respect of Geological Report of Machhakata Coal Block	Mahaguj Collieries Limited,	Rs. 1.00 Lakhs
24.	Testing and Characterization of Rock Parameters from a Proposed Uranium Mine in AP	Uranium Corporation of India Limited (UCIL)	Rs. 1.96 Lakhs

Patents (filed / granted)

1. Breath Panels
2. Carbon Dosing System
3. Chemo Bio-reactor
4. Kharagpur Filter
5. Non-contact type 3-D Rock Surface Profiler

Visits Abroad by Faculty Members

1. Das, Samir Kumar Project work (Petrosani University, Romania) 15 days
2. Das, Samir Kumar To attend SGEM 2008 SYMPOSIUM and presenting a paper (Albena, Bulgaria) One Week
3. Samanta, Biswajit Got an offer for adjunct faculty (University of Alaska, Fairbanks) May-July, 2008
4. Bhattacharya, Jayanta Research Assignment (Korea Institute fo GeoSciences and Minerals, Daejeon, South Korea) 15 days in September-October
5. Bhattacharjee, Ashis To set up collaboration in the field of Mine Health and Safety (University of Utah) July 14
6. Bhattacharjee, Ashis To set up collaboration in the area of Mine Health and Safety (Utah State University) July 8-10
7. Chakravarty, Debashish Paper presentation (Visit to Beijing, China) October 11-18, 2008

Invited Lectures by Faculty Members

1. Occupational Health and Safety Management *by* Das, Samir Kumar (Dept. of Mining Engg., IIT Kharagpur)
2. Key note address "Sustainable Development of Mining" *by* Mukhopadhyay, Subir Kumar (Central Institute of Mining and Fuel Research (CSIR), Dhanbad)
3. Assessment, Simulation and Control of Ungerground Coal Mine Climate *by* Sastry, Bhamidipati Suryan (Singareni Collieries Co Ltd, GDK-II Area, Ramagundam)
4. Economic Regeneration of Mined Lands *by* Bhattacharya, Jayanta (Daejeon Korea)
5. Keynote Lecture on Developments of belt conveyors system for bulk material handling and RopeCon *by* Pathak, Khanindra (ISMU, Dhanbad (National Seminar on Crushing, Screening and Conveying, CS&C-2008))
6. Maintenance of Bulk Material Handling System: Recent Developments *by* Pathak, Khanindra (NIT, Silchar (Keynote lecture at National Convention of Mechanical Engineer))
7. Methodology for Effective Teaching of Engineering to Undergraduate Students *by* Pathak, Khanindra (SKASVM Agadi College of Engg and Technology, Lakshmeswar, Karnataka)

Books Published

1. Samir Kumar Das A Hand Book on Surface Mining Technology *published by* Sagar Deep Prakashan (2008)
2. Jayanta Bhattacharya Combustion Quality of Coal and Lignite : Mine, Steel and Cement Plant Operating Guidebook (2009). Wide Publications, Kolkata . *published by* Wide Publishing (2009)

Short-Term Courses, Training Programmes and Workshops organized

1. Mines Safety and Legislation (August 11-14)
2. Mining Machinery Maintenance and Capacity Utilisation (September 26-28, 2008)
3. Safe Mining : Methods, Design & Technology (December 02-04, 2008)
4. Strategic Quality Control and Management for Coal Production and Supply (November 13-15, 2008)
5. Surface Mining Technology (May 28-30, 2008)

DEPARTMENT OF OCEAN ENGINEERING & NAVAL ARCHITECTURE

HEAD : Professor Nisith Ranjan Mandal

FACULTY

Professors

Mandal, Nisith Ranjan	Dr. Inz. (Poland), Welding Distortion of Large Stiffened Structures and Welding Techniques
Misra, Suresh Chandra	Ph.D. (Newcastle, UK), Marine Design, Applied Hydrodynamics
Satsangi, Subir Kumar	Ph.D. (IIT Kharagpur), Structural Engineering, Ship Structures
Sen, Debabrata	Ph.D. (Canada), Numerical Marine Hydrodynamics, Submerged Body Hydrodynamics, Wave-Induced Motions of Floating Bodies, Free Surface Hydrodynamics
Sha, Om Prakash	Ph.D. (IIT Kharagpur), Marine Design and Production

Associate Professor

Sahoo, Trilochan	Ph.D. (IISc. Bangalore), Ocean Hydrodynamics, Hydroelasticity
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Assistant Professors

Bhar, Ashoke	Ph.D. (IIT Kharagpur), Marine Structures
Bhaskaran, Prasad K	Ph.D. (Kuruksheetra), Wind-Wave Modeling, Coastal Processes, Marine Acoustics, Sediment Transport Dynamics
Warrior, Hari V	Computational Fluid Dynamics, Physical Oceanography, Resistance and Propulsion

Brief Description of on-going activities

The Department is very actively involved in various projects related to hydroelasticity of large flexible structures, marine structural analysis using composite materials, marine design and production, Ocean hydrodynamics, structural reliability, ocean wave modeling, suspended sediment dynamics, computational fluid dynamics and coastal processes.

Thrust Areas

1. Marine hydrodynamics
2. Computer aided design and manufacture in marine production
3. Offshore renewable energy

New Acquisitions

1. Friction stir welding setup and various transducers

Lectures by Visiting Experts

1. Recent Trends in Ocean Research by Allan Robinson (Emeritus Professor, Harvard University)
2. R&D activities in Ocean Engineering by Farooq Mistry (Professor)
3. Discussion with Faculty members for Project Proposals by Dr.K.R.G.K. Murthy (Chairman (Ocean-Environment), Naval Research Board)
4. Discussion on joint collaborative programmes with Pusan National University, South Korea by Dr. Myung Hyun Kim (Professor, Pusan National University, South Korea)
5. Delivered a general talk to Faculty and Students in November 2005. by Dr.Trevor Blakeley (Chief Executive, The Royal Institution of Naval Architects (RINA), U.K.)

6. General Discussion with Faculty Members by Dracos Vassalos & P.K.Das (Professor, Ship Stability Research Centre, U.K.)
7. General discussion with Faculty Members by Tony Roskilly (Professor, School of Marine Science & Technology, U.K.)
8. Requirement of Naval Architect students possessing 4 year experience by Teruaki Kaibara & Tamiki Takasi (Vice-President (Engineering), ABS Singapore)
9. Discussion on proposed conference ICoSOT 2009 by Mr. Trevor Blakeley (CEO, Royal Institution of Naval Architects, U.K.)
10. Research activities pursued in the Dept. of Naval Architecture and Ocean Engineering, Osaka University, JAPAN by Vishwanath Nagarajan (Ph.D student, Osaka University)
11. Research activities pursued in Center for Marine Technology and Engineering, Portugal by Professor Carlos Guedes Soares (Professor, Instituto Superior Technico, Lisboa, Portugal)

Doctoral and MS Degrees Awarded

1. Sanjay Pratap Singh 3D nonlinear sea keeping computation of realistic ship hulls (Ph.D.)
2. Joydip Bhattacharjee Fourier analysis and allied methods in wave structure interaction problems with application in hydroelasticity (Ph.D.)
3. Pankaj Biswas Thermo-mechanical analysis of line heating process (Ph.D.)
4. Rajiv Sharma An investigation into geometric modeling, geometric analysis and laser forming of surfaces defined over arbitrary domains (Ph.D.)
5. Mihir Chandra Manna Response and control of smart rubber / rubber composite structural components using nonlinear finite element analysis (Ph.D.)
6. Suresh Kumar Studies on a class of vertical, submerged and floating breakwaters in a two layer fluid (Ph.D.)

Fellow - Professional Bodies

1. Mandal, Nisith Ranjan (2006) Fellow - Royal Institution of Naval Architects
2. Mandal, Nisith Ranjan (2001) Fellow - Institution of Engineers, India
3. Sen, Debabrata (2006) Fellow - Royal Institution of Naval Architects, UK

Member - Editorial Board

1. Misra, Suresh Chandra (2008) Guest editor
- Theme of Applied Remote sensing in coastal and ocean engineering (ARSICOE). Journal of Imaging
2. Sen, Debabrata (2008) Member, Editorial Board
- Journal of Ocean Technology
3. Sen, Debabrata (2008) Member, Editorial Board
- Journal of Ship Technology
4. Sha, Om Prakash (2009) Editorial Board Member
- Journal of Naval Architecture and Ocean Engineering (JNAOE), Korea

Awards & Honours

1. Sha, Om Prakash (2008) Awarded "Best Paper" at ICSCI 2008, for the paper "Optimal Design of Fuzzy Systems using a Real-Coded Genetic Algorithm with Imbedded Constraint"
2. Sha, Om Prakash (2008) Awarded "The Institution Prize" (IE) for the paper "Shipping Demand Forecasting for the Development of an Integrated Container Shipping Model f"

Fellowships

1. Mandal, Nisith Ranjan (2008) Royal Society of Edinburgh International Exchange Programme

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	An Investigation into Geometric modelling, design and Analysis of Complex Surfaces	Defence Research and Development Organisation (DRDO)	Rs. 8.57 Lakhs
2.	An Investigation into Hydrodynamic Characteristics of Foils with and without Flaps	Naval Research Board,	Rs. 25.00 Lakhs
3.	Application of OceanSat-II data for development of a ship weather routing and safe navigation system	SAC, ISRO	Rs. 18.00 Lakhs
4.	Control of Ballast Water Problems in Ships through Design Developments	Ministry of Shipping	Rs. 50.00 Lakhs
5.	Development of a Comprehensive Atlas on Tsunami Travel Time and Propagation Model for the Indian Ocean	IIT Kharagpur	Rs. 1.10 Lakhs
6.	Development of an Autonomous Underwater Vehicle	Department of Ocean Development,	Rs.694.00 Lakhs
7.	Development of an integrated ocean wave forecasting system and study its impact on coastal structures	Indian National Centre for Ocean Information Services, Ministry of Earth Sciences, Hyderabad,	Rs. 47.00 Lakhs
8.	Development of an ocean forecast system for Kalpakkam	Indira Gandhi Center for Atomic Research	Rs. 30.00 Lakhs
9.	Development of compositionally graded coating on marine propeller for improving cavitation corrosion resistance	Naval Research Board, DRDO,	Rs. 35.56 Lakhs
10.	Development of Friction Stir Welding Process for Aluminum alloy and C-Mn Steel Plates	Naval Research Board, DRDO,	Rs. 16.68 Lakhs
11.	Development of FRP Roadside Barriers for National Highways	National Highway authority of India,	Rs. 11.06 Lakhs
12.	Estimation of suspended sediment concentration onboard OCEANSAT and algorithm development for settling velocity	Naval Research Board (DRDO), New Delhi,	Rs. 4.86 Lakhs
13.	Hydroelastic Analysis of floating and submerged flexible structures	Naval Research Board, New Delhi,	Rs. 18.04 Lakhs
14.	Implementation of an integrated nested wave-current-surge model with improved air-sea coupling parameterization for Kalpakkam region	Indira Gandhi Centre for Atomic Research, Kalpakkam	Rs. 33.91 Lakhs
15.	National Programme in Marine Hydrodynamics	Naval Research Board, DRDO,	Rs.255.00 Lakhs
16.	To develop computer model to predict weld induced residual distortion of large plate panels	DST	Rs. 15.78 Lakhs
17.	Weld Induced Distortion Analysis of 3-D Large Ship Structures	DST, New Delhi	Rs. 13.44 Lakhs

Consultancy Projects

1.	Consultancy for Project 'Indigo'	Tata consultancy Services,	Rs. 21.20 Lakhs
2.	Consultation services towards design and manufacturing of 250 Pax steel hull ferry	Maeksin Shipping Co. Pvt. Ltd, Kolkata,	Rs. 2.00 Lakhs
3.	Feasibility Study and Design of Shallow Draft Ore Carriers for Goa	National Ship Design & Research Centre, Ministry of Shipping, GOI, Visakhapatnam,	Rs. 8.50 Lakhs

4.	Hydrodynamic Design & Design of Control Surfaces for AUV	Naval Science and Technological Laboratory, Visakhapatnam,	Rs. 13.50 Lakhs
5.	Hydrodynamic design of high speed light weight torped	NSTL, Visakhapatnam	Rs. 22.25 Lakhs
6.	Lines Design of 12t Bollard Pull Tug	Manaksia Ltd., Kolkata	Rs. 1.00 Lakhs
7.	Model testing of 12t Bollard Pull Tug	Manaksia Ltd., Kolkata	Rs. 1.00 Lakhs
8.	Software for trajectory simulation of marine vehicles	Naval Science & Technological Laboratory, Visakhapatnam,	Rs. 25.00 Lakhs
9.	Techno-Environmental Feasibility Study of Ganga River Heritage Cruise Circuit	Modular Consultants, Kolkata,	Rs. 4.00 Lakhs
10.	Water entry shock estimation	NSTL, Visakhapatnam	Rs. 3.65 Lakhs
11.	Welding Distortion Analysis	ITER-India, Institute of Plasma Research	Rs. 2.00 Lakhs

Patents (filed / granted)

1. A new approach of ocean parameter retrieval using neural networks
2. Development of a comprehensive ocean atlas for Indian Ocean using ARGO data

Visits Abroad by Faculty Members

1. Mandal, Nisith Ranjan Working out joint research proposal and delivering lecture in a short course on Distortion Control (University of Strathclyde, Glasgow, UK) December 10-22
2. Sahoo, Trilochan To participate in the Intl Coference in Theoretical and Applied Mechanics (University of Adelaide, Australia) August 26-30, 2008

Invited Lectures by Faculty Members

1. New Trends of Ocean Wave Modeling - emerging issues and solutions *by* Bhaskaran, Prasad K (Department of Ocean Engineering, IIT Madras, Chennai)
2. Practical 3D linear and nonlinear computational seakeeping computations for design *by* Sen, Debabrata (IIT Madras)
3. Numerical methods in freesurface ship and offshore hydrodynamic problems *by* Sen, Debabrata (Utkal University, Bhubaneshwar)
4. An overview of marine hydrodynamics and its practical applications *by* Sen, Debabrata (NIT Durgapur)
5. Recent Developments of Ocean Wave Modeling in India *by* Bhaskaran, Prasad K (Andhra University, Visakhapatnam)

Books Published

1. N R Mandal *Welding Techniques, Distortion Control and Line Heating published by* Narosa Publishing House, New Delhi (2009)

Short-Term Courses, Training Programmes and Workshops organized

1. Introduction to Naval Architecture (Oct 2008)
2. Naval Architecture Training for L&T Officers, organised at L&T Hazira Works, Surat. (22/09-17/10, 2008)
3. Practical Shipbuilding (Dec 2008)
4. Practical shipbuilding for MDL officers (04/12 to 18/12/2008)

DEPARTMENT OF PHYSICS & METEOROLOGY

HEAD : Professor Ram Naresh Prasad Choudhary

FACULTY

Professors

Chandra, Naresh	Ph.D. (Queens University, UK), Atomic Molecular and Optical Physics, Quantum Information
Chandrasekar, A	Ph.D. (IISc. Bangalore), Atmospheric Sciences
Choudhary, Ram Naresh Prasad	Ph.D. (Edinburgh, UK), Condensed Matter Physics, Ferroelectricity, Liquid Crystals, Thermoelectricity, X-ray Crystallography
Ghatak, Sobhendu Kumar	Ph.D. (Calcutta University), Condensed Matter Physics Biophysics, Biophysics
Kumar, Krishna	Ph.D. (IIT Kanpur), Nonlinear Instabilities, Hydrodynamics
Mathur, Balbir Kumar	Ph.D. (IIT Kharagpur), Web Based Services, ERP, Microprocessors Based Systems
Raina, Prabhu Krishna	Ph.D. (IIT Kanpur), Nuclear Structure Double Beta Decay and Neutrino Physics, Nuclear Particle and Astrophysics
Ray, Samit Kumar	Ph.D. (IIT Kharagpur), Nanotechnology, Condensed Matter Physics, Semiconductor Physics and Devices, Optoelectronics
Samantaray, Biswas Kumar	Ph.D. (IIT Kharagpur), Experimental Physics, Structure of Matter, X-Rays
Sharma, Shivcharan Lal	Ph.D. (IIT Kanpur), Monte Carlo Simulation of Radiation Detectors and Semiconductor Devices, Particle and Cluster Emission in Fission and Fusion-Fission, Physics of Semiconductor Crystals and Thin Films, Radiation Measurement Techniques, Radiation Sensors and Dosimetry
Srinivas, Veeturi	Ph.D. (IIT Bombay), Electronic Properties of Solids
Taraphder, Arghya	Ph.D. (IISc. Bangalore), Condensed Matter Physics

Associate Professors

Bharadwaj, Somnath	Ph.D. (IISc. Bangalore), Astrophysics, Cosmology
Datta, Prasanta Kumar	Ph.D. (Burdwan University), Laser Physics / Nonlinear Optics / Photonics
Kar, Sayan	Ph.D. (IIT Kanpur), Gravitation and Geometry, High Energy Physics
Roy, Anushree	Ph.D. (IISc. Bangalore), Experimental Condensed Matter Physics

Assistant Professors

Chandra, Amreesh	Ph.D. (IT, BHU)
Das, Amal Kumar	Ph.D. (IOP Bhubaneswar), Experimental Condensed Matter Physics, Magnetism including Spintronics, Magnetic Semiconducting Nanoparticles and Thin Films, Mechanical and Magnetic Stress Measurement of Thin Films
Das, Baidya Nath	Ph.D. (IIT Kharagpur), Experimental Solid State Physics
Dhar, Achintya	Ph.D. (Jadavpur University), Semiconductor Nanostructures, Organic Electronics
Khastgir, Sugata Pratik	Ph.D. (IOP Bhubaneswar), Mathematical Physics / High Energy Physics

Majumder, Sonjoy	Ph.D. (IIA Bangalore), Atomic and Molecular Physics, Quantum Many-Body Theory, Astrophysical Spectroscopy, Nano- and Bulk-material Science
Murugesh, Subramaniam	Ph.D. (University of Madras), Nonlinear Dynamics
Nath, Tapan Kumar	Ph.D. (IIT Kanpur), Nanostructured Magnetic Materials, Spintronics, Magnetic Thin Films and Multilayers, Multiferroics
Nayak, Jhasaketan	Ph.D. (IP, Bhubaneswar)
Roy Chaudhuri, Partha	Ph.D. (IIT Delhi), Fiber and Integrated Optics, Optoelectronics, Experimental Bio-Photonics, Optical Imaging
Shukla, Pragya	Ph.D. (JNU, Delhi), Condensed Matter Physics, Physics of Complex Systems
Singh, Ajay Kumar	Ph.D. (Calcutta University), Experimental Nuclear Physics, Nuclear Structure
Srivastava, Sanjeev Kumar	Ph.D. (JNU, New Delhi), Materials Engineering using Ion Beams, Nuclear Condensed Matter Physics
Thakur, Awalendra Kumar	Ph.D. (NEHU Shillong), Experimental Condensed Matter Physics, Solid State Ionics, Ferroelectrics and Dielectrics, Renewable Energy (Portable Power) Sources

Scientific Officer

Chakraborty, Syamal	Ph.D. (IIT Kharagpur), Glass and Ceramics, Sol-gel Science, Preparatory Course Physics, Writing Popular Science
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Faculty Appointments

Dr. Jhasaketan Nayak	Assistant Professor
Dr. Amreesh Chandra	Assistant Professor

Brief Description 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 : Astrophysical Spectroscopy, Astrophysics, Atmospheric Sciences, Atomic and Molecular Physics, Biophysics, Condensed Matter Physics, Physics of Complex Systems, Cosmology, Electronic properties of solids, ERP, Bio-Photonics, Optical Imaging, Nuclear Physics, Ferroelectricity, Fiber & Integrated Optics, Optoelectronics, Gravitation and Geometry, High Energy Physics, Hydrodynamics, Laser Physics, Nonlinear Optics, Photonics, Magnetic semiconducting nanoparticles and thin films, Magnetism, Spintronics, Materials engineering, Mathematical Physics, Mechanical and magnetic stress, Microprocessors based systems, Monte Carlo Simulation of Radiation Detectors, Semiconductor Devices, Nano- and Bulk-material science, Nanostructured Magnetic Materials, Magnetic thin films and Multilayers, Multiferroics, Nanotechnology, Nonlinear Dynamics, Nonlinear instabilities, Nuclear Particle, Nuclear condensed matter physics, Nuclear Structure, Double Beta Decay and Neutrino Physics, Optoelectronics, Organic Electronics, Particle and Cluster Emission in Fission and Fusion-Fission, Physics of Semiconductor Crystals and Thin Films, Quantum Many-Body Theory, Radiation Measurement Techniques, Radiation Sensors and Dosimetry, Renewable Energy Sources, Semiconductors, Nanostructures, Solid State Ionics, Thermoelectricity, Web Based Services.

Thrust Areas

1. Condensed Matter Physics
2. Non-linear Dynamics and complexity
3. Astronomy and Astrophysics
4. Nuclear and Particle Physics

Lectures by Visiting Experts

1. Hamiltons diabolic singularity by Prof. Sir. Michael Berry (Bristol University)
2. Relativistic effects and precision navigation by Prof. Ghanshyam Date (IMS, Chennai)
3. Surface tension and the cosmological constant by Prof. Joseph Samuel (RRI Bangalore)
4. Stimulated Tetrahertz emission of strained p-Ge and SiGe/Si quantum-well structures doped with shallow acceptors by Dr. Miron Kagan (IREE, Russian Academy of Sciences)
5. The Physics of self-gravitating systems by Prof. Rajaram Nityananda (NCRA, TIFR, Pune)
6. Viscous fingering patterns in a lifting Hele-Shaw cell by Prof. S. Taraphdar (Jadavpur University)
7. Atomic layer deposited high-k and metal nanocrystals for memory applications by Dr. S. Maikap (CGU University Taiwan)
8. Extra solar planet by Dr. Sujan Sengupta (IIA, Bangalore)
9. Spin physics with Jets in polarized proton-proton collisions at $\sqrt{s} = 200$ GeV by Prof. Somnath Choudhury (Indiana University Cyclotron Facility)

Doctoral and MS Degrees Awarded

1. Sanjay Mondal Microstructural, magnetic, optical and transport studies of nanostructured diluted magnetic semiconducting $Zn(1-x)TMxO$ (TM-Co, Mn, Fe, Ni) and Manganite $La_{0.7}Ba_{0.3}MnO_3$ spintronic oxides (Ph.D.)
2. G Anil Kumar Some studies on important aspects of charged particle, spectroscopy with ionization, detector and some aspects of alpha induced fusion reaction with $^{27}/^{13}Al$ (Ph.D.)
3. V F Xavier The effect of assimilation of satellite and conventional meteorological data on the prediction of tropical meteorological system over India using a mesoscale model (Ph.D.)
4. P R Das Investigations of structural, dielectric and electrical properties of some tungsten bronz ferroelectric vandates (Ph.D.)
5. Puja Dey Investigation of Microstructural, electronic, transport, magneto-transport and magnetic properties of nano structured spintronic colossal magneto resistive manganites (Ph.D.)
6. D K Pradhan Studies on structural, vibrational, thermal and electrical properties of ionically conducting polymer nanocomposite electrolytes (Ph.D.)
7. Rama Ghosh Generation of bipertite states of qubits and characterization of their enlargement (Ph.D.)
8. Supriyo Paul Instabilities in externally driven hydrodynamic systems (Ph.D.)
9. S K Syd Ali Probing the universe using red shifted 21 cm HT (Ph.D.)
10. T K Barik Optical studies on liquids, films and soft materials (Ph.D.)
11. Srimant Pal Enhancement of membrane separation performance by turbulence promoters, electric field and plasma modification of surfaces (Ph.D.)
12. M Vasundhara Magnetic and electrical transport of Fe-based intermetallic Hauser alloys (Ph.D.)

Fellow - Professional Bodies

1. Ray, Samit Kumar (2008) Fellow Indian National Academy of Engineering

Member - Editorial Board

1. Chandrasekar, A (2005) Guest Editor for Special Issue on Mathematical Modeling for Earth System Sciences Content
- International Journal of Ecology & Development
2. Chandrasekar, A (2008) Member, Editorial Advisory Committee
- The Open Atmospheric Science Journal
3. Choudhary, Ram Naresh Prasad (2009) Editorial Advisory Board Member
- The Open Materials Science

4. Choudhary, Ram Naresh Prasad (2008) Editorial Board Member
- PMC Physics B
5. Choudhary, Ram Naresh Prasad (2007) Editorial board member
- Bulletin of Pure and Applied Sciences D
6. Choudhary, Ram Naresh Prasad (2009) Editorial board member
- Advances in condensed matter physics
7. Datta, Prasanta Kumar (2008) Editorial Board Member - KIRAN
- the Bulletin of the Indian Laser Association
8. Kar, Sayan (2008) Member, Editorial Board
- Indian Journal of Physics
9. Mathur, Balbir Kumar (0) xx -
10. Ray, Samit Kumar (0) Member of the Editorial Board
- Nanotrends
11. Srinivas, Veeturi (2009) Member of editorial board
- Journal of Magnetism
12. Thakur, Awalendra Kumar (2008) Editorial Borad Member
- The Open Energy & Fuels Journal

Awards & Honours

1. Thakur, Awalendra Kumar (2008) Best Poster Award, XIII Asian Conference on Solid State Ionics
2. Srivastava, Sanjeev Kumar (2008) Yong Physicist Award, The Indian Physical Society

Fellowships

1. Datta, Prasanta Kumar (2008) Visiting Professor Fellowship of the Scuola Superiore Sant-Anna, Pisa, Italy for 6 months
2. Datta, Prasanta Kumar (2008) ICTP regular associate fellowship for working at the Scuola Superiore Sant-Anna, Pisa Italy for 3 months
3. Datta, Prasanta Kumar (2008) Erasmus Mundus Teaching fellowship of European Union for working at the Heriot Watt University, Edinburgh, Scotland for 2 months
4. Nath, Tapan Kumar (2008) Royal Society Grant for the Royal Society International Short Visits Scheme 2008 for SPINTRONICS RESEARCH in the University of Sheffield, U.K.
5. Shukla, Pragya (2008) Visiting Fellow, Newton Institute of Mathematical Sciences, University of Cambridge, U.K.
6. Singh, Ajay Kumar (2008) Alexander von Humboldt Fellowship (follow up program) for three months

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A study of the impacts of initialization of the cyclonic vortex in a high resolution mesoscale tropical cyclone model	DST, New Delhi, India	Rs. 14.98 Lakhs
2.	A Theoretical Study on Coherent Structures and Chaos in Nanoscale Ferromagnets	SRIC (IIT-KGP)	Rs. 3.00 Lakhs
3.	Analysis, Modelling and Design of Semiconductor Optical Amplifier (SOA) based Photonic Components for Lightwave Systems and Networks	Japan-Indo Collaboration Programme: Kyushu University,	Rs. 20.00 Lakhs
4.	Angle- and spin-resolved photoelectron spectroscopy of atoms and molecules	DST, New Delhi	Rs. 1.60 Lakhs
5.	Assimilation of Oceansat 2 scatterometer winds in mesoscale model (Lakhs)	Space Application Center, ISRO, Ahmedabad,	Rs.11.00

6.	Assimilation of satellite data in mesoscale models	Space Application Center, ISRO, Ahmedabad, India,	Rs. 18.32 Lakhs
7.	Calculations of Hyperfine Structure Constants of Heavy Molecules using Relativistic Density Functional Method (DAAD Sandwiched Project, Rs.0.00 Lakhs)	SRIC	Rs. 3.00 Lakhs
8.	Ceramic Titania Foam		
9.	Coherent Structures and Patterns in Nonlinear Systems	DST	Rs. 8.00 Lakhs
10.	Cooperative Phenomenon and nanosize effects in some corelated systems	BRNS	Rs. 17.56 Lakhs
11.	CRP-Spintronic materials - Simulation and Design of Spintronics Materials	BRNS, DAE	Rs.107.30 Lakhs
12.	Development & characterization of nanostructured thin films for SiGe quantum well infrared photodetector and ferroelectric based gas / chemical sensors	DRDO	Rs.201.80 Lakhs
13.	Development and Evaluation of Novel Nanostructured Ionic Conductors for Low Temperature Solid State Secondary Battery Applications	ARMREB, DRDO, New Delhi	Rs. 52.56 Lakhs
14.	Development of Artificially Structured Nano Magnetic Materials for High Frequency Sensor Applications	DRDO	Rs. 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	Rs. 68.99 Lakhs
16.	Development of Ion Conducting Polymer-Nanoceramic Surfaces as Templates	CSIR, New Delhi	Rs. 12.00 Lakhs
17.	Development of novel magnetic materials for magnetoelectronic applications	BRNS, DAE	Rs. 23.00 Lakhs
18.	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, Govt. of India	Rs. 73.29 Lakhs
19.	Development of Polymer Nano-Composite Based Rechargeable Solid State Lithium Batteries For Ambient & Subambient Temp. Applications	MHRD, New Delhi	Rs. 15.00 Lakhs
20.	Development of Preform for High Power Fiber Laser	BRNS,	Rs. 24.69 Lakhs
21.	Development of quantum well infrared photodetectors in wavelength range 8-14 um using Si/SiGe nanotechnology	DIT	Rs. 92.24 Lakhs
22.	Development of terahertz sensors for biomedical imaging and remote detection of chemicals/ biological warfare agents	MHRD	Rs. 10.00 Lakhs
23.	Experimental Investigations on electronic and thermal transport processes in maganite perovskites and development of various sensing devices	CSIR	Rs. 7.78 Lakhs
24.	Fabrication and characterization of Novel Photonic Crystal Structures and Si/Ge Quantum Dots for Photonic Applications	DST-ITPAR (Italy)	Rs. 28.14 Lakhs
25.	Fabrication of cost-effective AC-magnetic susceptibility measurement set up for use with a liquid nitrogen cryostat assembly down to 70 Kelvin.	ISIRD, IIT Kharagpur	Rs. 3.00 Lakhs
26.	Fabrication of Doped Single-Mode Optical Fibers for Investigation of Bragg Grating Characteristics	DRDO	Rs. 24.70 Lakhs
27.	Feasibility Study of Neutrinoless Double Beta Decay in ¹²⁴ Sn.	DST, New Delhi	Rs. 51.00 Lakhs

28.	Giant magneto-impedance in manganite system	CSIR	Rs. 21.00 Lakhs
29.	Impact of assimilating high temporal resolution data from INSAT-3D in high-resolution mesoscale model for prediction of severe weather systems over Ba	Space Application Center, ISRO, Ahmedabad,	Rs. 5.64 Lakhs
30.	Investigation of Electrical-transport, Magneto-transport, Extraordinary Hall resistivity, Specific heat and Magnetic studies in nanostructured CMR man	DST, New Delhi	Rs. 128.00 Lakhs
31.	Kinematics of flows in diverse contexts	DST New Delhi	Rs. 8.52 Lakhs
32.	Low temperature Raman measurements on novel materials	DST	Rs. 36.00 Lakhs
33.	Measuring the HI power-spectrum with the GMRT	BRNS, DAE	Rs. 7.73 Lakhs
34.	On some aspects of Nano-photonics (M.I.U.R	Italian Ministry of Education)	Rs. 12.00 Lakhs
35.	Optical Properties of Fluorescent Nanocrystalline Phosphates and Gallates Co-Doped with transition and rare-earth element	CSIR	Rs. 7.16 Lakhs
36.	Positron Double-Beta-Decay Processes and Study of Some Fundamental Problems in Neutrino Physics.	DST, GOI and Italian Ministry of Foreign Affairs.,	Rs. 5.00 Lakhs
37.	R&D in Photonic Crystal Fibers: Design, Fabrication and Experimental Characterization for Applications in Optical Communications and Sensors	DST, GOI	Rs. 35.28 Lakhs
38.	Realization of packet switched node with optoelectronic and photonic technologies for ultra broadband communication systems and networks	Ministry of Education, Italy,	Rs. 35.00 Lakhs
39.	Second order cascaded nonlinear optical processes for all-optical photonic devices	DST, Govt. of India	Rs. 7.62 Lakhs
40.	Spectroscopy of nuclei close to beta-stability line by using complete- and incomplete-fusion and deep-inelastic reactions	DST, GOI	Rs. 13.00 Lakhs
41.	Studies in Photon-Atom and Photon-Molecule Interactions	DST, New Delhi	Rs. 5.50 Lakhs
42.	Studies in Quantum Information and Spectroscopy Involving Photons, Electrons, Atoms, and Molecules	Council of Scientific & Industrial Research,	Rs. 08.00 Lakhs
43.	Studies in Quantum Information and Spectroscopy Involving Photons, Electrons, Atoms, and Molecules.	CSIR, New Delhi	Rs. 08.00 Lakhs
44.	Studies of Atoms and Molecules in the Presence of External Fields	CSIR, New Delhi	Rs. 8.00 Lakhs
45.	Studies of Transport Properties and Localisation of Waves in Random Media	Department of Science and Technology,	Rs. 14.00 Lakhs
46.	Studies on impact of 3DVAR assimilation of surface, upper air and MODIS observations in mesoscale models during the Indian winter season	SASE, DRDO, Chandigarh,	Rs. 10.00 Lakhs
47.	Studies on Laser-Optical Fiber-Based Micro-Imaging Techniques in the Analysis of Tissue Structure and Detection of Abnormalities	ISRD, IIT Kharagpur	Rs. 5.00 Lakhs
48.	Studies on the impact of satellite data assimilation in mesoscale models	CSIR,	Rs. 10.00 Lakhs
49.	Study of Giant magneto-impedance(GMI) in soft ferromagnet for sensor application	CSIR	Rs. 11.75 Lakhs
50.	Study of magnetic properties of thin films on semiconductor substrates using cantilever beam magnetometer (jointl project with CSIR)	ISIRD, SRIC, IIT Kharagpur,	Rs. 3.00 Lakhs

51.	Technology Development and Research with Photonic Crystal Fibers and Components for Advanced Photonic Sensor System	DRDO, GOI	Rs. 62.84 Lakhs
52.	Terahertz emission of Si/SiGe structures doped with shallow acceptors	DST - RFBR (Moscow),	Rs. 9.63 Lakhs
53.	The Theory of Electron Correlation and Its Applications in Molecular and Nanoscience	Hungarian-Indian Intergovernmental S&T co-operation programme	Rs. 0.00 Lakhs
54.	Theoretical Study of Hyperfine Interaction in Heavy Atoms and Molecules for Quantum Computation and Frequency Standard	IIT-Kharagpur (ISIRD)	Rs. 3.00 Lakhs
55.	To study the effect of interfaces for efficient transport of carriers in organic light emitting materials	CSIR	Rs. 9.91 Lakhs
56.	Transport properties in organic light emitting materials and role of interfaces for efficient conduction (ISIRD)	SRIC, IIT Kharagpur)	Rs. 3.00 Lakhs
57.	Upgrading Raman spectrometer to microRaman spectrometer to study biomaterials	DRDO	Rs. 49.80 Lakhs

Consultancy Projects

1.	Development of Admission Modules for IISER	IISER Bhopal	Rs. 4.50 Lakhs
2.	Evaluation of Electrodes for Lithium Battery Applications	(UNTPL, Kolkata	Rs. 10.00 Lakhs
3.	Students Academic Management	IISER Pune	Rs. 1.75 Lakhs
4.	Thin Film Characterization	Various agencies	Rs. 2.00 Lakhs
5.	X-RAY, AFM and Impedance measurements for polymer based capacitor films and their temperature dependence	EPCOS India Pvt Ltd, Pune, India,	Rs. 0.60 Lakhs

Patents (filed / granted)

1.	Terahertz frequency radiation sources and detectors based on group-IV materials and method of manufacture
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Visits Abroad by Faculty Members

1.	Sharma, Shivcharan Lal	To participate and present two papers in 2008 IEEE NSS MIC RTSD Conference (Dresden, Germany) October 18-25, 2008
2.	Ray, Samit Kumar	Collaborative Research Work (University of Trento, Italy) One week
3.	Ray, Samit Kumar	Research Collaboration (University of Newcastle, UK) 3 days
4.	Singh, Ajay Kumar	Research collaboration (HISKP, University of Bonn) May-July
5.	Chandrasekar, A	For collaborative research work (Meteorological Research Institute, Tsukuba, Japan) May - July 2008
6.	Raina, Prabhu Krishna	Talk at International Workshop RPSint 2008 (KINR Kiev, Ukraine) September 8-11, 2008
7.	Raina, Prabhu Krishna	Faculty exchange visit under MOU with Roma 2 University Tor Vergata. (LNGS Gran Sasso ROME Italy) July 7-16, 2008
8.	Taraphder, Arghya	Research collaboration (Max Planck Institute, Dresden January-April
9.	Das, Amal Kumar	Scientific research collaborative works (Jaharnes Kepler University (JKU), Linz, Austria) two months
10.	Datta, Prasanta Kumar	Indo-Bulgarian Collaboration Research (Sofia University, Bulgaria) January 29 February 4, 2008

11. Datta, Prasanta Kumar Erasmus Mundus Teaching scholarship (Heriot Watt University, Edinburgh, Scotland) February 4 March 31, 2008
12. Datta, Prasanta Kumar Research work as a visiting Professor (Scuola Superiore Sant-Anna, Pisa, Italy) April 1 December 31, 2008
13. Datta, Prasanta Kumar Indo-Japan Research Collaboration meeting (Tokyo Institute of Technology, Tokyo & Osaka University, Osaka, Japan) July 1-7, 2008
14. Shukla, Pragya Visiting Fellow (Newton Institute of Mathematical Sciences, Cambridge, UK) December 5-19, 2008
15. Nath, Tapan Kumar To carry out Collaborative Research work on Fe-doped ZnO epitaxial films for Spintronics Applications (University of Sheffield, S3 7RH, Sheffield, UK) June 4-July 22, 2008 and December 4-24, 2008

Invited Lectures by Faculty Members

1. Students Academic Management *by* Mathur, Balbir Kumar (IISER Pune)
2. Hosts of All-fiber Passive Components -Fused Fiber Coupler & Hollow Optical Fiber: for Optical Comm *by* Roy Chaudhuri, Partha (Department of Electronics Engineering, Institute of Technology, Banaras Hindu University, Varanasi-221005)
3. Group-IV Nanophotonic Devices *by* Ray, Samit Kumar (University of Trento, Italy)
4. Semiconductor Nanostructures for Device applications *by* Ray, Samit Kumar (Inst. of Radio Physics & Electronics, Kolkata University)
5. Nanoelectronic and Sensing Devices *by* Ray, Samit Kumar (IIT Delhi)
6. Excitements in Nanoscience *by* Ray, Samit Kumar (Vidyasagar College, Kolkata)
7. SiGe based nanoelectronic and photonic devices *by* Ray, Samit Kumar (Univeristy of Newcastle, UK)
8. Semiconductor Nanotechnology for Electronic Devices *by* Ray, Samit Kumar (UGC State Level Seminar on "Fundamentals & Frontiers in Physics", 22nd September, Garbheta)
9. Semiconductor Nanostructures for Futuristic Devices *by* Ray, Samit Kumar (Annual Convention of Indian National Academy of Engineering, GOA)
10. Modeling of Extreme Rainfall Events over India during SouthWest Monsoon using JMA-NHM *by* Chandrasekar, A (Meteorological Research Institute, Tsukuba, Japan)
11. 3-D variational assimilation of satellite and radar data using WRF model *by* Chandrasekar, A (Brainstorming meet at Ministry of Earth Sciences, Government of India, New Delhi)
12. Multiferroics: A Boon to Advanced Research *by* Choudhary, Ram Naresh Prasad (Thapar University, Patiala, Punjab (NSFD, 15th))
13. Nanoferroelectrics: Synthesis and Characterization *by* Choudhary, Ram Naresh Prasad (B.S College, Danapur, Patna, Bihar (National seminar).)
14. Advances On Multifunctional Materials *by* Choudhary, Ram Naresh Prasad (University of North Bengal Siliguri, West Bengal (National Seminar))
15. Organic OptoElectronics : Present Status *by* Dhar, Achintya (BHU-IT, Varanasi)
16. Journey from 3D to 0D : nanomaterials *by* Dhar, Achintya (NIT, Raipur)
17. Organic and Inorganic nanostructures *by* Dhar, Achintya (Jadavpur University, Kolkata)
18. Organic OptoElectronics : A Review *by* Dhar, Achintya (IIT Kharagpur, Kolkata Ext Centre)
19. The Story of Light *by* Kar, Sayan (Science Education Programme on The Fascinating World of Physics, CMERI, Durgapur, May 26-31, 2008, (Sponsored by IAS, INSA and NASI))
20. Cosmological Braneworlds *by* Kar, Sayan (ICTS-IUCAA Workshop on Cosmology with CMB and LSS, IUCAA, Pune, August 28-31, 2008)
21. Novelty in the negative domain: facts and physics *by* Kar, Sayan (Science Day Lecture (Feb 27, 2009), DRDO, Balasore)
22. Plasement Optimization *by* Mathur, Balbir Kumar (Vidyasagar University)
23. Travelling waves in 2D simulation of thermal convection *by* Kumar, Krishna (IISc.)

24. Study of a Quantum Critical Material (Pd-Ni Alloy) via Impurity-Lattice Interactions *by* Srivastava, Sanjeev Kumar (Pondicherry University)
25. Microscopic Investigation of Hyperfine Field at Cu in Cr Using Energetic Heavy Ions *by* Srivastava, Sanjeev Kumar (Institute of Physics, Bhubaneswar)
26. Evidence of Quantum Criticality at Finite Temperatures in Pd-Ni Alloys via Impurity-Lattice Interact *by* Srivastava, Sanjeev Kumar (SINP, Kolkata)
27. Heavy Ion Induced Mixing: A Prospective Review *by* Srivastava, Sanjeev Kumar (University of Allahabad)
28. Magnetic and electric properties of Core-shell structured nanoparticles and composites *by* Srinivas, Veeturi (Bose Institute of Basic Sciences)
29. Optical hysteresis behaviour of semiconductor saturable absorber *by* Datta, Prasanta Kumar (Dept. of Physics, Pavia University, Italy)
30. Raman and Photoluminescence Spectroscopy : Analytical Techniques to Probe Nanomaterials *by* Roy, Anushree (IIT Gwahati)
31. Raman Imaging and Its Applications to Medical Sciences *by* Roy, Anushree (SMST, IIT Kharagpur)
32. Plasmon Coupling Between Gold Nanorods and Adsorbed Organic Molecules *by* Roy, Anushree (Jadavpur University)
33. Nano-BioScience *by* Roy, Anushree (Jadavpur University)
34. Breakdown of Meyer Neldel Rule beyond Polymer Phase Transition in Bulk and Nanocomposites *by* Thakur, Awalendra Kumar (BU DRDO Centre, Coimbatore, Tamilnadu, India)
35. Supercapacitors : Design and Evaluation *by* Thakur, Awalendra Kumar (Thapar University, Patiala, India)
36. Neutrinoless Double Beta Decay: Future Expectations and Perspective. Seminar at *by* Raina, Prabhu Krishna (Department of Physics. University of Jammu, Jammu.)
37. Tin as a candidate for low background experimentation : Some issues in Double Beta Decay *by* Raina, Prabhu Krishna (KINR Kiev, Ukraine)
38. Split-step bidirectional model for predicting the steady-state characteristics of a bulk semiconductor *by* Datta, Prasanta Kumar (Tokyo Institute of Technology, Tokyo, Japan)
39. On the measurement of imaginary part of second order optical nonlinearity *by* Datta, Prasanta Kumar (Tokyo Institute of Technology, Tokyo, Japan)
40. Optical hysteresis behaviour of vertical cavity semiconductor saturable gate *by* Datta, Prasanta Kumar (CEIIC, Scuola Superiore Sant-Anna, Pisa, Italy)
41. Derivation of closed form condition for optical bistability in vertical cavity semiconductor gate *by* Datta, Prasanta Kumar (CEIIC, Scuola Superiore Sant-Anna, Pisa, Italy)
42. Nanostructured CMR Manganite Oxides *by* Nath, Tapan Kumar (SN Bose National Center for Basic Sciences, Kolkata)
43. Colossal Magnetoresistive Manganites (CMR): Basic understanding and Applications *by* Nath, Tapan Kumar (Department of Physics, University of Sheffield, U.K.)
44. Carrier Induced Room Temperature Ferromagnetism in ZnFeO films for Spin-electronics *by* Nath, Tapan Kumar (Department of Physics, University of Sheffield, UK)
45. Quantum Entanglement of Flying Electronic Qubits *by* Chandra, Naresh (Harish-Chandra research Institute, Allahabad)

Books Published

1. Bharadwaj, Somnath; Khastgir, Pratik, S. Physics I Oscillations and Waves *published by* Cignus (2009)

Seminars, Conferences and Workshops Organised

1. 25th IAGRG meeting
2. 9th International Conference on Vibration Problems Jan 19-22, 2009
3. CTS workshop on vibration problem
4. Teachers Academy

CENTRE FOR EDUCATIONAL TECHNOLOGY

CHAIRMAN : Professor Tapan Kumar Basu

FACULTY

Assistant Professor

Bhattacharaya, Bani Ph.D. (IIT Kharagpur), Instructional Design, Distance Education, Evaluation in Teaching-Learning
Mohanty, Atasi Ph.D. (Utkal University), Cognitive Psychology and Human Resource Development

Visiting Faculty

Ray, A. K. Ph.D., Educational Technology; Video Systems Engineering

Brief Description of on-going activities

CET, IIT Kharagpur is offering an M.Tech Programme on "Media and Sound Engineering". The second batch of students have already joined the programme. CET has also initiated Ph.D programmes in both, areas related to educational pedagogy and in engineering. Research scholars are already working in these areas. Two research scholars have joined in the area of Educational Technology and two, in the area of Speech processing have joined the department. CET is also part of the NPTEL - Phase 2 - that has been already approved.

Thrust Areas

1. The center has produced nearly 4,800 hours of video courses in various engineering subjects. These are in use in more than 250 engineering colleges, universities and R & D laboratories. These courses are primarily used for self-learning by faculty, staff and students. Significant demand for them exists in overseas markets also. CD & DVD versions of these courses are available. CET is now also making the courses available on HDDs to be used in the Video-on-Demand (VOD) mode by institutions within their internal LAN. This allows access to any course on the LAN to a large number of users at any point of time along with the ability to control all normal play functions at will. More than 3700 users access these courses on any single day within the LAN of IIT Kharagpur.

New Acquisitions

1. Establishment of Video Systems Laboratory at CET : A state-of-the-art video systems laboratory has been set up with purchase of audio / video equipment worth Rs. 50 lakhs.

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning	MHRD	Rs. 5.00 Lakhs
2.	Identifying Inspirational Factors within the Affective Domain	Learning Resource Design & Development Project,	Rs. 6.00 Lakhs
3.	National Programme on Technology Enhanced Learning Phase 2	MHRD	Rs. 96.00 Lakhs

Consultancy Projects

1. National Programme on Technology Enhanced Learning MHRD, Government of India, Rs. 0.00 Lakhs

Invited Lectures by Faculty Members

1. Educational Pedagogy” TEQUIP programme, *by* Bhattacharaya, Bani (BIT, Mesra, Ranchi,)
2. 05 topics- Mentoring, Social Cognition, Personal Effectiveness, Conflict Resolution, Stress Manageme *by* Mohanty, Atasi (Summer School on Educational Technology, CET, IIT, Kharagpur)
3. Bridging the Gap between School Curriculum & Teacher Education Programmes *by* Mohanty, Atasi (Govt. Teacher Training College, Sevayatan, Jhargram, West Medinipur, West Bengal)

CENTRE FOR OCEANS, RIVERS, ATMOSPHERE AND LAND SCIENCES

HEAD : Professor A. Chandrasekar

FACULTY

Assistant Professor

Behera, Mukunda Dev	Ph.D. (IIRS, DehraDun), Land and Vegetation Study, Vegetation Carbon and Biomass Modelling, Remote Sensing and GIS
Chakraborty, Arun	Ph.D. (IIT Delhi), Ocean Circulation Modeling, Ocean and Climate Studies
Dash, Mihir Kumar	Ph.D. (Gujarat University), Satellite Oceanography, Cryospheric Studies, Ocean Modeling
Mandal, Manabottam	Ph.D. (IIT Delhi), Observations and Modeling of Thunderstorm, Modeling of Extreme Weather Events, Regional Climate Modeling, Cloud Microphysics, Mesoscale Data Assimilation
Satyanarayana, Achanta Naga Venkata	Ph.D. (BHU), Observations and Modeling of PBL Dynamics and Thunderstorms, Parameterization of Land Surface Processes, Land-Air-Sea Interactions
Shaji, C	Ph.D. (IIT Delhi), Ocean Modeling and Analysis, Coastal Processes, Monsoon Oceanography

Emeritus Professor

Pandey, Prem Chand	Ph.D. (Allahabad University), Satellite Oceanography, Atmospheric Science, Antarctic and Climate Change
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Faculty Appointments

Dr Shubha Verma	Joint Faculty, Assistant Professor
Dr. M.D. Behera	Assistant Professor -Transferred from RDC

New Academic Programmes

A new course named "Land System Studies" (CL60028) has been introduced as a CORAL elective from the Spring Semester of 2008-2009. Furthermore, an existing MTech CORAL lab course name was modified by introducing GIS applications and the above MTech course (CL69003) (0-0-3) 2 credits is now called as "Data Analysis and GIS Applications".

Brief Description of on-going activities

The CORAL center is actively participating in DST/MOES sponsored STORM (Severe Thunderstorms and Regional Modeling) which is in operation along East/North East part of India. Under this program a 50 m instrumented micro-meteorological tower was installed in IIT Kharagpur campus to monitor the atmospheric surface layer characteristics during the pre-monsoon thunderstorm activity. A state of art upper air sounding system was procured to study the atmospheric boundary layer dynamics during various epochs of thunderstorm activities at Kharagpur. The centre is also involved in the development of Data Assimilative Coastal Circulation Model Over Bay of Bengal; development of a Hybrid Coordinate Ocean Model (HYCOM) for the Bay of Bengal, numerical simulation of Bay-of-Bengal Circulation Features using satellite data; air-sea interaction studies, sea ice monitoring using remote sensing and satellite data obtained from Megha-Tropiques and to study any climate signal in their variation. Attempts are also underway in biodiversity characterization at landscape level using Satellite Remote Sensing and GIS for various states of India as well as Land Use and Land Cover change Dynamics. Moreover, studies involving assessment and modelling of Forest Biomass and Carbon Dynamics using Remote Sensing and GIS is on going.

Thrust Areas

1. Observations and modeling of atmosphere and oceans
2. Climate variation studies towards Climate Change

New Acquisitions

1. Vaisala DigiCORA MW31 System for measuring the vertical profiles of temperature, humidity, pressure, wind speed and wind direction
2. Cluster Computing Systems

Lectures by Visiting Experts

1. Severe Thunderstorm : Observations and Regional Modelling *by* Prof. U. C. Mohanty (CAS, IIT Delhi)
2. Dynamics of large-scale wind-driven circulation off the Indian coast *by* Dr. D. Shankar (Scientist, National Institute of Oceanography, Goa)

Member - Editorial Board

1. Pandey, Prem Chand (2007) *Member*
Proc. of the National Acad. of Sciences, India,-Physical Sciences, Allahabad

Fellowships

1. Pandey, Prem Chand (2009) *Fellow, Geological Society of India*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Development of a Hybrid Coordinate Ocean Model (HYCOM) for the Bay of Bengal	Indian National Centre for Ocean Information Services (INCOIS), Hyderabad,	Rs. 43.00 Lakhs
2.	Assessment and Modelling of Forest Biomass and Carbon Dynamics using Remote Sensing and GIS in Katerniaghat WLS, Uttar Pradesh	National Botanical Research Institute, Lucknow [CSIR],	Rs. 60.02 Lakhs
3.	Development of a Comprehensive Ocean Atlas for Indian Ocean utilising ARGOS Data	Indian National Center for Ocean Information Services (MoES), Hyderabad	Rs. 19.00 Lakhs
4.	Development of Data Assimilative Coastal Circulation Model Over Bay of Bengal	SAC, ISRO, Ahmedabad,	Rs. 22.80 Lakhs
5.	Development of Operational Physical Ocean Model for Bay-of-Bengal	INCOIS, Hyderabad	Rs. 54.00 Lakhs
6.	Land Use and Land Cover change Dynamics in relation to Human Dimension and Climate Change in Mahanadi River Basin, Orissa (National Remote Sensing Centre (NRSC), Hyderabad [Dept. of Space	(ISRO), Govt. of India]	Rs. 12.80 Lakhs
7.	Monitoring of sea ice using oceandat - 2 scatterometer data for determination of climatic trend	Space Applications Centre (ISRO), Ahmedabad,	Rs. 22.80 Lakhs
8.	Monitoring Thermodynamical structure of Atmospheric Boundary Layer during pre-monsoon convective activity over Kharagpur	DST, Govt. of India	Rs. 156.39 Lakhs
9.	Rural Technology Action Group-Eastern India (RuTAG-EI)	O/O Principal Scientific Advisor to Government of India, New Delhi,	Rs. 29.60 Lakhs
10.	Sea ice monitoring in the Arctic and the Antarctic	National Centre for Antarctic and Ocean Research (MOES), Goa,	Rs. 29.60 Lakhs

11.	Simulation of Bay-of-Bengal Circulation Features using OCEANSAT-II Scatterometer Wind and OCM	SAC, ISRO Ahmedabad,	Rs. 17.40 Lakhs
12.	Study of Bay of Bengele features and its impacts on the air-sea interaction using FORMS	Indian National Centre for Ocean Information Services (INCOIS), Hyderabad,	Rs. 33.90 Lakhs
13.	Study of Boundary Layer Characteristics at Kharagpur during occurrence of severe thunderstorms	Department of Science and Technology, Govt. of India,	Rs. 46.70 Lakhs
14.	Study of variability in the Air-sea interaction over the Tropical Indian Ocean using the observations from Megha Tropiques	Space Applications Centre (ISRO), Ahmedabad,	Rs. 12.24 Lakhs

Consultancy Projects

1.	Development of a comprehensive ocean atlas for Indian ocean utilising ARGO Data	Indian National Center for Ocean Information Services, (MoES), Hyderabad,	Rs. 19.00 Lakhs
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Invited Lectures by Faculty Members

1. Global warming *by* Pandey, Prem Chand (Gopalpur College, Balasore)
2. Antarctic Science and Climate Change research *by* Pandey, Prem Chand (Orissa College of Engineering, Bhubaneswar)
3. Energy Cycle of the Atmosphere (Second Lecture) *by* Chakraborty, Arun (KIST Bhubaneswar)
4. Atmosphere Composition (First Lecture) *by* Chakraborty, Arun (KIST Bhubaneswar)
5. Tropical Atmosphere (Third Lecture) *by* Chakraborty, Arun (KIST Bhubaneswar)
6. Basic Idea of Probability & Autocorrelation (Fourth Lecture) *by* Chakraborty, Arun (KIST Bhubaneswar)
7. Measuring Carbon Content in Different Forest Ecosystems *by* Behera, Mukunda Dev (State Forest College, Forest Research Institute, DehraDun)
8. Tropical Pacific Ocean Circulations using Hybrid Coordinate Ocean Model (HYCOM) and Observations *by* Shaji, C (Ocean Engg. & Naval Architecture, Indian Institute of Technology, Kharagpur)
9. Global Warming, Will Human-Induced Climate Change Destroy the World? *by* Dash, Mihir Kumar (Govt. Girls PG College, Bilaspur, Chhattisgarh)
10. Turbulent Transport in Atmospheric Boundary Layer *by* Satyanarayana, Achanta Naga Venkata (Department of Applied Mathematics, Birla Institute of Technology, Mesra-835 215 Ranchi)
11. Parameterization of Land Surface Processes and Planetary Boundary Layer Modeling *by* Satyanarayana, Achanta Naga Venkata (Department of Applied Mathematics, Birla Institute of Technology, Mesra-835 215 Ranchi)
12. Experimental Programmes on Atmospheric Boundary Layer *by* Satyanarayana, Achanta Naga Venkata (Department of Applied Mathematics, Birla Institute of Technology, Mesra-835 215 Ranchi)
13. Land surface modeling for weather and climate prediction *by* Mandal, Manabottam (BIT, Mesra, Ranchi)
14. Numerical Weather Prediction using Mesoscale Modeling System MM5 *by* Mandal, Manabottam (Indian Air Force Station, Kalaikunda)

Short-Term Courses, Training Programmes and Workshops organized

1. Natural Resources Planning for Rural Livelihood in Murshidabad District, W.B. (1-Week)

CRYOGENIC ENGINEERING CENTRE

HEAD : Professor Vutukuru Vasudeva Rao

FACULTY

Professor

Bandyopadhyay, Syamalendu Sekhar	Ph.D. (IIT Kharagpur), Separation Processes, Natural Gas Processing, Carbon Dioxide Capture and Sequestration, Air Breathing Propulsion
Chowdhury, Kanchan	Ph.D. (IIT Kharagpur), Cryogenic Air Separation, Safety in Oxygen-rich Environment, Refrigeration and Cold Storage Technology, Simulation of Helium Liquefiers
Dey, Tapas Kumar	Ph.D. (Delhi University), Thermophysical Properties of Materials, Cryo-instrumentation, Superconducting Materials and Devices
Rao, Vutukuru Vasudeva	Ph.D. (IIT Madras), Applied Superconductivity, Vacuum Technology, Cryo Physics
Sarangi, Sunil Kumar	Ph.D. (Stony Brook)

Assistant Professors

Adyam, Venimadhav	Ph.D. (IISc. Bangalore), Magnetic Thin Films, Functional Nanocomposite, Oxide Thermoelectrics
Ghosh, Indranil	Ph.D. (IIT, Kharagpur), Compact Heat Exchangers, Sorption Cooling
Ghosh, Parthasarathi	Ph.D. (IIT Kharagpur), Simulation of Helium Liquefiers, Cryogenic Turboexpander and Expansion Devices, Low Temperature Processes
Nandi, Tapas Kumar	Ph.D. (IIT Kharagpur), Matrix Heat Exchanger, Cryogenic Hydrostatic Bearing
Sandilya, Pavitra	Ph.D. (IIT Kanpur), Gas Hydrate, Non-conventional Energy

Brief Description of on-going activities

Cryogenic Engineering Centre is engaged in teaching at UG and PG levels, sponsored research and consultancy remain at the core activity of the Centre.

The Centre is also active in Continuing Education through training engineers from industries, faculty from academic institutions, and scientists from R&D organisations by conducting short term courses and workshops in specialised areas like Cryogenic Engineering, Air Separation, Vacuum Technology etc.

Thrust Areas

1. Cryogenic Engineering
2. Advanced Materials
3. Nonconventional Energy

Doctoral and MS Degrees Awarded

1. Soma Das Electrical, Transport and Magnetocaloric Properties in Potassium doped Lanthanum Manganites (Ph.D.)
2. Arunkumar Samanta Absorption of Carbon Dioxide into Piperazine Activated Alkanolamines (Ph.D.)

Fellow - Professional Bodies

1. Nandi, Tapas Kumar (2008) *Awarded* - Institution of Engineers (India)

Member - Editorial Board

1. Bandyopadhyay, Syamalendu Sekhar (2008) *Editor*
- Indian Chemical Engineer (ICE)

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Analysis & Development of Conceptual Design Methodologies for Air Collection and Enrichment System of Air Breathing Propulsion	ISRO	Rs. 15.00 Lakhs
2.	Analytical and Computational Evaluation of Various Parameters involved in the Design of SC cables (CIC type) to be used for fusion grade magnets	IPR Gujarat NFP	Rs. 42.70 Lakhs
3.	Design and development of hydrostatic journal bearings for cryogenic rocket engine turbopump	ISRO	Rs. 2.40 Lakhs
4.	Development of an experimental test facility for process intensification of an integrated fuel system for marine energy generation	NMRL (DRDO)	Rs. 194.44 Lakhs
5.	Development of perforated plate matrix heat exchanger	DST, Kolkata	Rs. 0.00 Lakhs
6.	Development of perforated plate matrix heat exchangers for cryogenic applications	Department of Science and Technology	Rs. 5.22 Lakhs
7.	Development of thermophysical measurement system for liquids and investigations on the thermal conductivity & pool boiling characteristics of various	DST, New Delhi	Rs. 29.00 Lakhs
8.	Fabrication of oxide multiferroic thin films by RF Magnetron Sputtering: Investigation of magnetodielectric and magnetoferroelectric properties	DST	Rs. 17.00 Lakhs
9.	Investigations on the giant magneto-impedance of bulk and thin films of lanthanum based doped manganites & development of contact less linear pos sens	Council of Scientific and Industrial Research, New Delhi	Rs. 10.12 Lakhs
10.	Investigation of the Effects of Tribocharging of Solid Particles on Possible Ignitions in Gaseous Oxygen System	Department of Science and Technology, Govt. of India,	Rs. 28.50 Lakhs
11.	Refurbishing a DC/RF Sputtering and development of Ferromagnetic/semiconductor hybrid structures for spintronics	SRIC	Rs. 4.60 Lakhs
12.	Safe design of systems with oxygen-rich environment	ISRO, IIT Kharagpur Space Technology Cell	Rs. 9.00 Lakhs
13.	Steady state and dynamic simulation of kW class helium refrigerator/liquefier for superconducting magnets used for fusion machines	Institute for Plasma Research, Gandhinagar, Gujarat,	Rs. 46.00 Lakhs
14.	Studies on Desorption Cooling from Activated Carbon	Indian Institute of Technology, Kharagpur	Rs. 3.00 Lakhs
15.	Studies on gas bearings for cryogenic turboexpander	ISIRD, SRIC, IIT Kharagpur,	Rs. 4.00 Lakhs
16.	Synthesis and multiferroic properties of AFe ₁₂ O ₁₉ (A= Ba, Sr) nanoparticles reinforced polymer nanocomposites for space applications	CSIR	Rs. 18.00 Lakhs

Consultancy Projects

1. Development of Software and detailed calculation for Explosive Decompression Chamber
Kasko Industries, Pune,
Rs. 0.50 Lakhs
2. Parallel flow and counter flow tube-in-tube heat exchanger
NIT, Rourkela
Rs. 0.76 Lakhs

3.	R&D Study on Aluminium Coating of Airframe Structure of PJ 10	DRDL, Hyderabad	Rs. 3.50 Lakhs
4.	Wetting of the Design of Vacuum Drying System	Mariental India Pvt. Ltd., New Delhi,	Rs. 1.00 Lakhs

Invited Lectures by Faculty Members

1. Designing of epitaxial multiferroics *by* Adyam, Venimadhav (IISER Kolkata)
2. Cryogenic Turboexpander in the short term course on Helium Cryogenics *by* Ghosh, Parthasarathi (NIT Rourkela)
3. Cooling of Superconducting Magnets: An overview *by* Nandi, Tapas Kumar (NIT, Rourkela)
4. Carbon dioxide capture and sequestration: perspectives and research need *by* Bandyopadhyay, Syamalendu Sekhar (National conference on Carbon Dioxide Capture and Sequestration-Challenges for Engineers, Anand, Gujarat)

Short-Term Courses, Training Programmes and Workshops organized

1. Cryogenic Air Separation (September 1624, 2008)
2. Cryogenic Air Separation -2008 (April 1116, 2008)
3. Vacuum Technology and Process Application (October 1222, 2008)

MATERIALS SCIENCE CENTRE

HEAD : Professor Basudam Achikari

FACULTY

Professor

Adhikari, Basudam

Ph.D. (Calcutta University), Development of jute based fully biodegradable green composites, Development of jute-cement concrete composites, Development of jute based geotextiles, Development of jute based sound proofing panels, Development of a suitable processing technique for rubber coating of jute, Development of conducting polymer based gas sensors, Biodegradation of polyethylene films, Polymer based drug delivery systems, Development of polymer based biomimetic taste sensor, Development of volatile compound based biosensor for pest control

Banthia, Ajit Kumar

Ph.D. (Calcutta University), Speciality Polymers

Bhattacharya, Debasis

Ph.D. (Calcutta University), Synthesis and processing of nanoceramics, Ceramic Technology, Refractory materials and coatings for thermal barrier and tribology applications, Nanobioceramics for prosthetic implants through tissue engineering, Ceramics for drug delivery, Ceramics for use in energy conversion and renewable energy applications, Shape memory materials for biomedical applications, High strength ceramic armor materials, Thin film technology for electrical and electronic applications

Das, Chapal Kumar

Ph.D. (IIT Kharagpur), Nano Composites, Recycling of Waste Polymers, Direct Fluorination of Polymer Composites, In-situ Nanocomposites

Ram, Shanker

Ph.D. (BHU, Varanasi), Glasses and Disordered solids, Alloys and Intermetallics, Nanoceramics and Hybrid composites, Magnetic and Magnetocaloric materials, Ferroics and applications, Porous materials and applications, Metallic foams for biological applications, Nanofluids, Films and Nanoglues, Optical Optical materials and applications, Biomaterials, Phase Transformation, Photonics, Quantum cutting

Associate Professors

Banerjee, Susanta

Ph.D. (IIT Kharagpur), Polymer synthesis and characterization,, High temperature Low-K polymers, Membranes for separation of gas mixtures, Organic light emitting polymers

Banerji, Pallab

Ph.D. (Jadavpur University), Semiconductor Materials and Devices

Jacob, Chacko

Ph.D. (Case Western, USA), Wide Bandgap Semiconductors / Nanomaterials / Direct Fluorination of Materials / Oxide semiconductors

Assistant Professors

Khatua, Bhanu Bhusan

Ph.D. (IIT Kharagpur), Polymer Blends and Composites, Polymer-clay and Polymer-CNT Nanocomposites, Polymer Blend-Clay Nanocomposites, Morphology control, Polymeric PTCR composites

Majumder, Subhasish Basu

Ph.D. (IIT Kanpur), Nanostructured ceramic gas sensors, Electrodes for Li rechargeable batteries, Multiferroic ceramics and thin films, Ceramic composites, Ferroelectric and relaxor thin films

Brief Description of on-going activities

Apart from teaching various courses in our M. Tech. Program on Materials Science and Engineering we also teach undergraduate and post graduate level courses on biomaterials, ceramic, polymer and electronic materials to other departments of our Institute. So far as the research activity is concerned our Centre is engaged in development and application of novel polymers, ceramics and semiconductor materials supported by our Institute as well as by various funding agencies. In the area of polymer materials besides polymer modification we synthesize new polymers for application as electronic materials, membranes for gas separation, nanoclay and carbon nanotube reinforced composites for automobiles and other high performance speciality applications. Few research projects are in progress for jute fiber reinforced cement concrete and biodegradable rigid composites. The Centre is now also engaged in a new field of welding thermoplastics, recycling waste polymers and direct fluorination of polymers. Apart from activities on structural ceramics, refractories, and bioceramics, we are also investigating various research issues related to the synthesis of nano-crystalline shape memory materials for biomedical applications, nano-fluids, nano ceramics for drug delivery, nano-structured oxides for ceramic gas sensor and cathode materials for lithium rechargeable batteries. We are also actively involved in the research on ferroic and multiferroic thin / thick films, sensors magnetic and magnetocaloric materials. Novel inorganic and organic semiconductor materials are being synthesized and characterized for various electronic and optoelectronic applications. MOCVD growth of InGaP epitaxial layers as well as quantum dots are also being carried out for various applications such as solar cell, etc. Another important area of research is the synthesis and characterization of wide band gap materials like SiC, ZnO and nitride semiconductors and nano materials for device applications. Multiwall carbon nanotubes are also being synthesized by CVD on silicon substrates.

Thrust Areas

1. Biomaterials
2. Nanomaterials / nanocomposites / sensors

New Acquisitions

1. Perkin Elmer Uv-vis-NIR Spectrophotometer
2. CHNS and O elemental analyser
3. Injection moulding machine
4. Ultra-thin film solution growth unit (LB. spin coat, dip coat)
5. Contact angle measurement set up
6. Thermal conductivity measurement setup
7. Rheometer
8. MS-FTIR attachment for Netzsch TGA/DSC

Lectures by Visiting Experts

1. Thermodynamics of Co/Cr super lattices *by* Tathagatha Mukherjee (University of Nebraska, USA)
2. Engineering Solid Electrolytes for Ionic Devices *by* V. Thangadurai (University Of Canada)
3. Flood disaster and its management *by* Swami Nityasatyananda (Ramakrishna Mission Shilpapith, Belgharia, Kolkata)
4. Semiconductors: A brief history *by* S. Ashok (Pennsylvania State University, USA)

Doctoral and MS Degrees Awarded

1. Arfat Anis Composite Polymer Electrolyte Membranes for Fuel Cell Application (Ph.D.)

2. Sanjay Sadhukhan Characterization of Jute Fiber and Generation of Development Stage Specific Expressed Sequence Tags in Relation to Fiber Formation (Ph.D.)
3. Tanya Das Speciality Polymer blends of high performance thermoplastics and liquid crystalline polymers (Ph.D.)
4. Jayanta Maity Direct fluorination of fibers & fiber Reinforced Composites (Ph.D.)
5. Anurag Gautam Microstructural, optical and Electrical properties of Silver reinforced poly(vinyl alcohol) Nanocomposites (Ph.D.)
6. Madhumita Mukherjee Effect of Fluorination and Oxy-Fluorination of Kevlar Fiber on the Properties of Short Fiber Reinforced Polymer Composites and its Mold Flow Simulation Study (Ph.D.)
7. Puspanjali Tripathy Synthesis, structure and optical properties of gold reinforced polymer nanofluids and films (Ph.D.)
8. Goutam Kr Jana Recycling of Natural Rubber Vulcanizates and Scrap Tyres by Mechanochemical Devulcanization Process (Ph.D.)
9. Ram Naresh Mahaling Development and Characterization of Elastomeric, Thermoplastic Polymer Nanocomposites Based on Unmodified and Modified Fillers (Ph.D.)
10. Sandeep Kumar Effect of In-Situ Fibrillation and Graphite Nanofillers on the Properties of High Performance Composites (Ph.D.)
11. Anindita Ghosh Synthesis, characterization and properties of novel fluorinated poly(imide siloxane) co-polymers (Ph.D.)
12. Pravin Sawai Electromagnetic interference shielding effectiveness of graphite filled polypropylene and polyetheramide based composites (MS)
13. R. Rajasekar Effect of epoxidized natural rubber and nano-clay composites in natural rubber and SBR compounds (MS)

Member - Editorial Board

1. Adhikari, Basudam (2007) *Member of the Editorial Board of*
- Indian Journal of Chemical Technology: A NISCOM (CSIR) Journal
2. Banerji, Pallab (2008) *Editorial Board Member*
- The Open Surface Science Journal
3. Das, Chapal Kumar (0) *Member of the Editorial Board*
- Research Letters in Materials Science
4. Das, Chapal Kumar (0) *Member of the Editorial Board*
- Nano Trends
5. Das, Chapal Kumar (0) *Member of the Editorial Board*
- Advances in Materials Science
6. Jacob, Chacko (2007) *Member of Editorial Board*
- The Open Electrical and Electronic Engineering Journal

Awards & Honours

1. Jacob, Chacko (2009) *Best Poster Award 20th MRSI AGM, Kolkata Feb 10-12*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Development of Cr ³⁺ /Cr ⁴⁺ +co-doped stabilized c-ZrO ₂ nanoparticles as a new series of high temperature solid electrolytes and their other applications	CSIR	Rs. 9.00 Lakhs
2.	Development of durable water-repellent jute geotextiles with natural ecofriendly additive for application in erosion control in river banks and other	JMDC, Kolkata	Rs. 168.73 Lakhs

3.	Development of eco-friendly / biodegradable rigid jute-based composites	JMDC, Kolkata	Rs. 69.93 Lakhs
4.	Development of High Performance Advanced Polymer Blends and Alloys for Aerospace Applications	DMSRDE, Kanpur	Rs. 9.00 Lakhs
5.	Development of jute based sound proofing composites	JMDC, Kolkata	Rs. 32.26 Lakhs
6.	Development of Jute Fiber Reinforced Cement Concrete Composites	JMDC, Kolkata	Rs. 75.60 Lakhs
7.	Development of Novel Polyphosphazene based High Performance Polymeric Composites For Wide Temperature Range Application	DRDO, New Delhi	Rs. 48.08 Lakhs
8.	Development of Phase Morphology in Incompatible Polymer Blends by Using Nanoclay	DST, New Delhi	Rs. 16.68 Lakhs
9.	Development of Polymer Based Biomimetic Sensors	DST, New Delhi	Rs. 10.35 Lakhs
10.	Development of Silicon Carbide Thin Films for High Temperature and High Power Devices	DRDO	Rs. 49.76 Lakhs
11.	Development of Suitable Production System for Natural Rubber Coated Jute Fabrics for Novel End Uses	JMDC, Kolkata	Rs. 30.00 Lakhs
12.	Development of Volatile Compound Based Biosensor for Pest Control	DST, New Delhi	Rs. 11.15 Lakhs
13.	High coercivity magnetic AFe ₁₂ O ₁₉ (A: Ba and/or Sr) nanofibrils of controlled shape anisotropy for radar and other high frequency applications	CSIR, New Delhi	Rs. 15.00 Lakhs
14.	Infrastructure Development for the Wet Chemical Synthesis of Advanced Ceramics	ISIRD, SRIC, IIT Kharagpur,	Rs. 3.00 Lakhs
15.	MOCVD growth and characterization of InGaP/GaAs and InGaP quantum dot solar cell	DST	Rs. 35.57 Lakhs
16.	MOCVD growth of GaAs epitaxial layers for solar cell applications	ISIRD, SRIC, IIT Kharagpur,	Rs. 3.00 Lakhs
17.	Molecularly engineered novel membrane precursors and preparation of novel polymer nano-composite membranes for selective separation of gas mixture	DST	Rs. 50.95 Lakhs
18.	New chemical methods in synthesis of noble-metal nano-powders & porous metal/ceramic composites for hydrogen energy storage, combustion and other	Department of Atomic Energy, Mumbai,	Rs. 19.00 Lakhs
19.	Novel Nano-structured Ceramics for Gas Sensing Applications	Department of Information Technology	Rs. 30.77 Lakhs
20.	Phase stability and intergranular giant-magnetoresistance properties in (La _{1-x} Eux) _{0.67} Ca _{0.33} MnO ₃ in a hybrid nanocomposite structure	UGC-DAE Consortium for Scientific Research (Indore)	Rs. 1.00 Lakhs
21.	Preparation of Novel Polymeric Materials for Chemical Sensor Application: Synthesis and Tailoring of Properties in Molecular Level	DRDE / DRDO	Rs. 7.54 Lakhs
22.	Preparation of poly(imide siloxane) in bulk quantity for analytical sample inlet	DRDE/DRDO, Gwalior	Rs. 8.54 Lakhs
23.	Synthesis and characterization of novel light emitting poly(arylene)s and poly(arylene ether)s and derivative thereof	CSIR	Rs. 9.06 Lakhs
24.	Synthesis by suspension polymerization and characterization of PMMA/clay and PS/clay nanocomposites	ISIRD, SRIC, IIT Kharagpur	Rs. 3.40 Lakhs
25.	Thin film shape memory alloys for device applications	DRDO	Rs. 300.00 Lakhs
26.	Use of nanocomposites for efficient welding of thermoplastics	DST-DFG	Rs. 7.64 Lakhs

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|-----|--|---|-----------------|
| 27. | Wet chemical synthesis of novel cathode materials for lithium ion rechargeable batteries | Council of Scientific and Industrial Research | Rs. 10.46 Lakhs |
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Consultancy Projects

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|----|---------------------------|---|----------------|
| 1. | Development of Composites | KE Technical Textiles Pvt. Ltd., Kharagpur, | Rs. 0.40 Lakhs |
|----|---------------------------|---|----------------|

Visits Abroad by Faculty Members

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|----|--------------------------|---|
| 1. | Banerji, Pallab | to attend MRS 2008 Fall Meeting and to present a paper (Boston, USA) December 1-5, 2008 |
| 2. | Banerjee, Susanta | Collaborative research (Follow up Programme of Humboldt Foundation) (Leibnz-Institute for Polymer Research, Dresden, Germany) 02 Months (19 May to 18 July, 2008) |
| 3. | Banerjee, Susanta | Presenting Research Paper in a Conference, Fluoropolymer 2008: (Charleston, South Carolina, USA) October 19-22, 2008 |
| 4. | Majumder, Subhasish Basu | as a visiting scientist for collaborative research (Department of Physics, University of Puerto Rico, San Juan, Puerto Rico (USA) 1 month (June 6 to July 6) |
| 5. | Ram, Shanker | Research (University of Ulm, Germany) May-July 2008 |
| 6. | Das, Chapal Kumar | INSA-PAS Bilateral exchange programme (Wroclaw University of Technology, Poland) June-July |
| 7. | Das, Chapal Kumar | DST-DFG programme (TU-Chemnitz, Germany) June |
| 8. | Das, Chapal Kumar | On invitation to deliver lecture (IPF-Dresden, Germany) July |

Invited Lectures by Faculty Members

1. MOCVD growth of Nanostructure Devices *by* Banerji, Pallab (Indian Association for the Cultivation of Science, Kolkata)
2. CVD of Nanomaterials: DST Advanced School on Nano Scienc & Technology *by* Banerji, Pallab (S.N. Bose National Centre for Basic Sciences, Kolkata)
3. Wide Bandgap Materials as High Temperature Materials *by* Jacob, Chacko (International Seminar on High Temperature Materials, IT-BHU, Varanasi)
4. Semi-fluorinated polym(ether imide)s for advanced application *by* Banerjee, Susanta (Pune, India)
5. Molecularely engineered novel semifluorinated polymers: Low-k materials *by* Banerjee, Susanta (Philips University Marburg, Germany)
6. Molecularely engineered novel semifluorinated polymers: Low-k materials *by* Banerjee, Susanta (Leibniz-Institute for Polymer Research, Dresden, Germany)
7. My Journey in Materials Science: From Ceramics to Semiconductors *by* Jacob, Chacko (Department of Ceramic Engineering, IT-BHU)
8. Nanomaterials for Electronic Applications *by* Jacob, Chacko (NIT, Rourkela)
9. Nanomaterials for Electronics *by* Jacob, Chacko (Crystal Growth Centre, Anna University)
10. Coordination Polymerization Made Easy *by* Banthia, Ajit Kumar (Department of Chemistry, Utkal University, Bhubaneswar)
11. Nano-Life Savior *by* Banthia, Ajit Kumar (Danapur College, Bihar)
12. Intelligent Society and Environment *by* Banthia, Ajit Kumar (PIET, Rourkela)
13. Biopolymers and Biomaterials Recent Thoughts *by* Banthia, Ajit Kumar (Jadavpur University)
14. Polymers Inspiration and Prespiration *by* Banthia, Ajit Kumar (IASST, Guwahati)
15. Biomedical Applications of Polymers *by* Banthia, Ajit Kumar (IASST, Guwahati)
16. Drug Delivery *by* Banthia, Ajit Kumar (IASST, Guwahati)
17. Conducting polymer nanocomposite as sensor material: An overview *by* Adhikari, Basudam (Tailormade nanomaterials and Applications for Chemical and Bio-Sensors, CGCRI, Jadavpur)
19. Polymers as Hi-Tech Materials *by* Adhikari, Basudam (Birla Institute of Technological Museum)

19. Polymers for Hi-Tech Applications and was invited as Chief Guest of the function *by* Adhikari, Basudam (National Science Day, 2009 at DMSRDE, kanpur)
20. Taste Sensing with Polymers in New Era in Polymer Science and Technology *by* Adhikari, Basudam (Department of Polymer Science and Technology, Calcutta University, Kolkata)
21. Role of polymers in sensor devices for environment monitoring and agriculture *by* Adhikari, Basudam (CGCRI, Jadavpur for a Technical Colloquium for a Chemical Hub)
22. Radiative emission in surface plasmon bands in gold nanofluids and nanocomposites of biomaterials *an by* Ram, Shanker (Banaras Hindu University)
23. Functional nanomaterials and applications *by* Ram, Shanker (Banaras Hindu University, Varanasi, India)
24. Nanomaterials for electronic applications”, School of Materials science and Technology *by* Ram, Shanker (Banaras Hindu University, Varanasi)
25. Ferromagnetic CrO₂ nanocomposites- a new series of ferromagnetic materials of spintronics and applic *by* Ram, Shanker (Department of Physics, Osmania University, Hyderabad, India)
26. In-situ synthesis of ceramic nanocomposites of stabilized zirconia for high temperature applications *by* Ram, Shanker (Department of Mechanical Engineering, Banaras Hindu University, India)
27. Surface enhanced spectroscopy in gold nanofluids for biomaterials and other applications *by* Ram, Shanker (Department of Physics, Allahabad Hindu University, India)

Seminars, Conferences and Workshops Organised

1. International Conference of High-Tech Materials (ICHTM-09)

Short-Term Courses, Training Programmes and Workshops organized

1. Nanoelectronics : Science, Nanotechnology, Engineering and Applications (July 07-19, 2008)
2. Optoelectronic Materials & Devices (29 December 29, 2008 - January 03, 2009)

RELIABILITY ENGINEERING CENTRE

HEAD : Professor V. N. Achutha Naikan

FACULTY

Professor

Misra, Ravindra Babu

Ph.D. (IIT Roorkee), Reliability Modelling of Engineering Systems, Software Reliability, Software Safety, Reliability Testing and Demonstration, Reliability Design

Associate Professor

Naikan, V N Achutha

Ph.D. (IIT Kharagpur), Reliability Engineering, Maintenance Engineering and Management

Assistant Professor

Chaturvedi, Sanjay Kumar

Ph.D., Maintenance Engineering, Network Reliability, Reliability

Senior Lecturer

Goyal, Neeraj Kumar

Ph.D. (IIT Kharagpur), Probabilistic Risk / Safety Assessment, Software Reliability, Communication Network, Reliability, Electronic Systems Reliability, Accelerated Life Testing

Brief Description of on-going activities

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. Accelerated Life Testing of some important components of Atomic Reactor has been carried out in the Environmental testing laboratory of the Centre. Sponsored Projects on reliability issues of missile systems are also being carried out in the Centre. Safety issues in operation of nuclear power plants is an important activity ongoing in the Centre.

Thrust Areas

1. Software Reliability
2. Condition Monitoring and Maintenance
3. Reliability Testing and Design

International Collaborations

1. Collaborative Research work on "Software Reliability Modelling" with DNV Norway is progressing

Lectures by Visiting Experts

1. Warranty Models by Dr. D.N.P. Murthy (Professor, Queensland University, Australia)
2. Warrantees - Theory and practices of Warranty data by Dr. Md. Rezaul Karim (Professor, University of Rajshahi, Bangladesh)
3. Reliability Design by Prof. K. B. Misra (RAMS Consultants, Jaipur)

Doctoral and MS Degrees Awarded

1. K. Saravan Kumar Early Software Reliability and Quality Prediction (Ph.D.)
2. Neelesh Bhattacharya Early Prediction of Software Quality Attributes using Software Engineering Matrices (MS)

Fellow - Professional Bodies

1. Misra, Ravindra Babu (2000) *Fellow* - Institution of Engineers India

Member - Editorial Board

1. Chaturvedi, Sanjay Kumar (2008) *Associate Editor*
- International Journal of Performability Engineering
2. Misra, Ravindra Babu (2007) *Member of Editorial Board*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Design of Minimal Cost Backbone Network Layout for Given Capacity and Reliability Requirements	VEICET	Rs. 16.00 Lakhs
2.	FIST PROGRAM : Infrastructure Development in Environment Lab, REC	DST	Rs. 36.50 Lakhs
3.	Reliability Analysis of Garuda	DRDL, Hyderabad	Rs. 11.68 Lakhs
4.	Reliability Prediction of DLS	DEAL Dehradun	Rs. 8.63 Lakhs
5.	Software Reliability & Safety	DNV Norway	Rs. 22.50 Lakhs

Consultancy Projects

1.	ALT on Connectors	ECIL/BARC	Rs. 2.25 Lakhs
2.	RAMS Model for Project ASTRA	DRDL Hyderabad	Rs. 11.00 Lakhs
3.	Reliability Improvement of Metering Products	Secure Meters Ltd. Udaipur	Rs. 20.00 Lakhs
4.	Reliability Modeling of GG	DRDL/RCI	Rs. 6.44 Lakhs
5.	Reliability Prediction of DLS	DEAL Dehradun	Rs. 8.63 Lakhs
6.	Reliability work Package for a missile project	DRDL, Hyderabad	Rs. 8.00 Lakhs
7.	Reliability Work Package for Missile Project: Phase II	DRDL, Hyderabad	Rs. 12.50 Lakhs
8.	Reliability Work Package of Garuda	DRDL, Hyderabad	Rs. 8.00 Lakhs
9.	Shutdown Probabilistic Safety Assessment of Kakrapara Nuclear Power Plant	NPCIL, Mumbai	Rs. 10.22 Lakhs
10.	Software and Hardware Reliability Modelling of AGNI-III missile	ASL, DRDO, Hyderabad,	Rs. 8.00 Lakhs

Invited Lectures by Faculty Members

1. Reliability in Space Systems *by* Misra, Ravindra Babu (Dept. of Space Hyderabad)

Books Published

1. V.N.A. Naikan Reliability Engineering and Life Testing *published by* Prentice Hall (2008)

Short-Term Courses, Training Programmes and Workshops organized

1. Product Reliability Assurance and Assessment (August 4-6, 2008)
2. REliability Engineering for DRDO Engineers (June 2008)
3. Sotware Reliability (August 2008)
4. Strategic Quality Control of Coal, for managers and engineers from Kothagudam Coal Mines (November 13-15, 2008)

RUBBER TECHNOLOGY CENTRE

HEAD : Professor Tapan Kumar Chaki

FACULTY

Professor

Bhowmick, Anil Kumar

Ph.D. (IIT Kharagpur), Nanocomposites, Polymer Blends and Thermoplastic Elastomers, Polymer Modification, Adhesion

Chaki, Tapan Kumar

Ph.D. (IIT Kharagpur), Electron Beam Modification of Polymers, Carbon Nanotube based Polymer Composites, Conductive Rubber Composites for EMI Shielding Application, Nano Silica based Thermoplastic Elastomers, Waste Plastics Modified Bitumen for Highway Application

Khastgir, Dipak

Ph.D. (IIT Kharagpur), Polyurethane Foam Composites with Special Properties, Conductive Polymer, Conductive Polymer and Composites, High Voltage Polymeric Insulator, Piezo Rubber and Composites, Nano Composites

Nando, Golok Behari

Ph.D. (IIT Kharagpur), Polymer blends- reactive compatibilization and miscibility, Vulcanization by conventional and nonconventional methods such as Electron beam irradiation, Modification of natural and synthetic latices, Nano material development from flyash and rubber nanocomposites, Thermoplastic polyurethane laponite clay nano composites, Polymer blends as implant devices and scaffolds in tissue engineering, Polymer modification and new materials development, Surface modification of additives and multifunctional properties

Tripathy, Deba Kumar

Ph.D. (IIT Kharagpur), Polymer Blends and Alloys, Elastomers, Rubber Engineering, Metal Forming, Unconventional Machining, Polymer Composites and Nanocomposites, Microcellular Rubber

Assistant Professors

Bandyopadhyay, Abhijit

Ph.D. (IIT Kharagpur), Polymer Science and Technology

Chakraborty, Kalyan Kumar

Ph.D. (Calcutta University), Polymer Science and Technology

Chattopadhyay, Santanu

Ph.D. (IIT Kharagpur), Viscoelastic Behaviours of Polymers, Blends and Composites, Thermoplastic Elastomers, Polymer Composites and Nanocomposites for Smart Applications, Structure-property Correlation for Elastomer / Rubber based Nano-structured Composites, Synthesis of Polyurethane based Nanomaterials for Speciality Applications

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), New polymerization techniques to prepare tailor-made new rubber and polymers, Block and graft copolymer, Thermo reversible smart polymers, Tailor-made Polymer nanocomposite, Modification of elastomers, Thermoplastic Elastomers (TPE) and Thermoplastic Vulcanizates (TPV), Polyurethanes, Characterization of Polymers and Rubbers

Brief Description of on-going activities

The Centre works in close collaboration with other departments and centers of this Institute and other R&D organizations in India and abroad. Several research projects sponsored by different agencies are in operation. The faculty members are engaged in different research areas :

1. Polymer nanocomposites
2. Chemical modification of rubbers
3. Thermoplastic elastomers based on novel blends and alloys
4. Recycling of rubber waste
5. Ionomers
6. Conductive rubber composites for electrical and electronics application
7. Electron beam modification of polymers
8. Rheology and processability of rubber compounds and polymer blends
9. Microcellular rubber composite for various industrial application
10. Development of rubber blends and composites for different industrial application like cable, oil seal, tank track pad, vibration isolators
11. Adhesion
12. Biodegradable polymers
13. Controlled radical polymerization
14. Polymers for biomedical application.

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 polymer and rubber
6. Electron beam treatment and Processing of polymer composites.

New Acquisitions

1. A Zwick UTM Z010 machine has been procured by the Centre.
2. Electro-mechanical Actuator (Zwick - Roell)
3. DESMA Injection Moulding Machine

Lectures by Visiting Experts

1. Atomic Force Microscopy *by* Dr. S. Magonov (Veeco, California, USA)
2. Dynamic Mechanical Analysis of Rubbers. *by* Dr. Arnaud Favier (Metravib, France)
3. Rubber Product Technology *by* Dr. Rabin Mukhopadhyay (Director, Hasteri J. K. Tyres Ltd. Kankroli, Rajasthan)
4. Modern characterization techniques for polymers *by* Dr. D. K. Setua (Deputy Director, DMSRD, Kanpur)
5. Scope of collaboration RTC, IIT Kharagpur with Polymer Science Dept. Yamagata University, Japan *by* Prof. Kiyohito Koyama (Director of the International Centre, Yamagata University, Japan)

Doctoral and MS Degrees Awarded

1. Madhuchhanda Maiti Fluoroelastomer-Layered Silicates Nanocomposites: Preparation, Characterization and Properties (Ph.D.)
2. Sambhu Bhadra Preparation, Properties, Processing and Applications of Polyaniline and its Composites (Ph.D.)

3. Anirban Ganguly Preparation and properties of Thermoplastic elastomer-Clay Nanocomposites from Unmodified and Chemically Modified Poly[styrene-(ethylene-co-butylene)-styrene] Triblock Copolymer (Ph.D.)
4. Samik Gupta Preparation properties of Novel Poly(Phenylene Ether) based thermoplastic elastomers (Ph.D.)
5. Haimanti Datta Synthesis and Properties of polyacrylates and their nanocomposites by atom transfer radical polymerization (Ph.D.)

Fellow - Professional Bodies

1. Bhowmick, Anil Kumar (2002) *Awarded* - Indian National Academy of Engineering
2. Bhowmick, Anil Kumar (1988) *Awarded* - Indian Rubber Institute

Member - Editorial Board

1. Bhowmick, Anil Kumar (2007) *Member of the Editorial Board* - J. Natural Rubber Research
2. Bhowmick, Anil Kumar (2007) *Member of the Editorial Board* - J. Applied Polymer Science
3. Bhowmick, Anil Kumar (2007) *Member of the Editorial Board* - Iranian Polymer Journal
4. Bhowmick, Anil Kumar (2007) *Member of the Editorial Board* - Polymer and Polymer Composites
5. Bhowmick, Anil Kumar (2007) *Member of the Editorial Board* - J. Adhesion Science and Technology
6. Bhowmick, Anil Kumar (2007) *Member of the Editorial Board* - J. Materials Science
7. Bhowmick, Anil Kumar (2007) *Member of the Editorial Board* - Rubber Chemistry and Technology (USA)
8. Bhowmick, Anil Kumar (2007) *Member of the Editorial Board* - J. Materials Science--Letters
9. Tripathy, Deba Kumar (2005) *Editorial Board Member* - Journal of ISTE
10. Tripathy, Deba Kumar (2007) *Editorial Board* - Journal of Chhatishgarh Science & Technology

Fellowships

1. Khastgir, Dipak (2008) *Third World Academy of Science Associateship*
2. Nando, Golok Behari (2008) *INSA-SAS Bilateral Exchange Fellowship Programme of Government of India for visiting Slovakia for senior scientists*
3. Singha, Nikhil Kumar (2008) *INSA-DFG Fellowship*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	An approach for recycling of polymeric wastes	ISIRD, SRIC, IIT Kharagpur,	Rs. 1.00 Lakhs
2.	Block Copolymers in Emulsion	Asian Paints Limited	Rs. 10.00 Lakhs
3.	Development of Adv Polym Mat for Improved Electric/ESD Properties using Nano Add. for Space Appl.	ISRO, IIT Kharagpur cell,	Rs. 10.00 Lakhs
4.	Development of advanced polymeric materials for improved electrical/ESD properties using nano additives for space application	KCSTC, IIT Kharagpur	Rs. 2.00 Lakhs

5.	Development of Castor Oil Based polyurethane Nanocomposite for Biomedical Application	CSIR, New Delhi	Rs. 7.00 Lakhs
6.	Development of Electron Beam Irradiated Composites based on Multi-Walled Carbon Nanotubes in Polymer Matrices	DAE, Mumbai	Rs. 14.60 Lakhs
7.	Development of Jute based coated Textile	AICTE, New Delhi	Rs. 15.05 Lakhs
8.	Development of Modified Bituminous Binder using Waste Plastics	DST, West Bengal	Rs. 4.00 Lakhs
9.	Development of novel applications using electron beam irradiation : (i) improved extrudability of raw and waste polymers, (ii) adhesion improvement of	DAE	Rs. 17.67 Lakhs
10.	Development of special purpose heat resistant cable insulating compounds based on polyolefins and polydimethylsiloxane rubber blends using EB	DAE, BARC, Mumbai	Rs. 13.11 Lakhs
11.	Dynamically vulcanized blends (TPVs) based on polyolefin elastomer (POE) via peroxide crosslinking	CSIR, New Delhi	Rs. 9.56 Lakhs
12.	Electron beam curing of functional elastomers : A novel approach	DAE, BARC, Mumbai	Rs. 14.00 Lakhs
13.	Flexible EMI Shielding Materials from Conductive Rubber Based Composites	ARDB, Govt. of India	Rs. 14.07 Lakhs
14.	Frontier methods of preparation and characterization of nanocomposites	Bridgestone Corporation Japan,	Rs. 0.00 Lakhs)
15.	Fundamental Studies on Improvement of Ageing and Degradation Resistance of the Hydrogenated Nitrile Rubber	Lanxess, Germany	Rs. 35.00 Lakhs
16.	Fundamental Studies on Structure and Properties of Nanocomposite Rubbers for the Applications	Goodyear Tire and Rubber Company, Akron, Ohio, USA,	Rs. 24.00 Lakhs
17.	Impact resistance of sensor loop belts	Phoneix Yule	Rs. 2.50 Lakhs
18.	Influence of modification of nanotubes on properties of EVA nanocomposites	DRDO, HQ, New Delhi,	Rs. 4.24 Lakhs
19.	Nanotechnology and radiation processing of organic-inorganic hybrid materials based on thermoplastic elastomer	DST, New Delhi	Rs. .9.00 Lakhs
20.	Novel Microporous Polymeric Membranes for Medical Applications	DBT, New Delhi	Rs. 21.00 Lakhs
21.	Novel rubber based nanocomposites using nanofibers and nanographites : Development, structure and properties	DRDO,	Rs. 20.80 Lakhs
22.	Novel thermoplastic elastomers based on Epoxidized Natural Rubber and PP by dynamic crosslinking	DST, New Delhi	Rs. 10.32 Lakhs
23.	Novel thermoplastic elastomers based on silicone rubber by dynamic vulcanization	ISIRD, IIT Kharagpur	Rs. 3.00 Lakhs
24.	Polyurethane Foam for Radioactive Material Transportation Packages	Department of Atomic Energy,	Rs. 30.00 Lakhs
25.	Preparation of Equivalent standards for Rubber mix and Products	DRDL, Hyderabad	Rs. 4.00 Lakhs
26.	Quality improvement of mold releasing Siliconized Paper.	Phoenix-Yule, Kalyani	Rs. 0.00 Lakhs
27.	Rheological behaviour of nanocomposites based on biodegradable polymers	DST-JSPS	Rs. 2.00 Lakhs
28.	Segmented polyurethane (SPU) based nano composites from functionalized nanoclays with special reference to fire and flammability	ISRO, Bangalore	Rs. 6.00 Lakhs

29.	Segmented Polyurethane clay nano composites for better fire and flame resisitant properties.	ISRO, Bangalore	Rs. 10.76 Lakhs
30.	Study of Modification and Properties of Thiol Terminated Liquid Polymers by Chemical Reaction with Nanostructures Functional Materials	ISRO, Thiruvanthapuram,	Rs. 18.00 Lakhs
31.	Tack and Cured Adhesion of Brominated Isobutylene Paramethyl Styrene with other Rubbers	ExxonMobil, Baytown, Texas, USA,	Rs. 24.00 Lakhs
32.	Tailor-made graft copolymerization on elastomers using controlled radical polymerization	CSIR, New Delhi	Rs. 10.92 Lakhs
33.	Transition Metal Catalyzed Radical Polymerization of the Specialty Monomers	Department of Science & Technology,	Rs. 14.00 Lakhs

Consultancy Projects

1.	Ageing, failure analysis and life estimation of rubber seals of military aircraft	RCMA, Pune	Rs. 9.15 Lakhs
2.	Analysis and development of sensor loop in conveyor belt	Phoenix Yule Ltd.,	Rs. 4.00 Lakhs
3.	Characterization of Emulsion samples (CESP)	Asian Paints Limited	Rs. 0.50 Lakhs
4.	Characterization of PET Resin through IR and XRD Studies	South Asian Petrochemicals Ltd.,	Rs. 0.50 Lakhs
5.	Development of Conductive Compounds 1&2	AppaloTyre	Rs. 0.56 Lakhs
6.	Development of Elastomeric Bearings	Hindustan Aeronautics Limited (HAL), Foundry and Forge Division, Bangalore India,	Rs. 2.25 Lakhs
7.	Development of Fire Resistant Conveyor Belt Compound as per AS-S grade	Phoenix Yule Limited; 11/1, Sarat Bose road, Kolkata,	Rs. 3.57 Lakhs
8.	Development of fire resistant energy optimized belt	Phoenix Yule	Rs. 2.00 Lakhs
9.	Development of Flame resistant Cable compound	Serve Udyog LTD, New Delhi,	Rs. 2.50 Lakhs
10.	Development of Heat and Flame resistant conveyor belts as per AS-S specifications	PYL, Kalyani, W.Bengal,	Rs. 3.57 Lakhs
11.	Development of High Temperature Sealing Compound	NICCO Engineering Service LTD, Kolkata,	Rs. 1.50 Lakhs
12.	Development of Lead free Bonder Compound for Steel Cord Conveyoy Belt	Phoenix Yule Limited; 11/1, Sarat Bose road, Kolkata,	Rs. 3.60 Lakhs
13.	Development of rubber clad rolls used in the PLTCM and the ECL sections of the cold rolling mill complex	Tata Steel, Jamshedpur,	Rs. 7.30 Lakhs
14.	Development of Steel Cord Conveyor Belt Cover Compound with High Tensile Strength	Phoenix Yule LTD, Kalyani,	Rs. 2.77 Lakhs
15.	Development of Two Part Compound for conveyor belt	Phoenix Yule, Kalyani	Rs. 3.20 Lakhs
16.	Elimination of Pit Mark on Platen during Vulcanisation of FR Conveyor Belt	Phoenix Yule	Rs. 2.69 Lakhs
17.	Studies of the Technical Requirements of Elastomeric Inflatable Seals	IGCAR, Kalpakkam	Rs. 22.00 Lakhs
18.	Studies on the technical requirements of elastomeric inflatable seals	Indra Gandhi Centre for Atomic Research, Kalpakkam,	Rs. 18.00 Lakhs
19.	Use of Advanced Materials in Conveyor Belt Technology (Sanctioned)	Phoenix Yule Limited, Kalyani,	Rs. 0.00 Lakhs
20.	Utilization of waste rubber	Packwell Ind., New Delhi,	Rs. 1.60 Lakhs

Patents (filed / granted)

1. Development of speciality rigid polyurethane foam
2. Fire Retardant Intumescent High Density Rigid Polyurethane Foam for Specialty applications

Visits Abroad by Faculty Members

1. Khastgir, Dipak Visited and discussed on future collaborative work with Prof Mika Martin Head of the institute (Institute of Chemical Technology, Technicka5, Technical University, Prague Federal Republic of Czechoslovakia) December 2
2. Khastgir, Dipak Visit and discussion on future Collaborative work between RTC and IPF (Institute of Polymer Science (IPF) Dresden Germany) Decmber 8-10
3. Khastgir, Dipak Visit and discussion with Prof Dussen Berek for possible collaborative work (Slovak Polymer Institute, Bratslva) December 5-7
4. Singha, Nikhil Kumar To participate in Collaborative Research Program under INSA, New Delhi and DFG, Germany (Leibniz Institute For Polymer Research, Dresden, Germany) May-July, 2008
5. Singha, Nikhil Kumar To discuss about the Collaborative Research Program (Max Planck Institute, Golm, Berlin) July, 2008
6. Bhowmick, Anil Kumar To deliver invited lecture (Scrap to profit conference, Clemson University, Rubber Manufacturer Association, San Diego, California San Diego, California) May 6-8
7. Bhowmick, Anil Kumar To deliver invited lecture (2nd TPE Conference Rubber Division, ACS, Dearborm MI) May 1-2
8. Bhowmick, Anil Kumar To deliver invited lecture (8th International Symposium on Ionizing Radiation and Polymers (IRaP 2008), Brazil) October 12-14
9. Bhowmick, Anil Kumar To deliver invited lecture (Rubber Mini Expo and 174th Technical Meeting & Educational Opportunities, Louisville, Kentucky, USA) October 14-16
10. Nando, Golok Behari INSA-SAS Bilateral Exchange programme (Bratislava, Slovakia) December 3-23, 2008
11. Nando, Golok Behari To visit three universities and deliver seminar talks (Germany) December 7-15, 2008

Invited Lectures by Faculty Members

1. Development and Application of Conductive rubber based Composites *by* Khastgir, Dipak (Institute of Chemical Technology Tecnicka5, Technical University of Prague, Czech Republic)
2. Developments of Rubber Components *by* Chaki, Tapan Kumar (Naval Science and Technology Laboratory, Visakhapatnam)
3. Polymer Nanocomposites *by* Chaki, Tapan Kumar (Sikkim Manipal Institute of Technology, Sikkim)
4. Application of Reverse Engineering in Rubber Industry *by* Chaki, Tapan Kumar (Indian Rubber Institute, Kolkata)
5. Macromolecular Engineering by Controlled Radical Polymerization *by* Singha, Nikhil Kumar (IPF, Institute of Polymer Research, Dresden, Germany)
6. Fuctional Polymers by Controlled Radical Polymerization *by* Singha, Nikhil Kumar (Pidilite Industries Limited, Mumbai)
7. Rubbers used in conveyor belts *by* Chattopadhyay, Santanu (Phoenix Yule Ltd., Kalyani)
8. Training of senior and middle level Managers on basic Rubber science and Technology *by* Chattopadhyay, Santanu (PYL, Kalyani)

9. Preparation and Properties of Thermoplastic Polyurethane Nanocomposite by Melt Blending: Effect of O by Tripathy, Deba Kumar (Cochin, Kerala, India)
10. Synthesis and characterization of Polyurethanes from renewable resources and nano clay composites by Nando, Golok Behari (The Polymer Institute , Bratislava , Slovakia)
11. Tack of Brominated isobutylene-co-p-methylstyrene (BIMS) Rubber by Bhowmick, Anil Kumar (Exxonmobil, Houston, USA)
12. Thermoplastic Elastomeric Nanocomposites by Bhowmick, Anil Kumar (2nd TPE Conference Rubber Division, ACS, Dearborn MI)
13. Waste Rubber: Characterization, Properties, and Utilization in Virgin Rubbers and Plastics by Bhowmick, Anil Kumar (Scrap to profit conference, Clemson University, Rubber Manufacturer Association, San Diego, California San Diego, California.)
14. Polymer Nanocomposites- Some Recent Studies by Bhowmick, Anil Kumar (Exxonmobil, Linden, USA)
15. Electron Beam Crosslinked Gels Preparation, Characterization by Bhowmick, Anil Kumar (8th International Symposium on Ionizing Radiation and Polymers (IRaP 2008), Brazil)
16. Vulcanization and viscoelastic properties of nanocomposites based on natural rubber by Bhowmick, Anil Kumar (Rubber Mini Expo and 174th Technical Meeting & Educational Opportunities, Louisville, Kentucky, USA)
17. Morphology and Thermo-mechanical Response of Polyurethane Nanocomposites by Bhowmick, Anil Kumar (Rubber Mini Expo and 174th Technical Meeting & Educational Opportunities, Louisville, Kentucky, USA)
18. Nanotechnology in Rubber-Myth or Reality? by Bhowmick, Anil Kumar (Cochin University of Science and Technology, Cochin, India)
19. Application of Nanofillers in Rubber by Bhowmick, Anil Kumar (IRMRA, Mumbai)
20. Rubber Processing-An Overview by Bhowmick, Anil Kumar (Polymer Processing Society, Goa)
21. Preparation and Characterization of segmented Polyurethanes-Laponite Clay Nanocomposites by Nando, Golok Behari (Leibniz Institute for Polymerforschung, Dresden, Germany)
22. Nano material development and Rubber nano composites. by Nando, Golok Behari (Technical University, Chemnitz, Germany)
23. Effect of Compatibilizer on the microstructure thermal and mechanical Properties of EPR/PP hybrid Na by Nando, Golok Behari (Martin Luther University, Merseburg, Haale(Saale) Germany)
24. Synthesis and Characterization of Polyurethanes and lapopnite Clay nano composites by Nando, Golok Behari (Institute of Macromolecular Chemistry, Prague, Czech Republic)
25. Polymer- the Contemporary issues and recent developments by Nando, Golok Behari (Thapar University ,Patiala, Punjab)

Books Published

1. Anil K. Bhowmick Current Topics of Elastomer Research *published by* Taylor and Francis (2008)

Seminars, Conferences and Workshops Organised

1. India Rubber Expo 2009

RURAL DEVELOPMENT CENTRE

HEAD : Professor Pratap Bhanu Singh Bhadoria

FACULTY

Associate Professors

Bhowmick, Pradip Kumar

Ph.D., D.Litt., Tribal and Rural Development

Lahiri, Debabrata

Ph.D. (BHU, Varanasi), Agricultural Economics, Transfer of Technology, Transfer of Technology

Mahapatra, Subhash Chandra

Ph.D. (IIT Kharagpur), Agronomy, Development and Transfer of Rural Technology

Brief Description of on-going activities

1. **Teaching** : 2 courses (RD30002 and RD30004) at undergraduate level as professional breadth
2. **Research and Development** :
 - i) Essential oil production technology
 - ii) Fish feed production from non-conventional sources
3. **Extension** : Technology transfer through Rural Tecechnology Action Group (RuTAG-EI)

Thrust Areas

1. Development and Transfer of Technology, Tribal Development

New Acquisitions

1. Rural Technology Action Group- Eastern India (RuTAG-EI)

Member - Editorial Board

1. Bhowmick, Pradip Kumar (2006) *Managing Editor*
- Man and Life
2. Bhowmick, Pradip Kumar (2006) *Editorial Board Member*
- Indian Journal of Millennium Development Studies
3. Bhowmick, Pradip Kumar (2003) *Managing Editor*
- Man and Life
4. Bhowmick, Pradip Kumar (2006) *Editorial Board Member*
- Indian Journal of Millennium Development Studies
5. Lahiri, Debabrata (2006) *Member*
- Indian Journal of Agricultural Marketing

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Appriaisal on NREGA	Ministry of Rural Development	Rs. 7.00 Lakhs
2.	Demonstration of Technologies for Green House Production of Roses and Extraction of Rose Oil	Science and Society Division, Department of Science & Technology, Govt. of India, New Delhi	Rs. 17.65 Lakhs

Visits Abroad by Faculty Members

1. Bhowmick, Pradip Kumar For Conducting Ph.D. Viva (Dhaka University, Department of Anthropology) 4 Days

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Design and Development of a Telecom Convergence Switch	Santech Commn. Inc., Kolkata	Rs. 100.00 Lakhs
2.	Design and Development of Turbo Convolutional and Product Codes'	DEAL, DRDO,	Rs. 9.20 Lakhs

8. Federalism in India *by* Prof. Vijay Kumar (National Law School of India University Bangalore)
9. Information Technology Law *by* Prof. V.C. Vivekanandan (NALSAR Hyderabad)
10. IP as a Career Option *by* Dr. Vidya Sagar (Remfry & Sagar)
11. Patent Drafting *by* Mr. Bhupathi Raju (Fox & Mandal, Bangalore)

Member - Editorial Board

1. Dube, Indrajit (2009) *Editor*
- International Journal on Corporate Governance
2. Raju, K. D. (2008) *Member*
- Indian Journal Of Intellectual Property

Awards & Honours

1. Shreya, Matilal (2008) *CALI Award For Future Excellence*

Fellowships

1. Shreya, Matilal (2008) *Fulbright Fellowship*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A Status Report of Service Conditions, Benefits and Hazards of Working Women in West Bengal and Karnataka	Ministry of Labour and Employment,	Rs. 3.03 Lakhs
2.	Agricultural biotech invention resource	SRIC IIT	Rs. 3.00 Lakhs
3.	Competition Policy & Law and Intellectual Property Law	Competition Commission of India and World Bank	Rs. 6.30 Lakhs
4.	Corporate Governance in SMEs	National Foundation for Corporate Governance	Rs. 6.50 Lakhs
5.	Disability and Victimization of Women	Ministry of Social Justice and Empowerment, x	Rs. 6.50 Lakhs
6.	IICA Hub	Ministry of Corporate Affair,	Rs. 40.00 Lakhs
7.	Microsoft Scholars Program	Microsoft Corporation India Private Limited	Rs. 65.00 Lakhs
8.	Mining and Mapping of Bioresource based Traditional Knowledge in Paschim Medinipur (West Midnapore), West Bengal.	ISIRD IIT Kharagpur	Rs. 5.00 Lakhs
9.	Protection of IP through the instrument of Criminal Law	MHRD, New Delhi	Rs. 8.50 Lakhs
10.	Role of flavonoids in disease response in maize	DST, New Delhi	Rs. 15.00 Lakhs
11.	Study of the mechanism of price control of drugs in selected countries	Department of Pharmaceuticals, Ministry of Chemicals and Fertilisers,	Rs. 6.00 Lakhs
12.	Traditional Handicrafts in West Bengal and Intellectual Property Protection Strategies	Ministry of Textiles	Rs. 9.50 Lakhs
13.	Women in BPO Sector	ISIRD, IIT Kharagpur	Rs. 1.01 Lakhs
14.	Women Scientist Scholarship Scheme (DST)	TIFAC-PFC	Rs. 60.00 Lakhs

Consultancy Projects

1. Develop Knowledge Management for IICA
Ministry of Corporate Affair
Rs. 6.48 Lakhs
2. Geographical Indications in Orissa
Textiles Department, Government of Orissa,
Rs. 23.00 Lakhs

3.	Manpower and Infrastructure requirement of IICA	Ministry of Corporate Affair	Rs. 6.48 Lakhs
4.	Review and Finalizing the Governance Structure of IICA	Ministry of Corporate Affair	Rs. 3.24 Lakhs
5.	Role and Functions of School and Center of IICA	Ministry of Corporate Affair,	Rs. 15.06 Lakhs
6.	Senior Legal Consultant	Khaitan & Partners	Rs. 3.00 Lakhs

Visits Abroad by Faculty Members

1. Chugh, Archana Conference paper presentation Oral & poster both (UK, University of Edinburgh) 5 days

Invited Lectures by Faculty Members

1. Property Law *by* Nandy, Sujit Kumar (National University of Juridical Sciences, Kolkata)
2. Civil Procedure, Art of writing orders and judgements *by* Nandy, Sujit Kumar (State Judicial Academy, Kolkata)

Books Published

1. Dipa Dube Crimes against Women, Halsbury Annotated Statutes of India *published by* Lexis Nexis Butterworths (2009)
2. Dipa Dube Rape Laws in India *published by* Lexis Nexis Butterworths (2008)
3. Indrajit Dube Environmental Jurisprudence *published by* Lexis Nexis Butterworth (2007)
4. Indrajit Dube Corporate Governance *published by* Lexis Nexis Butterworth (2008)
5. KD Raju World Trade Organization Agreement on Anti-dumping: A GATT/WTO and Indian Jurisprudence *published by* Kluwer Law International (2008)

Seminars, Conferences and Workshops Organised

1. Academia Industry Partnership
2. Industry Academia Summit

Short-Term Courses, Training Programmes and Workshops organized

1. AICTE Sponsored Induction Programme on IPR for Engineering College Teachers (15 days)
2. Capacity Building Programme on Geographical Indications and Designs for Orissa Government Officials (One Week)
3. DST-TIFAC Women Scientists Scholarship Scheme in IPR (2008-2009)

RANBIR AND CHITRA GUPTA SCHOOL OF INFRASTRUCTURE DESIGN AND MANAGEMENT

HEAD : Professor Kusam Sudhakar Reddy

New Academic Programmes

The School currently offers one M.Tech programme in "Infrastructure Design and Management". The first batch of M.Tech students has been admitted during the 2008-2009 academic year

Brief Description of on-going activities

The school was inaugurated by Padma Bhushan Professor Lord Shusantha Kumar Bhattacharyya of Warwick Manufacturing group on 18th of August 2008 (Institute Foundation Day). An advisory Council comprising eminent experts from different fields as external experts has been constituted. The first meeting of the advisory council meeting was held on 29th March 2009

Thrust Areas

1. **Transportation Engineering** : Planning, design, operation and management of highways, airport and seaport infrastructure
2. **Environmental Engineering** : Planning, design, operation and management of water supply and waste management systems, Environmental Impact Assessment
3. **Facilities Infrastructure** : Urban infrastructure planning and design, Facility programming and specialized building design, building automation systems design, building management systems, regional infrastructure planning and construction
4. **Power Systems** : Planning, design, operation and management of Thermal, hydel and Nuclear Power Plants, Renewable Power Plants, Power generation, transmission and distribution, power system planning and reliability
5. Infrastructure Project management Infrastructure Financing and Infrastructure Regulatory Issues

New Acquisitions

1. The school has acquired 10 desk top computers, PRIMAVERA and MX Roads softwares

SCHOOL OF INFORMATION TECHNOLOGY

HEAD : Professor Indranil Sen Gupta

FACULTY

Associate Professors

Ghosh, Soumya Kanti	Ph.D., Network Security, Spatial Database
Gupta, Arobinda	Ph.D. (Iowa), Distributed Systems, Ad Hoc Networks
Sural, Shamik	Ph.D., Information Security, Image and Video Processing

Assistant Professors

Misra, Sudip	Ph.D. (Carleton University, Canada), Computer Networks, Software Engineering
Samanta, Debasis	Ph.D. (IIT Kharagpur), Human Computer Interaction, Information System Design, Software Testing, Low Power VLSI Design
Sreenivasa Rao, Krothapalli	Ph.D. (IIT Madras), Speech Processing, Multimedia Signal Processing, Pattern Recognition, Neural Networks

Faculty Promotions

Dr, Soumya Kanti Ghosh	Associate Professor
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Brief Description of on-going activities

Computer and Communication Networks: Development of architectures, protocols and algorithms for mobile ad hoc networks, vehicular ad hoc networks, wireless sensor networks and wireless mesh networks. Geographical Information System: Enterprise-wide GIS database development and its policies and protocols to make it accessible as platform independent and support for decision making are under research and development. Human Computer Interaction: Development of adaptive user interfaces and automatic usability evaluations with simulated human user. Interface in Indian languages are under development to support physically disabled people. Speech Processing: Researchers working in this area are focusing on characterization and incorporation of emotions in speech, speaker recognition system for handheld devices in varying background environments and development of Text-to-Speech (TTS) system for Indian languages. Network Security: Various areas of network security are being explored, like penetrating testing, development of new algorithms for cryptography, their efficient and attack-resistant hardware implementation etc. Systems Security: Survivable information system architecture to tolerant with potential information warfare attacks is under development. Such systems are typically characterized by the presence of a large repository of sensitive data in a distributed environment. The architecture takes into account the presence of multiple operating systems and database platforms, their known and potential vulnerabilities as well as possibilities of simultaneous attacks from adversaries. It will be developed as a generic model which can be used to build specific information systems in a number of application domains like e-governance, finance and insurance, education, etc.

Thrust Areas

Distributed computing, wireless ad hoc and sensor networks, ubiquitous computing, network security, database systems and data mining, systems security, human computer interaction, geographical information system, speech processing, computer vision, VLSI design.

International Collaborations

1. With Prof. Sakti Pramanik, Michigan State University, USA
2. With Prof. V. Atluri, Rutgers University, USA
3. With Prof. M. S. Obaidat, Monmouth University, USA
4. With Prof. I. Woungang, Ryerson University, Canada
5. With Prof. B. J. Oommen, Carleton University, Canada

Lectures by Visiting Experts

1. Advanced Topics on Speech Processing by Dr. Samudra Vijaya (TIFR, Mumbai)
2. Advanced Topics on Speech Processing by Mr. S. P. Kishore (IIIT Hyderabad)
3. The Role Mining Problem - A Formal Perspective by Prof. V. Atluri (Rutgers University)
4. Indexing and Querying Multi-Media Data in Hybrid Data Spaces by Prof. Sakti Pramanik (Michigan State University)

Doctoral and MS Degrees Awarded

1. Rajiv Misra Domination algorithms for lifetime problems in self-organizing ad hoc and sensor networks (Ph.D.)
2. Samit Bhattacharaya Performance Modeling of Soft Keyboard based Visual Scanning for Physically Challenged Users (Ph.D.)
3. Suprio Das A Fuzzy System for Impact Analysis on TV Audience by Billboard Advertising in Soccer Matches (MS)
4. Syamantak Das A Novel Technique for Resistance Extraction and Current Density Profiling of Lateral Power arrays (MS)
5. Alokesh Chattaopadhyay An energy aware routing protocol for mobile ad hoc networks (MS)
6. Aditi Roy Modeling and Extraction of Views and States from Echocardiogram Video (MS)
7. Amlan Kundu Detection of Credit Card Fraud and Database Intrusion using Sequence Alignment (MS)

Member - Editorial Board

1. Misra, Sudip (2007) *Associate Editor*
- EURASIP Journal on Wireless Communications and Networking
2. Misra, Sudip (2008) *Editorial Board Member*
- Journal of Computer Systems, Networks and Communications
3. Misra, Sudip (2009) *Editorial Review Board Member*
- International Journal of Ad Hoc and Ubiquitous Computing
4. Misra, Sudip (2007) *Associate Editor*
- International Journal of Communication Systems
5. Misra, Sudip (2007) *Editorial Board Member*
- International Journal of Automation and Computing
6. Misra, Sudip (2007) *Associate Editor*
- Security and Communication Networks
7. Misra, Sudip (2009) *Editorial Board Member*
- International Journal of Theoretical and Applied Computer Sciences
8. Misra, Sudip (2007) *Editor-in-Chief*
- International Journal of Information and Coding Theory
9. Misra, Sudip (2008) *Editorial Board Member*
- IET Communications (formerly, IEE Proceedings on Communications)
10. Misra, Sudip (2009) *Editorial Board Member*
- International Journal of Internet Protocol Technology
11. Misra, Sudip (2007) *Editor-in-Chief*
- International Journal of Communication Networks and Distributed Systems
12. Misra, Sudip (2007) *Editorial Board Member*
- Computers & Electrical Engineering Journal
13. Misra, Sudip (2007) *Associate Editor*
- Telecommunication Systems Journal
14. Misra, Sudip (2007) *Editorial Board Member*
- Journal of High Speed Networks

15. Samanta, Debasis (2008) *Honorary Member of the Editorial Board*
- International Journal of BioSciences and Technology
16. Samanta, Debasis (2008) *Member of the Editorial Board*
- ICFAI University Journal of Information Technology
17. Samanta, Debasis (2008) *Member of the Editorial Board*
- International Journal of Communication Networks and Distributed Systems (IJCNDS),
18. Sreenivasa Rao, Krothapalli (2009) *Member*
- International Journal of BioSciences and Technology
19. Sreenivasa Rao, Krothapalli (2009) *Member*
- The Open Signal Processing Journal
20. Sreenivasa Rao, Krothapalli (2009) *Member*
- International Journal of UWB Communications and Systems
21. Sural, Shamik (2008) *Member, Editorial Board*
- International Journal of Data Mining Modelling and Management
22. Sural, Shamik (2008) *Member, Editorial Review Board*
- International Journal of Applied Metaheuristic Computing
23. Sural, Shamik (2008) *Member, Editorial Board*
- International Journal of Artificial Intelligence and Soft Computing

Awards & Honours

1. Sural, Shamik (2009) *Alexander von Humboldt Fellowship*
2. Misra, Sudip (2008) *The National Academy of Sciences, India Swarna Jayanti Puraskar (Golden Jubilee Award) 2008.*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	An Integeated Framework for Testing Object-Oriented Programs	Department of Science and Technology (DST), Govt. of India	Rs. 10.00 Lakhs
2.	Bio-inspired and nature-inspired solutions in wireless ad hoc and sensor networks	Department of Science and Technology,	Rs. 7.00 Lakhs
3.	Characterization and incorporation of emotions in speech	ISIRD, IIT Kharagpur	Rs. 3.00 Lakhs
4.	Content-Based Information Retrieval from Multimedia Databases	IIT Kharagpur	Rs. 2.88 Lakhs
5.	Design & Development of Models & Tools for Vulnerability Assessment of Embedded Systems	Ministry of Defence, Government of India	Rs. 49.20 Lakhs
6.	Development of an Enterprise GIS based on open GIS standards	Department of Science & Technology (DST), New Delhi,	Rs. 40.50 Lakhs
7.	Development of Multimodal User Interface to Internet for Common People in India	DIT, New Delhi	Rs. 58.00 Lakhs
8.	Development of Spatio-temporal Access Control Models	Dept. of Science & Technology, Govt. of India	Rs. 16.18 Lakhs
9.	Development of Text-to-Speech (TTS) system for Indian languages	Department of Information Technology,	Rs. 35.66 Lakhs
10.	DSM-Aware Synthesis of Low Power Circuits	Intel, USA	Rs. 10.00 Lakhs
11.	DSM/UDSM-Aware Synthesis for Low-Power High-Performance CMOS VLSI Circuits	CSIR, New Delhi	Rs. 14.00 Lakhs
12.	Efficient Index-supported Multimedia Search on the Internet	Dept. of Science & Technology	Rs. 6.38 Lakhs

13.	Enhanced SANYOG: A Portable Communication Tool for the Speech and Neuro Motor Impaired People	Media Lab Asia	Rs. 71.00 Lakhs
14.	Handling Anomalous Behaviors and Threats in Vehicular Networks	GM India Science Lab	Rs. 16.20 Lakhs
15.	Microsoft Lab Setup	Microsoft Corp. USA	Rs. 35.00 Lakhs
16.	Modeling and Management of Dynamic Multimedia Objects	Dept. of Science and Technology, Govt. of India,	Rs. 18.00 Lakhs
17.	Online Authentication Checking System with IRIS Biometric	Indian Institute of Technology Kharagpur (ISIRD Scheme)	Rs. 03.00 Lakhs
18.	Properties of High Dimensional Euclidean Space and their Applications in Approximate Nearest Neighbor Search on Multimedia Databases	Department of Science and Technology, Government of India	Rs. 3.30 Lakhs
19.	Shruti : A Vernacular Speech Recognition System	Media Lab Asia	Rs. 0.00 Lakhs
20.	Speaker recognition system for handheld devices in varying background environments	Department of Science and Technology	Rs. 23.03 Lakhs
21.	Survivable Information System Architecture with Intrusion tolerance, Containment and Recovery in Distributed Environment	Dept. of Information Technology, Govt. of India,	Rs. 55.00 Lakhs

Consultancy Projects

1.	Design & Development of a Penetration Testing And Security Assessment Tool	Ministry of Defence Government of India	Rs. 49.00 Lakhs
2.	Development of parameterized templates and R-extraction tools	National Semiconductor Corporation, Santa Clara, USA,	Rs. 153.00 Lakhs
3.	GM-CRL, IIT Kharagpur - VANET Communication & Security Group	General Motors	Rs. 500.00 Lakhs
4.	Placement and Routing of analog test Structures	National Semiconductor Corporation, Santa Clara, USA,	Rs. 46.00 Lakhs

Visits Abroad by Faculty Members

1.	Sural, Shamik	To attend conference (Turin, Italy,) 01/09/2008-06/09/2008
2.	Sural, Shamik	To attend conference (Naples. Italy,) 07/09/2008-10/09/2008
3.	Gupta, Arobinda	Present Paper (Dunedin, New Zealand,) Dec 1-5,
4.	Samanta, Debasis	IEEE Region 10 Meet (Hanoi, Vietnam,) 27 February - 01 March, 2008
5.	Ghosh, Soumya Kanti	Invited talk at OGC (Open Geospatial Consortium) Meet (Atlanta, USA,) 15-19 September 2008

Invited Lectures by Faculty Members

1.	Misra, Sudip (National Conference on Computer Networks (NCCN), Bangalore)
2.	Misra, Sudip (Fourth International Conference on Wireless Communication and Sensor Networks, Allahabad, UP)
3.	Misra, Sudip (National Conference on Wireless Communication and Applications, Surat, Gujarat)
4.	Misra, Sudip (International Conference on Computing, Communication and Networking (ICCCN-2008), Karur, Tamil Nadu)
5.	Misra, Sudip (National Conference on Computational Learning Theory (NCLT-2008), Bhubaneswar, Orissa)
6.	Misra, Sudip (Second International Conference on Resource Utilization and Intelligent Systems (INCRUIS 2008), Erode, Tamil Nadu)

SCHOOL OF MEDICAL SCIENCE & TECHNOLOGY

HEAD : Professor Ajoy Kumar Ray

FACULTY

Assistant Professors

Bhattacharya, Sangeeta Das	MD (Johns Hopkins University), Teaching Methods in Evidence Based Medicine, Epidemiology of Pediatric HIV in West Bengal, Use of Electronic Medical Records in the Management of Chronic Disease, Improving College Health in the Indian Scenario
Chakraborty, Chandan	Ph.D. (IIT Kharagpur), Biostatistics, Pattern Classification Techniques for Automated Diagnostics, Histopathological and Molecular Image Processing, Epidemiological study
Chatterjee, Jyotirmoy	Ph.D., Macro-Micro-Molecular Imaging and Analysis for Early Diagnosis of Precancer-Cancer and Wounds, Genetics and Molecular Profiling of Precancer-Cancer and Wounds, Wound Healing and Tissue Engineering, Radiation Hormesis
Chaudhury, Koel	Ph.D. (Delhi), Oxidative Stress and Infertility, Proteomics and Reproductive Health
Das, Soumen	Ph.D. (IIT Kharagpur), BioMEMS and Biotransducers, Microfluidic Devices, Characterization of Electrophysiological Parameters of Biological Species, Medical Instrumentation
Dhara, Santanu	Ph.D. (IIT Kharagpur), Biomaterials and Tissue Engineering, Fabrication and Surface Modification
Mandal, Mahitosh	Ph.D. (Jadavpur University), Cancer Biology, Signal Transduction, Apoptosis, Angiogenesis
Manjunatha M	Ph.D. (IIT Madras), Bio-Medical Instrumentation and Biosensors, Bio-signal Processing and Medical Imaging, Functional Electrical Stimulation of Nerve and Muscle, Neuro-Imaging, Retinal / Neural Prosthesis, Visual Evoked Response
Mitra, Analava	Ph.D. (IIT Kharagpur), Diabetology and Herbal Medicine, Nutraceuticals

Faculty Appointments

Dr. Chandan Chakraborty Assistant Professor

Faculty Promotions

Dr. Chandan Chakraborty Assistant Professor

Brief Description of on-going activities

1. Development of research laboratories at new SMST complex
2. Creation of micro / nano fabrication facility for basic and applied medical research
3. Development of micro-fluidic Biochips / Bio-MEMS for medical application
4. Development of single molecule DNA template nano-assembly and manipulation techniques
5. Design and Development of FPGA based artificial retinal chip
6. Laser speckle imaging of blood-flow in microcirculation
7. Development of micro-CT for pre-clinical investigation
8. Dynamics of Cardio-vascular responses to space flight
9. Development of statistical analyzer and disease pattern recognizer for Oral Pre-cancer and cancer
10. Design of an intelligent diagnostic tool through the extraction of diagnostic rules for asthma

11. Integrated macro and micro-imaging on various healing and non-healing wounds including oral and breast precancer and cancer for their early characterization through image processing and analysis as well as integration with clinico-epidemiological features
12. Physico-chemical characterization of natural wound healing agents for the development of wound dressing technology
13. Development of detailed database on respiratory rhythms for identifying their temporal and spatial characteristics in health and disease
14. Identification of mammalian biomarkers under low dose radiation biology
15. Characterization of natural materials for wound healing and development of wound healing technology
16. Development of biodegradable scaffold for tissue engineering and wound research
17. In vitro screening of anti-diabetes molecules
18. Design of a three dimensional scaffold and drug delivery system in arthritic hip joint
19. Design, Synthesis and reactivity of beta-lactum based hybrid molecules
20. Health Food and its applications
21. Signal Transduction
22. Molecular Tergated Therapy
23. Cancer Biomarker
24. New Cancer Drug Development
25. Neutraceuticals and Herbal medicine

Thrust Areas

1. Medical Imaging and Image Processing
2. Medical Instrumentation
3. Bio-MEMS
4. Medical Statistics and Pattern Recognition
5. Medical Expert System
6. Tissue Engineering
7. Bio-Materials
8. Drug Design
9. Cancer Biology
10. Signal Transduction
11. Proteomics and reproductive health
12. Diabetology and Herbal Medicine
13. Bio-Mechanics
14. Genetics and Molecular Profiling of Pre-cancer-Cancer and Wounds
15. Internal Medicine
16. Pediatrics HIV

New Acquisitions

1. Microscope
2. HPLC
3. GEL-electrophoresis
4. ELISA
5. Ultrasound
6. Antigen Retrieval system

Fellow - Professional Bodies

- | | |
|--------------------------------------|---|
| 1. Mitra, Analava (1988) | <i>Awarded</i>) - College of Chest Physicians -Delhi |
| 2. Bhattacharya, Sangeeta Das (2004) | <i>Fellow</i> - American Academy of Pediatrics |

Member - Editorial Board

1. Dhara, Santanu (2009) *Editorial Board Member*
- International Journal of BioSciences and Technology
2. Mandal, Mahitosh (2008) *Editorial Board Members*
- International Journal of BioSciences and Technology
3. Mitra, Analava (2009) *Reviewer*
- Journal of institution of Engineers
4. Mitra, Analava (2007) *Member Editorial Board*
- Studies in Ethno-medicine
5. Mitra, Analava (2007) *Reviewer*
- Journal of Association of Food Scientists and Technologists (India)
6. Mitra, Analava (2009) *Reviewer*
- African Journal Of Biochemistry Research
7. Mitra, Analava (2007) *Reviewer*
- International Journal of Human Ecology
8. Mitra, Analava (2008) *Member Editorial Board*
- International Journal of BioSciences and Technology
9. Mitra, Analava (2007) *Reviewer*
- Anthropology Today: Trends, Scope And Applications
10. Mitra, Analava (2008) *Member Editorial Board*
- Journal of Medicinal Plants Research
11. Mitra, Analava (2007) *Reviewer*
- Journal of Clinical and Diagnostic Research
12. Mitra, Analava (2009) *Reviewer*
- International Journal of Food Science and Technology
13. Mitra, Analava (2009) *Reviewer*
- International journal of Library Science

Awards & Honours

1. Manjunatha M (2008) *BEST PAPER AWARD by International Conference on Emerging Trends in Engineering & Technology, IEEE-Computer Society, Nagpur.*
2. Mandal, Mahitosh (2008) *Best Poster Award ,International Conference,KIIT University, Bhubaneswar, Orissa, INDIA.*
3. Chaudhury, Koel (2009) *Dr. CS Dawn Prize for best paper presentation in the category of Modern Technology in Womens Health*
4. Chakraborty, Chandan (2007) *ISCA Young Scientist Award in the 94th Indian Science Congress*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	A Computer-Aided Diagnostic System for Bronchial Asthma using a Clinico-Epidemiological Knowledgebase	SRIC, IIT Kharagpur	Rs. 1.00 Lakhs
2.	Characterization of Indian Honey & its Integration with wound Dressing System	SRIC, IIT-Kharagpur	Rs. 3.00 Lakhs
3.	Comparative Evaluation Of Anti-diabetic Potential of Two Indian Medicinal Plants in Vivo	IIT Kharagpur	Rs. 4.40 Lakhs
4.	Design & Development of a Distributed Database System, Statistical Analyser and Disease Pattern Recogniser for Preventive & Promotive Healthcare in Ru	DIT, Govt. of India	Rs. 25.68 Lakhs
5.	Design Development and Feasibility Study of a Versatile Low Cost FES for Hemiplegics	Ministry of Social Justice and Empowerment	Rs. 20.00 Lakhs

6.	Design, analysis and optimization of navigation grade silicon based MEMS accelerometer	ISRO-KCSTC Cell	Rs. 3.00 Lakhs
7.	Determining the Mechanisms of S100A7 (Psoriasin) in Mediating Anoikis Resistance and Tumor Progression in Squamous Cell Carcinoma of the Oral Cavi	SRIC, IIT, Kharagpur	Rs. 3.00 Lakhs
8.	Development of a Medical Expert System for Screening & Diagnosis of Coronary Artery Diseases	(VECC Kolkata, DAE Govt. Of India,	Rs. 43.20 Lakhs
9.	Development of a Medical Expert System for screening & Diagnosis of Coronary Artery Diseases	VECC, Kolkata.	Rs. 43.20 Lakhs
10.	Development of a MEMS based assay for bio-chemical diagnostics	ISRO, IIT Kharagpur Cell,	Rs. 05.00 Lakhs
11.	Development of a Statistical Analyzer based Computer Aided Diagnostic (CAD) System for Asthma	SERC Fast Track Scheme for Young Scientist, DST, Govt. of India,	Rs. 7.50 Lakhs
12.	Development of MEMS based accelerometers for aerospace applications	NPMAS, ADA, Bangalore,	Rs. 448.90 Lakhs
13.	Development of novel nano-bio composite osteogenic matrices for cell based bone tissue engineering.	DRDO	Rs. 21.60 Lakhs
14.	Development of Scaffold for Tissue Engineering	SRIC, IIT Kharagpur	Rs. 5.00 Lakhs
15.	Feasibility study of MEMS based biochip platform for characterisation of biospecies	IIT Kharagpur	Rs. 5.00 Lakhs
16.	Impact of Follicular Fluid and IVF Media-Generated Oxidative Stress on Oocyte Maturation, Fertilization and Subsequent Embryo Development	Dept. of Biotechnology	Rs. 9.26 Lakhs
17.	Laser Speckle Imaging of Bloodflow in Microcirculation	SRIC, IIT Kharagpur	Rs. 5.00 Lakhs
18.	Medical Image Analysis and MEMS based flow sensor development (MIA)	Texas Instruments India	Rs. 92.00 Lakhs
19.	MEMS based micropropulsion devices for microsatellite programme	ISRO, Bangalore	Rs. 122.96 Lakhs
20.	Net Shape Fabrication of Dental Crown using Computer Numerical Control (CNC) Machining of Green Ceramic Compacts	DBT, India	Rs. 43.02 Lakhs
21.	Purification and characterization of azurin from Pseudomonas aeruginosa 2453& its application in human breast cancer cells	AICTE, New Delhi	Rs. 0.00 Lakhs
22.	Synthesis, development and invitro characterization of bio-inert Ytria / Ceria coated / stabilized ZrO2 toughened Alumina composites for biomedical appl	DBT, India	Rs. 32.60 Lakhs
23.	To investigate the role of matrix metalloproteinases & tissue inhibitors of metalloproteinases in follicular fluid of women with endometriosis	WB-DST	Rs. 7.68 Lakhs
24.	Understanding the impact of pediatric HIV-1 infection on childhood imunization coverage in WB	IIT Kharagpur	Rs. 3.00 Lakhs
25.	Web enabled medical information access using handheld devices in a wireless environment for telemedicine applicaiton	Ministry of Gol Communications and Information Technology	Rs. 62.10 Lakhs

Patents (filed / granted)

1. Cellular geometry features of epithelial cells in FNAC samples of benign and malignant breast lesions
2. Oral Mucosa chacterization at tissue level and cellular level for early detection of oral cancer

Visits Abroad by Faculty Members

1. Mandal, Mahitosh Visiting Assistant Professor (Virginia Commonwealth University, Virginia, USA) 10th May- 9th July

Invited Lectures by Faculty Members

1. Statistical Concepts for Pattern Recognition & Image Processing *by* Chakraborty, Chandan (National Conference titled 'Indian Conference on Computer Vision, Graphics, Image & Video Processing- ICCVGIVP 2009' at Nagpur.)
2. Data classification techniques in bioinformatics *by* Chakraborty, Chandan (Workshop on Bioinformatics, Biotechnology Dept., IIT Kharagour)
3. Biological Applications of Computer *by* Mitra, Analava (MITS Raygadah)
4. Safe Mining : Methods, Design and Technology- Medical aspects *by* Mitra, Analava (IIT Kharagpur)
5. OCT in Characterization of wounds *by* Chatterjee, Jyotirmoy (VECC-DAE, Kolkata)
6. An integrated approach & molecular imaging for wound repair through tissue regeneration *by* Chatterjee, Jyotirmoy (Indo-Australian Discussion Meeting on Biomedical Devices at New Delhi-Invited by DBT, New Delhi)
7. Development of Medical Expert System *by* Chakraborty, Chandan (Variable Energy Cyclotron Center (VECC) Kolkata)
8. "Rheological Characterization of Colloidal Slurries" *by* Dhara, Santanu (Short Term Course on Advanced Ceramics Processing & Characterization organized by NIT, Rourkela)
9. "Advanced Processing of Ceramics via Colloidal Slurry" *by* Dhara, Santanu (NIT Rourkela)
10. "Development of Bioactive Scaffold for Tissue Engineering" *by* Dhara, Santanu (Indo-Australian Workshop Meeting, New Delhi)
11. Advanced Shape Forming of Ceramics *by* Dhara, Santanu (CGCRI, Kolkata)
12. Retinal Prosthesis *by* Manjunatha M (Electrical Engineering Department, IIT-Bombay)
13. Medical Image Processing based on DSP and FPGA *by* Manjunatha M (VECC-Kolkata (Societal applications of Computer))
14. S100A7 (Psoriasis) Mediates Anoikis Resistance and Tumor Progression in Squamous Cell Carcinoma *by* Mandal, Mahitosh (KIIT University, Bhubaneswar, Orissa, INDIA)
15. The molecular effect of ZD6474, a dual tyrosine kinase inhibitor of EGFR and VEGFR on breast cancer *by* Mandal, Mahitosh (Madras, IIT, India)
16. Threshold level of ROS in follicular fluid of women undergoing IVF *by* Chaudhury, Koel (IVF and Infertility Research Centre, Ranchi)

Seminars, Conferences and Workshops Organised

1. National Workshop on Technology in Health Care: Prospects and Challenges
2. National Workshop on Technology in healthcare: Prospects and challenges
3. Recent trends & Techniques in medical imaging & image analysis (QIP)

Short-Term Courses, Training Programmes and Workshops organized

1. Recent trends & Techniques in medical imaging & image analysis (November 3-8, 2008)
2. Recent Trends and techniques in Medical Imaging (5 days)

SCHOOL OF WATER RESOURCES

HEAD : Professor Sudhindra Nath Panda

FACULTY

Faculty Appointments

Prof. M. K. Ramesh

Adjunct Professor

New Academic Programmes

The M. Tech. programme in Water Management aims at providing integrated and interdisciplinary approaches, involving hydrological, biophysical, chemical, economic, institutional, legal, and policy-planning aspects, to solve water-related challenges in agriculture, industry, and domestic sectors. The programme is designed for professionals and fresh graduates with Agricultural, Civil, Mechanical, and Mining engineering background. It aims to develop knowledge, insight and skills required to design, implement, and evaluate water management policies and strategies for making judicious use of water and achieving effective governance of water resources. The programme consists of foundation, specialization, and integration phases. The foundation phase provides latest insights, context, and concepts in integrated water and environment management issues. In the specialization phase, the students choose to make in-depth study either in Rural and Urban Water Management or Agricultural Water Management. In the integration phase, the students are challenged to bring together and apply their cumulative learning process in the form of an M. Tech. thesis.

Brief Description of on-going activities

Collaborative research project with CORAL on Land use and Land Cover (LULC) Dynamics in Relation to Human Dimensions and Climate in Mahanadi River Basin, Orissa, funded by NRSC, Hyderabad, 2009-2012

Thrust Areas

1. Management of Excess Water
 - i) Rainwater Conservation and Reuse
 - ii) Managed Aquifer Recharge
 - iii) Agricultural Land Drainage
 - iv) Wastewater Management

New Acquisitions

1. Softwares such as ERDAS for remote sensing and MIKE BASIN for basin planning have been procured.

International Collaborations

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

Lectures by Visiting Experts

1. Water Networks by Prof. Iven Mareels (Dean, Melbourne School of Engineering, Australia)

VINOD GUPTA SCHOOL OF MANAGEMENT

HEAD : Professor S. Srinivasan

FACULTY

Professors

Bagchi, Tapan P	Ph.D. (University of Toronto), Scheduling of Production and Services, Metaheuristics (GA), Software Engineering and Quality Assurance, Macroeconomic Modeling in Forecasting, Mathematical Modeling of Business and Information Systems, Taguchi Methods in Quality Engineering
Ghosh, Ranjan	D.Sc. (Columbia University), Operations Management, Project Management, Supply Chain Management
Guin, Kalyan Kumar	B.Tech. (IIT Kharagpur), Marketing Research, Quant Modelling of Business Strategy, Entrepreneurship
Sinha, Gautam	Ph.D. (IIT Kharagpur), Operations Management / SCM / Manufacturing Strategy / HR

Associate Professors

De, Sadhan Kumar	Ph.D. (UK), E-Business / E-Commerce, Enterprise Systems / ERP, Management of Technology and Innovation
Rajib, Prabina	Ph.D. (IIT Kharagpur), Corporate Finance, Risk Management, Commodity Derivatives
Roy, Santanu	Ph.D. (IIT Kharagpur) Quant. Meth., Tech. Mgt., Org. Behaviour

Assistant Professors

Datta, Biplab	Ph.D. (IIT Delhi), Marketing Management, Leadership and Teamwork, Industrial Marketing, High-Tech Marketing, Human Behaviour in Organisation
Datta, Saroj Kumar	Ph.D. (University of Burdwan), Strategic Management, Marketing Management
Malik, Aradhna	Ph.D. (University of Denver), Intercultural Communication, Human Technology Interaction, Social Welfare Management, Communication Competence
Mishra, Chandra Sekhar	Ph.D. (Utkal University), Corporate Finance, Financial Reporting and Analysis, Financial Markets, Management Accounting, Company Valuation
Misra, Arun Kumar	Ph.D. (IIT Mumbai), Financial Markets, Banking, Risk Management, International Finance, Financial Econometrics
Mukhopadhyay, Susmita	Ph.D. (Calcutta University), Organizational Behaviour, HR, Business Ethics, Microfinance
Pradhan, Rudra Prakash	Ph.D. (IIT Kharagpur), Infrastructural Finance, Financial Markets, Econometric Modelling, Business Forecasting, Foreign Direct Investment
Sahney, Sangeeta	Ph.D. (IIT Delhi), Marketing Management, Services Quality, Buyer Behavior, Quality Management in Services

Faculty Appointments

Dr. Tapan Bagchi	Professor
Dr. Ranjan Ghosh	Professor
Dr. Aradhna Malik	Visiting Assistant Professor

Dr. Swarup Mandal	Adjunct Professor
Dr. Prithwis Mukherjee	Adjunct Professor
Dr. Ramanuj Majumdar	Adjunct Professor

Faculty Retirement

Dr. Santanu Roy	Associate Professor
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New Academic Programmes

1. Formulating a Dual Degree Postgraduate programme in Financial Engineering with interested departments at IIT Kharagpur.

Brief Description of on-going activities

1. Currently offering M.B.A. and Ph.D. degrees.

Thrust Areas

1. Entrepreneurship
2. Financial Engineering
3. Small and Medium Enterprises

International Collaborations

1. Continuing collaboration with University of Nebraska, Omaha, and Creighton University

Lectures by Visiting Experts

1. Social Entrepreneurship on the IIT Campus *by* Prof. Dhruvish Biswas (MD, STEP, IIT Kharagpur)
2. Corporate governance and its implications for budding managers *by* Prof. Indrajit Dube (Rajiv Gandhi School of Intellectual Property Law of)
3. Product management and brand development *by* Mr. Deepak Ranjan (General Manager (Marketing), Adhunik Cement)
4. Turnaround of Hindustan Copper Limited: A case study *by* Mr. O. P. Chugh (Executive Director (Modernization), Hindustan Copper Limited)
5. Functional aspects and importance of customer relationship management *by* Mr. Mohan Kumar Silaparasetty (Industry Leader, IBM-India)
6. Corporate entrepreneurship *by* Mr. Allwin Agnel (Founder and CEO, Pagalguy.com)
7. Stress management *by* Dr. A. K. Dutta (Renowned Heart Specialist and spiritual leader)
8. Turnaround of Kolkata Municipal Corporation: A case study *by* Mr. Debasish Som (Head, Eastern Region, Feedback Ventures)
9. The financial crisis of 2008: Causes and consequences *by* Dr. Mandira Roy (Independent research professional, New York City area)
10. Importance of reliability in designing of industrial products *by* Dr. D. N. P. Murthy (Research Professor, Division of Mechanical Engineering, University of Queensland, Australia)
11. Importance of reliability in designing of industrial products *by* Dr. Rezaul Karim ()
12. Global Entrepreneurship *by* Prof. Vijaya L. Narapareddy (Associate Professor, Daniels College of Business, University of Denver, USA)
13. Adoption of new products: Finding early adopters and impact of selection bias in trial evaluation *by* Dr. Arun Bhattacharya (Principal, Advanced Analytics, Wolters Kluwer Health, Pharma Solutions Group, New Jersey, USA)
14. New product development *by* Ms. Jayshree Saha ()
15. Venture capitalism: Opportunities in India *by* Mr. Paresh Sheth (Chief Distribution Officer, FirstRand Bank)

16. IT Management in Banking *by* Mr. Anupam Shringi (Director & Head- Cost and Resource Management; Program Manager - Big Rock Initiatives at UBS)
17. Global Economy, Indian Economy and Markets and their Immediate and Long term Prospects *by* Mr. R. Ravimohan (Managing Director and Region Head (South and South East Asia), Standard and Poors)
18. Basel II: Challenges Ahead of the Indian Banking Industry" *by* Mr. V. Vasanthan (Regional Head, RBI, Kolkata)
19. Supply chain management *by* Mr. Saurabh Tiwari (Sector Manager (Planning and Procurement), Cadbury India Limited)
20. Introduction to the Toastmasters Club *by* Mr. Kunal Pabrai (Toastmasters)
21. Business Technology at Indian Oil (SAP implementation) *by* Mr. S. Ramasamy (Executive Director (IS), Indian Oil Corporation Ltd.)

Doctoral and MS Degrees Awarded

1. Rajesh Kumar B. An Analytical Study on Mergers in India (Ph.D.)
2. Uttam Kumar Chatterjee Uni TPM: A Fast Track TMP Implementation Approach and Its Applications (Ph.D.)
3. Madhurima Deb Customer Relationship Management (CRM) Practices in Indian Retailing Sector-Focussed Study on Retailer-Customer Relationship Outcomes (Ph.D.)

Fellow - Professional Bodies

1. De, Sadhan Kumar (1991) *Fellow* - The Institution of Engineers (India)

Member - Editorial Board

1. Bagchi, Tapan P (2008) *Member Editorial Board*
- International Journal of Advanced Operations Management
2. Datta, Biplab (2007) *Editor*
- Globsyn Business Journal
3. Ghosh, Ranjan (2008) *Member of the Editorial Board*
- Vilakshan
4. Malik, Aradhna (2009) *Member of Editorial Group*
- Asian English as a Foreign Language Journal
5. Pradhan, Rudra Prakash (2008) *Editorial Board Member*
- Pragayaan
6. Pradhan, Rudra Prakash (2007) *Reviewer*
- ICFAI Journal of Mergers and Acquisitions
7. Pradhan, Rudra Prakash (2007) *Editorial Board Member*
- Journal of Applied Economics and Policy Analysis
8. Pradhan, Rudra Prakash (2007) *Reviewer*
- Economic Modelling

Awards & Honours

1. Sahney, Sangeeta (2009) *Distinguished Paper Award 2009 International Conference on E-Commerce held in Singapore, from 8th-10h January, 2009.*

Fellowships

1. Mukhopadhyay, Susmita (2009) *MICROFINANCE RESEARCHERS ALLIANCE PROGRAM- FELLOW*
2. Pradhan, Rudra Prakash (2008) *SAP Fellowship*

Sponsored Research Projects

#	Title of the Project	Sponsor(s)	Amount
1.	Development of Scheduling Algorithm and its Software Implementation for Multi-Satellite Operations Scheduling by Genetic Algorithms	ISTRAC ISRO Bangalore	Rs. 5.00 Lakhs
2.	Development of Soundproofing Composite Materials Using Jute Products	Jute Manufacturers Development Council, Kolkata,	Rs. 32.26 Lakhs
3.	EXTECIM Eurindia Scientific Project on E-Commerce and Intelligent Manufacturing	Ecople de Mines, Nantes France,	Rs. 3.50 Lakhs
4.	Impact of Select Issues in Consumer Demographics and Psychographics on Online Buying Behavior	ISIRD - IIT Kharagpur	Rs. 3.00 Lakhs
5.	Optimum Sizing of Regional Aircraft and Domestic Air Traffic Projection till 2025	NAL Bangalore	Rs. 10.00 Lakhs
6.	Quality Management System for Education Programmes of IIT Kharagpur	ISIRD IIT Kharagpur	Rs. 3.00 Lakhs
7.	Rule-based and Auto0nomous:Specifying Conditions for the Successful Implementation of ISO 9000	NSF and University of Minnesota USA	Rs. 5.00 Lakhs

Consultancy Projects

1.	Employee Engagement	Tata Metaliks	Rs. 0.60 Lakhs
2.	Implementation of Lean Engineering Practices at Base Repair Depot, Nasik	Indian Air Force	Rs. 56.00 Lakhs
3.	Manpower study of CBM and MBA Basin	ONGC	Rs. 0.00 Lakhs
4.	Restoring Industrial harmony for textile and dyeing industries of Rajarhat	Rajarhat dyeing and Bleaching association	Rs. 0.00 Lakhs
5.	Six Sigma Defect Reduction Project Demonstration on Shop Floor	Tata Bearings Plant, Kharagpur	Rs. 0.00 Lakhs
6.	To conduct Employee Engagement Survey at Tata Metaliks	SRIC	Rs. 0.60 Lakhs

Visits Abroad by Faculty Members

1.	Pradhan, Rudra Prakash	To attend Nobel Laureates meeting (Germany and Switzerland) August 20-23
2.	Sahney, Sangeeta	Presented Paper at an International Conference, eCASE 2009, January 8-10, 2009 (Singapore)

Invited Lectures by Faculty Members

1.	Commodity Derivatives <i>by</i> Rajib, Prabina (XLRI, Jamshedpur)
2.	Emerging Trends in Indian Capital Market <i>by</i> Rajib, Prabina (Vidyasagar University)
3.	Personality Traits of Entrepreneurs <i>by</i> Mukhopadhyay, Susmita (STEP-IIT KGP)
4.	Counseling Airmen <i>by</i> Mukhopadhyay, Susmita (Air Force Station, Salua)
5.	CSR <i>by</i> Mukhopadhyay, Susmita (Tata Bearings)

Books Published

1.	Aradhna Malik	Media screens & the preschooler [ISBN: 978-3-639-08260-9] <i>published by</i> VDM Verlag Dr. Müller Aktiengesellschaft & Co. KG (2008)
2.	Rudra Prakash Pradhan	Forecasting Financial Markets in India <i>published by</i> Allied (2008)
3.	Saroj Datta	Marketing Management <i>published by</i> Parshava Publishing (2008)

Seminars, Conferences and Workshops Organised

1. Departmental Research Seminar Series initiated
2. Forecasting Financial Markets in India
3. Georgia Tech-IITKGP toward IT-Enabled Value Creation through Engineering
4. Optimization Methods and Financial Applications (March 23-26, 2009)
5. Statistical Modelling for Data Analysis
6. Teachers Training Programme on Managerial Economics

Short-Term Courses, Training Programmes and Workshops organized

1. AICTE/MHRD Summer School "Skill development of new management faculty" (July-August 2008)
2. Competency Development for New Management Faculty (July 7-20, 2008)
3. Emerging Trends in Capital Market and Equity Valuation (September 06-10, 2008)
4. Equity Valuation & Emerging Trends in Indian Capital Market (September 06-10, 2008)
5. ERP and Integration of Business Processes (23 June- 6 July 2008 & July 14-22, 2008 at Kolkata)
6. ERP : Technologies and Applications to Integrate the Business Supply Chain (December 19-27, 2008)
7. Practical Leadership (23-6-2008 to 5-7-2008)

PART - II

CENTRALIZED UNITS AND SERVICES

& ALUMNI AFFAIRS

&

INTERNATIONAL RELATIONS

ALUMNI AFFAIRS & INTERNATIONAL RELATIONS

DEAN : Professor Amit Patra

ALUMNI AFFAIRS & IR COMMITTEE :

Professor-in-Charge, Information Cell

Prof. B. K. Mathur

Department of Physics & Meteorology

Professor-in-Charge of News Letters / Publications

Prof. Joy Sen

Department of Architecture & Regional Planning
Chief Editor

Technology Alumni Association Secretariat

Prof. Goutam Bandyopadhyay

President

Department of Aerospace Engineering

Dr. Dilip. K. Nanda

Secretary

Computer & Informatics Centre

Prof. Kajal Biswas

Joint Secretary

Department of Mechanical Engineering,

Prof. Joy Sen

Treasurer

Department of Architecture & Regional Planning

The various activities of the office of the Dean of Alumni Affairs over the past one year are as follows :

1. A new alumni affairs website www.alumnet.iitkgp.ernet.in has been created by the newly formed Alumni Cell student members to facilitate alumni all over the globe to register online. The site has a new look with added facilities like online payment. The new website is already operational.
2. An extremely popular Alumni newsletter "KGPian" is being published regularly every three months. Presently it is running in its 6th year.
3. The 58th Foundation Day of the Institute was celebrated on 18th August, 2008. The 2nd *Nina Saxena Excellence in Technology Award*, a first of its kind India -wide Technical Innovation Award instituted by IIT Kharagpur in 2006 was presented to *Dr. Subhash P. Andey, Scientist, Geo-Environment Management Division, NEERI, Nagpur* by the Chief Guest *Lord S.K. Bhattacharya, Director of Warwick Manufacturing Group, UK*. The award consists of a cash prize of Rs. 51,000/- and a gold plated plaque. Commemorating the spirit of Dr. Nina Saxena, B.Tech. (Hons.), ECE 1992, who passed away tragically in 2005, the award is an attempt to encourage and promote technical innovation with a social development focus. The award is the result of a lot of hard work on Nina's husband, Dr. Akhil Sahai's part; also our alumnus.
4. *Distinguished Alumnus Award* was conferred on alumni of IIT Kharagpur who have distinguished themselves in their own domain of work and made their Alma Mater proud during the 54th Annual Convocation held on 25th July 2008. *Dr. Duvvuri Subbarao, Dr. Pradip K. Roy, Dr. Anil K. Malhotra and Sri. Shantanu Mohapatra* were awarded the Distinguished Alumnus Award. *Dr. Pradip K. Roy, Dr. Anil K. Malhotra and Sri. Shantanu Mohapatra* received the award in person whereas *Dr. Duvvuri Subbarao* could not attend the function.
5. The New Year brought together the alumni of the Institute again for the sixth time to IIT in the form of 6th *Annual Alumni Meet 2009* held during 3rd - 4th January 2009. The Meet was, dedicated to those who graduated in the years 1959 and 1984. Many alumni came with their spouses and some with children and even grand children. To commemorate the occasion a Souvenir, "Yearnings of Yore Volume VI" was published. The programme consisted of Inauguration & Award Ceremony, Alumni General Meeting, Hall Reunion, Cultural Programme by ETMS and TDS and HASYA KAVI SAMMELAN. A small memento was presented to all participants belonging to the Silver Jubilee and Golden Jubilee Batches.

For the first time the entire function was conducted and organized by the student members of the newly formed Alumni CELL.

6. PAN IIT 2008 was held at IIT Madras, Chennai during 19-21 December 2008. Prof. Damodar Acharya, Director; Prof. M. Chakraborty, Dy. Director; Prof. Amit Patra, Dean (AA&IR); Prof. Dhruv Biswas, Managing Director (STEP) and few students of the alumni cell attended the event.

INSTITUTE LECTURE SERIES

1. Dr. Chi- Foon Chan President, Synopsis Inc, USA - 8th July,2008 delivered lecture on "*Economic Challenges and Technological Complexities in the High-tech World of Today*"
2. Dr. Gary vanLoon President, Shastri Indo-Canadian Institute, New Delhi 23rd July, 2008 delivered lecture on "*Global Water Challenges*"
3. Mohan Yegnashankaran Senior Vice President, Worldwide Technology Development, National Semiconductor Corporation 30th July, 2008 delivered lecture on "*Academics to Industry*"
4. James Lin, Vice President, Technology Infrastructure Group, National Semiconductor Corporation 30th July, 2008 delivered lecture on "*Future of EDA Industry*"
5. Swami Sarvapriyanandaji Maharaj Ramakrishna Mission, Belur Math 13th August, 2008 delivered lecture on "*Ancient Wisdom for the Modern Age The Philosophy of the Upanishad*"
6. Dr. P. M. Bhargava Chairperson, Anveshna, Hyderabad- 28th August,2008 delivered lecture on "*Scientific Basis of Aesthetic Appreciation: Why do we respond to beauty*"
7. Dr. Ganesh Pandey Dy. Director, National Chemical Laboratory, Pune- 4th September,2008 delivered lecture on "*Odyssey with Radical Ions*"
8. Dr. M. Vidyasagar Executive Vice President, Tata consultancy Services, Hyderabad 23rd September,2008 delivered lecture on "*The human body as a dynamical system: Motivations and applications to drug development*"
9. Swami Samarpananda Ramakrishna Mission, Belur Math-1st October,2008 delivered lecture on "*Tapping the Infinite Potential The Vedantic Way*"
10. Prof. D. P. Chandrasekharan Professor of Forensic Sciences & Guest Faculty, National Law University, Jodhpur & National Law School of India University, Bangalore - 10th November,2008 delivered lecture on "*Role of Engineering in Crime Investigation*"
11. Prof. Rajarshi Basu Director, Women's Study Centre, Viswa Bharti University-11th November,2008 (National Education Day Lecture) delivered lecture on "*Contributions of Maulana Abul Kalam Azad both in pre and post-independence era*"
12. Dr. T. Ramasami Secretary, Department of Science and Technology, New Delhi-22nd November,2008 delivered lecture on "*Chromium Induced Apoptosis*"
13. Sir Richard Stagg British High Commissioner, New Delhi, India-10th December, 2008 delivered lecture on "*Interaction with Faculty and Students*"
14. Paramahansa Prajnanananda President of Prajnana Mission, Head Kriya Yoga International Organizations 5th January, 2009 delivered lecture on "*Breath, Mind and Consciousness*"

15. Rao R. Tummala
Director, Microsystems Packaging Research Center (PRC), Joseph. M Petit Chair Professor in Microsystems Packaging Georgia Tech., Atlanta, USA 22nd January, 2009 delivered lecture on *"Advances on Nano Assembly in 3 Dimensions"*
15. Vinod K. Gaur
Distinguished Professor, Indian Institute of Astrophysics, Koramangala, Bangalore - 5th February, 2009 delivered lecture on *"The Earth's Changing Climate Through The Aeons"*
16. Dr. Pinakpani Chakrabarti
Professor and J.C. Bose National Fellow, Department of Biochemistry and Bioinformatics Centre, Bose Institute, Kolkata - 28th February, 2009 (Science-Day Lecture) delivered lecture on *"Features of Protein Structures"*
17. Rajeev Sangal
Director, International Institute of Information Technology, Hyderabad - 12th March, 2009 delivered lecture on *"To Follow Or To Lead : Aiming High With Self Confidence"*
18. Mr. J. N. Mohanty
Secretary, Satsang Vihar Delhi, Saha Prati Ritwik (SPR), Satsang 17th March, 2009 delivered lecture on *"Contemporary Challenges : Role of the Young Generation"*

MAJOR DONORS

1. Mr. Ranbir "Ron" Singh Gupta
(B.Arch/1970/ARP) for development of a School of Infrastructure, Ranbir & Chitra Gupta School of Infrastructure Design and Management (RCG INFRATECH)
2. Mr. Anand Deshpande
(B.Tech/1984/CSE/Patel) Towards 1984 Batch Endowment Fund
3. Mr. Sekar Srinivasan
(B.Tech/1984/CSE/LLR) Towards 1984 Batch Endowment Fund
4. Mr. Rahul Kumar Jha
(B.Tech/2005/Mech) Towards creation of a Soft-Computing Laboratory in the Mechanical Engineering Department

VISIT OF THE ALUMNI

1. Mr. Ron Gupta
Visited several times in the year and discussed about the Ranbir & Chitra Gupta School of Infrastructure Design & Management, formation of the Advisory committee and Programme Implementation Committee, inauguration of the School and initiation of the academic programme and school location both temporary and permanent site, building design, schedule etc.
2. Prof. Lord Sushantha Kumar Bhattacharyya
Director, Warwick Management Group, Warwick was the Chief Guest on 18th August, 2008, the Institute Foundation Day. He was awarded D.Sc. (Honoris Causa)
3. Dr. Prabhakant Sinha
Educator, entrepreneur and thought leader and a former Associate Professor of Marketing from the Kellogg School of Management at Northwestern University, USA visited IIT Kharagpur and interacted with Director, Deputy Director and other faculty members of Chemical Engineering Department

4. 19 nos. of alumni (Class of 19661971, ARP Dept.) visited IIT Kharagpur during February 2123, 2009 to rekindle their alma mate and to relive the campus in those days.

MEMORANDUM OF UNDERSTANDING SIGNED

We have had a number of renowned universities coming forward with exchange programmes and the Institute has seen an influx in successful Memoranda of Understanding (MoU) and Memoranda of Agreement (MoA) lately.

MoUs signed during the academic year 2008-2009 are as under :

1. UC Berkeley, USA
2. University of Rome, "Tor Vergata"
3. RWTH, AACHEN, Germany
4. Berlin Institute of Technology (TU Berlin), Germany
5. University of Southampton
6. Leibniz University, Hannover, Germany
7. The University of Warwick, Warwick
8. University of Tokyo, Japan
9. Lulea University of Technology, Sweden
10. National Semiconductor Corporation, USA
11. University of Utah, Utah
12. University of Ontario, Canada
13. Politecnico di Milano, Italy
14. National University of Singapore
15. TOTAL, France

INTERNATIONAL VISITORS

1. Mr. Mohan Yegnashankaran Senior Vice President, Worldwide Technology Development, National Semiconductor Corporation and Mr. James Line, Vice President, Technology Infrastructure Group, NSC visited IIT Kharagpur on 30th July, 2008.
2. Prof. Iven Mareels Dean, Melbourne School of Engineering and Dillan Golightly, Program Coordinator, Melbourne School of Engineering, University of Melbourne, VIC, 3010 visited on 20th August, 2008.
3. Prof. Joy Laskar Georgia Institute of Technology and Prof. Renu Laskar, Clemson University, USA visited during November 1213, 2008.
4. Dr. Tetsuo SHIMIZU Associate Professor, Department of Civil Engineering, University of Tokyo visited during March 78, 2008.
5. Dr. P J Singh Adjunct Professor of Electrical Engineering, SUNY New Paltz, IBM Materials engineering, Poughkeepsie, NY visited during March 1719, 2009.
6. Prof. Bill Wakeham Vice Chancellor, and Ms. J. L. Nesbitt, Deputy Director of the International Office and Regional Director, University of Southampton, Southampton, UK visited during March 2324, 2009.

EXCHANGE STUDENTS

1. Two girl students - Ina HAYDOUTOV and Michèle BERGER from University of Science and Technology, Polytech'Lille - Graduate School of Engineering, France did their 3-months (30-04-08 to 30-07-08) project *in the field of Food Science* from the Dept. of Agricultural and Food Engineering Department
2. Mr. Toren Monson, a student of University of Utah, Utah, USA is doing Spring semester 2009 in the Dept. of Computer Science and Engineering, IIT Kharagpur.
3. Mr. Jan-Hernik Meier, a Masters student of Geography in the Leibniz University, Hannover, Germany is doing his internship for three months (1st February to 30th April, 2009) in the School of Water Resources, IIT Kharagpur.

ADVANCED TECHNOLOGY DEVELOPMENT CENTRE

CHAIRMAN : Professor Partha Pratim Chakrabarti

FACULTY ASSOCIATED

Professor

Chakrabarti, P. P.
Computer Science & Engineering

Ph.D., Artificial Intelligence, CAD for VLSI Design of Algorithms, Formal Verification

Lahiri, S. K.
Advisor, Sponsored Research & Industrial Consultancy

Ph.D., Microelectronics, VLSI, MEMS, Integrated optics

Sengupta, S.
Electronics & Electrical Communication Engineering

Ph.D., Computer vision, Multimedia

Patra, A.
Electrical Engineering

Ph.D., VLSI Design of Power Converters, Industrial Information Technology

Basu, A.
Computer Science & Engineering

Ph.D., Embedded Systems, Artificial Intelligence application

Banerjee, S.
Electrical Engineering

Ph.D., Bifurcation Theory, Chaos, Nonlinear Dynamics

Roy, S. K.
Physics & Meteorology

Ph.D., Solid State Physics, thin film, nanotechnology

Pal, S. P.
Computer Science & Engineering

Ph.D., Computational geometry, Design and analysis of algorithms

Manna, I.
Metallurgical & Materials Engineering

Ph.D., Corrosion and Surface Protection, Phase Transformation, Nano-cermet, Physical Metallurgy, Surface Engineering, Wear of Metals

Bhattacharya, S.
Civil Engineering

Ph.D., Structural Engineering

Ghosh, A.
Biotechnology

Ph.D., Virology and Molecular Biology

Basak, A.
Chemistry

Ph.D., Bioorganic Chemistry

Dey, S.
Biotechnology

Ph.D., Microbial and Plant Biotechnology

Chakraborty, S.
Mechanical Engineering

Ph.D., Micro fluidics

Mishra, H. N.
Agricultural & Food Engineering

Ph.D., Food Technology

Prasad, Suresh
Agricultural & Food Engineering

Ph.D., Food Process Engineering, Post Harvest Engineering

Pathak, S. S.
Electronics & Electrical Communication Engineering

Ph.D., Digital Communication

Associate Professor

Bhattacharyya, T. K.
Electronics & Electrical Communication Engineering

Ph.D., Microelectronics, VLSI, MEMS

Jacob, Chacko
Materials Science

Ph.D., Wide Bandgap Semiconductors / Nanomaterials / Direct Fluorination of Materials / Oxide semiconductors

Majumdar, G. C.
Agricultural & Food Engineering

Ph.D., Post Harvest Engineering, Food Engineering, Agri. Systems Management

Dutta Gupta, S.
Agricultural & Food Engineering
Dey, Joykrishna
Chemistry

Ph.D., Plant Tissue Culture & Biotechnology

Ph.D., Physical Chemistry

Assistant Professor

Dhar, A.
Physics & Meteorology

Ph.D., Condensed matter Physics,
nanotechnology

Das, S.
Medical Science & Technology

Ph.D., MEMS and Microsystems including Bio-MEMS
and Bio-Transducers, Microelectronic devices, Medical
Instrumentation and Medical chip design.

Srivastav, P. P.
Agricultural & Food Engineering

Ph.D., Food Technology

Rao, P. S.
Agricultural & Food Engineering

Ph.D., Post Harvest Engineering, Aquacultural
Engineering

Guha, P.
Agricultural & Food Engineering

Ph.D., Agronomy

Senior Scientific Officer

Gangopadhyay, Pranabendu

Ph.D., Photonics, Optical Metrology, Optical Materials,
MOEMS, Microelectronics

LABORATORIES INVOLVED

- 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
- i x) 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.

Design and development of MEMS based micropropulsion devices for micro / nano satellite programme such as Microthruster, Microvalve and Micropump.

The MEMS design laboratory, a national facility created under NPSM programme is actively involved with design work on MEMS including microfluidic devices. A number of students from various departments like ATDC, E&ECE, Electrical, Mechanical, Biotechnology, Material Science Department / Centre are involved in the Design Centre to do their project / thesis works. Other academic Institutions like Jadavpur University and CMERI, Durgapur, are also involved in the Design Centre. Research and development is also undertaken in the field of Integrated Optics. 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 60 different chips have been fabricated and tested. 15 leading companies have joined the AVLSI Consortium. More than 12 ongoing collaborative research projects funded by the Government of India and leading companies including National Semiconductors, Intel, Synopsys, Infineon, Texas Instruments, Si2 Microsystems, Agilent, Tessolve, Analog Devices and General Motors. The laboratory also offers regular intensive training to students of IIT Kharagpur. Buoyed by these initial successes, the laboratory is striving to attain still higher levels of excellence. Research directions are diversifying to new areas of mixed-signal SOCs, IP cores for embedded applications and analog DFT. Existing expertise on formal verification and optimization methods is being applied to design verification, synthesis and CAD Tool development for the deep sub-micron processes. More than fifty Doctoral and Masters students are working on various emerging areas. The Centre for Theoretical Studies (CTS) is primarily engaged to generate and nucleate theoretical research on fundamental aspects of basic and engineering sciences.

The Advanced Laboratory for Plant Genetic Engineering is dedicated to develop technologies suitable to enhance the productivity potential of some of our major crop plants through biotechnological approach. The laboratory has met with some success in identifying specific genetic elements associated with fiber development in jute stem through functional genomic approach. Additionally, attempts to map the individual seven linkage groups of jute are underway. Discovery of certain plant genes and regulatory elements involved in the metabolic pathway of fatty acid synthesis and modification of their functional role in case of synthesis of seed oil of Indian mustard (*Brassica juncea*), are in active state of pursuit. Additionally, attempts have been initiated to genetically tamper the lignin biosynthetic pathway in vegetative parts of jute and sorghum plants by anti-sense approach. Major attempts have also been made in strategy development for generation of genetically modified crop plants resistant against insect pests belonging to lepidoptera, coleoptera and homoptera. Some success could be attained in case of cotton, Brassica and rice. Discovery of novel insecticidal genes from plants and bacteria and generation of transgenic crop plants expressing these insecticidal genes have been accomplished. Attention has also been directed towards development of efficient transformation methods for certain recalcitrant crop plants that have not yet been accessible to gene transfer methodologies. Further, development of marker free transgenic plant generation and site-specific integration of transferred DNA have figured as major targets of activities in order to enhance the efficacies of gene transfer techniques to a great height. The laboratory has also developed a microbial bioprocess technology using the state of the art of bio-film technology for high through-put production of superior quality of jute fibers. The technique reduces production time by ~70% and results significantly low effluents and green house gases. The process thus developed is safe for human handling and offers excellent quality control ensuing at least 2-3 grades better fiber quality against methods that are in use by the jute growers. Further, attempts to explore the possibilities for generation of jute fiber based bio-composites have also been initiated. The laboratory is further working on microbial bio-film based technology for high through-put production of specific carbohydrate macerating enzymes that carries industrial significance.

Thrust Areas

- i) Inertial MEMS
- ii) Micro Sensors and actuators for automobile, space, and defense applications
- iii) Micropropulsion device for micro / nano satellite application
- iv) RF-MEMS
- v) Bio-MEMS
- vi) Semiconductor devices
- vii) Nanotechnology
- viii) Lithium niobate integrated optics
- ix) Astrophysics
- x) Cosmology

- xi) Nonlinear Sciences
- xii) Theoretical condensed matter physics
- xiii) Wireless communication and Baseband processing
- xiv) Analog and RF circuits
- xv) Plant biotechnology

New Acquisitions :

- i) MEMS vaporising liquid microthruster
- ii) Microflow for microvalve, micropump
- iii) MEMS flow sensors
- iv) Integrated-optic switch
- v) MEMS accelerometer for aircraft motion sensing
- vi) Tunneling accelerometer and Capacitive accelerometer

ON-GOING RESEARCH PROJECTS

Sponsored Projects

#	Title of the Project	Sponsor(s)	Duration
1.	Indo-US Joint Centre on Advanced and Futuristic Manufacturing	Indo-US Science & Tech. Forum	On-going
2.	Development of Silicon Microsensors for Flow Measurement	MHRD	On-going
3.	Design, analysis and optimization of navigation grade silicon based MEMS accelerometer	ISRO-KCSTC cell	On-going
4.	Upgrading facilities for MEMS design activities at national resource centre	NPMASS, ADA, Bangalore	On-going
5.	Development of MEMS based components for RF applications	NPMASS, ADA	On-going
6.	Development of MEMS based accelerometers for Aerospace applications	NPMASS, ADA	On-going
7.	MEMS based micro-propulsion devices for micro-satellite programme	ISRO	On-going
8.	Multi-scale modeling to study the role of atomic scale defects in CNT-based nanocomposites	DST	On-going
9.	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	On-going
10.	Kinematics of flows in diverse contexts	DST, New Delhi	On-going
11.	Measuring the HI power spectrum with the GMRT	BRNS, DAE, Mumbai	On-going
12.	Targeted gene integration in rice and cotton	National Fund for Basic Science, ICAR	On-going
13.	Establishment of independence of Linkage Groups of jute through trisomic analysis in order to construct the genetical and physical map of jute genome.	DBT	On-going
14.	Application of technology for tomato hybrid seed industry involving rural women for employment and income generation	DST	On-going
15.	Recombinant DNA for development of a male-sterility system in jute.	DBT	On-going
16.	Generation and cataloguing of bast fibre developmental stage specific EST library from jute	DBT	On-going
17.	Design and fabrication of high sensitivity micro machined silicon tunneling accelerometer with micro-g resolution	ISRO	On-going
18.	Development & characterization of nanostructured thin films for SiGe quantum well infrared photodetector and ferroelectric based gas / chemical sensors	DRDO	On-going
19.	Terahertz emission of Si / SiGe structures doped with shallow acceptors	DST	On-going

20.	Synthesis and characterization of nanostructured materials for functional and structural applications	DST	On-going
21.	Fabrication and characterization of Novel Photonic Crystal Structures and Si / Ge Quantum Dots for Photonic Applications	DST-ITPAR, Italy	On-going
22.	Design, analysis and optimization of navigation grade silicon based MEMS accelerometer	ISRO-KCSTC	On-going
23.	Medical image analysis and MEMS based flow sensor development	DST x	On-going
24.	Feasibility study of MEMS based biochip platform for characterisation of biospecies	IIT Kharagpur	On-going
25.	All India Coordinated Research Project on Post Harvest Technology	ICAR, New Delhi	On-going
26.	A Value Chain on Aloe Vera Processing	ICAR, New Delhi	On-going
27.	Development of Silicon Carbide Thin Films for High Temperature and High Power Devices	DRDO	On-going
28.	All India Coordinated Research Project on Post Harvest Technology	ICAR, New Delhi	On-going
29.	A Value Chain on Aloe Vera Processing	ICAR, New Delhi	On-going

Consultancy Projects

#	Title of the Project	Sponsor(s)	Duration
1.	Development and realization of high Q-factor quartz double ended tuning forks using micromachining technology	ISRO-IISU	On-going
2.	Development of ADC and Receiver for wireless applications	Si2 Microsystems	On-going
3.	Design of RFIC modules	National Semiconductor Corporation, USA	On-going
4.	Design and processing of MEMS microstructure for mechanical property evolution	DMRL, Hyderabad	On-going
5.	Thin Film Characterization	Various agencies	On-going

VISITS ABROAD BY FACULTY MEMBER

1.	Prof. S. K. Ray	Group-IV Nanophotonic Devices, University of Trento, Italy
2.	Prof. S. K. Ray	SiGe based nanoelectronic and photonic devices, Univeristy of Newcastle, UK
3.	Prof. S. K. Ray	Visiting Professor, Tokyo Institute of Technology, May/June, 2007
4.	Prof. S. K. Ray	National University of Singapore, July 3, 2007
5.	Dr. T. K. Bhattacharyya	DST / JSPS Project work, University of Tokyo, Japan, April 2008
6.	Dr. T. K. Bhattacharyya	IndoTrento programme for advanced research ITPAR programme, Italy, June 2009

INVITED LECTURES BY FACULTY MEMBERS

1.	Prof. S. K. Ray	Semiconductor Nanostructures for Device applications at Institute of Radio Physics & Electronics, Kolkata University
2.	Prof. S. K. Ray	Nanoelectronic and Sensing Devices at IIT Delhi
3.	Prof. S. K. Ray	Excitements in Nanoscience at Vidyasagar College, Kolkata
4.	Prof. S. K. Ray	Semiconductor Nanotechnology for Electronic Devices at UGC State Level Seminar on "Fundamentals & Frontiers in Physics", 22nd September, Garbheta
5.	Prof. S. K. Ray	Semiconductor Nanostructures for Futuristic Devices at Annual Convention of Indian National Academy of Engineering, Goa
6.	Dr. Soumen Das	Invited Lecture : Nanoelectronics : Science, nanotechnology, engineering and applications, IIT Kharagpur
7.	Dr. Soumen Das	Invited Lecture : 3D bioengineering, IIT Bombay

8. Dr. Soumen Das Invited Lecture : Nanobioengineering and family welfare, IIT Kharagpur
9. Dr. Chacko Jacob Wide Bandgap Materials as High Temperature Materials at International Seminar on High Temperature Materials, IT-BHU, Varanasi (February 23-25)
10. Dr. Chacko Jacob My Journey in Materials Science : From Ceramics to Semiconductors at Department of Ceramic Engineering, IT-BHU
11. Dr. Chacko Jacob Nanomaterials for Electronic Applications at NIT, Rourkela
12. Dr. Chacko Jacob Nanomaterials for Electronics at Crystal Growth Centre, Anna University

LECTURE BY VISITING EXPERT

1. Mr. Sourabh Datta Chowdhury Ongoing research activities at Maxim, 2009
Maxim Integrated Products,
California, USA

BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. S. K. Ray, R. Mahapatra, G. S. Kar and S. Maikap	"Dilute carbon alloy group-IV semiconductor heterostructures for advanced MOSFET devices"	(ISBN : 978-81-308-0238-1)	2008

PATENTS GRANTED

1. Terahertz frequency radiation sources and detectors based on group-IV materials and Method of manufacture (Granted, Ref: US Patent No. : US 7,386, 016 B2 dated 10th June, 2008)
2. 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
3. Nobel Diamond Like Nanocomposite material use for biocompatible coating application, Patent Application No. 896/kOL/2008.

LAURELS & DISTINCTIONS

1. Dr. P. Gangopadhyay Royal Society Incoming Fellowship to UK

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

FACILITIES NEW ADDITION

Recently IIT Kharagpur has installed a new novel custom made MBE (Molecular Beam Epitaxy) machine, Riber France made. The versatile MBE system is Compact, flexible and affordable with features carefully designed to meet the highest specifications for the research of all III-V compound semiconductor materials. This is a "Vertical Reactor" technology, with 3-inch wafer diameter integrated system. The MBE has Arsenide and Nitride growth facilities with 6 cells. Out of the 6 cells, one is Arsenic valved cracker which allows evaporating As₂ and As₄ both the allotropes. The presence of cracker cell gives us the flexibility to maintain As₂:As₄ ratio for optimizing the Gallium Arsenide growth along with reloading of As without disturbing the chamber vacuum. Also the machine has both Ammonia (NH₃) and plasma N₂ sources for Gallium Nitride growth. Ammonia will be used for thick film growth and plasma N₂ for very fine structures. Besides, the MBE has double dopant (Si and Mg) cell for acceptor and donor impurities. The cryogenic pump is used for 10⁻¹¹ Torr vacuum and the pump is water cooled. So, uninterrupted water supply to the pump is essential to maintain the vacuum system. The uninterrupted power supply to the system is at the same time important to power the cryo-pump, turbo-molecular pump, computer, HMI and all the cells. For that a custom designed UPS & generator system has been successfully installed.

COMPUTER & INFORMATICS CENTRE

HEAD : Professor Prabir Kumar Biswas

Officer

Nanda, Dilip Kumar	M.Sc., DIIT, Ph.D. (IIT Kharagpur), IT Infrastructure Management and Operations, Application Software & Numerical Techniques
Goswami, Partha	B.Tech. (CU), M.Tech. (IIT Kharagpur), Enterprise & Optical transport network
Singh, Pramod Kumar (on lien)	B.Tech., M.Tech., Ph.D. (IIT Kharagpur), Algorithm and Data Network
Roy, Devshri	B.Tech., M.Tech., Ph.D. (IIT Kharagpur), Artificial Intelligence, DBMS
Dutta, Bimal Kanti	M.Sc., PGDCS (Roorkee Univ.), DBMS, OS, Algorithms, Computer Networks, Distributed DBMS & Graphics Programming
Das, Surid Kumar	B.Tech., M.Tech. (Rajasthan Vidyapith Deemed University), Hardware, Computer Network
Chattopadhyay, A.	M.Sc., MS (IIT Kharagpur), Hardware, OS, Network Security & Applications
Das, Sudipto	B.Tech., M.Tech. (Rajasthan Vidyapith Deemed University), OS & Network Applications

FACILITIES

(i) Network Facility

Institute has its long history of network growth and witnessed several re-engineering and expansion of networking Infrastructure. Computer and Informatics center (CIC) is always in the process of exploring efficient solutions and process to address the ever expanding networking needs of the institute. Presently Institute backbone network is based on Gigabit Ethernet, which is spread over the Academic and Hall areas. The Core Switching infrastructure is in the Centre, the Distribution Switching elements are in the Departments & Halls and the Access Switching elements are in the Laboratories or in the floor of the corridors. Internet connectivity has been upgraded and rearranged with two STM1 (155 Mbps) links in order to cater to the high bandwidth (bandwidth utilization report is available at <http://144.16.203.239>) requirement of the Institute. The CIC is maintaining two registered domains (iitkgp.ernet.in and iitkgp.ac.in) and owning 8 Class C IP address from APNIC. The Centre has upgraded the Institute's lease line connectivity with the two extension centers (8Mbps each) located at Bhubaneswar and Kolkata. The National Knowledge Network is also terminated at CIC through 1 Gbps redundant links. CIC has put in place a Wi-Fi based Wireless LAN network at couple of hot spots. Limited residential users are continuing network access through telephone networks. Users may lodge their network related complaints at 82385 between 8 am to 10 pm apart from the web based complaint interface at <http://www.cic.iitkgp.ernet.in/sw/src/login.php>.

The Centre has taken up Networking Expansion / Upgradation at School of Medical Science & Technology (SMST), Rajiv Gandhi School of Intellectual Property Law, Ashutosh Mukherjee Hall of Residence, Mother Teresa Hall of Residence, ERP Development Lab at Industrial Engineering & Management Department and Central Library. The networking of the SMST is on the verge of completion. Design, up-gradation and extension of the networks in the various Departments/Centers as per their requirements have also been undertaken by CIC. The centre is gradually replacing UTP based backbone to OFC based backbone. As a pilot project towards this, initiative has been taken to upgrade the network in the Physics department located in three floor of Main building. A Major component of application traffic is due to web access through proxy servers. Users need to often select / change proxy servers to facilitate improved throughput. The Centre is in the process of procuring proxy server load-balancing switch to distribute the client requests among the proxy servers and to make the proxy server usage more efficient.

The Centre is in the process of upgrading the existing PPP servers used by the dialup users of the campus by providing a Remote Access Server (RAS) which will be interfaced with Institute PBX to support 120 number of simultaneous dialup connections. This upgradation will help the residential users to access network through dialup link as redundancy to the existing ADSL connections. The Centre is going to provide the existing spare fiber infrastructure and space to house head-end of Gigabit passive optical network (GPON) that is being planned.

(ii) Laboratory Facility

The three number PC laboratories of the CIC are fully functional with around 100 seats in each laboratory. Students are engaged in regular laboratory classes in these laboratories. The students for their browsing and other computational uses utilize the Terminal Room of the Centre. The Center is maintaining Work Station Laboratory for research scholars of the Institute. Servers available in the Centre are connected to the institute LAN and the users can work from any corner of the academic campus. CIC also provides computational servers to the students with specific hardware and software requirement for their research. The Centre has also provided support to set up network laboratory during various network related short-term course and is looking forward to setting up a full-fledged hardware & software based network simulation laboratory. One more PC Laboratory with around 50 seats is being planned to be set up in order to cater to the requirements of student's laboratory of the Institute.

(iii) Email & Web Hosting Facility

The Centre is continuing support to the mail services in two domains namely ernet.in and ac.in to all its users along with general notifications services to a group of users through gmail. Major departmental servers are maintained in the Server laboratory of the Centre. In addition to this all major web servers and the facweb server for the interested faculty members is also maintained in the Server laboratory of the Centre.

(iv) Software Facility

Users are updating their desktops with the latest version of CA eTrust Anti Virus software from Centre. Software's like Abacus (for finite element modeling and analysis), MATLAB (for integrated technical computing), Solid Works (for Engineering drawing), SPSS (statistical package) is also available to the Users of the IIT community. The Institute also has Microsoft campus wide licensing.

CONTINUING EDUCATION CENTRE

DEAN : Professor Ajay Chakrabarty

FACILITIES

(a) Equipments

- (i) High luminosity overhead projectors.
- (ii) LCD Panel for multimedia projection.
- (iii) 3M Multimedia Projector.
- (iv) Shure cordless microphone and transmitter / receiver set.
- (v) Ahuja tape recorder and public address system.

(b) Software

- (i) Distance Education Database (from International Centre for Distant Learning)
- (ii) KOMPASS Industrial Directory of India giving details of over 60,000 companies
- (iii) Macromedia Authorware (4.0.6 licences)
- (iv) Adobe Photoshop - graphics package
- (v) Microsoft Front Page Express - for Web page development
- (vi) Microsoft Office 2000 Professional
- (vii) Microsoft Windows 2000 Professional
- (viii) Microsoft Windows 2000 Server with terminal server facility
- (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

(i)	No. of Teachers completed Ph.D degree	:	21
(ii)	No. of Teachers completed M.Tech programme	:	13
(iii)	No. of Teachers joined Ph.D programme	:	17
(iv)	No. of Teachers taking advance admission to Ph.D programme	:	18
(v)	No. of Teachers joined M.Tech. programme	:	14

CD CELL ACTIVITIES

(i)	Manuscripts for text books completed	:	05
(ii)	No. of Text books approved	:	05
(iii)	No. of CAI packages approved	:	0

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

(i)	Total No. of Workshops / Conferences Organized	:	14
(ii)	Total No. of participants attended	:	560

#	Short Term Courses organized under	No. of Courses	No. of participants	Duration
1.	QIP (AICTE) Short Term Courses	09	267	10 Weeks
2.	MHRD / AICTE Special Summer Short Term Courses	14	450	28 Weeks
3.	MHRD / AICTE Special Winter Short Term Courses	08	391	09 Weeks
4.	Sponsored / Self finance Short term courses	65	1950	
	Total ::	96	3058	

CENTRAL RESEARCH FACILITY

CHAIRMAN : Professor Indranil Manna

FACULTY ASSOCIATED

Prof. A. K. Das	Vice Chairman, Life Science Division
Prof. Rahul Mitra	Vice Chairman, Materials Division
Prof. A. Basak	In charge, CD Polarimeter
Prof. M. Bhattacharjee	In charge, EPR
Prof. S. K. Srivastava	In charge, ESCA
Prof. S. K. Ghosh / Prof. T. K. Maiti	In charge, FACS
Prof. I. Manna	In charge, FESEM, XRD, HRXRD
Prof. B. Adhikari	In charge, FTIR
Prof. T. K. Nath	In charge, Hall Effect
Prof. R. Banerjee	In charge, HPLC
Prof. Rahul Mitra	In charge, HRTEM
Prof. K. K. Ray	In charge, UTM (Instron)
Prof. A. K. Das	In charge, MALDI
Prof. S. Roy	In charge, Mass Spectrometer
Prof. S. B. Singh	
Prof. J. Dutta Majumder	In charge, Optical Emission Spectrometer
Prof. B. K. Dhindaw	In charge, Optical Microscopy and Mechanical Testing
Prof. P. K. Datta / Prof. P. Roy Chowdhury	In charge, Optical Fibre
Prof. A. K. Ghosh	In charge, PCR, 2-D Gel. DNA Sequencer
Prof. M. Chakraborty	
Prof. R. Mitra	In charge, SEM, Analytical SEM
Prof. C. Jacob	In charge, SPM
Prof. S. Das	In charge, TEM
Prof. K. Das	In charge, Thermal Analysis
Prof. S. H. Dey	In charge, LC-MS / MS

Senior Scientific Officer

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

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

2D GEL :

Two-dimensional gel electrophoresis system : This equipment is used for analyzing protein samples (qualitative and quantitative) provided by investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE).

DNA sequencer; Real time Polymeric Cyclic Reaction (PCR) analyzer, 2-Dimensional gel electrophoresis :

Automated DNA sequencer : This equipment is used to determine nucleotide sequence of DNA samples provided by different investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE and AgFE).

Real Time PCR machine : This machine is used to analyze gene expression level (quantitative) in different tissue samples provided by investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE)

FACS :

The BD FACSCalibur™ system is four-color, dual-laser, bench top system capable of both cell analysis and sorting. This machine designed specifically to support a wide range of applications like immunophenotyping, absolute counting, residual white blood cell enumeration, stem cell analysis, DNA analysis and isolation by sorting. Recent Experiments carried out with this instrument :

- 1) Drug delivery
- 2) Detection of apoptotic cell death by TUNEL Assay
- 3) Interaction between cell and fluorescent labeled toxin molecules etc.
- 4) Cell cycle analysis

This instrument is currently used by both internal and external users. At least 20 samples / day are analyzed by this machine.

FESEM Lab. :

The field emission gun assisted scanning electron microscopy (FE-SEM, Supra 40V, Carl Zeiss, Germany) provides an excellent scope of microstructural characterization using secondary or back-scattered imaging, energy dispersive spectroscopy and electron back scattered diffraction analysis. This facility offers the highest resolution imaging facility by SEM in this Institute and eastern part of India. The samples analysed include various metals and alloys, semi-conducting and insulating films, refractories, polymeric and ceramic powders, failed engineering components and hybrid / composite materials. Besides offering services to the DST project (through which this equipment was purchased) members and Institute scholars / researchers this instrument has provided important services to several industries and neighbouring institutes. A challenging consultancy job was conducted concerning pipeline failure analysis for a petroleum company abroad. A new deposition unit has been installed for SEM analysis of non-conducting samples. This FE-SEM unit has also been used for laboratory classes of a few departments. The average utilization rate of this instrument has been about 90% of the stipulated working hours. Recently a new project has been initiated for microstructural characterization of sensor materials being developed by a collaboration between IGCAR, Kalpakkam and IIT Kharagpur.

FTIR Lab :

FTIR analysis of different samples in powder, liquid and also film form in MID-IR and FAR-IR range was done at both ambient and above ambient temperatures by our institute students and faculties. We also served outside institutes and industries by analyzing their samples.

Hall Effect :

The Hall effect laboratory at CRF, IIT Kharagpur provides the facilities to measure temperature and magnetic field dependent Hall effect, Magneto-resistance and electrical resistivity of various materials, namely, pure semiconductors, oxide semiconductors, dilute magnetic semiconductors, noble metals, transition metals, GMR, CMR materials, composites, nanoparticles, heterojunctions etc. either in thin film or bulk pellet form. The Hall measurement set up consists of a high field electromagnet (up to 1 Tesla magnetic field) and a magnet power supply, variable temperature cryostat down to 77 K, Rotary vacuum pump with readout gauge, water chiller (150 litre tank) with circulation pump, various measuring equipments (Precision Current source, Nanovoltmeter, Gaussmeter, Temperature controller, 9 channel Scanner), UPS, voltage stabilizer (3 phase input / 3 phase output), a PC for automated measurement etc.. The set up needs 8 litres liquid nitrogen every day as a coolant (procured from Cryogenic Engineering Centre).

The temperature and magnetic field dependent Hall voltage, Magneto-resistance and electrical resistivity measurement facilities are provided to various departments in IIT KGP (Physics, Material Science Centre etc.) regularly. The measurements are done in manual mode (by the laboratory technician) as the computer automated mode is not working at present. As the set up is working in manual mode, every sample measurement takes about 5-6 hours, mainly due to the data are taken by hand. The temperature controller and the Gaussmeter (Hall probe for field measurement) components have been sent for repairing to the company in USA as those were malfunctioning. Recently, the company has intimated that they have successfully repaired those components (a letter from them is enclosed). They are going to handover those repaired items to our freight forwarder soon. Once those components arrive soon, the

unit will be ready for complete measurement of any sample in automated faster mode in the temperature range of 77-300 K. At present measurements are done in manual mode. The maintenance of the set up is also done in regular basis. The water chiller, the connected copper tubes, water flow switches and monitors to the magnet, the water flow pumps etc. gets rusted/ oxidized very often. Thorough cleaning and changing of water in the tank are done regularly to run the magnet power supply and the electromagnet smoothly by sufficient effective cooling of them. The maintenance of variable temperature cryostat (VTI) and the sample holder are also done regularly.

HRTEM Lab :

The HRTEM laboratory is equipped with the JEOL JEM-2100 High Resolution Transmission Electron Microscope, OXFORD INCA EDS microanalytical system and GATAN CCD camera. The JEOL JEM 2100 HRTEM is used for observation of specimens to observe the microstructures at high resolution, up to the level of arrangement of atoms, and determination of the crystal structure and chemical composition at selected positions.

The machine is routinely used for research on nano-structured materials, including bulk alloys, thin films and powders. In addition, it is used for identification and composition of phases, measurement of grain size, and to study line defects and stacking faults in metallic, intermetallic and ceramic samples, as well as composites. In addition, it is possible to study phase transitions at low temperatures using the specimen holder operating at the liquid nitrogen temperature. The users of the HRTEM from IIT, Kharagpur include the students and faculty members of the departments of our institute include Biotechnology, Chemistry, Chemical Engineering, Cryogenic Engineering, Electronics and Electrical Communication Engineering, Electrical Engineering, Geology, Mechanical Engineering, Metallurgical and Materials Engineering, Materials Science Centre, Rubber Technology Centre, Physics, and so on. The external users include the other educational institutes, R&D laboratories and industries. The projects associated with the equipment are based on aluminium alloys, steels, composites, Biomaterials, Nanostructured materials, steel, intermetallics, Rubber and polymer based composites, Ceramic materials, Electronic Materials, etc. The laboratory has received and executed orders for study of a large number of samples from RDCIS, SAIL, Ranchi. A large number of publications, as well as Ph.D., M.Tech and B.Tech theses have come out with contributions from HRTEM laboratory.

MALDI-ToF :

Matrix Assisted Laser Desorption Ionization (MALDI)-Time of flight (ToF) mass spectrometry has provided continuous service to the internal (within IIT) and external users for mass analysis of polymers, proteins and other small molecules (>500Da). This is also used for biomarker identification of different species.

Optical Microscope Lab :

The Optical Microscopy and Characterization Lab. has been busy with all the time slots full and is being used by most of the departments of IIT Kharagpur, like, Electronics & Electrical Communication Engineering, Chemical Engineering, Rubber Technology Center, Mechanical Engineering, Metallurgical & Materials Engineering etc.

Optical Fiber Lab :

A. Upgradation /Renovation of infrastructure

- (i) **Optical lathe :** The mechanical zig (the unit of two-motor based rotation chuck system, oxy-hydrogen flame-brush assembly) of the optical lathe has been set into operation. The control electronics (the interface / drive card) has been replaced and calibrated. The system has now **fully operational** and has been tested with PCF preform collapse four times in last 3 months.
- (ii) **Chiller plant :** The chiller plant that supplies cold water to the oxy-hydrogen burner has been renovated with the replacement of plant accessories.
- (iii) **Nitrogen plant :** the nitrogen plant has been thoroughly upgraded along with the replacement of **solenoid valves, supply pipe lines and flow-controlling electronic components**. The system is being regularly used.

B. Fabrication of PCF perform

Pure quartz-tube (both solid rods and capillary tubes) were stacked in the form of a cylindrically symmetric arrayed structure with a solid rod as the core surrounded by capillaries in a closed-pack form. Using oxy-hydrogen flame in the optical lathe, the structure has been transformed into PCF preform collapsing the same at a temperature off $\sim 1800^{\circ}\text{C}$. Fabrication of PCF using "stack & draw" has been a challenging task nationwide. Thus, this has been a great development from the point of view of research achievement. Other designs of PCF as sensor are currently underway and will be attempted next for configuring PCF based photonic sensor.

PROTEIN CRYSTALLOGRAPHY :

Protein X-ray Crystallography (PX) : Rigaku Micromax 007^{HF} X-ray generator is equipped with RaxisIV++ detector and X-stream cryo for X-ray diffraction studies of protein crystals to determine their 3D structure in atomic resolution. Three dimensional structures of proteins from pathogenic organisms like *M. tuberculosis* and *S. aureus* have been determined.

SEM :

Research and Development :

The SEM laboratories are equipped with 1) JEOL JSM-5800, 2) ZEISS EVO-60 Scanning Microscopes. The analytical attachments with these instruments are OXFORD ISIS-300, INCA Energy-250 EDS systems, INCA Wave-500 WDS system and HKL Channel-5 EBSD system. These SEM are most useful instruments for the people working with the surface and interface characterization of materials in particular. The students and faculties of various departments of the institute involved in materials research has been extensively used the instrument during last one year. The external users from various educational institutes, R&D laboratories and industries from different parts of the country, also have utilized the facility for their research work with satisfaction.

The projects associated with the instrument are aluminium alloys, In-situ composites, failure analysis of materials, Biomaterials, Nanostructured materials, Microalloyed steel, Laser surface alloying, Cutting tool materials, Functionally graded materials, Intermetallics, Rubber and polymer based composites, Ceramic materials etc.

SPM Lab :

The Scanning Probe Microscopy (SPM) Lab is being used to analyze materials on a microscopic and nanoscopic scale to determine surface morphology, phase separation, etc. Surface topography of various metals, semiconductor, ceramic and polymer samples were studied. Phase imaging of polymer sample surface was done successfully. Research workers of different departments and centres of this institute (Physics, Chemistry, Chemical engineering, SMST, Materials Sc, MME, RTC, Biotechnology, Mechanical engineering and ECE) use the laboratory for different surface studies of their samples. The SPM controller was upgraded to achieve better results. In September 2008 some problem was detected and thereafter the machine is shut down and the repairing is under process. Before shut down the machine was used for 27 hrs.

TEM and TEM Sample Preparation Lab :

The laboratory is proving excellent services to users of our Institute and from outside organizations, Research workers from Vidyasagar University, Kalyani University, S.N.Bose Institute, Kolkata, Appolo Tyres, Kochi University, Presidency College used the sample preparation facilities for making samples for TEM study.

Thermal Analysis :

Thermal analysis is one of the most basic characterization tools and is often used to study degradation of materials, reaction mechanisms and phase transformations in materials, etc. In our thermal analysis laboratory, we have one Differential Scanning Calorimeter (DSC), one Thermo-gravimetric and Differential Thermal Analyzer (TG-DTA) and one Thermo Mechanical Analyzer (TMA). These facilities are used by research workers of different departments and centres of the institute as well as outside institutions and

industrial organizations. 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 calcination 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

X-ray diffraction (XRD) facility of CRF includes three units : PW Philips 1710, Expert PRO I and Expert PRO II. While the first unit is used for routine powder diffraction studies, Expert PRO I is dedicated to texture and residual stress analysis and high temperature XRD. Expert PRO II unit is utilised for powder diffraction at normal and high resolution and low angle incidence mode. All the three units are extensively used to conduct phase analysis and identification, crystallite size determination, plastic strain measurements, texture evolution, surface residual stress measurements, phase transition studies (ex situ and in situ), volume fraction determination and failure analysis of engineering components. Besides catering to the entire Institute community for XRD analysis, these units are utilised for teaching in UG and PG level by several Departments within IIT and even Institutes / colleges in the neighbouring region.

The Philips **PW1710** X-Ray diffractometer has provided continuous service to the internal (within IIT) and external users for diffraction analysis of metallic, ceramic and polymeric samples to identify the phases and their distribution, determine volume fraction of the phases, monitor phase transition and evaluation and evaluate normal residual stress, phase evaluation studies in nanocrystalline and amorphous products have yielded the most interesting series of results from the work carried out in this laboratory in the past one year.

The Panalytical X-Pert Pro PW 3040/60 **High Resolution-I** and **High Resolution-II** X-Ray diffractometer has also provided continuous service to the internal (within IIT) and external users. Normal phase analysis with X'Celerator, monitor phase transition and evaluation and evaluate normal residual stress, Texture, Thinfilm (GIXRD) and Phase transformation at High Temperature, phase evaluation studies in nanocrystalline and amorphous products have yielded the most interesting series of results from the work carried out in this laboratory in the past one year.

Consultancy work from several industries, universities and research organization like Vidyasagar University; Department of Central Mechanical Engineering Research Institute (CMERI), Durgapur, Central Institute of Plastics Engineering and Technology (CIPET), Bhubaneswar, Utkal University, Visvabharati University, Shantiniketan and was undertaken by the XRD Lab, CRF, IIT Kharagpur.

HPLC :

HPLC is an efficient technique used for the separation of macro/micro molecules such as organic compounds, amino acids, nucleotides, aroma/fragrance, enzymes and proteins etc. The present system procured and installed at CRF was from M/s Agilent Technologies. The instrument has the following facilities:

There are quaternary pumps, along with different detectors like Refractive Index (RI) and Photo diode array at variable wavelengths, manual injecting valves, ports. There are various columns available for separating different molecules along with the guard columns which are placed anterior to the separating column. The active fraction from the column can be eluted and separated for further analysis through fraction collector. The Chem Station software controls the instrument where the detail analysis of the data can be obtained.

HPLC is now one of the most powerful tools in analytical chemistry, with the ability to separate, identify and quantify the compounds that are present in any sample that can be dissolved in a liquid. Today, trace concentrations of compounds, as low as "parts per trillion" (ppt), are easily obtained. HPLC can be applied to just about any sample, such as pharmaceuticals, food, nutraceuticals, cosmetics, environmental matrices, forensic samples, and industrial chemicals.

New Acquisitions :

1. **SEM** : ZEISS EVO-60 Scanning Microscope (Carl Zeiss, Germany); INCA Energy-250 EDS systems, INCA Wave-500 WDS system and HKL Channel-5 EBSD system (Oxford Instruments, UK)
2. **New Acquisition** : ZEISS EVO-60 Scanning Microscope (Carl Zeiss, Germany); INCA Energy-250 EDS systems, INCA Wave-500 WDS system and HKL Channel-5 EBSD system (Oxford Instruments, UK)

SERVICE RENDERED TO OTHER INSTITUTES :

IIT Roorkee, Ravenshaw College, Vidyasagar University, IACS Calcutta, ISM Dhanbad, NML Jamshedpur, BIT Meshra, Cochin University of Science and Technology and NIT Durgapur.

SAIL R&D, IACS Kolkata, VSSC Trivandrum, S.N. Bose Institute Kolkata, IIT Guwahati, IIT Kanpur, Mahatma Gandhi University, Kottayam (Kerala), PSG College of Technology, Coimbatore, ISM Dhanbad, Viswabharati University, BESU Shibpur, Jadavpur University Kolkata, Vidyasagar University, etc.

VISITS ABROAD :

Dr. Santi Mohan Mandal, Technical Assistant, CRF, is at present in the Department of Neurology, University of Texas Medical Branch (UTMB), Galveston, USA as a Research Fellow and he is on EOL from 9th July 2008 to 8th July 2010.

LAURELS & DISTINCTIONS :

Dr. Santi Mohan Mandal, Technical Assistant, CRF, has been awarded Jr. Scientist of the Year 2007 in December 2007 at the XXth Annual Conference of the National Environmental Science Academy, New Delhi. Dr. Mandal is at present in the Department of Neurology, University of Texas Medical Branch (UTMB), Galveston, USA as a Research Fellow and he is on EOL from 9th July 2008 to 8th July 2010.

CENTRAL LIBRARY

CHAIRMAN : Professor Sadananda Sahu

Librarian

Sutradhar, B. Ph.D., M.Sc., M.L.I.Sc.

Deputy Librarian :

Ratnasamy, M. M.L.I.S., P.G.D.C.A.

Pusty, J. N. M.Lib.Sc., M.Com.

Assistant Librarian :

Shankar, Uma M.Lib.I.Sc., M.A.

Mazumdar, Kamal M.Lib.I.Sc., B.A., B.Com., CPDA

Pathak, Sandeep K. Ph.D, M.Sc., M.Lib.I.Sc., M.A., DCA

Mohapatra, P. K. M.Lib.I.Sc, M.A.

Nandi, Atin M.Lib.I.Sc, M.Sc.

APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Retirement :

Mr. M. M. Jana Junior Technician

Mr. T. K. Chakraborty Senior Mechanic

The Central Library is one of the biggest technical libraries in Asia and its web site address is <http://www.library.iitkgp.ernet.in>

PRINT DOCUMENTS ADDED DURING THE YEAR 2008-2009

The Central Library acquired 1909 general books and 3492 text books. It also added 4013 bound volumes of periodicals, 480 Theses, besides reprints and annual reports of other universities.

NEW E-RESOURCES ADDED DURING THE YEAR 2008-2009

500 online journals from different publishers

7000 Springer E-books collection copy right years 2008-2009

Online Database: LexisNexis (Law)

CIRCULATION

The books circulation activities are fully automated and serve the users consisting of the faculty, research scholars, students and staff. The books circulation service is kept open for 50 hours a week. On the average, the monthly circulation transactions are about 10000. About 60 copies of documents were obtained through Inter-Library Loan.

DIGITAL LIBRARY

The Digital Library provides access to the following e-resources :

Full-text databases : Access to 10000 full-text journals from the following databases.

Elsevier Science Direct, Springer Link, Proquest, ABI/INFORM, Applied Science & Technology Plus online, IEL (IEEE & IEE electronic library), ACM Digital Library, ASME, ASCE, EBSCO Databases, Emerald, Nature Journal, ASTM Standard, Capitaline, ACS Journals.

BIBLIOGRAPHIC DATABASES

SciFinder Scholar, ISI Web of Science, MathSciNet, J-Gate Custom Content for Consortia and SCOPUS.

E-BOOKS

Ebrary (30,000 e-books database)

Springer E-Books (all Springer e-books copy right years 2005-2009)

800 CRC Press Hand Books (CRCnetBASE)

The digital library also provides access to Video-Courses which contained the lectures delivered by our faculty members. Twice a week the Digital Library organizes User Education Programme so as to train the students to use our digital resources effectively.

INDEST-AICTE CONSORTIUM DATABASES

The Central Library IIT, Kharagpur is a core member of the INDEST Consortium. INDEST membership facilitates the users to access the full text of about 10000 online journals and 5 bibliographic databases

INSTITUTIONAL DIGITAL REPOSITORY

Central Library, IIT Kharagpur has setup an Institutional Digital Repository using open source software 'D-Space'. At present the Institutional Digital Repository has 2000 articles, several question papers, books and theses.

RENOVATION WORK

Hall No. 1 and 2 at Central Library of IIT Kharagpur have been renovated

CIRCULATION COUNTER

New Circulation Counter has been made for the users

HELP DESK SERVICE

New help Desk service has been introduced

NEW EQUIPMENT AND FURNITURE

The following equipment and furniture have been acquired for the users :

1. Mail Server
2. 100 reading chairs
3. 20 reading tables

The Console room has been upgraded with high-end mail server. The main reading halls and circulation counter have been renovated.

EXTENDED LIBRARY HOURS

Central Library hours has been extended up to 12 midnight throughout the year except Institute's holidays.

DEGREE ACQUIRED

Mr. Samrat Guha Roy, SLIA, has been acquired B.Lib.I.Sc., from Annamalai University

INVITED LECTURES

Dr. B. Sutradhar

Invited lecture delivered on "Access Management of e-resources" as Guest of Honour in one day Workshop on User Awareness Programme on Access to E-resources under UGC INFONET Digital Library Consortium held on 25 March 2009 at North Bengal University

Dr. B. Sutradhar

Invited lecture delivered on "Electronic resource management" at 2-day training workshop on *Access to E-resources under UGC-INFONET Digital Library Consortium* during February 2-3, 2009 organized by University of Kalyani, West Bengal.

Dr. B. Sutradhar	Invited lecture delivered on "Building Digital Libraries: A practical approach" at 2 days Workshop on Capacity Building for College and University Libraries on 13 January 2009 organized by Sambalpur University, Orissas
Dr. B. Sutradhar	Invited lecture delivered on "Subscription and Management of E-Resources" on 30 July 2008 at UGC sponsored refresher course on Management of Electronic Information organized by Jadavpur University, Kolkata.
Dr. B. Sutradhar	Participated in panel discussion on USER-PUBLISHING INDUSTRY-LIBRARIAN as panelist at 23rd IASLIC National Seminar at Bose Institute, Kolkata during 10-13 December, 2008.
Mr. P. K. Mohapatra	Invited lecture delivered on "Natural Disaster and its impact on Indian Economy" in a National Level Seminar sponsored by UGC and organized by Dept. of Economics, U N College, Soro in joint collaboration with Khaira College, Khaira on 25 th & 26 th Feb., 2009.

PARTICIPATION IN CONFERENCE / WORKSHOPS

Dr. B Sutradhar	Attended INDEST-AICTE <i>Workshop and Sixth Annual Meet at IIT Bombay during 7-9 January</i>
Dr. B Sutradhar	Attended 23rd IASLIC National Seminar at Bose Institute, Kolkata during 10-13 December, 2008.
Mr. P. K. Mohapatra	Attended the NCSI IDRC Workshop on 'Integrated Library Automation Packages' from January 05-09, 2009 at NCSI, IISc, Bangalore.
Mr. D. N Mandal	Attended the NCSI IDRC Workshop on 'Integrated Library Automation Packages' from January 05-09, 2009 at NCSI, IISc, Bangalore.

INTERNATIONAL AWARD

The 2nd best International Research Paper by ASIST (American Society for Information, Science & Technology) on 23 July, 2008 awarded to Dr. S. K. Pathak for following paper :

Dr. Pathak, S K and Dr. Deshpande, N J (2008). Usage of e-journals in Astronomy and Astrophysics Libraries and Information Centres in India: a users' perspective. *International Information and Library Review*, Vol 40 (3). pp. 153-164.

VISITS ABROAD

Professor S. Sahu, Chairman, Central Library visited :

1. Central Library of National University of Singapore in May 2008.
2. Central Library of Nanyang Technological University, Singapore in May 2008.
3. Central Library of Loughborough University, UK in June 2008.
4. British Library, London in June 2008.
5. National Library board, Singapore in December 2008.

CENTRAL WORKSHOP & INSTRUMENTS SERVICE SECTION

CHAIRMAN : Professor Prasanta Kumar Das

Officer

Patra, S.

Assistant Workshop Superintendent

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 postgraduate and research activity in the Institute.

It is one of the major service sections of the Institute having following units :

1. Mechanical
2. Glass Blowing
3. Carpentry
4. Electronics
5. Audio Visual

Apart from executing work orders from various Departments / Centers / Sections of the Institute, CWISS also undertakes work orders from outside on cost basis.

(1) MECHANICAL SECTION

Mechanical Section in CWISS comprises Mechanical Fabrication, Mechanical Instrument and Glass Blowing Section.

(a) Mechanical Fabrication Section

It is equipped with various types of machines like CNC Lathe, EDM, Milling, Conventional Lathe, Bench Lathe, Watch Maker's Lathe, Drilling, Shaping Machine, Bench Drill, Bench Shaper, Grinding Machines (Surface, Cylindrical, Pedestal, Belt and Hand operated), Jig Boring, and Pantograph Machine, Power Saw, Shearing Machine, Polishing, Press, Arc Welding, Brazing and Soldering, etc. This year we have designed and fabricated on prototype ship for the project, Meval PMC Centre, Jamnagar.

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.

During the year 2008-2009 the Mechanical Section has performed jobs of about 90 work orders, comprising of

- i) Fabrication of different types of Wave Guides
- ii) Fabrication of Die-Punches of different sizes
- iii) Fabrication of different sizes tensile, Charpy specimens of different materials
- iv) Fabrication of sample holder for wear test
- v) Fabrication of different types of flanges. Studs etc.
- vi) Fabrication of Rack, Pinion & Gears
- vii) Fabrication of Sample for, XRD, X-ray, SEM, test
- viii) Fabrication of different attachment for leaser operation
- ix) Fabrication of Micro- channel
- x) Fabrication of Mould with different materials
- xi) Fabrication of different types of adaptors
- xii) Fabrication of CBM set-up
- xiii) Flat Pannel Bio-reactor
- ixv) Heat sink.

(b) Mechanical Instruments Section

Different types of precision mechanical instruments are repaired in this section. Some typical examples include different types of stopwatches, gauges, valve regulators,

balances, vacuum pumps, gear pumps, husk cutter, water flow meter, gas flow meter, dial indicator, dial gauge, micrometer, gas regulator, pressure gauge, autoclave, viscometer, various types of equipments & machines used in our Hospital, etc. Fabrication of sample holders of SEM & XRD, fabrication of very precision items etc.

(2) 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 FB, RB, 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 80 work orders.

(3) CARPENTRY SECTION

Housed in the workshop complex behind Chemical Engineering and 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 and upholstery jobs as students projects.

This section also meets the major requirements of furniture of the Institute. During the year 2008-2009, this section has completed 130 work orders.

Details of some of the Work done during period :

i)	Faculty Table	--	14 Nos.
ii)	Office Table	--	16 Nos.
iii)	Computer Table	--	10 Nos.
iv)	Laboratory Table	--	16 Nos.
v)	Working Table	--	22 Nos.
vi)	Book Shelf	--	06 Nos.
vii)	Sign Board	--	19 Nos.
viii)	Wall Partion	--	04 Nos.
ix)	Model for Students	--	04 Nos.
x)	Notice / Key Board	--	13 Nos.
xi)	Stool / Bench	--	14 Nos.
xii)	Box as per design / Packing	--	12 Nos.
xiii)	Wooden Desk	--	05 Nos.
xiv)	Wooden blocks	--	36 Nos.
xv)	Name Plate	--	45 Nos.
xvi)	Repair of old Table and Chair	--	18 Nos.
xvii)	No parking board	--	21 Nos.
xviii)	For Kshitij	--	09 Nos.
xix)	Structures / Arena	--	09 Nos.
xx)	Both side reading table for library	--	20 Nos.

(4) ELECTRONICS SECTION

Electronics plays a major part in the design of almost all the machines and equipments. With the advent of microprocessor technology the design has become more sophisticated. Electronics section of CWISS looks after the breakdown maintenance of such machines which are spread all

over the institute. It has also a LPKF PCB Prototyping machine which can produce double sided PCBs with PTH facility as per require design.

Lists of some of the equipments repaired by the Section are :

i)	Microprocessor based Controller	Chemical Engineering
ii)	Lemo pre-amplifire	Mechanical Engineering
iii)	Gauss meter	Physics & Meteorology
iv)	UPS (2 Nos.)	Chemical Engineering, Materials Science
v)	Voltage Stabilizer (4 Nos.)	Chemistry, Biotechnology
vi)	Electronics Microscope (2)	Chemical Engineering, Chemistry
vii)	500 KW Motor's control panel	Ocean Engineering & Naval Architecture
viii)	Dual channel battery charger	Agricultural & Food Engineering
ix)	Plotter	Metallurgical & Materials Engineering
x)	WIRE EDM Machine	Mechanical Engineering
xi)	Lamination machine	Academic Section
xii)	Balance (3 Nos.)	Chemistry, Agricultural & Food Engineering, Ocean Engineering & Naval Architecture
xiii)	Astro furnace (2 Nos.)	Metallurgical & Materials Engineering
xiv)	Precision Weighting balance	Mechanical Engineering
xv)	Ultrasonic machine	B. C. Roy Technology Hospital
xvi)	Temperature Controller (2 Nos.)	Metallurgical & Materials Engineering, Physics & Meteorology
xvii)	CORTEST Machine	Metallurgical & Materials Engineering
xviii)	ND-YAG laser	Mechanical Engineering
xix)	Electro Phoresis Power supply	Chemistry
xx)	Water bath of rotary evaporator	Chemistry
xxi)	Gas-leak detector	Chemistry
xxii)	Digital mv / ma source cum meter	Physics & Meteorology
xxiii)	Oscilloscope	Physics & Meteorology
xxiv)	Chilled water bath	Chemistry
xxv)	CORTEST Machine control panel	Metallurgical & Materials Engineering
xxvi)	UV Visible detector	Chemistry
xxvii)	Suction machine	B. C. Roy Technology Hospital
xxviii)	SMPS	Chemistry
xxix)	Polishing machine	Metallurgical & Materials Engineering
xxx)	Indo therm Digital temperature Controller	Physics & Meteorology
xxxi)	Digital counter	Civil Engineering
xxxii)	D. C. Power supply	Mining Engineering
xxxiii)	Specto photometer	Agricultural & Food Engineering
xxxiv)	Scanning poten tiostart	Metallurgical & Materials Engineering
xxxv)	Gel Rocker	Biotechnology
xxxvi)	Microscope for X-Ray machine	Chemistry
xxxvii)	Rock compression machine	Mining Engineering

(5) AUDIO VISUAL SECTION

Audio Visual Cell is primarily involved in providing audio visual support for conducting regular classes at different lecture halls (approximately 150 classes per week). AV Cell also provides support to various student activities like Quiz, Plays, Spring festival, Kshitij, Inter Hall competitions and T&P activities. It also helps in various other academic activities like Convocation, Senate Meeting, National & International seminars, Conferences and Workshops and also to JEE & GATE units.

The Audio Visual Cell has a number of sophisticated equipments like Multimedia Projectors, Document Cameras, High quality Amplifiers and Mixtures, Wireless Microphones & Conference Systems.

CENTRE FOR THEORETICAL STUDIES

HEAD : Professor Pratim Kumar Chattaraj

FACULTY ASSOCIATED

Pal, Sudebkumar Prasant	B.Tech. (Hons.), M.Tech., Ph.D. (IISc Bangalore), (Computer Science & Engineering) Computational geometry, Design and analysis of algorithms
Banerjee, Soumitro	B.E., M.Tech., Ph.D. (IIT Delhi), (Electrical Engineering) Nonlinear Dynamics, Chaos / Bifurcation Theory
Ghatak, S. K.	Ph.D. (Calcutta University), (Physics & Meteorology) Condensed Matter Physics
Taraphder, A.	M.Sc., Ph.D (IISc Bangalore), (Physics & Meteorology) Theoretical Condensed Matter Physics
Bharadwarj, Somnath	M.Sc., Ph.D. (IISc Bangalore), (Physics & Meteorology) Theoretical Astrophysics and Cosmology
Kar, Sayan	M.Sc., Ph.D. (IIT Kanpur), (Physics & Meteorology) Relativity and High Energy Physics
Khastgir, S. Pratik	M.Sc., Ph.D. (IOP, Bhubaneswar), (Physics & Meteorology) Mathematical Physics and Integral Models
DasGupta, Anirvan	B.Tech., M.Tech., Ph.D. (Kanpur), (Mechanical Engineering) 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
Kumar, Somesh	M.Sc., Ph.D. (IIT Kanpur), (Mathematics) Statistical Decision Theory and Inference, Quantum Computing
Roy, A. R.	M.Sc., Ph.D. (IIT Kharagpur), (Mathematics) Relativistic Cosmology, Fuzzy Mathematics, Operations Research
Choudhary, R. N. P.	Ph.D. (Edinburgh University), (Physics & Meteorology) Condensed Matter Physics (Expt.)

Staff :

Halder, Ujal	Post Diploma in Computer Application, Diploma in Electrical Engineering (Computer Science & Engineering) Administration, Networking, Web development, Trouble shooting etc.
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Project Staff :

Nandan, Hemwati	KFD, SRF, 3 years
Guha Sarkar, Tapamoy	JRF, MRT, 3 years
Das Adhikari, Samaresh	ENV, JRF, 3 years
Panda, Subhasis	CSIR, JRF, 2 years
Ghosh, Tatan	CSIR, JRF, 2 years

RESEARCH AND DEVELOPMENT

Brief Descriptions on-going activities :

Research is carried out in CTS on the following areas:

1. Astrophysics, Cosmology and Relativity
 - (i) Magnetic fields of strange stars and neutron stars
 - (ii) Large scale structure formation in the Universe
 - (iii) Bulk-brane dynamics
2. Dynamics and control
 - (i) Nonlinear dynamics : Bifurcation Theory and Chaos
 - (ii) Control theory
 - (iii) Vibrations
3. Mathematics, Mathematical physics and Theoretical Computer Science
 - (i) Integrable models
 - (ii) Computational and combinatorial geometry
 - (iii) Pure and applied mathematics
 - (iv) Quantum computation and quantum information
 - (v) Graph and Hypergraph Theory
4. Theoretical Condensed Matter Physics
 - (i) Computational Condensed Matter and Statistical Physics
 - (ii) Superconductivity
5. Theoretical Chemistry
 - (i) Large scale simulations of complex systems
 - (ii) Density functional theory, quantum chaos

Thrust Areas :

1. Astrophysics, Cosmology & Relativity
2. Nonlinear Sciences
3. Mathematics, Mathematical physics and Theoretical Computer Science
4. Theoretical Condensed matter Physics
5. Theoretical Chemistry

ACTIVITIES

Courses and Graduate Programme :

1. CTS is offering new advanced post-graduate courses which are relevant across departments through involvement of faculty from various departments. These courses are :
 - (i) Methods in molecular simulations (TS70001)
 - (ii) Advanced dynamics (TS70002)
 - (iii) Wave propagation in continuous media (TS70003)
 - (iv) Advanced Mathematical techniques (TS70004)
 - (v) Advanced quantum theory (TS70005)
 - (vi) Quantum mechanics and quantum computing (TS70006)
2. TS 70001 and TS 70002 have been offered and has run in Spring 2008-2009.
3. CTS is also admitting PhD students through sponsored projects and fellowships (CSIR) under Advanced Technology Development Center. Currently three such students are enrolled.

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

FACILITIES

- i) A Computer Lab with 11 Pentiums, 2 Quad core server and a Linux Cluster from CDC
- ii) HP Laser printer, HP Laserjet duplex network printer, HP Colour Deskjet Printers, Scanner, Multimedia Projector
- iii) Software (Mathematica, Matlab, Maple, Scilab, IDL, etc.)
- iv) CTS library
- v) Visitor's Hall for the Visitors visiting the Institute under CTS Visitors Programme

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
- v) To offer postgraduate level elective courses

The Centre for Theoretical Studies (CTS) at the Indian Institute of Technology, Kharagpur (IIT KGP) has been in existence since 1998 and is located in the first floor of the Sahid Bhavan (Old Institute Building) at the Eastern end of the IIT campus. Its primary goal is to generate and nucleate theoretical research on fundamental aspects of basic and engineering sciences. The role of the CTS in the academic framework of IIT KGP is to bring together people of similar interests under a common umbrella. The CTS, apart from acting as a facility for research in theoretical studies in science and engineering, also trains graduate students and provide opportunities to post-doctoral workers and researchers from outside IIT KGP. Additionally, the CTS has an active visitors programme of both short and long term visitors. The CTS also organizes seminars, workshops on a regular basis on diverse topics. An important component of CTS workshops and seminars is to motivate young students (both undergraduates from IIT KGP and graduate students from within and outside IIT KGP) to actively pursue theoretical research in front-line areas of science and engineering. Finally, besides promoting research on 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.

VISITORS PROGRAMME

Objective

To provide facilities to faculty members, postdoctoral fellows and students from academic and research institutions in India and abroad to conduct research on theoretical problems in science and engineering in collaboration with faculty members of IIT Kharagpur.

COLLABORATIVE EFFORTS

The Center for Theoretical Studies has very active collaborative research programmes in the 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.

VISITORS DURING 2008-2009

#	Name of the Visitor	Institute / University	Associated Faculty
1.	Md. Nurujjaman	Research Fellow SINP, Kolkata	Prof. S. Banerjee Electrical Engineering
2.	Dr. Motahar Reza	Assistant Professor NIST, Berhampur	Prof. S. Chakraborty Mechanical Engineering
3.	Dr. Arindam Chakraborty	Assistant Teacher JPHS, Kolkata	Prof. P. K. Chattaraj Chemistry
4.	Dr. Nilabja Haldar	Teacher RMRC, Narendrapur	Prof. S. Kar Physics & Meteorology
5.	Dr. Dilip Kr. Maity	Lecturer BITS, Pilani	Prof. S. Bhattacharyya Dept. of Mathematics
6.	Dr. Sanjay K Pandey	Reader LBS Clooeege, Gonda	Prof. S. Bharadwaj Physics & Meteorology
7.	Mr. R. Vijayaraj	Sr. Research Fellow CLRI, Chennai	Prof. P. K. Chattaraj Dept. of Chemistry
8.	Miss. Ruchi Gupta	M.Sc. Student Laxmi Bai Nagar, New Delhi	Prof. S. Chakraborty Mechanical Engineering
9.	Dr. Sujit kumar Bose	Professor [Retd.], SNBNCBS, Kolkata	Prof. S. Dey Civil Engineering
10.	Dr. Sanjay Gupta	Lecturer BIT Mesra, Ranchi	Prof. A. Taraphder Physics & Meteorology
11.	Dr. Akhilesh Ranjan	PhD. Student IIT Kanpur	Prof. P. K. Raina Physics & Meteorology
12.	Dr. Umananda Dev Goswami	Post Doc TIFR, Mumbai	Prof. P. K. Raina Physics & Meteorology
13.	Dr. Tanima Banerjee	Lecturer MIT, Manipal	Prof. S. Majumder Physics & Meteorology
14.	Mr. Debabrata Parihari	Ph.D. Student JNCASR, Bangalore	Prof. A. Taraphder Physics & Meteorology

LECTURE BY VISITING EXPERT

1.	Prof. Naresh Dadhich IUCAA, Pune	Title : On gravitational dynamics Date: March 18, 2009
2.	Prof. A. Basu Indian Institute of Management Bangalore	Title : Reinforcement Learning in Games Date : March 16, 2009
3.	Prof. J. L. Vignerese Fac de Sciences, Nancy-Université France	Title : Early earth Date : March 9, 2009
4.	Prof. S. R. Gadre, FNA, FASc Department of Chemistry Pune University	Title : Treating large molecular clusters by ab initio methods Date : February 25, 2009
5.	Prof. Joseph Samuel Raman Research Institute Bangalore	Title : Ricci Flows and General Relativity Date : February 19, 2009
6.	Prof. S. Ramasesha Indian Institute of Science Bangalore	Title : Chemistry and physics of correlated electrons Date : February 04, 2009
7.	Prof. M. K. Harbola IIT, Kanpur	Title : Time independent density functional theory for excited state: formalism and applications Date : February 04, 2009
8.	Prof. Ranjit Biswas S. N. Bose National Centre for Basic Sciences, Kolkata	Title : Dynamics in Room Temperature Ionic Liquids : Theory and Experiments Date : November 20, 2008

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|-----|---|---|
| 9. | Dr. Pijush K Ghosh
Department of Physics
Visva Bharati, Shantiniketan | Title : Is (Dirac)-Hermiticity necessary in Quantum Physics
Date : October 21, 2008 |
| 10. | Dr. Satrajit Adhikari
IACS, Kolkata | Title : A Quantum - Classical Approach to the Photo absorption spectrum of Pyrazine, Butatriene and Benzene Cation
Date : September 15, 2008 |
| 11. | Prof. Ramesh Krishnamurti
School of Computing Science
Simon Fraser University | Title : The Capacitated Max-k-cut Problem
Date : April 04, 2008 |

LAURELS & DISTINCTIONS

- | | | |
|----|------------------|--|
| 1. | Dr. Somesh Kumar | Executive Editor, International Journal of Mathematics and Computation |
| 2. | Dr. Somesh Kumar | Editor, International Journal of Applied Mathematics and Statistics |
| 3. | Dr. Somesh Kumar | Editor, Bulletin of Statistics and Economics |
| 4. | Dr. Somesh Kumar | Associate Editor, J. Indian Society for Probability and Statistics |

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

- | | | |
|----|--|---------------------|
| 1. | 12th Young Astronomers' Meet (YAM-2009) | March 14-16, 2009 |
| 2. | One-day Symposium on Chemistry and Physics of Materials and Fluids | February 04, 2009 |
| 3. | 9th International Conference on Vibration Problems (ICoVP-2009) | January 19-22, 2009 |

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 renovated the web sites of the Institute and Online Notice-Board. The Cell also created and hosted sites of about forty conferences, seminars, workshops and short-term courses held during the past year and to be held in the next academic year. In addition to regular updating information on departmental pages, academic programmes, profiles of all faculty, halls of residences and administrative positions in the Institute, the Cell also published information books like Communication Directory and Pocket Guide. The Cell participated in preparation of Press Releases and Institute Information Notes as and when required from time to time.

The Cell also developed additional information modules for in-house application and they can be used in any other academic organization as well. These are : on-line Faculty Self Appraisal Package, Departmental Report Package, Online Voting System, Guest House Booking Package, Extension of on-line Message Board facility to the Academic Section, Training and Placement Section and the Technology Students Gymkhana. The Cell has made available the basic information about all Institute Staff on the LAN. The Cell has also developed software for various service sections for online filling of complaints.

In a major developed work being carried out in the Cell, distributed academic databases of the Institute are going to be linked to create a one-point information access system. It will make easy availability of information as well as provide a strong decision making support to the Institute.

INSTITUTE CIVIL WORKS

CHAIRMAN : Professor Sriman Kumar Bhattacharyya

Officer

Mukherjee, T. K.

Superintending Engineer (Civil)

Roy, Subrat

Executive Engineer (Civil)

The development programme of the Institute Campus involving infrastructure and new facilities have been taken up in view of increase in student population, faculty strength and staff strength. The programme includes construction of new hostel building, extension of existing students' hall of residence, class room complex, residential flats for faculty and staff members etc.

(i) Students' Accommodation

Arrangements have been made for the construction of 2 (two) nos. of 2000 capacity 3 (three) seater Boys' hostel. Construction work of new students' blocks of R.P. and R.K. Hall of Residence is in progress to accommodate 288 students in each block. Construction of one additional floor for each of existing Azad, Nehru and Patel Halls of Residence is also going on.

(ii) J. C. Ghosh Science Block & P. C. Roy Laboratory Block

Arrangements have been made for the construction of J. C. Ghosh Science Block and P. C. Roy Laboratory Block for Chemistry Department and Rubber Technology Centre.

(iii) Guest House

The construction of 100 roomed guest house is on the verge of completion. Provision for both standard rooms and VIP suites has been made.

(iv) Residential Apartments for Faculty and Staff

The construction works for 63 nos. of A-type flats and 81 nos. of B-type flats are going on for the faculty housing.

Arrangements have been made for the construction of 64 nos. of 2-BR type and 80 Nos. of 1-BR type of flats for staff housing.

(v) Project Staff Accommodation

The extension programme for the Vikram Sarabhai Residential Complex is in the process.

M/s. GKKSSA has been entrusted with the job for the development of Campus Master Plan. Several infrastructural development programmes have been undertaken in view of the increasing student population in the Campus. These include students' amenity centre, centralised food court, several food chains, library building, convention centre etc.

INSTITUTE ELECTRICAL WORKS

PROFESSOR-IN-CHARGE : Professor Debapriya Das

Officer

Ghosh, Sabyasachi	Executive Engineer (Electrical)
Kumar, Mahesh	Executive Engineer (Electrical)
Chakrabarty, Dipak Kumar	Executive Engineer (Electrical)

Brief description of major activities and on going projects

Keeping in pace with increased strength of the students, different measures have been taken by this Section for augmentation of power supply system and revamping the distribution system.

- i) Augmentation of the 33kV substation to 17.6MVA.
- ii) Contractual demand with WBSEDCL has been enhanced upto 13MVA in steps in the next five years.
- iii) The capacities of all distribution substations have been doubled.
- iv) All Power lines have been converted to underground cables.
- v) Fire detection and alarm technique being introduced in the library and class rooms in the main building.
- vi) All the 11kV Bulk oil circuit breakers have been retrofitted to 11kV Vacuum circuit breakers.
- vii) A new set of capacitor banks of 1542 kVAR capacity (for full load condition) and one 850 kVAR capacity (for light load condition) has been installed to lower the active power consumption.
- viii) Construction of a new 250kVA substation at Balarampur is going on.
- ix) All low voltage switchgears in the substations have been modernized with state-of- the-art technology.
- x) All substations in the residential area have been interlinked with a ring main at 415V to improve reliability and faster restoration under emergency.
- xi) Installation and commissioning of auto synchronization cum AMF panel for the DG sets at the service centre of new academic complex.
- xii) Augmentation of power supply with higher size power cables from substation / feeder pillars to different departments and replacement of most of old distribution panels by MCCB controlled cubical panels with suitable metering and protection system have been completed.
- xiii) Renovation of Institute Committee room, most of the laboratories and class rooms was done with energy saving luminaries and MCB controlled distribution boxes.
- xiv) Power connection for Air Conditioners have been provided to 60% of the faculty rooms and Energy saving measures have been implemented in different Departments / academic buildings, commercial establishments, and residential complexes by replacing analog energy meters with digital / static energy meters.

INSTITUTE WATER WORKS

PROFESSOR-IN-CHARGE : Professor Ashok Kumar Gupta

Officer

Biswas, Shyamal Kumar

Engineer

To meet the additional water demand from the increased student and faculty strength, Water Works Section of the Institute has taken up several new water related works. They are in different stages of progress.

Works completed :

The following works have been just completed :

1. Installation of flow meters at water sources.
2. Construction of new deep tubewells at Anicut Pumphouse, Bharatsangha area, Balarampur Pumphouse
3. Providing additional water tanks at various Halls of Residence
4. Providing water connection to Steel Technology Centre
5. Surging of existing tubewells
6. Providing kitchen sink at C-type Qrts.

On-going works :

The following new projects are being implemented :

1. Providing additional water tanks at single storied C₁ & B type qrts.
2. Installation of flow meter at Underground Pumphouse

Works in the pipe line :

1. Laying of 250 mm dia main water pipe line between Underground Pump house and Hall area
2. Construction of iron removal plant for deepwell near B.C.Roy Technology Hospital

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
Chakrabarty, Ajay	Ph.D., Microwave circuits & Antennas & EMI/EMC
Sen, S.	Ph.D., MEMS
Patra, Amit	Ph.D., Power System & VLSI Design
Das, S. K.	Ph.D., Control System
Rajakumar, R. V.	Ph.D., Communication & Signal Processing
Sanyal, S.	Ph.D., RF & Microwave Engineering
Chakraborti, S.	Ph.D., Communication
Biswas, P. K.	Ph.D., Image Processing
Bandyopadhyay, S. S.	Ph.D., Cryogenic Engineering
Chowdhury, K.	Ph.D., Cryogenic Engineering
Bandyopadhyay, K.	Ph.D., Satellite Communication
Manna, I.	Ph.D., Material
Ray, G.	Ph.D., Control System
Sengupta, I.	Ph.D., Mobile Communication, VLSI

Associate Professor :

Saha, G.	Ph.D., Communication
Chakrabarty, C.	Ph.D., Control System
Sant, S. B.	Ph.D., Material

Assistant Professor :

Nandi, T. K.	Ph.D., Cryogenic Engineering
Sinha, M.	Ph.D., Aerospace Engineering
Mukhopadhyay, S.	Ph.D., Video Image & Processing
Bhattacharya, A.	Ph.D., RF & Microwave Engineering
Das, S.	Ph.D., MEMS & Microsystems
Chakraborty, P. K.	Ph.D., Solid-state Science and Technology
Ghosh, B.	Ph.D., RF & Microwave Engineering
Bhattacharya, T. K.	Ph.D., RF MEMS

Chair Professor :

Sarkar, B. K.	Ph.D., RF & Microwave Engineering
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Visiting / Adjunct Faculty :

Bose, A.	M.E., Mechanical Engineering
Dasgupta, S.	Ph.D., Control System
Das, B. B.	Ph.D., Control System

Officer :

Sahoo, G.	Ph.D., EMI / EMC, Microwave, Waveguide Slot Antenna and Mining Electronics
Guchait, P. K.	M.Tech., Polymers Science & Engineering
Ghosh, Saswati	Ph.D., EMI / EMC, RF Microwave Circuit & Antenna

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

Space Technology Cell, IIT Kharagpur was renamed as Kalpana Chawla Space Technology Cell and was formally inaugurated by Chairman ISRO on 17th November 2004 this Cell has been functioning under the supervision of 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, 19th IEEE/ACM International Conference on VLSI Design
47. High Level Synthesis of Linear Analog Systems, International Conference on Emerging Applications of IT (EAIT 2006)
48. AGC of a Hydrothermal System with Thyristor Controlled Phase Shifter in the Tie-Line
49. Texture Classification Using a Novel, Soft-Set Theory Based Classification Algorithm
50. TEM Characterization of Polyester Urethane Clay (3 Weigth%) nanocomposite

Multimedia and Video Processing :

An FPGA based state of the art video codec is being developed. The system under development finds its usage in Digital Video Broadcasting (DVB) system and performs real time encoding of colour videos of CIF frams size (352×288 pixels) at 30 frames/sec

Radiation patterns of antennas on satellite :

Radiation due antennas in free space can be readily computed and measured. However, when the antenna platform, that is the satellite structure need to be accounted for, then it becomes impractical to measured even in the must modern Anechoic Chambers of the world. Also, numerical techniques fail to predict the effect of the large structure on antenna radiation due to the limitations of computer memory and speed, even in today's world. Hence, analytical techniques like STD needs to be developed for this purpose. This has been the field of study for the present investigator.

Monopulse Comparator :

Design of highly compact comparator for monopulse radar application using reduced height Ku-band waveguided.

DRA

Design, Simulation and fabrication of CPW feed DRA ton the narrow band application.

IRA

Impulse Radiating Antenna. Design Simulation and fabrication of USB IRSA

MPCA

Miniaturized Printed Circuit Antenna Design, Simulation and fabrication, Testing of Antenna for different Applications like Mobile, UMTS, etc.

RFID

Radio frequency Identification- Design Implementation of Tracking Algorithm and the simulation of the Antenna

MTMs

Gain Enhancement of electrically small antennas using Metamaterials:- Design and Simulation of an electrically small antenna surrounded by Metamaterial shell / sphere

MOM

Method of Moment (MOM) analysis, design, fabrication and testing of various types of waveguide slot excited Dielectric resonator Antennas (DRAs)

Electromagnetic Modeling of high frequency electronic systems to estimate EMC

Electromagnetic interference is becoming a crucial issue in the design of modern high frequency electronic systems. In the conventional design methodology, EMC issues are addressed only after a prototype is built. However, this process has a potentially significant impact on the cost and time-to-market of the products. This needs to develop an accurate and efficient electromagnetic analysis and modeling to analyze the performance of high frequency electronic circuits for verifying the design against all sorts of electromagnetic interference before fabrication. This has been taken up as the present work. Different conducting and dielectric bodies have been modeled using Method of Moments and the radiation and reception characteristic have been studied.

GPS

Global positioning system (GPS), Adaptive Equalizer, Adaptive Array Antenna (Smart Antenna), Digital Signal Processing, Microwave Communication, Image processing & Numerical Techniques in Electromagnetic.

Antenna Design

Project title : Reduction of Mutual Coupling between microstrip antennas.
Use Software : HFSS, CST

Impulse Radiating Antenna (IRA)

CST MS software is being used to design and simulate an Ultra wideband Impulse Radiating Antenna (IRA), a TEM horn antenna (sensor), a 50 to 100 ohm impedance transformer and a splitter (50 ohm to 100 ohm coaxial cable) for differential feed to a full (4 arm) IRA.

Site Specific Propagation Channel Modeling

Our goal is to develop deterministic propagation channel model for micro and Pico cell scenario. Now a days, industry are using statistical channel modeling to characterize the wireless channel but following the reduction in cell size, accurate characterization of channel becomes of vital significance. This leads to further investigation into the model which is accurate, deterministic and amenable to industry requirement.

Thrust Areas :

- 1) Micromachining (MEMS)
- 2) Cryogenics
- 3) Propulsion and Engines
- 4) EMI / EMC
- 5) Sensors
- 6) RF and Microwave Planar Circuits
- 7) Digital Communication
- 8) Embedded Software Solutions
- 9) Antennas
- 10) Control Systems
- 11) Microelectronics
- 12) IP Core Design
- 13) Life Support Engineering

- 14) Smart Materials & Exotic Materials
- 15) Power Electronics
- 16) Space Education
- 17) Electronic devices

New Acquisitions :

- 1) CST Software Microwave studio, version 5.
- 2) IE3D - version 9 by Zeland Software Inc.
- 3) WIPL-D
- 4) HFSS
- 5) VCO Model No. ZOS 1025, Freq. Range - 685-1025MHz
- 6) **LNA**
 - (i) Model - ZEL 0812 LM, Freq. Range - 800-1200 MHz
 - (ii) Model ZHL - 0812 HLN, Freq. Range -800-1200MHz
 - (iii) Model ZHL-2HAD, Freq. Range -50-1000 MHz
 - (iv) Model - ZFL 1000VH2, Freq. Range - 10-1000MHz
- 7) **Filters**
 LOW PASS FILTER : Model No. BLP 550, Freq. Range DC-520
 HIGH PASS FILTER : Model No. NHP-1000, Freq. Range - DC-550
- 8) **Mixers**
 - (i) Model.No. - ZLW 2, Freq. Range - 685-1025MHz
 - (ii) Model No. ZEM - 4300, Freq. Range - 300-4300MHz

ON-GOING RESEARCH PROJECTS

Sponsored Projects

#	Title of the Project	Sponsor(s)
1.	Electromagnetic Modeling of High Frequency Electronic Systems to Estimate Electromagnetic Compatibility	DST, New Delhi
2.	Development of Specific Software Modules for Realising Monopulse Slotted Array Antenna Using Non-Standard Wave guide at Ku-Band Along Sensitivity Analysis	RCI, Hyderabad
3.	Feasibility Study of Anti-Jam GPS Receiver for GPS Guided Weapons	ARMREB, New Delhi
4.	FPGA based design and development of H-264 Codec	ISRO- IIT Kharagpur Cell
5.	Development of RF MEMS Capacitive Shunt Switch in Application as Phase Shifters for Satellite Communication System	ISRO- IIT Kharagpur Cell
6.	Feasibility Study of Microwave Imaging for Material Resource Exploitation in Planetary Mission	ISRO- IIT Kharagpur Cell
7.	Contoured beam synthesis for array antenna to obtain efficient footprint pattern with gain optimization	ISRO- IIT Kharagpur Cell
8.	Feasibility Study of Compact Foldable Type Trans / Receive Antenna Design in 2-3GHz Band	ISRO- IIT Kharagpur Cell
9.	Development of Algorithm for Adaptive Antenna Array for Satellite Communication	ISRO- IIT Kharagpur Cell
10.	Development of Software Packages for Waveguide-based Microwave Circuits	ISRO- IIT Kharagpur Cell
11.	Gigahertz Transverse Electromagnetic Cell	Army Technology Board
12.	Simulation on Electromagnetic Battlespace in a corps zone	Army Technology Board
13.	FPGA based design and development of H - 264 codec	ISRO- IIT Kharagpur Cell
14.	Maritime location based service	ISRO- IIT Kharagpur Cell

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|-----|--|--------------------------|
| 15. | Ka Band Propagation Experiments over Indian Tropical Region for Improvement of Ka Band Satellite Communication | ISRO- IIT Kharagpur Cell |
| 16. | Studies on the Construction and Performance Evaluation of Multiplexed Binary Offset Carrier (MBOC) Spreading Modulation for Improved Satellite Radio Navigation Signal and System Design | ISRO- IIT Kharagpur Cell |
| 17. | Study of CDMA codes for Satellite Navigation | ISRO- IIT Kharagpur Cell |
| 18. | Error resilient scheme for Satellite TV system | ISRO- IIT Kharagpur Cell |

Consultancy Projects :

#	Title of the Project	Sponsor(s)
1.	Preparation of Vision/theme and feasibility report	Tirupati Assets Pvt. Ltd., Kolkata
2.	Development of Educational Complex	Tirupati Assets Pvt. Ltd., Kolkata
3.	RF Fundamentals for Wireless Network	WMNetServ Ltd., Bangalore
4.	Mast clamp current probe antenna	Naval EMC Centre, Mumbai

INVITED LECTURES BY FACULTY MEMBERS

- | | | |
|-----|--------------------------|---|
| 1. | Prof. Ajay Chakrabarty | Lecture on "EMI / EMC" on September 23-24, 2008 at Ambedkar Institute of Technology, Delhi |
| 2. | Prof. Ajay Chakrabarty | Lecture on "EMI / EMC" on December 8-10, 2008 at Andhra University College of Engineering, Visakhapatnam, AP |
| 3. | Prof. Ajay Chakrabarty | Lecture on "EMI / EMC" on April 24, 2008 at NSEC, Kolkata |
| 4. | Prof. Ajay Chakrabarty | Lecture on "EMI / EMC" on May 30, 2008 at National Institute of Technology, Warangal |
| 5. | Prof. Ajay Chakrabarty | Lecture on "EMI / EMC" on May 21-23, 2008 at DEAL, Dehradun |
| 6. | Prof. Ajay Chakrabarty | Lecture on "EMI / EMC" on July 17, 2008 at MNIT, Jaipur |
| 7. | Prof. Somnath Sengupta | "Neural Networks" on June 20-21, 2008 at Srinidhi Institute of Science and Technology, Hyderabad, Andhra Pradesh |
| 8. | Prof. Somnath Sengupta | "Advances in Video Processing" on November 26, 2008 at the Department of Electronics and Communication Engineering, Yeshwantrao Chavan College of Engineering, Nagpur |
| 9. | Prof. Subrata Sanyal | National symposium on Antennas and Propagation 2008, at Cochin University of Science and technology, Kochi, during December 29-31, 2008, India |
| 10. | Prof. Subrata Sanyal | GTD Techniques and its applications to problems in antennas and propagation |
| 11. | Prof. B. K. Sarkar | "Radar and its applications" (invited) at the state level workshop on "Advanced Microwave Technology" on April 08, 2006 at the University Institute of Technology, Barkatullah University, Bhopal |
| 12. | Prof. T. K. Bhattacharya | "Low Power RF IC design", BESU, Shibpur 2008 |
| 13. | Prof. T. K. Bhattacharya | "MEMS and its Applications" Serampore Textile College 2008 TM Gwalior 2008 |
| 14. | Prof. T. K. Bhattacharya | "Low Power CMOS RFIC design", IIITM Gwalior 2008 |
| 15. | Prof. T. K. Bhattacharya | "Wireless Integrated Micro Sensors" NIT Nagpur 2008 |
| 16. | Prof. T. K. Bhattacharya | "Challenges of Micro and Nano Systems" IIITM Gwalior 2008 |
| 17. | Prof. Bratin Ghosh | University of Rajasthan, Jaipur, 'CPW feed to the dielectric resonator antenna', November, 2008. |

18. Prof. A. Bhattacharya Interim Test Range, Balasore, "Basic Radar Principles", July 07, 2008
19. Prof. A. Bhattacharya KITS University, Bhubaneswar, "Wireless Channel Characterisation", August 6, 2008
20. Prof. A. Bhattacharya Army Centre for Electromagnetics, Mhow, "Emerging Technologies and their spectrum requirements", August 12, 2008
21. Prof. A. Bhattacharya NIT, Rourkella, "Recent Advances in EMI / EMC", September 19, 2008
22. Prof. A. Bhattacharya CEM, Kolaghat, "Confluence of Hardware & Software in present day Technologies", October 23, 2008
23. Prof. Soumen Das "Nanoelectronics : Science, nanotechnology, engineering and applications", IIT Kharagpur, Participants : 40
24. Prof. Soumen Das "3D bioengineering", IIT Bombay, Participants : 25
25. Prof. Soumen Das "Nanobioengineering and family welfare", IIT Kharagpur, Participants : 30

THESES (Doctoral and MS)

#	Name of Scholar	Title of Thesis
1.	S. Das	
2.	Priyanka Mandal	Design & Analysis of Microwave Antennas and Passive Components for Wireless Communication
3.	Mainak Mukhopadhyay	Some Studies on Global Positioning System Anti Jamming Technique for GPS and Smart Antennas
4.	Abdulla P.	Constant Aperture Antenna
5.	Debendra Panda	Planar Antenna
6.	Yatendra Singh	Study on Dielectric Materials
7.	Atanu Roy	The Feasibility Study For Missile-Borne Phased Array Radar To Detect Small RCS Targets Using Commercial Off The Shelf (COTS) Components
8.	Anindya Kundu	Adaptive Beamforming for Anti-Jam Global Positioning System Receiver

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

1.	"Development of RF MEMS Capacitive Shunt Switch in Application as Phase Shifters for Satellite Communication Systems"	September 25, 2008
2.	"Design and Development of Hydrostatic Journal Bearings for Cryogenic Rocket Engine Turbopump"	September 25, 2008
3.	"Feasibility Study of Microwave Imaging for Material Resource Exploitation in Planetary mission"	September 25, 2008
4.	"MEMS Based Micropropulsion Devices for Micro-Satellite Programme"	July 26, 2008
5.	ISRO IIT workshop	November 27, 2008
6.	"RF Fundamentals for Modern Wireless and Satellite Communication System"	June 16-29, 2008, IIT Kharagpur Kolkata Extension Centre
7.	"An Introduction to RF Techniques for Modern Communication System"	July 01-06, 2008, KCSTC, IIT Kharagpur
8.	"Recent Advances in RF Techniques for Wireless Communication"	July 07-12, 2008, KCSTC, IIT Kharagpur
9.	"RF and Microwave Measurement Fundamentals for Modern Electronic Systems"	June 09-22, 2008, IIT Kharagpur Bhubaneswar Extension Centre

10. "RF and Microwave Fundamentals for Modern Electronics Systems" December 22-28, 2008,
IIT Kharagpur
Bhubaneswar Extension
Centre
11. "Satellite Communications Technology and Its Applications" March 16-21, 2009
at IIT Kharagpur Kolkata
Extension Centre, Kolkata

NATIONAL CADET CORPS (NCC)

COMMANDING OFFICER : Wg. Cdr. V. K. Gupta

AIMS & OBJECTIVES

- (i) To develop qualities of character, courage, comradeship, discipline, leadership, secular outlook, spirit of adventure & sportsmanship and the ideas of selfless service among the youth to make them useful citizens.
- (ii) To create a human resource of organized, trained and motivated youth, to provide leadership in all walks of life including the Armed Forces and be always available for the service of the nation.
- (iii) To create suitable environment to motivate the youth to take up a career in the Armed Forces.

MAJOR ACTIVITIES

During the training year 2008-2009, 227 cadets of 1st year and 2nd year of engineering were trained as NCC cadets. One Service Officer, one Associated NCC Officer and 11 service personnel were involved in imparting NCC training to the IIT students.

LECTURES BY VISITING EXPERTS

Cadets got a chance to visit AF Station Kalaikunda, have an explore with all military equipments and the Air Force environments. Experts were invited from Air Force Station Kalaikunda to deliver lectures to the cadets regarding Fire Extinguisher & First Aid.

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

1. A Combined Annual Training Camp was conducted for all 1st year NCC cadets at Gangadhar Academy, Belda, West Midnapur, organized by the Unit. The cadets were made to experience the military field conditions. Drill practice, Physical training, Games, Debates, Quiz competition and cultural programs kept the cadets glued with thrill and excitement. Group Commander of NCC GP HQ also paid visit to the camp
November 26 --
December 05, 2008

NATIONAL SERVICE SCHEME (NSS)

HEAD : Professor P. K. Bhowmick

STUDENTS ACTIVITIES RELATED TO NSS

The National Service Scheme (NSS) Unit of the Institute registered 606 students of 1st year and 2nd year at undergraduate level during the session. It took up several service oriented activities in the fringe villages of IIT Kharagpur campus under the direct guidance and supervision of eight faculty Program Officers and five faculty volunteers besides the Head, NSS and the Coordinator, EAA. The important activities it performed during the session include, providing basic education (3Rs) to the 36 illiterate children working in the shops, stalls, canteens etc. in the locality, special coaching to about 83 school going and dropouts; plantation and up keeping of more than 600 forest plants under environment protection programme; preparation and demonstration of scientific and technological models with Nehru S & T Museum at the Institute; conducting health and nutrition survey in the villages, organizing health awareness campaigning programme, etc. The NSS unit has successfully completed the Annual Camping programme during November 26th to December 5th, 2008 with 200 volunteers in the villages of Sonamukhi, Balarampur, Saraswatipur, Chitripur, Kashijora, Gholegharia villages centering at Balarampur Abhoy Ashram. The NSS volunteers have developed a website (<http://teamvivek.50.webs.com>) to share their works.

RAJBHASHA VIBHAG

CHAIRMAN : Professor Parmeshwary Dayal Srivastava

Rajbhasha Vibhag earlier known as 'Hindi Cell' was attached with the Department of Humanities & Social Sciences. Its main activities were limited to translate Institute's Annual Report and Annual Accounts from English to Hindi for sending them to Ministry for their placement in the Parliament. Later, it was felt that Institute has to play greater role in the implementation of Official Language Policy of the Government of India. As a result, Rajbhasha Vibhag was separated from the Department of Humanities & Social Science in the Academic year 2006-2007. Since then it functions as an independent entity in its new office situated at old building.

It has a well established setup with fullfledged Library of more than 600 Hindi books. It has latest bi-lingual software for preparation of documents in bi-lingual form. It has been assigned with the responsibility of implementation of Official Language at IIT Kharagpur. Its activities include translation of Annual Reports, Annual Accounts, Audit Reports, different nameplates & stamps, preparation of Degrees / Diplomas in Hindi and publication of a monthly Hindi e-magazine "Jharokha". A three day programme celebrating "Hindi Divas" was organised during 12-14 September 2008 in which several competitions were held for both Hindi and non-Hindi speaking employees as well as for the students of nearby schools. Two guest speakers, Dr. P K Srivastava, CDRI, Lucknow, world famous scientoonist and Dr. Madhusudan Saha a well known Hindi writer, delivered informative and interesting talks. Dr. Srivastava's presentation showed the noble method of popularisation of science through science cartoons while Dr. Saha depicted the harmony among different Indian languages. Cash prizes were given to successful participants.

A Five days Translation Training programme (May 13-17, 2008) were organized. Approximately 100 employees from various departments are benefited by these programmes. Most of the Resource Persons for these programmes are directly related to Rajbhasha Vibhag, Delhi, Bangalore and Kolkata. A Hindi Classes under Hindi Teaching Scheme were organized for employees in month of June 2008 in which 23 participants had completed their training and sucessfully passed their examination with 100 percent result.

Two meetings of the Town Official Language Implementation Committee (TOLIC) were held on 26th August 2008 and 28th January 2009 in which decision was taken for implementing of Official Language policy in each of the organisation connected with TOLIC. It was decided that stamps used by each TOLIC members should be made bilingually with the help of Rajbhasha Vibhag, IIT Kharagpur.

SPONSORED RESEARCH & INDUSTRIAL CONSULTANCY

DEAN : Professor Partha Pratim Chakrabarti

Since our founding in 1952, the Indian Institute of Technology Kharagpur has focused on some of our nation's most challenging problems. The various departments, centers, schools and research programs work across traditional academic boundaries to promote research and teaching that is interdisciplinary, collaborative and groundbreaking. Our researchers and educators find innovative answers to society's needs, focusing particularly on energy and environment, health and well-being, infrastructure and information management. IIT Kharagpur benefits greatly from the Institute's longstanding ties with government agencies, foundations and corporate partners. Research at IIT Kharagpur is committed to knowledge transfer and engages in technology transfer and economic development activities that benefit local, national, and international constituents.

The scientific and technical themes that are changing the world *computation and information technology, life sciences and biotechnology, nanotechnology, Infrastructure, energy and the environment* are at the center of IIT Kharagpur's research focus.

During the year 2008-2009 the Institute received from the Government, private and international funding agencies / enterprises 167 research projects for a total value of Rs. 158.39 crores (31.35 million USD) and 142 consultancy projects worth Rs. 12.87 (2.55 million USD) crores aggregating a total of 309 projects for Rs.171.25 crores (33.9 million USD) for the year 2008-2009.

Over the years IIT Kharagpur has gained special expertise in *advanced chip design and CAD for VLSI and MEMS* including in areas like *formal verification* where it works hand in hand with international organizations. The areas of software development, planning, management, ERP are core capabilities of the institute. The large gamut of specialized *software technologies* include *power management software* (used by Power Grid Corporation), *telemedicine software* (currently used in several remote sites in several states), *communication empowerment software for physically challenged*, software for medical measurements and tools for *security and biometric authentication*. Other important software developed include a specialized *bond-graph based technology* that is used in a variety of areas for analysis of dynamics by companies within and outside the country, a *biomechanics simulator* that is now deployed in industry and a fluid mechanics and ocean dynamics based *software for storm surge* measurements that has been deployed in several countries. *ERP software* has been developed and deployed in Coal India, Neyveli Lignite Corporation and other organizations. Research work is also going on development of MEMS based accelerometers for aerospace applications and design automation of analog VLSI. A Mission Project for development of Virtual Labs involving premier Institutes of the nation has been initiated this year.

The Institute has a long-standing focus on Life Sciences research with special emphasis in *medical science and technology*. Artificial heart development program is undergoing phase II, a unique *male contraceptive, RISUG* is undergoing third phase of trials and research work on development of a medical expert system is also undergoing. Interdisciplinary research is being carried out in areas of, *non-invasive measurements, advanced image processing, medical implants, protein structure analysis and drug design, orthopedic biomechanics* and brain research. Green technology routes have produced unique protocols for *insect resistant cotton, jute, bio-hydrogen, separation and purification of anti-carcinogenic components from green tea leaves*, etc. Research in biotechnology has resulted in a number of high quality *enzymatic processes for a variety of food technologies*. Research work is being carried out on high pressure processing on high value perishable commodities, development of novel nano-biocomposite osteogenic matrices for cell based bone tissue engineering, production of pure variety disease free potato seeds through in-vitro culture technique and design & development of non-invasive blood glucose measuring system.

The major research initiatives in nanotechnology and *nano-materials* include unique microstructures prepared from gelcast ceramics, nano-composites, nano-wires, semiconductors and metal alloys. The MEMS group has made significant contributions to national research programs of ISRO and DRDO by development of advanced *accelerometers, gyros, micro-valves*, etc. The area of *micro-fluidics and bio-nano-mems* has developed new techniques for *DNA hybridization and micro-scale cooling for electronic components*. The institute has special expertise in advanced *plasma technologies and plasma based materials* that are being used for advanced research for industrial, strategic and biomedical areas. The institute has been recognized with a special research program in microfabrication and fabronics with support from Indo-US Science & Technology Forum.

The vibrant energy research programs at IIT Kharagpur include *fuel cell based systems and energy materials, production of renewable hydrogen combined with CO₂ capture* to address global warming and energy production. The current ongoing research activities in *mechanical sciences* include thermal engineering, CFD, motion and vibration dynamics, *robotics* and robot development, etc. The institute has developed *state-of-the-art cutting tools* comparable to the best available worldwide. Prototype vehicle development activities include development of a large *autonomous underwater vehicle*, fault-tolerant micro-aero vehicle, hovercraft and electric vehicles as well as development of aircraft.

Industry academia partnership at IIT Khargpur is thriving with industries forming partnerships in joint research projects, acquiring technologies developed in the institute and seeking consultancy supports from the Institute. Some of the major research initiatives in recent years include Steel Technology Center, major R&D Centers in Energy Sector in collaboration with DVC, Tea Engineering Research Center, Vodafone-Essar-IIT Kharagpur Centre of Excellence in Telecommunications, National Program in Marine Hydrodynamics, Santech - IIT Kharagpur Research Initiative in Telecommunication, Centre of Excellence in Information Assurance, 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 Intellectual Property Rights and Industrial Relations (IPR & IR) Cell under SRIC is responsible for the licensing and the transfer of technologies developed by faculty members, students and other researchers at IIT Kharagpur to the commercial sector. The technologies developed at IIT Kharagpur are showcased to an audience of small and medium scale industries (SME) during IndAc 2009 in Kolkata during March 2009 culminating in a number of technology transfers and licensing. IIT Kharagpur has a long tradition of protecting inventions and has received numerous patents (103 in number) over the years.

SCIENCE & TECHNOLOGY ENTREPRENEURS' PARK

MANAGING DIRECTOR : Professor Dhruves Biswas

MAJOR IMPROVEMENTS IN STEP IIT KHARAGPUR MAIN CAMPUS

1. The development infrastructural facilities have been made in accordance with the requirement of the office space as well as other important necessities.
 - i) Remodeling of the STEP office seating space
 - ii) Creation of additional seating capacity (to accommodate Entrepreneurs including Students, Faculties & General Public)
 - iii) Purchase of PCs for improvement of accounting & computing infrastructure
 - iv) Maintenance of existing PCs with new software tools to facilitate finance & accounts
 - v) Construction of a new office cabin
 - vi) The Guest House of STEP has been renovated to provide three star facilities
 - vii) A new glow sign-board at the main gate for STEP has been put up.
2. Appointment of experienced professionals for reorganization and proper working of the new projects of STEP.
3. The security system has been started and realigned at the STEP main premise. The security personnel have also been given proper uniform at the expense of STEP as a priority in consonance with our vision to bring a level of security within the STEP boundaries.
4. The garden and landscaping of STEP is being maintained by its own employees. The seasonal gardening is also being taken care with the help of existing entrepreneurs.
5. Infrastructural development of the old building of STEP for proper facilitation of the incubatees.
 - i) Some of the rooms have been redesigned to meet the needs of the incubatees
 - ii) Creation of a new space for a bio-technical laboratory
 - iii) Construction of a new lavatory including the toilet and bath facilities for incubatees
 - iv) Construction of a pharmaceutical based lab for facilitating an incubatee who will work for the bulk production of male contraceptive to meet the Family Welfare Programme needs
 - v) A generator room has been provided on demand to one of the incubatees to meet the urgent needs of its company. The facility is scalable for other incubatees as per the requirement

BRIEF DESCRIPTIONS OF ON-GOING ENTREPRENEURIAL ACTIVITIES

(i) **At STEP IIT Kharagpur premises**

Companies under incubation of STEP

Major entrepreneurial activity

1. Sankalp Semiconductors

Analog / Mixed Signal / RF semiconductors service provider with a mission to serve worldwide customer with bench mark quality. There are about twenty employees for the R&D purpose of the company. Sankalp's endeavor is an effort towards creating a value based organization where the values and culture are embedded deep into the sub-consciousness of the individuals and where they are nurtured into becoming world leaders and entrepreneurs with conscience

2. P2 Power Solutions Pvt. Ltd.

Work in the domain of Power Quality enhancement at distribution level helping industries strengthen their power assets through avant-garde technology and technical expertise. In today's highly competitive environment, poor Power Quality and inefficient usage of power

- can significantly erode net earnings due to high operating costs. Installation of P2 power products reduces operating costs by improving the efficiency of the power supply system and almost eliminating failures and trips due to inefficient and poor Power Quality.
3. DataResolve Systems
DataResolve Systems offers the most innovative product and services for information and data security. All the products and services of the company revolve around the issue of securing different forms of electronic data in the form of files, archives of a corporate firm lying unprotected anywhere in the world which is potentially prone to theft. The product named U-Hook has been launched and steps are being taken to market it worldwide.
 4. ElectroSoft Consultants
Involved in several sponsored and consultancy projects dedicated towards empowerment of physically challenged people, automation and control systems, to preparation of Vision and Theme papers.
 5. Centre for Advanced Communication
Interactive Software Integrated Learning System (ISILS) is the heart beat, nerve centre, brain, driving force of our overall system.
 6. Integrated Chemical Industries
Integrated chemical Industries provides for manufacturing leather chemical and specialty chemicals for industrial use.
 7. Nucleodyne Computer System Pvt. Ltd.
Software Development and consultancy
 8. National Institute of Science and Technology.
It works in the field of software technology in consultancy mode.
 9. Hydrodyne
Work in the arena of Sophisticated Naval Architecture and design. Already constructed two hovercrafts which are undertaking comprehensive test run and trial to suit the long term needs of the Indian Navy.
 10. High tech consultants
Modeling, simulation, Control, Fault Detection and Isolation
 11. Focus R&D
Software Research
 12. Sparsh Learning
Works in the area of software and research.
 13. Intellisys
Works in the area of video conferencing.
 14. Softlore Solutions
Training programs on various new software technologies.
 15. Capillary Technologies
Mobile based marketing and advertisement software.
 16. RISUG
The company has opened its R & D lab here in consonance with the Family Welfare
 17. Intinno Technologies Pvt.Ltd.
The firm is committed to Hi-tech Research and Development in Education/Learning technologies, web2.0, Data Mining, Information Retrieval and software development; the first three fields being latest. The company also has a long-term initiative to improve the quality of education through its endeavor.
 18. Greenhat Technologies
Product for educational platform for delivery of industry relevant content with efficient performance assessment and analytics module.

It has already been noted that STEP has become an independent entity. Furthermore, it has also initiated the canteen facility in consonance with the long term vision to make STEP, IIT KGP to be recognized for serving the employees of incubatees as well as staff at its best.

There are other 12 companies under the incubation of TIETS as well.

The Established TePP Centre at STEP has been declared the Regional Centre for its activities covering the states of Orissa, West Bengal, Bihar and entire of North East. There are 16 innovators who have already been sanctioned the angle funding.

The TBI VLSI purchase of Equipments has already been sanctioned.

(ii) At STEP Gopali

#	Companies under incubation of STEP	Major entrepreneurial activity
1.	Raghunath Fertilizers	Creating Vermi-compost.
2.	Sri Balaji Mushroom	Organic mushroom cultivation
3.	Raghunath & Company	Works in the area of bio-fertilizer
4.	Pooja Enterprises	Created by grass-root student entrepreneur for making package materials.
5.	Electro Thermal Insulation	In the field of Insulation wires and polymer insulations
6.	Sandhya Glass works	Glass cutting work. Design of glass mirrors
7.	Gulton Rubber works	Making of Rice husk rollers

Present activities being undertaken at STEP-Gopali are as under :

1. The security pattern has been redesigned
2. Light Pruning operation of the Tea garden
3. Redesigning of the irrigation system to meet the demand of water for all the vegetation as well as to save the water resource
4. Repairing of the boundary walls to provide strong security to the incubatees
5. Managing director keeps in touch with the day to day activities at STEP-Gopali by weekly and daily appraisal reports sent to him in accordance
6. The MD makes sure to visit the place for timely meetings and discussions with the entrepreneurs.

MAJOR THRUST AREAS

1. VLSI for Technology Business Incubation and high technology incubation.
2. Agro-based products at Gopali
3. Management Process for launching and sustaining Startups
4. Organic fertilizer through vermi-composting & its training Programs
5. Product focus in Energy, Environment, Education & Health.

MISSION PROJECTS

1. The proposal for the starting of Small and Medium Scale Industries' Business Incubator has been accepted and the MD has been invited to take the SME Incubation.
2. Technology Refinement and Marketing Plan (TREMAPP) proposal has been submitted for filling of the gap of commercialization for TePP innovators.
3. Proposal for the Health Partnership plan between India and Finland has been submitted to the Department of Biotechnology, Ministry of Science & Technology.

NEW ORGANIZATIONS INCUBATING

#	Name of Company / Proprietor
1.	Sparsh Learning Technologies
2.	RISUG
3.	Intinno Technologies

4. Capillary Technologies
5. Greenhat Technologies
6. Intellisys
7. Sankalp Semi conductors
8. Gulton Rubber works

COLLABORATIVE EFFORTS

International collaborations

We have been played as a host to eminent dignitaries from around the world. We have been honored to have with us some eminent luminaries from.

- i) Jyvaskyla University, Finland
- ii) University of California, Berkeley
- iii) Georgia Institute of Technology, Atlanta, Georgia, United States

As part of our wider effort to bridge common ground having entrepreneurship as a common platform, Prof. Biswas visited JYU (Jyvaskyla, University of Finland) and participated as well as conducted various entrepreneurship sessions with the students.

Global Venture Lab

The lab is an effort to create practice based entrepreneurship with the collaborative gains from three recognized universities namely,

- i) IIT Kharagpur, India
- ii) University of Jyvaskyla, Finland
- iii) University of Berkeley, California

The lab has already been inaugurated on 8th of January 2009 at STEP, IIT Kharagpur in the presence of the four Finnish delegates and the director of the institute. GVL-Finland has been inaugurated on 23rd March 2009 in the presence of Prof. Biswas and Prof. Ikhlq Sidhu at Finland.

LECTURE BY VISITING EXPERT

- | | | |
|------|-------------------------------|--|
| i) | Prof. Marko Seppa | University of Jyvaskyla, Finland, visited STEP IIT Kharagpur on January 2009. He lectured about the global partnership and told about his visions of transferring knowledge to capital. He addressed the E Cell students and grass-root entrepreneurs at STEP. |
| ii) | Dr. Mari Suoranta | University of Jyvaskyla, Finland addressed the students of IIT Kharagpur and grass-root entrepreneurs at STEP during the visit for inauguration of GVL in the month of January. She talked about the entrepreneurial marketing and ways to create innovation in marketing. |
| iii) | Prof. Joy Lashkar | Georgia Institute of Technology, Atlanta, Georgia visited STEP in the month of November 2008 and motivated the students in business plan and technology transfer. |
| iv) | Prof. Partha S. Ghosh, Boston | Machachusetts, USA. Lectures the grass-root Entrepreneurs on motivation and leadership during the month of December 2008. |

ON-GOING TRAINING PROGRAMS

(i) Technology Entrepreneurship Development Program (TEDP)

The TEDP program has been reengineered for grass root entrepreneurship relevant to semi urban and rural poor people. This time we have scaled up our TEDP to conduct 4 such programs

for the grassroots entrepreneurs in the domains of EEEH (energy environment education and health) utilizing the vibrant ecosystem at STEP IIT KGP. This effort is in consonance with the vision of local solutions to be provided to the local people by training the grass-root people in these four domains. The students are trained to serve themselves as entrepreneurs as well as these grass-root entrepreneurs are exposed to the environment of IIT for 6 weeks. This gives them self confidence to establish themselves. The efforts are being given to create health based entrepreneurs.

(ii) SIDBI Skill up gradation programme for Grass-root Entrepreneurs

The programme was conducted in collaboration with the SIDBI programme of IIT Kharagpur. It was attended by 50 entrepreneurs. They were provided comprehensive skill up gradation and visits to create awareness of new technologies among them.

(iii) Faculty Development Program (FDP)

A two weeks' program positioned towards training faculties from other engineering colleges in the local area including IIT Kharagpur was sent and it was accepted by Department of Science & Technology. FDP is aimed at the faculties of the entire northeastern, eastern region of India as well as South India for the purpose of advancing the entrepreneurial culture in and around their region. Forty three faculties from various places such as Jharkhand, Bihar, West Bengal, Manipur and Tamil Nadu had come to participate in the program. The approach is towards training the faculties so that they in return are able to train the students back home and create an entrepreneurial ecosystem. The FDP was received with admiration and was able to meet its desired objective of entrepreneurial knowledge propagation.

(iv) Training Programme in Production & Processing of Tea

A two day's training programme was conducted by STEP on the latest methods of tea production and processing. This programme was appreciated by the participants and requested for further similar programmes of such agro based trainings.

TRAINING & PLACEMENT SECTION

PROFESOR-IN-CHARGE : Professor Balbir Kumar Mathur

PLACEMENT DETAILS

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

135 companies / organizations visited and the campus for recruitment in 2008-2009. 14 others preferred to have telephonic interview, videoconference and 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 20.04.2009 are as follows :

Course/Degree	No. of students interested	No. of students placed
B.Tech. (Hons.)	359	300
B.Arch. (Hons.)	011	009
M.Sc.	133	068
Dual Degree M.Tech.	158	136
M.Tech. / MCP	517	212
DIPLOMA (LAW)	006	004
M.B.M.	112	093
Ph.D. / MS	006	006
Total	1320	828

SUMMER TRAINING

Eight weeks of Summer Practical Training at the end of 3rd year B.Tech. / Dual Degree is a compulsory part of the B.Tech.(Hons.) / Dual Degree curriculum at IIT Kharagpur, carrying 2 credits. All efforts are made to place the concerned students in the best of organizations in India and abroad, for summer training. An emergent trend is that more and more students are seeking summer training abroad.

A total of 1430 companies / organizations in India were contacted for training facilities for the last summer vacations in May-July 2009. Among these 103 in India had offered training facilities, out of which 48 organizations had extended out-of-pocket allowances (covering 204 students) and many other extended subsidized transport, subsidized canteen and/or subsidized accommodation for our students. The highest out-of-pocket allowance of Rs. 25,000 per month was paid by HUL, Yahoo and six organizations extended Rs.15, 000/-per month, (ITC Ltd., Microsoft, Barclay Capital, Rd. Reddy's Lab, IBM, Tata Steel, L&T and Goldman Sach 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/-.

400 students (all years) will take up summer training in organizations abroad during the summer 2009. During summer 2009, a total of 635 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 2008-2009 placement saw students participating in running placement process. In fact, through this participation it was possible to run up to seven / eight companies per day and round the clock. Students take active part in calling up companies and managing the logistics of placement.

TECHNOLOGY TELECOM CENTRE

PROFESSOR-IN-CHARGE : Professor Ratnam Varada Raja Kumar

Officer

Gupta, Pankaj

B.Tech. in Computer Engineering

NEW PLANNING

- i) Laying cable to VSRC to give emergency telephones at each block. Work Order has been issued by Store and Purchase Section and work is about to start.
- ii) Planning to lay the underground cable to each independent Quarter (B & C1 type) in Dandakaranya Area to minimize the maintenance problem. Price bid has been opened and process is going on to award the tender.
- iii) Planning to install Satellite Exchange at New Guest House. A request was made to the PIC, Civil Works for providing a room at the guest house in this regard to install the Satellite Exchange.
- iv) A plan for installing WiMAX network connectivity is made and expression of interest and quotation was called for.

NEW CONNECTIONS

- i) Three Security help line numbers are given.
- ii) Three hospital emergency help line numbers are given.
- iii) Apart from the above, nearly 40 Nos. of New connections have been given to New faculties and new Labs.

ROUTINE MAINTENANCE

- i) The complaint can be lodged in person, over phone and online through Institute Website.

TECHNOLOGY STUDENTS' GYMKHANA

PRESIDENT : Professor Manish Bhattacharjee

ACTIVITIES

Inter IIT Sports Meet

The 44th Inter IIT Sports Meet began with the Inter IIT Aquatic Meet held during October 6-9, 2008, at IIT Madras. IIT Kharagpur secured over all 3rd position in Swimming. Extra ordinary performance in swimming by Chirag Fialoke, a second year UG student, was the highlight of the meet. He created two new meet records in 200m free style and 1500m freestyle. He also won 3 gold and two silver medals. The second phase, which includes all other games, started during December 11-17, 2008. IIT Kharagpur secured Silver Medals in Badminton (M), Athletics, Basketball (M), Table Tennis (M) and Bronze Medals in Hockey and Table Tennis (W). The IIT Kharagpur Inter IIT contingent stood at the 3rd place in the meet, behind only IIT Bombay and IIT Madras.

Inter Hall Competitions in Sports & Games

During the Autumn Semester, Inter Hall competitions started with the Inter Hall Aquatic competitions in the month of August 2008. Chirag Fialoke of RP Hall won the Individual Championship. Inter Hall Athletics Meet was held during November 14-15, 2008.

In the Spring Semester, the second phase of inter hall competitions in cricket, football, hockey, basketball, volleyball, badminton, table tennis, tennis and weight lifting were held.

The Inter Hall Competitions among the girl's hostels were conducted in table tennis, badminton, swimming and basketball.

Inter Hall Competitions in Social & Culture Events

As usual the Inter Hall competitions in various social & culture events are organized. The traditional Inter Hall Illumination & Rangoli competition was organized on non-competitive basis because of time constraints.

Inter Hall Competitions in Technology

Inter Hall competitions in Technology are held in various categories.

MAJOR EVENTS ORGANISED

Shaurya'08

This year, Technology Students' Gymkhana organized SHAURYA, an Inter-College Sports Meet, from 31st October to 3rd November 2008. Basketball, Tennis, Volleyball, Hockey and Table Tennis were held. Five colleges, namely, St. Xavier's, Ranchi, KIIT Bhubaneswar, Marine Engineering College, Kolkata, NIIT Rourkela and IIT Kharagpur, took part.

Spring Fest'09

The Annual Social Cultural Festival Spring Fest'09 celebrated its golden jubilee during January 22-25, 2009. Spring Fest Kavi Sammelan organized during Alumni meet was largely applauded. This year Spring Fest witnessed overwhelming participation from various prestigious colleges across the country and even international participation from New Zealand, Belgium, Netherlands, Tunisia, Brazil and Poland where students took part in a complete new genre of competitive events like Youth Flick Quiz, Fusion Fiesta, SF Karaoke and Twisted Grades. Maestros like Krishna Kumar, Pt. Chitresh Das, Grammy Awards winner Jason Samuels in Tap Dance, Pdt. Vakil's Rhythm Riders and Led Zepplca (Southern California based rock band) captivated the huge audience. The Hasya Kavi Sammelan as usual delighted TOAT-full audience.

Kshitiz'09

Kshitij The annual Techno management fest was organized from 29th January to 1st February 2009. Around 5000 participants from various colleges of India and abroad took part in various competitive events like Business Plan, Advertisement Designing, Case Studies to Paper Presentations, Computer Programming and Robotics. Societies of International repute gave their support to events in Kshitij. ACM, ASHRAE, ASME and IMeche endowed KSHITIJ with their prized certifications. Students came up with innovative designs for the Kharagpur Railway Station, as a part of the event, 'The Grand Central'. Prizes money awarded was worth Rs. 45.00 lacs. The B-Plan Incubation this year was Rs. 25.00 lacs. Presence of stalwarts from scientific, technical and managerial domains like Mr. Prahlad Kakkar, Mr. Philip Emeagwali, the Father of Internet, Nobel Laureate Kurt Wuthrich, Prof. Chandra Lalwani from Hull University, Pioneer S. K. Shivkumar, Prof. Chandra Wickramasinghe, Emmy Award winner Jeremy Bristow NASA's Christopher McKay were attractions of the fest. Technical Exhibitions and Workshops like Forensic Sciences, Financial Risk Management, Mind Reading Machines and Solar Robotics laid the foundation for the learning aspect of the fest.

OUTSIDE PARTICIPATIONS

The Cricket Team of IIT Kharagpur participated in the Ajay Ghosh Memorial Trophy Limited over cricket tournament organized by the Cricket Association of Bengal at Malda. They also participated in the Inter University Day-and-Night T-20 Cricket tournament organized by KIIT, Bhubaneswar.

Ramachandra Memorial Tennis Tournament

The Tennis team of IIT Kharagpur participated in the Ramachandra Memorial Tennis Tournament organized by Midnapore District.

DEVELOPMENTS

- i) Two Turf Wickets in Tata Steel Sports Complex
- ii) Jogging track in Tata Steel Sports Complex

FACILITIES

- i) Modern Gymnasium
- ii) Billiards
- iii) Athletics Stadium with modern training facilities
- iv) Two Cricket Fields with two turf wickets.
- v) Jogging track along with modern practice facilities in Tata Steel Sports Complex
- vi) Six Tennis Courts including two flood lit courts
- vii) Two flood lit Volleyball Courts
- viii) Two flood lit Basketball Courts
- ix) One wooden Badminton Court
- x) Table Tennis room with two tables
- xi) Yoga room
- xii) Standard Swimming Pool

ANNUAL PRIZE DISTRIBUTION CEREMONY AND FAREWELL PROGRAMME FOR FINAL YEARS

The Prize distribution ceremony and farewell to final years was held on 15th April, 2009. Acting Director Prof. M. Chakraborty presided over the function. Eight Institute Blues in Sports & Games, Five Order of Merit in Soc. & Cult and in Technology are awarded to final years for their outstanding achievements in respective fields. Mr. Robin Anil received the Prof. G. S. Sanyal Cup for his all-round performance in Technology. Mr. Bipul Kumar and Mr. Chirag Fialoke received the Alumni Trophy jointly for their all round performance in sports & games.

EXTRA ORDINARY ACHIEVEMENTS BY THE STUDENTS

- i) ETDS (English Technology Dramatics Society) won the 1st prize in the National level Dramatics competition hosted by National Law School, Bangalore from 29th October to 2nd November 2008, beating teams from prestigious institutions from across the country.
- ii) A team from the IIT KGP Quiz Club participated in the MNNIT Allahabad's quiz fest, Gnosiomania. The team was represented by Ankit Sethi, Neeraj Goswami and Aditya Mani Jha. The team stood 1st in the general and entertainment quizzes, and 2nd in IT and corporate quiz, making them the Best Team of the fest.
- iii) Balgovind Tewari represented West Bengal in the National Powerlifting championship held in Noida.
- iv) Prateek Bumb and Aniruddha Sharma won the "Creme-de-la-Creme Business Plan Conclave" held during PAN-IIT 2008, during December 19-21, 2008. They presented their Business Plan "CODE GREEN". They have been invited to San Francisco to present their technology to lead researchers (from Stanford, UC Berkeley & MIT) and industry experts at the CLEANTECH FORUM between 23rd and 25th February 2009

PART - III

STATISTICAL INFORMATION

Table : A-1

ADMISSION TO UNDERGRADUATE (B.TECH. / B.ARCH. / M.SC. / DUAL DEGREE) COURSES IN THE SESSION 2008-2009

#	Course	SANCTIONED STRENGTH				ADMISSION OFFERED				ACTUALLY REGISTERED						
		GN	SC	ST	OB	TOTAL (PD)	GN	SC	ST	OB	TOTAL	GN	SC	ST	OB	TOTAL
(A) B.TECH. 4-YEAR																
1	Aerospace Engg	16	4	2	22	24(1)	16	4	1	2	23	15	4	1	2	22
2	Agril. & Food Engg.	17	4	2	2	25(1)	17	3	2	2	24	16	3	2	2	23
3	Biotech. & Bioch. Engg.	14	3	2	2	21(1)	14	2	2	2	20	13	2	2	2	19
4	Chemical Engg.	26	5	3	3	37(1)	26	5	2	3	36	26	5	2	3	36
5	Civil Engg.	31	7	3	4	45(1)	31	7	3	4	45	30	7	3	4	44
6	Computer Sc. & Engg.	28	7	3	4	42(1)	28	7	3	4	42	28	7	3	4	42
7	Electrical Engg.	28	6	3	3	40(1)	27	7	4	3	41	27	7	4	3	41
8	Electronics & ECE	31	7	3	4	45(1)	31	7	3	4	45	31	7	3	4	45
9	Industrial Engg.	15	2	2	2	21(1)	15	2	1	2	20	15	2	1	2	20
10	Instrumentation Engg.	16	4	2	2	24(1)	16	4	2	2	24	14	4	2	2	22
11	Manuf. Sc. & Engg.	15	3	2	2	22(1)	15	3	2	2	22	15	3	1	2	21
12	Mechanical Engg.	34	7	3	6	50(1)	35	7	5	6	53	35	7	5	6	53
13	Met. & Mat. Engg.	22	5	2	3	32(1)	22	4	2	3	31	22	4	2	3	31
14	Mining Engg.	20	4	2	3	29(1)	20	4	2	3	29	19	3	2	3	27
15	Ocean Engg. & N.A.	17	4	2	2	25(1)	17	1	2	2	22	17	1	2	2	22
	Total (A)	330	72	36	44	482	330	67	36	44	477	323	66	35	44	468
(B) B.ARCH. 5-YEAR																
1	Architecture	25	5	3	3	36(1)	26	2	2	1	31	22	2	2	1	27
	Total (B)	25	5	3	3	36	26	2	2	1	31	22	2	2	1	27
(C) M.Sc. INTEGRATED 5-YEAR																
1	Applied Geology	18	4	2	2	26(1)	18	4	1	2	25	18	2	1	2	23
2	Economics	22	5	2	3	32(1)	22	-	2	2	26	18	-	2	1	21
3	Expl. Geophysics	17	4	2	2	25(1)	17	3	2	1	23	16	3	2	1	22
4	Industrial Chemistry	17	4	2	3	26(1)	17	1	1	-	19	12	1	1	-	14
5	Maths. & Computing	17	4	2	2	25(1)	17	1	2	2	22	15	1	2	2	20
6	Physics	18	4	2	2	26(1)	18	1	-	2	21	11	1	-	2	14
7	Statistics & Informatics	22	5	2	3	32(1)	22	5	2	3	32	22	4	2	3	31
	Total (C)	131	30	14	17	192	131	15	10	12	168	112	12	10	11	145

Table : A-1 (Contd.)

#	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	SC	ST	OB	TOTAL (PD)	GN	SC	ST	OB	TOTAL	GN	SC	ST	OB	TOTAL
(D) DUAL DEGREE 5-YEAR																
1	Aerospace Engg.	9	2	1	1	13(1)	9	2	-	1	12	8	2	-	1	11
2	AG & F.E. with M.Tech in any of the listed specialization	16	3	2	2	23(1)	16	1	1	2	20	15	-	1	2	18
3	Biotech. & Biochem. Engg.	12	3	1	1	17(1)	12	3	1	1	17	9	3	1	1	14
4	Chemical Engg.	13	3	2	2	20(1)	13	3	1	2	19	13	3	1	2	19
5	Civil Engg. with M. Tech in any of the listed specialization	10	2	1	1	14(1)	10	2	1	1	14	10	2	1	1	14
6	Computer Sc. & Engg.	19	4	2	3	28(1)	18	4	2	4	28	18	4	2	4	28
7	Elect. Engg. with M. Tech in any of the listed specialization	12	3	1	1	17(1)	12	3	2	1	18	12	3	2	1	18
8	E&ECE with M. Tech in any of the listed specialization	19	4	2	3	28(1)	19	4	2	3	28	19	4	2	3	28
9	Industrial Engg. /IEM	13	3	2	2	20(1)	13	3	1	2	19	13	3	1	2	19
10	Manuf. Sc. & Engg./IEM	9	2	2	1	13(1)	9	-	1	1	11	7	-	1	1	9
11	M.E. with M. Tech in any of the listed specialization	23	4	2	3	32(1)	23	4	2	3	32	23	4	2	3	32
12	Met. & Mat. Engg./Met. Engg.	9	2	1	2	14(1)	9	2	1	2	14	9	2	1	2	14
13	Mining Engg.	9	2	1	1	13(1)	9	2	1	1	13	8	2	1	1	12
14	Mining Engg. / Safety Engg. & Disaster Mgt. in Mines	8	2	1	1	12(1)	8	2	1	1	12	7	2	1	1	11
15	Ocean Engg. & naval Arch.	10	2	1	1	14(1)	10	1	1	1	13	10	1	1	1	13
	Total (D)	191	41	21	25	278	190	36	18	26	270	181	35	18	26	260
	Total (A + B + C + D)	677	148	74	89	988*	677	120	66	83	946	638	115	65	82	900**

* Under PD category a maximum of one seat in each course is reserved subject to 3% of total seats i.e. 30 seats. ** Including preparatory and re-admission.

Table : A-2

ADMISSION TO 2-YEAR M.SC. COURSES, 2008 – 2009

#	Course	OFFERED					REGISTERED					NOT REGISTERED				
		GN	SC	ST	OB	TOTAL (PD)	GN	SC	ST	OB	TOTAL	GN	SC	ST	OB	TOTAL
1	Chemistry	22	6	-	3	31	22	6	-	3	31	-	-	-	-	-
2	Geophysics	16	1	1	2	20	15	1	-	2	18	1	-	1	-	2
3	Geological Sciences	12	-	-	-	12	12	-	-	-	12	-	-	-	-	-
4	Mathematics	13	3	-	3	19	13	1	-	3	17	-	2	-	-	2
5	Physics	24	4	1	3	32	24	4	1	3	32	-	-	-	-	-
6	Statistics & Informatics	13	-	-	1	14	10	-	-	-	10	3	-	-	1	4
	TOTAL	100	14	2	12	128	96	12	1	11	120	4	2	1	1	8

Table : A-3

DISCIPLINE-WISE BREAK-UP OF STUDENTS AWARDED M.C.M. SCHOLARSHIP 2007-2008

Rate of Scholarship : Rs.1000/- p.m. plus Free-tuitionship

#	Course	1 st yr.	2 nd yr.	3 rd yr.	4 th yr.	5 th yr.	Total
(A) B.Tech. 4-Year							
1	Aerospace Engg.	08	08	05	04		25
2	Agri. & Food Engg.	08	02	05	01		16
3	Biotech. & Bioch. Engg.	04	04	04	04		16
4	Chemical Engg.	06	06	09	04		25
5	Civil Engg.	08	05	14	04		31
6	Computer Sc. & Engg.	08	06	12	11		37
7	Electrical Engg.	11	07	12	11		41
8	Electronics & ECE	06	10	09	02		27
9	Energy Engg.		05	03	03		11
10	Industrial Engg.	05	04	02	05		16
11	Instrumentation Engg.	06	05	03	04		18
12	Manuf. Sc. & Engg.	05	04	03	03		15
13	Mechanical Engg.	12	10	10	08		40
14	Met. & Mat. Engg.	08	04	05	07		24
15	Mining Engg.	06	04	04	04		18
16	Ocean Engg. & N.A.	05	03	04	04		16
(B) B.Arch. 5-Year							
1	Architecture	10	03	08	02	03	26
(C) M.Sc. Integrated 5-Year							
1	Applied Geology	06	03	-	02	02	13
2	Economics	04	02	04	-	-	10
3	Expl. Geophysics	02	03	-	05	03	13
4	Industrial Chemistry	02	01	02	02	01	08
5	Maths. & Computing	02	06	05	05	04	22
6	Physics	02	03	-	01	04	10
7	Statistics & Informatics	06	05	05	-	-	16
(D) M.Sc. 2-Year							
1	Chemistry				04	14	18
2	Geophysics				03	03	06
3	Geological Sciences				07	07	14
4	Mathematics				03	07	10
5	Physics				08	13	21
6	Statistics & Informatics				01	05	06
(E) Dual Degree 5-Year							
1	Aerospace Engg.	03	02	01	04	-	10
2	Ag. & F. E./ Water Res. Dev. & Manag.	03	01	-	04	-	08
3	Biotech. & Bioch. Engg.	02	03	02	03	-	10
4	Chemical Engg.	04	05	06	01	-	16
5	Civil Engg./Struct. Engg.	05	03	04	-	-	12
6	Computer Sc. & Engg./Comp. & Information Technology	04	05	02	06	-	17
7	Electrical Engg./Instrumentation Engg.	04	03	-	04	-	11
8	E & ECE/Automation & Comp. Vision	04	08	05	01	-	18
9	Industrial Engg./IEM.	07	02	02	03	-	14
10	Manuf. Sc.& Engg./IEM	02	03	02	02	-	09
11	M.E./M.S. Engg.	04	04	04	06	-	18
12	M.E./Thermal, Energy & Environ. Engg.						
13	Met. & Mat. Engg./ Metallurgical Engg.	-	02	02	01	-	05
14	Mining Engineering	07	05	10	02	-	24
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines						
16	Ocean Engg. & N.A.	01	01	04	03	-	09
Total:		216	209	172	136	17	750

Table : A-4A

STUDENTS AWARDED ONLY FREE TUITIONSHIP 2007-2008

#	Course	1 st yr.	2 nd yr.	3 rd yr.	4 th yr.	5 th yr.	Total
(A) B.Tech. 4-Year							
1	Aerospace Engg.	-	01	03	01	-	05
2	Agri. & Food Engg.	-	01	01	-	-	02
3	Biotech. & Bioch. Engg.	-	-	02	-	-	02
4	Chemical Engg.	-	01	-	01	-	02
5	Civil Engg.	-	02	-	01	-	03
6	Computer Sc. & Engg.	-	01	01	02	-	04
7	Electrical Engg.	-	01	01	01	-	03
8	Electronics & ECE	-	02	-	04	-	06
9	Energy Engg.	-	-	-	-	-	-
10	Industrial Engg.	-	01	02	-	-	03
11	Instrumentation Engg.	-	-	01	01	-	02
12	Manuf. Sc. & Engg.	-	02	-	-	-	02
13	Mechanical Engg.	-	01	03	05	0-	09
14	Met. & Mat. Engg.	-	02	-	-	-	02
15	Mining Engg.	-	03	02	-	-	05
16	Ocean Engg. & N.A.	-	01	01	-	-	02
(B) B.Arch. 5-Year							
	Architecture	-	04	01	-	-	05
(C) M.Sc. Integrated 5-Year							
1	Applied Geology	-	02	02	01	-	05
2	Economics	-	03	-	-	-	03
3	Expl. Geophysics	-	-	02	-	02	04
4	Industrial Chemistry	-	01	-	03	01	05
5	Maths. & Computing	-	01	03	-	-	04
6	Physics	-	01	03	01	02	07
7	Statistics & Informatics	-	03	04	01	-	08
(D) M.Sc. 2-Year							
1	Chemistry				03	-	03
2	Geophysics				01	01	02
3	Geological Sciences				01	-	01
4	Mathematics				03	02	05
5	Physics				03	-	03
6	Statistics & Informatics				01	-	01
(E) Dual Degree 5-Year							
1	Aerospace Engg.	-	02	02	-	-	04
2	Ag. & F. E./ Water Res. Dev. & Manag.	-	03	-	-	-	03
3	Biotech. & Bioch. Engg.	-	02	-	-	-	02
4	Chemical Engg.	-	01	-	-	-	01
5	Civil Engg./Struct. Engg.	-	01	-	-	-	01
6	Computer Sc. & Engg./ Comp. & Information Technology	-	-	-	-	--	
7	Electrical Engg./Instrumentation Engg.	-	01	02	01	-	04
8	E & ECE/Automation & Comp. Vision	-	02	01	01	-	04
9	Industrial Engg./IEM	-	-	01	-	-	01
10	Manuf. Sc. & Engg./IEM	-	01	01	-	-	02
11	M.E./M.S. Engg.	-	01	07	03	-	11
12	M.E./Thermal, Energy & Environ. Engg.						
13	Met. & Mat. Engg./ Metallurgical Engg.	-	-	-	-	-	-
14	Mining Engineering	-	02	01	-	-	03
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines						
16	Ocean Engg. & N.A.	-	-	01	-	-	01
	Total :	12	53	48	27	05	145

Table : A-4B

STUDENTS GRANTED TUITION FEE EXEMPTION (ONLY SC / ST) 2007-2008

#	Course	1 st yr.		2 nd yr.		3 rd yr.		4 th yr.		5 th yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
(A) B.Tech. 4-Year												
1	Aerospace Engg.	3	1	3	2	2	-	2	-			13
2	Agri. & Food Engg.	3	-	2	-	-	-	-	-			05
3	Biotech. & Bioch. Engg.	4	1	3	-	1	1	1	1			12
4	Chemical Engg.	5	2	5	-	6	-	4	-			22
5	Civil Engg.	8	-	10	1	3	-	4	-			26
6	Computer Sc. & Engg.	7	4	6	3	5	2	4	3			34
7	Electrical Engg.	5	3	5	2	5	2	5	2			29
8	Electronics & ECE	6	3	6	3	5	2	4	2			31
9	Energy Engg.	-	-	2	1	5	1	3	-			12
10	Industrial Engg.	4	-	3	-	2	-	2	-			11
11	Instrumentation Engg.	3	-	3	1	3	1	3	1			15
12	Manuf. Sc. & Engg.	3	2	3	-	2	1	4	-			15
13	Mechanical Engg.	7	1	7	3	4	2	5	1			30
14	Met. & Mat. Engg.	4	2	7	-	3	-	3	-			19
15	Mining Engg.	1	1	7	1	2	-	-	-			12
16	Ocean Engg. & N.A.	3	2	6	-	2	-	3	-			16
	Total (A):	66	22	78	17	50	12	47	10			302
(B) B.Arch. 5-Year												
1	Architecture	1	-	-	-	-	-	-	-	-	-	01
	Total (B):	1	-	-	-	-	-	-	-	-	-	01
(C) M.Sc. Integrated 5-Year												
1	Applied Geology	3	-	-	-	-	-	-	-	-	-	03
2	Economics	1	-	-	-	-	-	-	-	-	-	01
3	Expl. Geophysics	-	2	1	-	-	-	-	-	-	-	03
4	Industrial Chemistry	-	-	-	-	-	-	-	-	-	-	-
5	Maths. & Computing	3	-	6	-	3	-	-	-	1	-	13
6	Physics	1	-	4	-	-	-	-	-	-	-	05
7	Statistics & Informatics	3	1	1	-	-	-	-	-	-	-	05
	Total (C):	11	3	12	-	3	-	-	-	1	-	30
(D) M.Sc. 2-Year												
1	Chemistry							3	-	5	1	09
2	Geophysics							-	-	-	-	-
3	Geological Sciences							2	-	3	1	06
4	Mathematics							2	-	3	-	05
5	Physics							5	1	5	1	12
6	Statistics & Informatics							-	-	1	-	01
	Total (D):							12	1	17	3	33
(E) M.Tech. Dual Degree 5-Year												
1	Aerospace Engg.	3	1	2	-	2	-	-	-	2	-	10
2	Ag. & F. E./ Water Res. Dev. & Manag.	-	-	3	-	1	-	-	-	-	-	04
3	Biotech. & Bioch. Engg.	3	-	3	-	2	1	1	-	-	-	10
4	Chemical Engg.	3	1	4	-	3	1	-	-	3	-	15
5	Civil Engg./Struct. Engg.	3	-	3	-	3	-	-	-	1	-	10
6	Computer Sc. & Engg./ Comp. & Information Technology	4	1	4	2	2	4	3	1	2	1	24
7	Electrical Engg./Instrumentation Engg.	2	-	2	1	2	2	2	1	2	1	15
8	E & ECE/Automation & Comp. Vision	4	2	4	3	2	3	2	1	2	-	23
9	Industrial Engg./IEM	4	-	5	-	1	-	-	-	1	-	11
10	Manuf. Sc.& Engg./IEM	2	1	2	-	2	1	1	-	1	-	10
11	M.E./M.S. Engg.	4	-	4	2	2	1	3	1	-	1	18
12	M.E./Thermal, Energy & Environ. Engg.	-	-	-	-	2	-	1	-	1	1	05
13	Met. & Mat. Engg./ Metallurgical Engg.	-	1	1	-	-	-	1	-	1	-	04
14	Mining Engineering	2	1	1	-	-	-	-	-	-	-	04
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines	2	1	1	-	-	-	-	-	-	-	04
16	Ocean Engg. & N.A.	2	1	4	-	2	-	-	-	1	1	11
	Total (E) :	38	10	43	8	26	13	14	4	17	5	178
	Total (A+B+C+D+E) :	116	35	133	25	79	25	73	15	35	8	544

Table : A-5
STUDENTS (SC & ST) AWARDED FINANCIAL ASSISTANCE 2007-2008

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

#	Course	1 st yr.		2 nd yr.		3 rd yr.		4 th yr.		5 th yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
(A) B.Tech. 4-Year												
1	Aerospace Engg.					1						1
2	Agri. & Food Engg.											
3	Biotech. & Bioch. Engg.											
4	Chemical Engg.			1		3						4
5	Civil Engg.		1	1								2
6	Computer Sc. & Engg.				2							2
7	Electrical Engg.						1					1
8	Electronics & ECE					1						1
9	Energy Engg.											
10	Industrial Engg.	1										1
11	Instrumentation Engg.											
12	Manuf. Sc. & Engg.	1										1
13	Mechanical Engg.											
14	Met. & Mat. Engg.					1		1				2
15	Mining Engg.		1			1						2
16	Ocean Engg. & N.A.		1	2								3
(B) B.Arch. 5-Year												
	Architecture											
(C) M.Sc. Integrated 5-Year												
1	Applied Geology											
2	Economics											
3	Expl. Geophysics		1									1
4	Industrial Chemistry											
5	Maths. & Computing		1	1								2
6	Physics											
7	Statistics & Informatics	1										1
(D) M.Sc. 2-Year												
1	Chemistry							1		4		5
2	Geophysics											
3	Geological Sciences							1			1	2
4	Mathematics									2		2
5	Physics											
6	Statistics & Informatics									3	1	4
(E) Dual Degree 5-Year												
1	Aerospace Engg.		1									1
2	Ag. & F. E./ Water Res. Dev. & Manag.											
3	Biotech. & Bioch. Engg.											
4	Chemical Engg.			3		1						4
5	Civil Engg./Struct. Engg.											
6	Computer Sc. & Engg./ Comp. & Information Technology						1					1
7	Electrical Engg./ Instrumentation Engg.											
8	E & ECE/Automation & Comp. Vision											
(E) Dual Degree 5-Year												
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				2
14	Mining Engineering											
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines											
16	Ocean Engg. & N.A.		1									1
	Total:	5	8	14	6	11	2	2				48

Table : A-6

A. STUDENTS AWARDED ENDOWMENT PRIZES : 2007-2008

1. ENDOWMENT PRIZES - (UNDER GRADUATE) :

#	Name of Prize	Name of the winner	Instt. Roll No.	Amount Rs.
1.	Sarat Memorial Prize	Ridhima Kedia	04CS1021	500.00
2.	Suhasini Devi Memorial Prize	Asha Parekh	04CH1027	500.00
3.	P. K Bhattacharya Memorial Prize	Nishank Saxena	03EX2008	500.00
4.	Sachinandan Basak Memorial Prize	Anandaroop Chakraborty	06EC1045	500.00
5.	Amlan Sen Memorial Prize	Amit Gahoi	04ME1040	1,000.00
6.	Swapan Kumar Saha Memorial Prize	Rithe Rahul Kumar Jagdish	04EC1029	1,000.00
7.	Medury Bhanumurthy Memorial Prize	Indrajit Mal	04MT1016	350.00
8.	H. N. Bose Memorial Prize	Anirban Ghosh	03PH2001	3,000.00
9.	Sharmila Bose Memorial Prize	Aditi Das	03CY2018	3,000.00
10.	Bigyan Sinha Memorial Prize	Rishabh Singh	04CS1015	1,000.00
11.	Usha Martin Award	Indrajit Mal	04MT1016	1,000.00
12.	Systems Society Award	Sandesh V Borgaonkar	04EE1023	2,500.00
13.	Prof.K. L. Chopra Award	Subhamoy Ghatak	06PH4016	1,000.00
14.	Charubala Devi Memorial Prize	Anvesh Komuravelli	05CS1031	1,000.00
15.	Gouri Basak Design Award	Deepak Sohane	04AR1013	1,000.00
16.	Prof. Prabodh Chandra Sanyal Award	Sanchayan Chakraborty	03MA2004	1,000.00
17.	B. L. Naggal Memorial Prize	Puneet Kumar Patra	05CE1032	2,000.00
18.	Umesh Kumar Bhatia Sports Prize	Indrajit Mal	04MT1016	1,000.00
19.	Pradeep Kumar Chakraborty Award	Arunima Singh	05MT1025	1,000.00
20.	G. B. Mitra Award	Anirban Ghosh	03PH2001	1,000.00
21.	Bhartiya Cutler Hammer Prize	Mayank Kr Bhagat	05EE1014	3,000.00
22.	R. M. Lalwani Prize	Anvesh Komuravelli	05CS1031	1,000.00
23.	H. P. Bhadury Memorial Prize	Shrenik Kothari	05ME1042	1,500.00
24.	John Von Neuman Award	Anvesh Komuravelli	05CS1031	2,500.00
25.	Prof. S. K. Nandi Memorial Prize	Himanshu Yadav	05CH1033	500.00
26.	International Symposium (Microwave & Communication) 1981 Prize	Amit Agarwal	05EC1033	3,000.00
27.	Class Of 1970 Alumni (US) Association Prize	Arka Alope Bhattacharya	06CS1039	2,500.00
28.	Technology Alumni Association (Delhi Chapter) Award	Rasha Eqbal	07CH1030	1,500.00
29.	IITKharagpur Alumni (California Chapter) Award	Arka Alope Bhattacharya	06CS1039	3,000.00
30.	Ram Gopal Kabre Memorial Prize	Pradipta Banerjee	06AR1001	1,000.00
31.	Prof. S. P. Sengupta Memorial Prize	Anirban Garai	04ME3203	2,500.00
32.	K. Rama Rao Endowment Prize	Kumar Satyam	05AG1016	2,500.00
33.	Smt. Ava Sanyal Memorial Prize	Arunima Singh	05MT1025	2,500.00
34.	Prof. B.N. Avasthi Memorial Award For Sports	Jointly : Chirag Fialoke (male) Shivani Pal (female)	07CY2017 05EE1031	2,500.00 2,500.00
35.	Prof. Sunil Kanti Sen Memorial Award	Jointly : Rasha Eqbal Aritra Chatterjee	07CH1030 07NA3007	2,000.00 2,000.00
36.	Prof. Sudhir Ranjan Sengupta Memorial Prize	Priyanka Thamma	04CE1009	2,000.00
37.	Best B.Tech. Project Thesis Award By Mr. Mitrajit Mukhopadhyay	1 st Himanshu Sharma 2 nd Richa 3 rd Vivek Kumar	04CH3007 04CH1016 04CH1024	25,000.00 15,000.00 10,000.00
38.	A. A. Hakim Memorial Endowment Prize	Amrita S Sarma	03AG3304	2,500.00
39.	Keshab K Parhi Endowment Prize	Prithviraj Banerjee	03EC3510	15,000.00
40.	Nilanjan Ganguly Memorial Award For E&ECE Deptt	Ritesh Parikh	04EC3207	10,000.00
41.	Nilanjan Ganguly Memorial Award For Physics Deptt	Anirban Ghosh	03PH2001	10,000.00
42.	Kedar Nath Singh Memorial Prize	Anirban Ghosh	03PH2001	6400.00
43.	Dwaraka Nath Singh Memorial Prize	Amod Kumar Jain	03ME3016	6400.00
44.	Jugal Kishore Singh Memorial Prize	Sourav Padhy	04ME1042	6400.00

Table : A-6 (Contd.)**2. J. C. GOSH MEMORIAL PRIZES :**

#	Name of Prize	Name of the winner	Instit. Roll No.	Amount Rs.
1	Aerospace Engineering	Richa Singh	05AE1019	2000.00
2	Agricultural & Food Engineering	Tushar Gulati	05AG3005	2000.00
3	Biotechnology & Biochemical Engineering	K.M.Saravana Kumar	05BT3013	2000.00
4	Chemical Engineering	Himanshu Yadav	05CH1033	2000.00
5	Civil Engineering	Puneet Kumar Patra	05CE1032	2000.00
6	Computer Science & Engineering	Anvesh Komuravelli	05CS1031	2000.00
7	Electrical Engineering	Mayank Kr Bhagat	05EE1014	2000.00
8	Energy Engineering	Apte Chinmay Raghunath	05EG1013	2000.00
9	Instrumentation Engineering	Kartikya K Sharma	05IE1021	2000.00
10	Electronics & Elect. Commu. Engineering	Amit Agarwal	05EC1033	2000.00
11	Industrial Engineering	Soumya Ranjan Nanda	05IM1015	2000.00
12	Mechanical Engineering	Shrenik Kothari	05ME1042	2000.00
13	Manufacturing Science & Engineering	Akash Reddy Senji	05MF1020	2000.00
14	Metallurgical & Materials Engineering	Arunima Singh	05MT1025	2000.00
15	Mining Engineering	Amit Agasty	05MI3004	2000.00
16	Ocean Engineering & Naval Architecture	Deepak Abraham Cherian	05NA3006	2000.00
17	Industrial Chemistry	Gourab Bhattacharje	04CY2008	2000.00
18	Applied Geology	Khushboo Arora	04GG2008	2000.00
19	Exploration Geophysics	Siddharth Mukund	04EX2019	2000.00
20	Mathematics & Computing	Abinash Pati	04MA2007	2000.00
21	Physics	Wrick Sengupta	04PH2001	2000.00

3. BEST PROJECT AWARD :**(a) 4-YEAR B. TECH.(HONS.) COURSES :**

#	Name of Prize	Name of the winner	Instit. Roll No.	Amount Rs.
1	Aerospace Engineering	Potturi Amarnatha Sarma	04AE1011	1,000.00
2	Agricultural & Food Engineering	Mohit Gupta	04AG1011	1,000.00
3	Biotechnology & Biochemical Engineering	Debkishore Mitra	04BT1003	1,000.00
4	Chemical Engineering	Srimoyee Bhattacharya	04CH1015	1,000.00
5	Civil Engineering	Bhasker Rathi	04CE1019	1,000.00
6	Computer Science & Engineering	Mridul Aanjaneya	04CS1022	1,000.00
7	Electrical Engineering	Kumar Anubhav	04EE1008	1,000.00
8	Energy Engineering	Parag Jain	04EG1001	1,000.00
9	Instrumentation Engineering	Subhojit Chakladhar	04IE1010	1,000.00
10	Industrial Engineering	Raja Ram Mohan Roy M	04IM1013	1,000.00
11	Electronics & Electrical. Comm. Engineering	Rithe Rahul Kumar Jagdish	04EC1029	1,000.00
12	Mechanical Engineering	Naveen Agarwal	04ME1033	1,000.00
13	Manufacturing Science & Engineering	Vishal Garg	04MF3006	1,000.00
14	Metallurgical & Materials Engineering	Sudhanshu Shekhar Singh	04MT1011	1,000.00
15	Mining Engineering	Vinay Kumar Pilia	04MI3006	1,000.00
16	Ocean Engineering & Naval Architecture	Vineet Bhardwaj	04NA1014	1,000.00

Table : A-6 (Contd.)**(b) 5-YEAR DUAL DEGREE COURSES :**

#	Name of Prize	Name of the winner	Instit. Roll No.	Amount Rs.
1	Aerospace Engineering (AE1)	Abhishek Halder	03AE3009	1,000.00
2	Agricultural & Food Engineering (AG1)	Konica Gupta	03AG3305	1,000.00
3	Biotechnology & Biochemical Engineering (BT1)	Riddhiman Dhar	03BT3010	1,000.00
4	Chemical Engineering (CH1)	Ankur Gupta	03CH3001	1,000.00
5	Civil Engineering (CE1)	Shravan Bendapudi	03CE3002	1,000.00
6	Computer Science & Engineering (CS1)	Kumar Puspesh	03CS3025	1,000.00
7	Electrical Engineering (EE1)	Paritosh Pande	03EE3014	1,000.00
8	Electronics & Elect. Commu. Engineering (EC1)	Jointly : Saurav Bandyopadhyay Kaushik Dasgupta	03EC3205 03EC3202	500.00 500.00
9	Industrial Engineering & Management (IM1)	Ankit Kumar Gandhi	03IM3011	1,000.00
10	Mechanical Engineering (ME1)	Amod Kumar Jain	03ME3016	1,000.00
11	Mechanical Engineering (ME2)	Akshay Mishra	03ME3033	1,000.00
12	Mechanical Engineering (ME4)	Atul Goyal	03ME3402	1,000.00
13	Manufacturing Science & Engineering (MF1)	Nikhil S Prakash	03MF3010	1,000.00
14	Metallurgical & Materials Engineering (MT1)	Mohan Sushantam	03MT3007	1,000.00
15	Mining Engineering (MI1)	Lalit Sharma	03MI3004	1,000.00
16	Ocean Engineering & Naval Architecture (NA1)	Rajnish Kumar	03NA3008	1,000.00

(c) 5-YEAR M. SC. COURSES :

#	Name of Prize	Name of the winner	Instit. Roll No.	Amount Rs.
1	Industrial Chemistry	Shiladitya Sen	03CY2019	1,000.00
2	Exploration Geophysics	Abhishek Raj	03EX2011	1,000.00
3	Applied Geology	Dip Shankar Nanda	03GG2016	1,000.00
4	Mathematics & Computing	Anindya Roy	03MA2022	1,000.00
5	Physics	Debyendu Mondal	03PH2007	1,000.00

(d) 2-YEAR M. SC. COURSES :

#	Name of Prize	Name of the winner	Instit. Roll No.	Amount Rs.
1	Chemistry	Arjun Sengupta	06CY4001	1,000.00
2	Geological Sciences	Arnab Ghosh	06GG4009	1,000.00
3	Geophysics	Uday Shanker Mishra	06EX4002	1,000.00
4	Mathematics	Jointly : 1) Hari Shankar Mahato 2) Supratim Das	06MA4008 06MA4013	500.00 500.00
5	Physics	Jointly : 1) Somnath Nag 2) Arunabha Saha	06PH4006 06PH4019	500.00 500.00
6	Statistics & Informatics	Ishapathik Das	06SI4006	1,000.00

Table : A-6 (Contd.)

B. STUDENTS AWARDED ENDOWMENT MERIT SCHOLARSHIP : 2007-2008

Sl. No.	Name of the Scholarship	Name of the Scholarship holder with Roll Number	Amount Rs.
1	B.P.Poddar Scholarship	Siddhartha Sen, 04EC1030	1000/- P.M.
2	Vinod Gupta Leadership Scholarship	S Muralidhar Duvvuri, 05AG3008	400/- P.M.
3	Kumud Manorama Memorial Scholarship	Oliv Sen, 05ME1033	1000/- P.M.
4	Hem Chandra Rout Memorial Scholarship	Umesh Gupta, 04NA3005	500/- P.M.
5	Mrs. Minoti Bagchi Memorial Scholarship	Mahendra Shukla, 07SI2018	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 c) Andhavarapu Radhika, 07MI1020	1000/- P.M. 1000/- P.M. 1000/- P.M.
8	American Business List Humanities Scholarship	Sailesh Pati, 03EC3201	400/- P.M.
9	Technology Alumni Association (Kharagpur Chapter) Scholarship		1000/- P.M.
10	Technology Alumni Association (Calcutta Chapter) Scholarship	Rasha Eqbal, 07CS1039	500/- P.M.
11	K.K. Agarwal Memorial Scholarship	Devanshu Agrawal, 04AG1012	400/- P.M.
12	Indian Women's Association, Bonn Scholarship	Soumya Shaw, 07HS2008	1500/- P.M.
13	HPCL Start Up Scholarship	a) Neetesh Gupta, 07CS1007 b) Naveen Kumar, 07CS1008 c) Sumit Sinha, 07CS1009 d) Koushik Das, 07EC1037 e) Nijwm Wary, 07EC1036	1000/- P.M. 1000/- P.M. 1000/- P.M. 1000/- P.M. 1000/- P.M.
14	Devi Mahamaya Mallick Memorial Scholarship	Sri Ankit Pat, 07MA2003	1200/- P.M.
15	Dr. Arunabha Chatterjee Memorial Scholarship	Anirban Gangopadhyay, 03PH2002	4380/- P.M.
16	Goralal Syngal Memorial Scholarship	a) Sougata Sarkar, 04EC1004 b) Vinu Rajashekhar, 05CS3025 c) Prateek, 06CS1006 d) Dheeraj Kr. Singh, 07CS1004 e) Md. Jawaid Iqbal, 07CS1006 f) Amit Sharma, 06CS1025 g) Parth Sethi, 05CS1025 h) Rithe Rahul Kumar Jagdish, 04EC1029 i) Ritesh Parikh, 04EC3207	2100/- P.M. 2100/- P.M. 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) Ganshyam Meena, 06ME1003 b) Kuldeep Kumar, 06MT1003	1000/- P.M. 1000/- P.M.
18	Prova Basu Memorial Scholarship	Sourav Saha, 05EE3002	12,000/- per annum
19	Mrinal Chandra Basu Memorial Scholarship	Ankur Kothari, 04IE1015	12,000/- per annum
20	ABS Scholarship	Yagnish Rathi, 04NA1008	1000/- P.M.
21	Guru Kripa Educational Loan Scholarship	a) Koushik Hembram, 06EC3004 b) Raghav Agrawal, 06EC1012	750/- P.M. 750/- P.M.
22	Arjun Das Datta Memorial Scholarship	a) Md. Tanweer Alam, 06CS3012 b) Arit Kr. Mondal, 06CS1008 c) P. Deepak, 06EE1020 d) M. Ravikant, 06MT3009 e) Kushal Pandya, 06ME1030 f) Ankit Kumar, 07CE1001 g) I Priyadarshini Bobburi, 07BT3014 h) Kripasindhu Sarkar, 07CS3025 i) Adhihi Shwetha Adhi, 07AR1002 j) Abhirup Mallik, 07PH2009	2500/- P.M. 2500/- P.M. 2500/- P.M. 2500/- P.M. 2500/- P.M. 2500/- P.M. 2500/- P.M. 2500/- P.M. 2500/- P.M. 2500/- P.M.
23	Rajendra Nath Das Merit-cum-Means Awards	a) Sudip Roy, 05CS1035 b) Vaibhav Goel, 05EC1021 c) Himanshu Yadav, 05CG1033 d) K. M. Saravana Kumar, 05BT3013 e) Ullas Agrawal, 05ME3034 f) Gourav Khaneja, 06CS1017 g) Rahul Gupta, 06EE1027 h) Udit Kejriwal, 06ME1047 i) Vivek Khetan, 06CH3004	25,000/- 25,000/- 25,000/- 25,000/- 25,000/- 25,000/- 25,000/- 25,000/- 25,000/-
25	Dr. J. C. Ghosh Memorial Scholarship	Vajha Myna, 07EC1015	5000/- P.M.

Table : A-7

STUDENTS AWARDED SCHOLARSHIPS BY EXTERNAL AGENCIES (2007-2008)

Sl. No.	Awarding Organization	No. of Recipients
1.	National Council of Educational Research & Training, Sri Aurobinda Marg, New Delhi 16	101
2.	Directorate of Technical Education, West Bengal	-
3.	Directorate of Tech. Education, Assam	01
4.	Directorate of Higher Education, Tripura	-
5.	Directorate of Collegiate Education, Trivandrum, Kerala	-
6.	Directorate of Technical Education, Bhopal, MP	-
7.	SC and ST Dev. Department, Bhubaneswar, Orissa	01
8.	Directorate of Higher Education, Arunachal Pradesh	03
9.	Birsa Munda Scholarship, Jharkhand	01
10.	Steel Authority of India Ltd., Durgapur, Rourkela, Bhilai, Vishakhapatnam Steel Plant, Bokaro	05
11.	Office of the Administrator, Mining Areas Development Fund, Govt. of Orissa	-
12.	New Central Sector Scholarship for Top Class Education for SC Students, Ministry of S.J&E, New Delhi	10
13.	Department of Telecommunication, Calcutta.	-
14.	Central Coal-fields Ltd., Ranchi.	01
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.	01
21.	Jagadish Chandra Bose National Talent Search, Calcutta (JBNSTS)	26
22.	Jubilee Scholarship Committee, TISCO, Jamshedpur.	-
23.	Metallurgical & Engineering Consultants (India) Ltd, Ranchi	-
24.	Indian Oil Corporation Ltd., New Delhi.	01
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 - OPJEM Scholarship	03
29.	CMRF, Govt. of Bihar, C.M.Secretariate, Patna	03
30.	G.O.I. Scholarship, Govt. of Tamilnadu	01
31.	NEC Scholarship, Guwahati, Assam	01
32.	CMERI, Durgapur	-
33.	TATA Millennium Scholarship (Russi Mody)	06
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.	06
38.	Rajendra Vidyalaya, Jamshedpur	-
39.	KVPY Scholarship, IISc, Bangalore	04
40.	NEC, Shilong	-
41.	Siksha Deep Trust, Raj Bhavan, Chhatisgarh	01
42.	CBSE, New Delhi	-
43.	MECON, Ranchi	01
44.	MCM Scholarship for Minorities Communities, Ministry of Minority Affairs, New Delhi	03
45.	Tribal Welfare (GOI) Scholarship, Jabalpur, M.P.	01
	TOTAL :	181

Table : A-8

STUDENTS FROM FOREIGN COUNTRIES ON ROLL OF UNDERGRADUATE COURSES, CLASS WISE, 2008-2009

#	Course	1 st yr.	2 nd yr.	3 rd yr.	4 th yr.	5 th yr.	Total
(A) B.Tech. 4-Year							
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.Arch. 5-Year							
1	Architecture	-	-	-	-	-	-
(C) M.Sc. Integrated 5-Year							
1	Applied Geology	-	-	-	-	-	-
2	Economics	-	-	-	-	-	-
3	Expl. Geophysics	-	-	-	-	-	-
4	Industrial Chemistry	-	-	-	-	-	-
5	Maths. & Computing	-	-	-	-	-	-
6	Physics	-	-	-	-	-	-
7	Statistics & Informatics	-	-	-	-	-	-
(D) M.Sc. 2-Year							
1	Chemistry	-	-	-	-	-	-
2	Geophysics	-	-	-	-	-	-
3	Geological Sciences	-	-	-	-	-	-
4	Mathematics	-	-	-	-	-	-
5	Physics	-	-	-	-	-	-
6	Statistics & Informatics	-	-	-	-	-	-
(E) Dual Degree 5-Year							
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.	-	-	-	-	-	-
	Total :	NIL	NIL	NIL	NIL	NIL	NIL

Table : A-9

COUNTRY-WISE DISTRIBUTION OF FOREIGN STUDENTS (2008-2009)

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

Table : A-10

STUDENTS ON ROLL UNDERGRADUATE (B.TECH. / B.ARCH. / M.SC. / DUAL DEGREE) COURSES AT THE BEGINNING OF THE SESSION 2008-2009

#	Course	1 st yr.		2 nd yr.		3 rd yr.		4 th yr.		5 th yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
(A) B.Tech. 4-Year												
1	Aerospace Engg.	20	2	22	1	18	2	18	2			85
2	Agri. & Food Engg.	19	4	9	2	13	2	12	2			63
3	Biotech. & Bioch. Engg.	17	2	13	3	15	2	10	2			64
4	Chemical Engg.	32	4	31	5	34	1	31	4			142
5	Civil Engg.	43	1	32	4	34	2	29	1			146
6	Computer Sc. & Engg.	40	2	42	1	41	-	38	2			166
7	Electrical Engg.	37	4	36	4	37	3	35	1			157
8	Electronics & ECE	42	3	44	2	41	1	34	-			167
9	Energy Engg.	-	-	-	-	15	1	21	-			37
10	Industrial Engg.	18	2	21	1	20	-	15	-			77
11	Instrumentation Engg.	19	3	16	8	17	4	20	1			88
12	Manuf. Sc. & Engg.	18	3	20	2	21	1	22	-			87
13	Mechanical Engg.	53	-	48	1	48	-	48	-			198
14	Met. & Mat Engg.	27	4	24	3	19	1	19	3			100
15	Mining Engg.	27	1	19	1	20	1	13	-			82
16	Ocean Engg. & N.A.	20	2	17	3	20	1	15	-			78
TOTAL (A):		432	37	394	41	413	22	380	18			1737
(B) B.Arch. 5-Year												
	Architecture	23	4	14	10	17	8	15	3	11	2	107
TOTAL (B):		23	4	14	10	17	8	15	3	11	2	107
(C) M.Sc. Integrated 5-Year												
1	Applied Geology	21	2	14	1	11	-	5	2	9	3	68
2	Economics	19	2	16	-	19	-	11	-			67
3	Expl. Geophysics	18	4	21	1	14	-	7	2	14	1	82
4	Industrial Chemistry	9	5	5	-	7	1	5	-	14	2	48
5	Maths. & Computing	19	1	24	-	22	2	22	-	18	5	113
6	Physics	14	-	6	4	18	-	12	1	13	5	73
7	Statistics & Informatics	26	5	23	1	25	1	23	-			104
TOTAL (C):		126	19	109	7	116	4	85	5	68	16	555

Table : A-10 (Contd.)

#	Course	1 st yr.		2 nd yr.		3 rd yr.		4 th yr.		5 th yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
(D) M.Sc. 2-Year												
1	Chemistry							26	4	22	5	57
2	Geological Sciences							13	5	10	7	35
3	Geophysics							8	3	8	1	20
4	Mathematics							14	4	7	4	29
5	Physics							24	8	20	2	54
6	Statistics & Informatics							6	4	12	1	23
	TOTAL (D):							91	28	79	20	218
(E) Dual Degree 5-Year												
1	Aerospace Engg.	11	-	11	-	11	-	9	1	10	-	53
2	Ag. & F. E./ Water Res. Dev. & Manag.	17	1	13	1	15	2	10	-	6	-	65
3	Biotech. & Bioch. Engg.	11	3	10	4	11	2	12	1	12	1	67
4	Chemical Engg.	17	2	16	3	12	7	13	3	10	-	83
5	Civil Engg./Struct. Engg.	11	3	13	-	13	1	11	-	6	-	58
6	Computer Sc. & Engg./ Comp. & Information Technology	27	1	28	-	27	1	26	-	28	-	138
7	Electrical Engg./ Instru. Engg.	14	4	16	1	16	1	15	-	14	1	82
8	E & ECE/Automation & Comp. Vision	26	2	27	2	26	1	19	1	18	2	124
9	Industrial Engg./IEM	19	-	16	-	17	-	10	-	7	1	70
10	Manuf. Sc. & Engg./IEM	8	1	12	1	11	1	11	-	13	-	58
11	M.E./M.S. Engg.	30	2	33	1	31	1	30	-	29	1	158
12	M.E./Thermal, Energy & Environ. Engg.											
13	Met. & Mat. Engg./ Metallurgical Engg.	12	2	9	-	5	1	7	1	6	1	44
14	Mining Engg.	23	-	13	-	16	-	16	-	6	-	74
15	Mining Engg./Safety E. & Disaster Mgt in Mines											
16	Ocean Engg. & N.A.	13	-	9	-	9	-	10	-	6	-	47
	Total (E):	239	21	226	13	220	18	199	7	171	7	1151
	TOTAL (A+B+C+D+E)	820	81	743	71	766	52	770	61	329	45	3738

Table : A-11

STATEMENT OF RESULTS (UNDERGRADUATE) 20072008

#	Course	1 st yr.		2 nd yr.		3 rd yr.		4 th yr.		5 th yr.		Total
		P	I	P	I	P	I	P	I	P	I	
(A) B.Tech. 4-Year												
1	Aerospace Engg.	18	02	22	-	20	-	15	-			77
2	Agri. & Food Engg.	17	-	15	-	12	-	10	-			54
3	Biotech. & Bioch. Engg.	19	-	16	01	12	-	10	-			58
4	Chemical Engg.	31	01	35	-	33	-	21	01			122
5	Civil Engg.	38	01	31	02	26	01	23	03			125
6	Computer Sc. & Engg.	39	-	39	01	35	02	31	07			154
7	Electrical Engg.	34	02	34	06	33	01	32	02			144
8	Electronics & ECE	37	03	34	06	33	-	23	05			141
9	Energy Engg.	-	-	14	02	20	-	11	03			50
10	Industrial Engg.	19	-	20	02	14	01	10	02			68
11	Instrumentation Engg.	18	01	20	01	20	-	20	-			80
12	Manuf. Sc. & Engg.	19	01	21	01	20	-	14	03			79
13	Mechanical Engg.	40	03	43	06	40	01	38	03			174
14	Met. & Mat. Engg.	27	-	18	03	19	-	17	-			84
15	Mining Engg.	18	02	22	02	04	10	13	-			71
16	Ocean Engg. & N.A.	19	03	19	02	14	-	14	-			71
	Total (A)	393	19	403	35	355	16	302	29			1552
(B) B.Arch. 5-Year												
	Architecture	23	01	24	-	17	01	13	-	10	01	90
	Total (B)	23	01	24	-	17	01	13	-	10	01	90
(C) M.Sc. Integrated 5-Year												
1	Applied Geology	17	04	11	01	06	-	11	01	10	-	61
2	Economics	20	01	15	04	10	01					51
3	Expl. Geophysics	16	01	14	01	09	-	14	-	14	-	69
4	Industrial Chemistry	15	-	08	-	05	-	16	-	15	-	59
5	Maths. & Computing	19	-	23	01	22	-	22	-	19	-	106
6	Physics	16	-	16	03	13	-	18	-	22	-	88
7	Statistics & Informatics	25	-	21	04	22	01					73
	Total (C)	128	06	108	14	87	02	81	01	80	-	507
(D) M.Sc. 2-Year												
1	Chemistry							27	-	27	-	54
2	Geophysics							10	-	07	-	17
3	Geological Sciences							17	01	20	-	38
4	Mathematics							11	-	19	-	30
5	Physics							22	-	25	-	47
6	Statistics & Informatics							13	-	19	-	32
	Total (D)							100	01	117	-	218

Table : A-11 (Contd.)

#	Course	1 st yr.		2 nd yr.		3 rd yr.		4 th yr.		5 th yr.		Total
		P	I	P	I	P	I	P	I	P	I	
(E) Dual Degree 5-Year												
1	Aerospace Engg.	11	01	10	01	08	01	08	01	10	-	51
2	Ag. & F. E../ Dual Degree	14	-	09	-	08	-	05	01	06	-	43
3	Ag.&F.F/Management			07	01	-						09
4	Biotech. & Bioch. Engg.	13	02	12	01	12	01	13	-	11	01	66
5	Chemical Engg.	15	02	16	03	16	-	10	-	07	-	69
6	Chemical Engg./Management			01	-							01
7	Civil Engg./Dual Degree	11	02	12	-	11	-	06	-	06	-	48
8	Civil Engg./Management			02	-							02
9	Computer Sc. & Engg./ Dual Degree	22	02	20	07	25	-	19	07	20	02	124
10	Electrical Engg./Dual Degree	14	-	14	03	14	-	14	01	14	02	76
11	Electrical Engg./Management					01	-					01
12	E & ECE/Dual Degree	24	01	24	02	19	-	17	03	17	-	107
13	Industrial Engg./IEM	16	01	15	02	10	-	08	-	08	01	61
14	Manuf. Sc.& Engg./IEM	11	01	12	-	10	01	13	-	09	-	57
15	M.E./Dual Degree	24	03	31	32	29	01	28	01	27	02	148
16	Met. & Mat. Engg./Dual Degree	09	-	07	01	07	-	06	-	06	-	36
17	Met. & Mat Engg./Management					01	-					01
18	Mining Engineering	09	-	04	03	05	04	06	-	06	-	37
19	Mining Engg./Safety Engg. & Disaster Mgt. in Mines	09	01	06	01	05	01					23
20	Mining Engg./Management			02	-							02
21	Ocean Engg. & N.A.	09	02	09	-	10	-	06	-	08	01	45
22	Ocean Engg. & N.A./Management			-	01							01
	Total (E)	211	18	213	28	192	09	159	14	155	09	1008
	TOTAL (A+B+C+D+E)	755	44	748	77	651	28	655	45	362	10	3375

P Passed, I - Incomplete

Table : B-1

ADMISSION TO POSTGRADUATE COURSES IN 2008-2009

Dept. / Centre	Specialization	Admitted	Regular	SP	QIP	DF	GN	SC	ST	PH	OBC	M	F
AE	Aerospace Engineering	14	11	00	00	03	11	00	02	00	01	13	01
AgFE	Farm Machinery & Power	09	09	00	00	00	04	03	01	00	01	09	00
	Soil & Water Conservation Engineering	08	08	00	00	00	05	01	01	00	01	07	01
	Dairy & Food Engineering	09	09	00	00	00	03	02	01	00	03	09	00
	Applied Botany	13	13	00	00	00	08	01	00	00	04	10	03
	Water Resource Development & Management	11	11	00	00	00	05	04	01	00	01	09	02
	Aquacultural Engineering	07	07	00	00	00	03	01	00	00	03	06	01
	Post Harvest Engineering.	09	09	00	00	00	03	00	01	00	05	08	01
ARP	City Planning	24	24	00	00	00	13	04	02	00	05	13	11
ChE	Chemical Engineering.	48	45	01	00	02	30	07	03	00	08	40	08
Civil	Hydraulic & Water Resources Engineering.	09	09	00	00	00	05	02	01	00	01	09	00
	Transportation Engineering.	14	13	00	00	01	05	03	02	00	04	14	00
	Environmental Engineering & Management	05	04	01	00	00	02	01	00	00	02	04	01
	Structural Engineering.	10	08	00	00	02	07	01	00	00	02	09	01
CSE	Computer Science & Engineering.	24	16	01	02	05	18	02	01	00	03	23	01
EE	Mach. Drives & Power Elect.	08	08	00	00	00	04	02	00	00	02	08	00
	Control System Engineering.	11	10	00	01	00	09	01	01	00	00	10	01
	Power System Engineering	12	10	01	01	00	07	02	01	00	02	11	01
	Instrumentation	15	13	00	01	01	09	01	00	00	05	13	02
E & ECE	Micro Electronic & VLSI Design (EC 2)	25	19	00	02	04	16	03	02	01	03	24	01
	RF & Microwave Engg. (EC 3)	17	14	01	00	02	13	00	00	00	04	14	03
	Telecomm. Systems Engg. (EC 4)	20	13	01	01	05	12	02	02	00	04	18	02
	Visual Infor. & Embedded System (EC 5)	15	15	00	00	00	09	03	02	00	01	14	01
CET	Media & Sound Engg.	07	07	00	00	00	03	00	01	00	03	05	02
GG	Earth & Environmental Sciences	08	08	00	00	00	03	02	01	00	02	08	00
	Computational Seismology	07	07	00	00	00	04	01	00	00	02	07	00
SIT	Information Technology	19	14	01	01	03	13	02	01	00	03	18	01
MA	Comp. Sc. & Data Processing	25	22	02	01	00	17	04	02	00	02	23	02
ME	Manufac. Science Engineering.	19	18	00	00	01	13	03	01	00	02	18	01
	Thermal Science & Engg.	20	18	00	01	01	12	04	00	00	04	19	01
	Mechanical System Design	20	16	01	01	02	10	03	01	00	06	18	02
	Mech. Sys. Dynamic & Control	15	09	01	00	05	11	03	00	00	01	14	01
MT	Metallurgical & Materials Engineering.	19	15	03	00	01	09	04	02	00	04	18	01
MI	Mining Engineering.	09	09	00	00	00	07	00	00	00	02	09	00
OE	Ocean Engineering & Naval Arch.	12	06	05	00	01	12	00	00	00	00	11	01
PH	Solid State Technology	15	15	00	00	00	07	03	01	00	04	12	03
BT	Biotechnology & Biochemical	13	11	00	02	00	06	03	01	00	03	07	06
CR	Cryogenic Engineering.	05	05	00	00	00	02	02	01	00	00	05	00
HS	Hum. Resources Dev. & Managmt.	12	12	00	00	00	06	02	01	00	03	11	01
IEM	Industrial Engg. & Management.	12	11	00	00	01	07	02	02	00	01	12	00
RE	Reliability Engineering.	15	09	01	00	05	09	02	02	00	02	14	01
MS	Material Sc. & Engineering.	15	14	01	00	00	09	03	00	00	03	12	03
RT	Rubber Technology	12	11	00	00	01	06	04	00	00	02	11	01
ID	Infrastructure Design & Management	09	09	00	00	00	06	02	00	00	01	05	04
WM	Water Management	07	07	00	00	00	01	00	00	00	06	03	04
VGSOM	Business Administration	82	00	82	00	00	51	14	08	02	07	67	15
SMST	Medical Imaging & Image Analysis	10	09	01	00	00	05	02	01	00	02	09	01
	Medical Science & Technology	09	09	00	00	00	07	01	01	00	00	07	02
MT	PG Diploma in Steel Technology	21	00	21	00	00	21	00	00	00	00	21	00
CL	CORAL	07	07	00	00	00	04	02	00	00	01	05	02
RGSOPL	LLB (IPR)	21	00	21	00	00	18	01	01	00	01	18	03
LLBIPR													
Total		782	576	146	14	46	480	115	52	3	132	682	100

Table : B-2

POSTGRADUATE STUDENTS ON ROLL
1st year 2008-2009 & 2nd year 2007-2008

Dept. / Centre	Specialization	Intake Capacity	1 st Year		2 nd Year		Total	
			M	F	M	F	M	F
AE	Aerospace Engineering.	17	13	01	16	00	29	01
AgE	Farm Machinery & Power	110	09	00	12	00	21	00
	Soil & Water Conservation Engineering.		07	01	09	03	16	04
	Dairy & Food Engineering.		09	00	09	02	18	02
	Applied Botany		10	03	09	04	19	07
	Water Resource Devl. & Management		09	02	12	01	21	03
	Aquacultural Engineering.		06	01	09	03	15	04
	Agril. System & Management		00	00	07	02	07	02
	Post Harvest Engineering.		08	01	11	01	19	02
ARP	City Planning	32	13	11	07	13	20	24
ChE	Chemical Engineering.	60	40	08	47	04	87	12
Civil	Hydraulic & Water Resource Engineering.	69	09	00	06	01	15	01
	Transportation Engineering.		14	00	10	01	24	01
	Environmental Engg. & Management		04	01	04	02	08	03
	Geo-Technical Engineering.		00	00	07	01	07	01
	Structural Engineering		09	01	13	00	22	01
CSE	Computer Science & Engg.	31	23	01	27	01	50	02
EE	Machine Drives & Power Electronics	56	08	00	11	01	19	01
	Control System Engineering.		10	01	06	01	16	02
	Power System Engineering.		11	01	12	00	23	01
	Instrumentation		13	02	12	00	25	02
E&ECE	Microelectronics & VLSI Design	86	24	01	18	01	42	02
	RF & Microwave Engg.		14	03	16	00	30	03
	Telecommunication Systems Engineering		18	02	16	02	34	04
	Visual Information & Embedded System		14	01	17	01	31	02
GG	Earth & Environmental Sc.	26	08	00	09	01	17	01
	Computational Seismology		07	00	09	00	16	00
SIT	Information Technology	20	18	01	20	00	38	01
MA	Comp. Sc.& Data Processing	25	23	02	22	00	45	02
ME	Manufac. Science Engg.	97	18	01	21	01	39	02
	Thermal Science & Engineering.		19	01	24	00	43	01
	Mechanical System Design		18	02	20	00	38	02
	Mechanical System Dynamics & Control		14	01	15	00	29	01
MT	Metallurgical & Materials Engg.	38	18	01	25	05	43	06
MI	Mining Engineering	18	09	00	11	00	20	00
OENA	Ocean Engineering & Naval Arch.	19	11	01	09	00	20	01
PH	Solid State Tech.	19	12	03	14	01	26	04
BT	Biotechnology & Biochemical	17	07	06	09	06	16	12
CR	Cryogenic Engineering	17	05	00	07	00	12	00
HSS	Hum. Resources. Dev. & Management	18	11	01	13	01	24	02

Table : B-2 (Contd.)

Dept. / Centre	Specialization	Intake Capacity	1 st Year		2 nd Year		Total	
			M	F	M	F	M	F
IEM	Industrial Engg. & Managt.	23	12	00	19	00	31	00
RE	Reliability Engineerg.	17	14	01	14	02	28	03
MS	Material Science & Engg.	22	12	03	11	04	23	07
RT	Rubber Technology	19	11	01	13	00	24	01
ID	Infrastructure Design & Management	22	05	04	00	00	05	04
WM	Water Management	06	03	04	00	00	03	04
VGSOM	Business Administration	136	67	15	98	18	165	33
VGSOM	PGDBA	120	00	00	43	07	43	07
SIT	PG Diploma in Information Technology	90	00	00	77	04	77	04
OENA	Maritime Operation & Management	20	00	00	03	00	03	00
SMST	Medical Imaging & Image Analysis	11	09	01	07	02	16	03
	Medical Science & Technology	11	07	02	08	00	15	02
VGSOM	PG Diploma in Management	15	00	00	08	00	08	00
MT	PG Diploma in Steel Technology	25	21	00	22	00	43	00
CORAL	CORAL	23	05	02	10	02	15	04
RGSOIP	LLL (IPR)	50	18	03	12	07	30	10
RGSOIPL	PGDIPL	75	00	00	04	05	04	05
CET	Media & Sound Engg.	11	05	02	08	01	13	03
GSST	PGDTNM	25	00	00	12	01	12	01
	Total	1496	682	100	920	113	1602	213

Table : B-3

**STATEMENT OF RESULTS OF POSTGRADUATE EXAMINATION
M.TECH. / MCP / MBM 2006-2007 BATCH OF STUDENTS**

Dept. / Centre	Specialization	Number Registered	Number Declared Successful	No. of Incomplete Results	Remarks
AE	Aerospace Engineering.	15	15	-	
AG	Farm Machinery & Power	15	12	06AG6101, 06AG6113, 06AG6115	
	Soil & Water Conservation Engineering.	09	07	06AG6203, 06AG6210	
	Dairy & Food Engineering.	13	13	-	
	Applied Botany	10	10	-	
	Water Resource Development & Management	08	08	-	
	Aquacultural Engineering.	05	05	-	
	Agril. System & Management	07	07	-	
	Post Harvest Engineering.	11	11	-	
AR	City Planning	23	23	-	
CH	Chemical Engineering.	45	44	06CH6006	05CH6208, 05CH6034 Old Batch
CORAL	Oceans, Rivers, Atmosphere & Land Sciences	08	08	-	
ET	Educational Technology	05	05	-	
CE	Hydraulic & Water Resources Engineering	07	07	-	
	Transportation Engineering.	11	11	-	04CE6206 Old Batch
	Environmental Engg. & Management	11	11	-	
	Geo-Technical Engineering.	05	05	-	
	Structural Engineering	09	09	-	
CS	Computer Science & Engg.	31	31	-	
EE	Mach. Drives & Power Electronics	10	10	-	
	Control System Engineering	11	10	06EE6206	
	Power System Engg.	10	09	06EE6303	
	Instrumentation	11	11	-	
E&ECE	Microelectronics & VLSI Design	23	23	-	
	RF & Microwave Engg.	14	14	-	
	Telecommunication Systems Engineering	19	19	-	
	Visual Information & Embedded System Engg.		18	17	
06EC6418					
GG	Earth & Environmental Sciences	07	07	-	
	Computational Seismology	05	05	-	
SIT	Information Technology	16	15	06IT6004	05IT6021 Old Batch
MA	Computer Science & Data Processing	20	20	-	
ME	Manufacturing Science & Engineering.	22	22	-	
	Thermal, Energy & Environmental Engg.	19	19	-	
	Mechanical System Design	23	23	-	05ME6302 Old Batch
	Mech. Sys. Dynamics & Control	15	15	-	
MT	Metallurgical & Materials Engg.	24	23	06MT6024	

Table : B-3 (Contd.)

Dept. / Centre	Specialization	Number Registered	Number Declared Successful	No. of Incomplete Results	Remarks
MI	Mining Engineering.	08	08	-	03MI6001, 04MI6009 Old Batch
NA	Ocean Engg. & Naval Architecture	11	11	-	
PH	Solid State Technology.	13	13	-	
BT	Biotechnology & Biochemical	15	15	-	05BTC002 Old Batch
CR	Cryogenic Engineering.	12	11	06CR6011	
HS	Hum. Resources. Dev. & Management	18	18	-	
IM	Industrial Engg. & Management	18	16	06IM6008, 06IM6019	05IM6015 Old Batch
RE	Reliability Engineering	08	08	-	
MS	Materials Sc. & Engg.	15	15	-	
RTC	Rubber Technology	15	15	-	
VGSOM	Business Administration	121	121	-	
PGDIT	Information Technology	79	76	07IT5118, 07IT5329, 07IT5332	06IT5333 Old Batch
MMST	Medical Science & Technology	09	09	-	
PGDMOM	Maritime Operation & Management	03	03	-	
VGSOM	PG Diploma in Business Administration	104	100	06BM5113, 06BM5315, 06BM5510, 06BM5524	05BM5102 Old Batch
VGSOM	PG Diploma in Management	08	08	-	
MT	PG Diploma in Steel Technology	22	22	-	
GSSST	PGTNM	11	11	-	
RDC	PGDRD	06	06	-	
RGSOIPL	PGDIPL	12	12	-	
Total		1010	992	21	

Table : C-1

**NUMBER OF RESEARCH SCHOLARS ENROLLED FOR THE PH.D.
DEGREE DURING 2008-2009
(01/07/2008 TO 30/06/2009)**

Department / Centre / School	Institute Scholar	Sponsored Scholar	Scheme / FN / QIP	Self- Financing	Teaching / Non- teaching	Total	General	SC	ST	OBC	M	F
AE	02	02	-	-	-	04	03	-	-	01	03	01
AG	04	04	08	-	-	16	11	01	01	03	12	04
AR	05	02	-	-	-	07	06	-	-	01	01	06
AT	01	01	05	-	-	07	06	-	-	01	07	-
BT	01	01	08	-	-	10	08	02	-	-	06	04
CY	03	-	26	-	-	29	28	-	-	01	23	06
CH	02	-	01	-	-	03	02	01	-	-	03	-
CE	05	-	01	-	-	06	05	01	-	-	06	-
CS	06	-	04	-	-	10	10	-	-	-	08	02
CR	03	-	02	-	-	05	05	-	-	-	04	01
ET	02	-	01	-	-	03	03	-	-	-	01	02
CL	04	01	04	-	-	09	05	-	-	04	09	-
EE	06	01	03	-	-	10	09	-	-	01	08	02
EC	05	03	06	-	-	14	13	01	-	-	13	01
GG	03	01	11	-	-	15	11	02	-	02	11	04
GS	03	-	-	-	-	03	02	01	-	-	03	-
HS	06	03	02	-	-	11	10	-	-	01	06	05
IM	04	02	01	-	-	07	06	01	-	-	06	01
IP	-	-	-	-	-	-	-	-	-	-	-	-
MS	05	-	10	-	-	15	12	02	-	01	12	03
MA	01	-	04	-	-	05	05	-	-	-	04	01
ME	03	02	05	-	-	10	09	-	01	-	10	-
MT	02	04	03	-	-	09	06	02	-	01	08	01
MI	02	-	01	-	-	03	03	-	-	-	03	-
NA	-	-	06	-	-	06	06	-	-	-	06	-
PH	07	-	03	-	-	10	09	01	-	-	07	03
RE	01	-	01	-	-	02	02	-	-	-	02	-
RT	03	-	04	-	-	07	06	01	-	-	07	-
RD	-	01	-	-	-	01	01	-	-	-	01	-
MM	04	03	03	-	-	10	09	-	01	-	06	04
IT	-	-	05	-	-	05	05	-	-	-	04	01
BM	03	-	-	-	-	03	03	-	-	-	-	03
TOTAL	96	31	128	-	-	255	219	16	03	17	200	55

Table : C-2

**NUMBER OF MS STUDENTS ENROLLED DURING 2008-2009
(01/07/2008 TO 30/06/2009)**

Department / Centre / School	Total	General	SC	ST	OBC	Male	Female
AG	01	01	-	-	-	01	-
AT	01	01	-	-	-	01	-
CS	06	06	-	-	-	06	-
CE	01	01	-	-	-	01	-
EC	09	08	-	01	-	09	-
EE	04	04	-	-	-	04	-
GS	03	03	-	-	-	02	01
IM	03	02	01	-	-	03	-
IT	08	07	-	-	01	04	04
MI	01	01	-	-	-	01	-
MT	01	01	-	-	-	-	01
ME	02	02	-	-	-	01	01
MM	04	04	-	-	-	03	01
BM	02	02	-	-	-	02	-
TOTAL	46	43	01	01	01	38	08

Table : C-3

**NUMBER OF POST DOCTORAL FELLOWS ENROLLED DURING: 2008-2009
(01/07/2008 TO 30/06/2009)**

Department / Centre / School	Total	General	SC	ST	OBC	Male	Female
AG	01	01	-	-	-	-	01

Table : C-4

**UGC SCHOLARS ENROLLED DURING 2008-2009
(01/07/2008 TO 30/06/2009)**

Department / Centre / School	Total Number	General	SC	ST	OBC	Male	Female
BT	03	02	01	-	-	03	-
CY	03	03	-	-	-	03	-
RT	01	01	-	-	-	01	-
TOTAL	07	06	01	-	-	07	-

Table : C-5

**NUMBER OF RESEARCH SCHOLARS FROM OTHER COUNTRIES
(01/07/2008 TO 30/06/2009)**

NIL

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

Department / Centre / School	Name of the Degree Recipients
Aerospace Engineering	Rajesh Kumar, Santanu Mitra, Udar Ratnakar Shankarrao
Agricultural and Food Engineering	Soumen Palit, Chandra Shekhar Sahay, Ashish Sachan, Brijesh Srivastava, Manisha Basu, Aditi Bhadra, Rajitha K., P. Anand Kumar, Kaushal Kishor Garg, Shiby Varghese K., Subrat Kumar Behera, Krishna Narayan Dewangan, Aum Sarma, Arsh Alam Singh, Jatindra Kumar Sahu, Parag Prakash Sutar, Annapurna Kumari, Ranjan Kumar Nanda, Arnab Bandyopadhyay
Architecture and Regional Planning	Basina Uma Sankar, Joydeep Dutta, Susmita Sen, Haimanti Banerji
Biotechnology	Dipanjan Ghosh, Devrani Mitra, Rashmi Shrivastava, Hari Hara Surya Kumar Potula, Sampurna Sattar
Chemical Engineering	Ujjal K Ghosh, Srikanta Dinda, Tapas Kumar Mandal, Arun Kumar Jana, Pinakpani Biswas, Pankaj Vijay Mathure, Chandan Das
Chemistry	Snehadrinarayan Khatua, Susmita Podder, Himadri Acharya, Devalina Ray, Moumita Kar, Pallab Pahari, Surajit Som, Sasmita Mohapatra, Soumen Basu, Snigdhamayee Praharaj, Sohaham Dasgupta, Bikash Kumar Jena, Ujjal Kanti Roy, Manishabrata Bhowmick, Debesh Ranjan Roy, Susmita Behera, Jyotiranjana Ota, Runa Pal, Sanjoy Kumar Maji
Civil Engineering	A. Mani, Navneet Pratap Singh, S. Ayoob, Puspendu Bhunia, Priyaranjan Pal
Computer Science and Engineering	Shibaji Banerjee, Sayantan Das, Abhishek Somani, Pramod Kumar Singh, Prasenjit Basu, Monojit Choudhury, V. Pallavi, Suchismita Roy, Ansuman Banerjee
Cryogenic Engineering	Soma Das
Electrical Engineering	Leena G., Suvajit Mukherjee, H.N. Nagaraja, Suvarun Dalapati, Rajesh Joseph Abraham
Electronics and Electrical	Paramesha, Sushrut Das, Rajarshi Mahapatra, Benudhar Sahu,
Communication Engineering	Mrinal Kanti Mandal, C. B. Ashesh, Nandedkar Abhijeet Vijay, Aruna Tripathy, Vustikayala Sivakumar Reddy
Geology and Geophysics	Rashmi, Vikas Chand Baranwal, Suman Das, Rajesh Kumar Naik, Saikat Sengupta, Swapnendu Goon
Humanities and Social Sciences	Sudeep Budhaditya Deb, Vani Archana, Balivada Pavan Kumar, Shalini Dixit, Ujjwal Jana
Industrial Engineering and Management	Shivashankaragouda V. Patil, Ashutosh Sarkar, Subhash Chandra Panja, Asit Baran Bera, Chimata Murali Krishna, Preethi Upamaka
Information Technology	Sushanta Kumar Mandal
Materials Science	Suparna Sarkar, Aparna Gupta, Somnath Biswas, Kunal Pal, Partha Pratim Sengupta, Samik Pal, Hiranmayee Satapathy, Sanjoy Sadhukhan, Tanya Das
Mathematics	P. Anantha Lakshmi Narayana, P.K. Parida, S. Dhinakaran, Narmada Behera, Aameeya Kumar Nayak
Mechanical Engineering	Sudarsan Ghosh, Muralidhar Manapuram, Nirmal Baran Hui, Debashis Khan, Nilotpal Banerjee, Suvankar Ganguly, Mahesh B. Parappagoudar, Sashi Kanta Panigrahi, P. Ramesh Babu, Arun Kumar Pradhan, Amitava Ghosh, Kate Ramesh Prabhakar, D. S. Nagesh, Manas Mohan Mahapatra, Neeraj Agrawal, Promod Kumar Patowari, J. Shivakumar, Karali Patra, Brajesh Tripathi

Table : C-6 (Contd.)

Department / Centre / School	Name of the Degree Recipients
Metallurgical and Materials Engineering	Subhrangshu Moitra, Golap Mohammad Chowdhury, Animesh Mandal, Mervin A. Herbert, Kausik Chattopadhyay, T. Gnanadurai, V.M. Sreekumar
Medical Science and Technology	Sunil Kumar
Mining Engineering	Gyan Prakash Singh, Devi Prasad Mishra
Ocean Engineering and Naval Architecture	Joydip Bhattacharjee, Sanjay Pratap Singh, P. Suresh Kumar, Rajiv Sharma
Physics and Meteorology	Tarun Kumar Jha, Piyush Ranjan Das, Xavier V.F., Gourishetty Anil Kumar, Sanjay Kumar Mandal, Puja Dey, Dillip Kumar Pradhan, Rama Ghosh
Reliability Engineering	Naga Srinivasa Rao Pulimi
Rubber Technology	Madhuchhanda Maiti, Anirban Ganguly, Samik Gupta, Sambhu Bhadra
Vinod Gupta School of Management	Rajesh Kumar B., Uttam Kumar Chatterjee, Madhurima Deb

Table : C-7

NAMES OF THE MS DEGREE RECIPIENTS

Department / Centre / School	Name of the Degree Recipients
Chemical Engineering	Rajaram Vijayan, Parama Ghoshal
Computer Science and Engineering	Chandan Karfa, Atanu Basu, Soham Sundar Chakraborty, G. Sundar, Anindya Chakraborty, Anirvan DuttaGupta, Anindyasundar Nandi, Md. Monjur Alam, Santosh Ghosh, Debojyoti Bhattacharya, Barun Bikash Paul
Electrical Engineering	Prabir Kumar Saha, Papiya Dutta, Rajarshi Paul, Samrat Ray
Electronics and Electrical Communication Engineering	Rajarshi Bhattacharya, Debasish Paul, Pralay Mandal, Manabendra Maji, Sanjoy Kumar Dey, Anirban Das, Arindrajit Ghosh, Ravi Shankar Prasad, Debashis Mandal
G. S. Sanyal School of Telecommunications	Debasish Bera, Sujay Deb, Md. Safiullah
Information Technology	Manoj Paul, Debasish Kundu, Somnath Dey, Ranjan Maity, Aditi Roy, Vinay Kumar Vishwakarma
Mathematics	Anil Kumar Lenka
Mining Engineering	Swapan Kumar Khatua

**INDIAN INSTITUTE OF TECHNOLOGY
KHARAGPUR**

RECEIPT AND PAYMENT ACCOUNT FOR THE YEAR ENDED 2008–2009

#	RECEIPTS	AMOUNT (Rs.)	#	PAYMENTS	AMOUNT (Rs.)
I	Opening Balance (Bank Balances)		I	EXPENSES	
	a) In Current accounts	99484733.00		a) Establishment Expenses	1206911747.00
	b) In Deposit accounts	0.00		b) Administrative Expenses	351353215.00
	c) In Savings accounts	553344.00			
II	Grants Received From Government of India		II	Investments and deposits made	
	a) Non-Recurring (Plan)	903100000.00		a) Out of Earmarked / Endowment Funds	526390000.00
	b) Recurring (Non-Plan)	1592700000.00		b) Out of Institute Development Fund	303055619.00
	c) OSC-PLAN	1273250000.00		c) Out of Own Funds & Others	7172528122.00
III	Income on Investments from		III	Expenditure on Fixed Assets & Capital Work-in-progress	
	a) Earmarked / Endowment Fund	62582950.00			865821545.00
	b) Institute Development Fund	17504072.00			
	c) Own Funds	25497321.00			
IV	Interest Received		IV	Other Payments	1299053229.00
	a) On Bank deposits	375245.00			
	b) Recoverable Advances	4347467.00			
V	Other Income	327161616.00	V	Closing Balances	
				a) In current accounts	913280589.00
				b) In savings accounts	7678179.00
VI	Amount Borrowed	257400000.00			
VII	Other Receipts	8082115497.00			
	TOTAL	12646072245.00		TOTAL	12646072245.00

RESEARCH PUBLICATIONS

DEPARTMENT OF AEROSPACE ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1. Small Scale Effect on Vibration Analysis of Single-Walled Carbon Nanotubes Embedded in an Elastic Medium using Nonlocal Elasticity Theory, By Pradhan, S. C. and Murmu T., *JOURNAL OF APPLIED PHYSICS* (2009)
2. 2D simulation of fluid-structure interaction using finite element method By Mitra S., Sinhamahapatra K. P. *Finite Elements in Analysis and Design* 45, 52-59 (2008)
3. Bending vibration and buckling analysis of nonhomogeneous nanotubes using nonlocal elasticity theory and GDQ Method By Phadikar J. K. and Pradhan S. C., *JOURNAL OF AEROSPACE SCIENCES AND TECHNOLOGIES* (2008)
4. Buckling analysis of a single-walled carbon nanotubes embedded in an elastic medium based on nonlocal continuum mechanics. By Murmu T. and Pradhan, S. C. *PHYSICA E: Low-Dimensional Systems and Nanostructures* (2008)
5. Buckling Analysis of Beam on Winkler Foundation by using MDQM and Nonlocal Theory, By Murmu T and Pradhan, S. C., *JOURNAL OF AEROSPACE SCIENCES AND TECHNOLOGIES* Vol 60(3), 206-215 (2008)
6. Buckling response of sandwich plate with random material properties using an improved higher order zig-zag theory By M. K. Pandit, B. N. Singh and A. H. Sheikh *AIAA Journal* 47(2), 418-28 (2009)
7. Closed-Loop Active Vibration Control of A Typical Nose Landing Gear With Torsional Mr Fluid Based Damper By B. Sateesh and D. K. Maiti *Structural Engineering And Mechanics, An International Journal* 31 (1), 39-56 (2009)
8. Differential Quadrature Method for Vibration Analysis of Beam on Winkler Foundation based on Nonlocal Elastic Theory, By Pradhan, S. C. and Murmu T, *JOURNAL OF THE INSTITUTION OF ENGINEERS (India), Mechanical Engineering Division*. Vol 89 , pp 3-12 (2009)
9. Dynamics of Liquid inside a Container in Three Dimensions by Pressure Based Finite Element Method By Mitra S., Sinhamahapatra K. P. *International Journal of Dynamics of Fluids* 4, 43-55 (2008)
10. Inertial Characterization of Unmanned Aerial Vehicle AX-1 By Halder, A., Agrawal, V, Garhwal, R., Sinha, M. *Journal of Institution of Engineers* 89 (2008)
11. Non-linear free vibration analysis of composite plates with material uncertainties: A Monte Carlo Simulation approach By B. N. Singh, A. K. S. Bist, M. K. Pandit and K. K. Shukla *Journal of Sound and Vibration* 10.1016/j.jsv.2009.0 (2009)
12. Nonlinear Analysis of a Typical Nose Landing Gear Model with Torsional Free-Play By B. Sateesh and D. K. Maiti *IMECH Journal of Aerospace Engineering* Under Review (2009)
13. Nonlinear finite element model of single wall carbon nano tubes, By Phadikar J. K. and Pradhan S. C., *JOURNAL OF THE INSTITUTION OF ENGINEERS (India), Metallurgy and Materials Engineering Division*, Vol 89, pp 3-8 (2008)
14. Nonlinear free vibration analysis of laminated composite cylindrical/hyperboloid shell panel based on HSDT using nonlinear FEM By Panda, S. K. and Singh, B. N. *Proc. IMechE part G: Journal of Aerospace Engineering* 222(7), 993-1006 (2008)
15. Nonlinear free vibration of laminated composite plates on elastic foundation with random system properties" By Lal A., Singh, B. N and Rakesh Kumar *International Journal of Mechanical Sciences* 50(7), 1203-12, 2008 (2008)
16. Nonlocal Elasticity Theory for Vibration of Nanoplates, By S.C. Pradhan and J K Phadikar *JOURNAL OF SOUND AND VIBRATION* (2009)

17. Post buckling response of laminated composite plate on elastic foundation with random system properties By Singh, B. N., Lal A. and Rakesh Kumar *Int. Journal of Communications in Nonlinear Sciences and Numerical Simulation* 14(1), 284-300 (2009)
18. Small Scale Effect on Vibration of Embedded Multilayered Graphene Sheets Based on Nonlocal Continuum Models, By Pradhan S. C. and Phadikar J. K., *PHYSICS LETTERS A* (2008)
19. Small-Scale Effect on the Vibration of Nonuniform Nanocantilever based on Nonlocal Elasticity Theory By Murmu T. and Pradhan, S. C. *PHYSICA E: Low-Dimensional Systems and Nanostructures* (2009)
20. Stochastic Free Vibration of Smart Random Plates By Singh B. N, Vyas N and P. Das *Journal of Structural Engineering and Mechanics* 31(5), 481-506 (2009)
21. Stochastic Nonlinear Free Vibration of Laminated Composite Plates resting on elastic foundation in Thermal Environments By Achchhe Lal and B. N. Singh *Computational Mechanics (Springer)* 44(1), 15-25 (2009)
22. The Analysis of Shimmy Instability of a Typical Nose Landing Gear using Active Torsional Magneto-Rheological (MR) Damper By B. Sateesh and D. K. Maiti *IMECH Journal of Aerospace Engineering Online* (2009)
23. Thermal buckling of composite plates with SMA fibres By Kumar S and Singh B. N *ASCE J. of Aerospace Engineering* (2009)
24. Thermal buckling of conical panel/shell embedded with and without piezoelectric layers with random material properties By Singh B. N. and Babu Jibumon *International Journal of Crashworthiness* 14(1), 73-81 (2009)
25. Thermal buckling of laminated composite plates with random geometric and material properties By V. K. Verma and B. N. Singh *International Journal of Structural Stability and Dynamics* 9(2), 187-211 (2009)
26. Thermal buckling response of laminated composite plate with random system properties By Lal, A. and Singh, B. N. *International Journal of Computational Methods (IJCM)* 6(2) (2009)
27. Thermo-mechanical Vibration of a Single-Walled Carbon Nanotube Embedded in an Elastic Medium based on Nonlocal Elasticity Theory, By Murmu T. and Pradhan, S. C., *COMPUTATIONAL MATERIAL SCIENCE* (2008)
28. Vibration Analysis of Nano Single - Layered Graphene Sheets Embedded in Elastic Medium Based on Nonlocal Elasticity Theory, By Murmu T. and Pradhan, S. C., *JOURNAL OF APPLIED PHYSICS* (2009)
29. Vibration and Buckling Analysis of Nano-Scale Beams via Nonlocal Elasticity and Timoshenko Beam Theory: A Differential Quadrature Approach By 13. Murmu T and Pradhan, S. C. *JOURNAL OF AEROSPACE SCIENCES AND TECHNOLOGIES* (2009)
30. Vibration characteristic of laminated sandwich plates with soft core based on an improved higher order zigzag theory By Pandit, M. K., Sheikh, A.H. and Singh B. N *Proc. IMechE, Part C: J. Mechanical Engineering Science* 222(C8), 1143-52 (2008)
31. Vibration control of composite thick shells using higher order shear deformation theory By Narendra, K. and Pradhan S. C. *JOURNAL OF AEROSPACE SCIENCES AND TECHNOLOGIES* (2009)
32. Vibration control of FGM thick shells using higher order shear deformation theory By Narendra, K. and Pradhan S. C. *JOURNAL OF AEROSPACE SCIENCES AND TECHNOLOGIES* (2009)
33. Vibration suppression analysis of FGM shells with higher order shear deformation theory, By Pradhan S. C., *JOURNAL OF MECHANICS OF MATERIALS AND STRUCTURES* (2009)

Seminars / Workshops / Conferences :

1. A C0 finite element for free vibration analysis of shear deformable FGM plate, By Md. Talha and B. N. Singh, *ICOVP*, Centre for Theoretical Studies, IIT Kharagpur, (2009)

2. An accurate assesment of the behaviour of sandwich panels using an improved higher order zigzag plate model, *By A. H. Sheikh, M. K. Pandit, and B. N. Singh, 20th Australisian Conf. Mechanics of Material and Structures (ACMSM20), Toowoomba, queensland, Australia, (2008)*
3. Analysis of crack growth in functionally graded bonded joints, *By Pradhan, S. C., Sharma A. K. and Jaura A., Interquadrennial Conference of International Congress on Fracture 2008 (IQCICF 2008), Bangalore, (0)*
4. Analysis of laminated sandwich plates based on an improved higher order zigzag theory, *By Mihir K. Pandit, Abdul H. Sheikh and Bhrigu N. Singh,, 8th International Conference on Sandwich Structures (ICSS8),, Porto, Portugal, (2008)*
5. Assessment of Various Displacement Based Laminate Theories for Static Analysis of Composite Structures, *By Dipanjan Biswas, Gaurav Singh Bawa and D. K. Maiti, Proceedings of the ISMPE National Conference on Composites-7, NAL, Bangalore, (2008)*
6. "Large-eddy Simulation of Turbulent Flow over Bluff Bodies in Wind Tunnel", *By Ajoy Kumar Das and Navtej Singh, 10th Annual CFD Symposium: CFD Division of Ae.SI held on NAL, Bangalore held on 11th -12th August, 2008, NAL, Bangalore, (0)*
7. Bending Response Statistics of Laminated Composite Plate Resting on Elastic Foundation with Random proeptries, *By Achchhe Lal, B. N. Singh and Mihir V Tadvi, International Conference on Advances in Mechanical Engineering, IISc Bangalore, India, (2008)*
8. Buckling behaviour of laminated sandwich plates with soft core based on improved higher-order zig-zag theory, *By M. K. Pandit, B. N. Singh and A. H. Sheikh, International Conference on Aerospace Science and Technology (INCAST),, Bangalore, India,, (2008)*
9. Damage Assessment of Cantilever Beam from Changes in Natural Frequencies using Particle Swarm Optimization, *By N. G. Sai Srinivas, Damodar Maity and Dipak Kumar Maiti, SEC 2008, SERC, Chennai, (2008)*
10. Differential Quadrature Model for Stability Analysis of Nano-Scale Structures based on Nonlocal Timoshenko Beam Theory, *By Murmu T. and Pradhan, S. C., The Second International Conference on Frontiers in Nanoscience and Technology (Cochin Nano-2009), Cochin, (0)*
11. Dynamic Instability Due to Follower Forces on Plates, *By Datta,P.K. and Biswas.S, 4th National Comference on Applicable Mathematics in Wave Mechanics and Vibrations, WMVC-2008, JECRC, Jaipur, (2008)*
12. Effect of Preload on Static, Dynamic and Aeroelastic Behavior of Laminated Composite Structures, *By P. K. Mahato and D. K. Maiti, Symposium on Multi-Functional Material Structures and Systems, IISc, Bangalore, (2008)*
13. Effect of Random Material Properties on the Thermal Buckling Response of Laminated Composite Plates, *By Achchhe Lal, B. N. Singh and Mihir V Tadvi, International Conference on Advances in Mechanical Engineering, IISc Bangalore, India, (2008)*
14. Effects of random material properties on Buckling of soft core Sandwich plates using an improved higher order zig-zag theory, *By M. K. Pandit, B. N. Singh and A. H. Sheikh, PLMSS-2008, NAL Bangalore, India, (2008)*
15. Flow over two side-by-side circular cylinders at a medium gap, *By Singha S. and Sinhamahapatra K. P., 22nd National Convention of Aerospace Engineers, Ranchi, (2008)*
16. Free Transverse Vibration of a Carbon Nanotube Embedded in a Polymer Matrix using Nonlocal Elasticity and Timoshenko Beam Theory,, *By Murmu T. and Pradhan,, International Conference on Active / Smart Materials (ICASM),, Thiagarajar College of Enging Madurai, (2009)*
17. Free vibration analysis of geometrically nonlinear laminated composite cylindrical shell panel using nonlinear FEM, *By S. K. Panda and B. N. Singh, International Conf. on Vibration Problems, Centre of Theoretical Studies, (2009)*
18. Free vibration analysis of shear deformable laminated composite plate with uncertain system properties, *By Padmonav Das and B. N. Singh, ICOVP-09, Centre for Theoretical Studies, IIT Khar, (2009)*

19. Fuzzy State Noise Driven Kalman Filter for Sensor Fusion IEEE International Conference, By Chauhan, S., Patil, C., Halder, A., Sinha, M., *IEEE International Conference*, IIT, Kharagpur, India, (2009)
20. Investigation of Small Scale Effect on Buckling of Nonlocal Elastic Nanoplates Using Differential Quadrature Method,, By Phadikar, J.K., Roy A and Pradhan, S. C., *The Second International Conference on Frontiers in Nanoscience and Technology (Cochin Nano-2009)*, Cochin, (0)
21. Lateral Stability of a Typical Nose Landing Gear using Torsional Magneto-Rheological (MR) Damper, By B. Sateesh and D. K. Maiti, *Proceeding of IEEE Conference & Exhibition on Control, Communication and Automation*, IIT, Kanpur, (2008)
22. Mixed joints for Aircraft Structural Repair, By Saji D Byji Varughese and Pradhan ,S.C., *ISAMPE National Conference on Composites (INCCOM-7)*., Bangalore, (0)
23. Natural frequency of Laminated Sandwich Plate with soft core, By M. K. Pandit, B. N. Singh and A. H. Sheikh, *International Conference on Vibration Problems*, Centre of Theoretical Studies, IIT Kharagpur, (2009)
24. Non-linear Analysis of a Typical Nose Landing Gear Model with Torsional Free Play, By B. Sateesh and D. K. Maiti, *Proceeding of International Conference on Vibration Problems in Engineering (ICOVP-2008)*, IIT, Kharagpur, (2009)
25. Nonlinear analysis of carbon nano tubes, By Pradhan, S. C. and J. K. Phadikar,, *Fifth ISSS International Conference on Smart Materials, Structures and Systems*, Bangalore, (0)
26. Nonlinear finite element analysis of carbon nano tubes,, By Pradhan, S. C., *13th Composites Durability Workshop (CDW-13)*, National University Singapore, (0)
27. Nonlinear free vibration analysis of shear deformable smart laminated composite plates, By Padmanav Das and B. N. Singh, *ISSS -2008*, NAL Bangalore, India, (2008)
28. Numerical simulation of axisymmetric cold jet aerodynamics using k-e turbulence model, By Upadhyay P. P. and Sinhamahapatra K. P., *22nd National Convention of Aerospace Engineers*, Ranchi, (2008)
29. Parametric Study of Energy Separation in Cryogenic Vortex Tube Using a CFD Model, By Dutta T., Sinhamahapatra K. P. and Bandyopdhay, S. S., *61st Annual Session of IChE & CHEMCON-2008*, Chandigarh, (2008)
30. Simulation of stationary dry thunderstorm microburst, By Dash K. K., Ghosh A. K. and Sinhamahapatra K. P., *10th AeSI CFD Symposium*, Bangalore, (2008)
31. Static analysis of laminated composite plate embedded with and without magnetostrictive layers, By MVH Kishore and B. N. Singh, *International Conference on Smart Materials Structures and Systems (ISSS 2008)*, Bangalore, India, (2008)
32. Stochastic Non-linear Thermal free vibration of laminated composite plates resting on elastic foundation with random foundation parameters, By Achchhe Lal and B. N. Singh, *International Conference on Vibration Problems*, Centre for Theoretical Studies, (2009)
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DEPARTMENT OF AGRICULTURAL & FOOD ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1. A program in Visual Basic for predicting haulage and field performance of 2WD tractors By Ranjit Kumar and K P Pandey *Computers and Electronics in Agriculture* In Press (2009)
2. A quick method for estimating furrow infiltration By Mailapalli, D. R., Wallender, W. W., Raghuwanshi, N. S., Singh, R J. *Irrigation & Drainage. Eng* 134(6):788-795 (2008)
3. A Rapid FT-NIR method for determination of Aflatoxin B1 content in red chili powder. By Tripathi Smita and Mishra, H N *Food Control* Accepted, In press (2008)
4. A review on utilization of the single cell protein - Spirulina International By Tripathi S, Srivastav P P and Mishra H N *Journal of Food Science Technology and Nutrition* Accepted, In press (2008)
5. A therapeutic and health food from nature - Noni (*Morinda citrifolia*) By Prabuthas P, Tripathi Smita, Srivastav P P and H N Mishra *Journal of Nutrition and Food Science* Accepted, In press (2008)
6. Accumulation of cell wall-bound phenolic metabolites and their upliftment in hairy root cultures of tomato (*Lycopersicon esculentum* Mill.) By Sudhamoy Mndal and Adinpunya Mitra *Biotechnology Letters* 30: 1253-1258 (2008)
7. Accumulation of phenylpropanoid derivatives in chitosan-induced cell suspension culture of *Cocos nucifera* By Moumita Chakraborty, Anitha Karun and Adinpunya Mitra *Journal of Plant Physiology* 166: 63-71 (2009)
8. Application of a non-standard explicit integration to solve Green and Ampt infiltration equation By Mailapalli, D. R., Wallender, W. W., Singh, R. Raghuwanshi, N. S. *J. Hydrologic Engineering* 14(2):203-206 (2008)
9. Application of neural network and adaptive neuro-fuzzy inference system for river flow prediction By Pramanik N. and Panda R. K. *Hydrological Sciences Journal* 54 (2), 247-260 (2009)
10. Biochemical characterization of oxidative burst during interaction between *Solanum lycopersicum* and *Fusarium oxysporum* f. sp. *lycopersici* By Mandal, S., Mitra, A. and Mallick, N. *Physiological and Molecular Plant Pathology* 72: 56-61. (2008)
11. Changes in physical and thermo-physical properties of sugarcane, palmyra-palm and date-palm juices at different concentration of sugar. By P.V. K. Jagannadha Rao, Madhusweta Das and S. K. Das *Journal of Food Engineering* 90(4), 559-566 (2009)
12. Changes in physical and thermo-physical properties of sugarcane, palmyra-palm and date-palm juices at different concentration of sugar. By P.V. K. Jagannadha Rao, Madhusweta Das and S. K. Das *Journal of Food Engineering* 90 (4), 559-566 (2009)
13. Characteristics of hand-transmitted vibration of a hand tractor used in three operational modes By K. N. Dewangan and V. K. Tewari *International Journal of Industrial Ergonomics* 100, 535-546 (2008)
14. Characteristics of vibration transmission in the hand-arm system and subjective response during field operation of hand tractor By K. N. Dewangan and V. K. Tewari *Biosystems Engineering* 100, 535-546 (2008)
15. Characterization of amylase and protease produced by *Aspergillus awamori* in single bioreactor By Negi S and Banerjee R *Food Research International* doi:10.1016/j.foodr (2009)
16. Comparative performance of precooling methods for the storage of mangoes (*mangifera indica* L. Cv. Amrapali). By Menon Rekha Ravindra, Goswami, T.K. *J. of Food Process Engineering* 31: 3, 354-371 (2008)
17. Comparative study of conventional and artificial neural network-based ETo estimation models By Kumar, M., Bandyopadhyay, A., Raghuwanshi, N.S. and Singh, R. *Irrigation Science* 26, 531-545 (2008)

18. Comparison between ANN and conventional ETo models By Kumar, M., Bandopadhyaya, A., Raghuwanshi, N. S., and Singh R. *Irrigation Science* 26:531-545 (2008)
19. Comparison of hydrodynamic models of different complexities to model floods with emergency storage areas By Chatterjee, C., Förster, S., and Bronstert, A. *Hydrological Processes* 22(24), 4695-4709 (2008)
20. Computer simulation of ballast management of agricultural tractors By P K Pranav and K P Pandey *Journal of Terramechanics* 45(6):185-192 (2008)
21. Cost-effective approaches for sustainable groundwater management in alluvial aquifer systems By Jha, M.K., Kamii, Y. and Chikamori, K. *Water Resources Management* 23(2): 219-233. (2009)
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24. Desorption and adsorption characteristics of bael (*Aegle marmelos*) pulp and powder By Bag SK, Srivastav PP and Mishra HN *International Food Research Journal* Accepted, In press (2009)
25. Development and validation of GANN model for evapotranspiration estimation By Kumar, M., Raghuwanshi, N.S. and Singh, R. *J. Hydrologic Engineering* 14 (2), 131-140 (2009)
26. Development of a Geomorphological Instantaneous Unit Hydrograph Model for Scantily Watersheds. By Bhadra, A., Panigrahy, N., Singh, R., Raghuwanshi, N.S., Mal, B.C., and Tripathi.M.P. *Environmental Modelling & Software* 23(8): 1013-1025 (2008)
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83. Prediction of optimized pretreatment process parameters for biodiesel production using ANN and GA. By Machavaram Rajendra, Prakash Chandra Jena, Hifjur Raheman *Journal of Fuel* 88:868-875 (2009)
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89. Simulation-optimization modelling for optimal cropping patterns and pumpage for sustainable groundwater management in a Coastal Basin of Orissa, India By Rejani, R. M.K.Jha and S.N.Panda *Water Resources Management* 23 (2):235-263 (2009)
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95. Studies on the efficacy of physical, chemical and biological aflatoxin B1 detoxification approaches in red chilli powder. By Tripathi S and Mishra HN *International Journal of Food Safety, Nutrition and Public Health* Accepted, In press (2009)
96. Suitable tyre size selection for 2WD tractor. By Raheman, H *Journal of the Institution of Engineers (India)*, 89(2): 40-43 (2008)
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98. Textural properties of mango soy fortified probiotic yoghurt: optimization of inoculum level of yoghurt and probiotic culture By Kaur H, Mishra, H N and Kumar P *International Journal of Food Science and Technology* Accepted, In Press (2008)
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102. Thin layer chromatographic detection of poly- α -hydroxybutyrate (PHB) and poly- α -hydroxyvalerate (PHV) in cyanobacteria. *Indian Journal of Biotechnology* 7: 230-234 By Panda, B., Sharma, L., Singh, A.K. and Mallick, N. *Indian Journal of Biotechnology* 7: 230-234 (2008)
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104. Vertical electrical sounding survey and resistivity inversion using Genetic Algorithm optimization technique By Jha, M.K., Kumar, S. and Chowdhury, A. *Journal of Hydrology* 359(1-2): 71-87 (2008)
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2. Aeration performance of a propeller-aspirator-pump aerator, By Kumar, A., Moulick, S. and Mal, B.C., *All India Seminar on Recent Advances in Processing and Marketing of Fishery and Horticulture Products*, Kolkata, (2008)
3. An introduction to recirculating tank aquaculture system, By Mohd. Tanveer, Sudeep, P.S., Johnson, P., Sajana, T. K., Moulick, S., Majumdar, G. C. and Mukherjee, C. K., *All India Seminar on Recent Advances in Processing and Marketing of Fishery and Horticulture Products.*, Kolkata, (2008)
4. Analysis of natural recharge and groundwater dynamics in alluvial aquifer systems, By Jha, M.K., Roshni, T. and Kamii, Y., *International Conference on Water, Environment, Energy and Society (WEES-2009)*, New Delhi, (2009)

5. Application of ARIMA model for Monthly Stream flow Forecasting of Kangsabati River, By Singh, M., Patra, J.P. and Singh, R., *Geomatics 2009*, Dehradun, (2009)
6. Application of biofiltration techniques in aquaculture, By Sudeep, P.S., Mohd. Tanveer, Johnson, P., Moulick, S., Majumdar, G. C. and Mukherjee, C. K., *All India Seminar on Recent Advances in Processing and Marketing of Fishery and Horticulture Products*, Kolkata, (2008)
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8. Aqua Effluent as an Irrigation Source, By Ray, Lala I.P., Moulick, S., Mal, B. C. and Panigrahi, P.K., *National conference on Integrated Water and Wastewater Management*, Jadavpur University, Kolkata, (2008)
9. Biodiesel production process for vegetable oils with high free fatty acids and their mixtures, By Raheman H. and Jena P. C., *Renewable Energy and Environment for Sustainable Development*, IIT, Delhi, (2008)
10. Comparative evaluation of HEC-HMS and WEPP hydrologic models for simulating watershed runoff, By Verma, A.K., Jha, M.K. and Mahana, R.K., *ISAE Annual Convention and Symposium*, BAU, Ranchi, (2009)
11. Decision support system for management and operation in canal command, By Patra, J. P., Raghuvanshi, N. S., Singh, R., *Nat. Seminar on Technological Options for Improving Water Productivity in Agriculture*, Jabalpur, (2008)
12. Deflection and contact characteristics of bias-ply tyres used in agricultural tractors, By K P Pandey and Vijay K Tiwari, *IRE 09-5th International Conference and India rubber Expo 2009*, Kolkata, (2009)
13. Design of modified atmosphere packaging for royal delicious apple, By Mangaraj, S. and Goswami, T.K., *3rd Indian Horticulture Congress*, Bhubaneswar, (2008)
14. Desorption and adsorption characteristics of Bael (Aegle marmelos) pulp and powder, By Bag SK, Srivastav PP and Mishra HN, *XLIII ISAE Annual Convention & Symposium*, Ranchi, (2009)
15. Determining the Appropriate DEM Cell Size for Subsequent Hydrologic Modeling in a Reservoir Catchment, By Sharma, A., Tiwari, K.N., Bhadoria, P.B.S., *Proceedings of XXVIII INCA International Congress on Collaborative Mapping & Space Technology*, Gandhinagar, (2008)
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DEPARTMENT OF CHEMICAL ENGINEERING

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DEPARTMENT OF CHEMISTRY

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3. "Biocoordination and coordination chemistry of sodium, potassium, calcium and nickel", By D. Ray, *State DST Sponsored Seminar on Metal Ions in Biological Systems, Department of Chemistry*, Raghunathpur College, Purulia, WB, (2008)
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DEPARTMENT OF CIVIL ENGINEERING

RESEARCH PUBLICATIONS

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DEPARTMENT OF MATHEMATICS

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7. Foreign Exchange Rate Prediction Using Artificial Neural Networks, By Ravi Thanvi, Debjani Chakraborty & S. V. Barai, *National Conference on Forecasting Financial Markets in India (FFMI-08)*, IIT Kharagpur, (2008)
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DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING

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73. Toughening of epoxy resin with solid amine terminated poly(ethylene glycol) benzoate and effect of red mud waste particles By B. C. Samanta, T. Maity, S. Dalai and A. K. Banthia *Journal of Materials Science & Technology* 24(2), 272-8 (2008)
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