

# Annual Report

2014 - 2015



Indian Institute of Technology  
Kharagpur

*August, 2015*

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## Members of the Council of Indian Institutes of Technology

Sl.No.	Name and Designation
1.	Smt. Smriti Zubin Irani, Hon'ble Minister of Human Resource Development
2.	Dr. Anil Kakodkar, Chairperson, Board of Governors, IIT-Bombay & Chairperson Standing Committee of the IIT Council (SCIC)
3.	Shri Ashok Thakur, Secretary (HE), MHRD, New Delhi
4.	Dr. Vijay P. Bhatkar, Chairperson, Board of Governors, IIT Delhi
5.	Prof. M. Anandakrishnan, Chairperson, Board of Governors, IIT Kanpur
6.	Prof. Ashok Misra, Board of Governors, IIT Roorkee
7.	Dr. Baldev Raj, Chairperson, Board of Governors, IIT Gandhinagar
8.	Prof. Goverdhan Mehta, Chairperson, Board of Governors, IIT Jodhpur
9.	Dr. M. Natarajan, Chairperson, Board of Governors, IIT Mandi
10.	Mrs. Lila Poonawalla, Chairperson, Board of Governors, IIT Ropar
11.	Prof. Devang V. Khakhar, Director, IIT Bombay
12.	Prof. R.K. Shevgaonkar, Director, IIT Delhi
13.	Prof. Gautam Biswas, Director, IIT Guwahati
14.	Prof. Indranil Manna, Director, IIT Kanpur
15.	Prof. Bhaskar Ramamurthi, Director, IIT Madras
16.	Prof. Pradipta Banerji, Director, IIT Roorkee
17.	Prof. Sudhir K. Jain, Director, IIT Gandhinagar
18.	Prof. U.B. Desai, Director, IIT Hyderabad
19.	Prof. M.K. Surappa, Director, IIT Ropar
20.	Prof. Sujit Roy, Acting Director, IIT Bhubaneswar
21.	Prof. C.V.R. Murty, Director, IIT Jodhpur
22.	Prof. Timothy A. Gonsalves, Director, IIT Mandi
23.	Prof. Pradeep Mathur, Director, IIT Indore
24.	Prof. Partha P. Chakrabarti, Director, IIT Kharagpur/IIT-Patna
25.	Prof. Ashok Jhunjhunwala, Deptt. of Elect. Engg., IIT Madras
26.	Prof. Vijayalakshmi Ravindranath, Chairperson, Centre For Neuroscience, Old TIFR Building, Indian Institute of Science, Bangalore-560012.
27.	Dr. (Mrs.) Tessa Thomas, Outstanding Scientist' & Director, Advanced Systems Laboratory (ASL), Hyderabad.
28.	Shri Yogendra Tripathi, JS&FA, MHRD
29.	Shri Amarjeet Sinha, AS (TE), MHRD
30.	Shri Alok Mishra, Director (IITs), MHRD, New Delhi
31.	Dr. M. Ariz Ahammed, Director (Secondary Education), MHRD
32.	Dr. Avinash S. Pant, Vice Chairperson, All India Council for Technical Education, New Delhi.

33.	Ms. Prisca Mathew, Under Secretary (IITs), MHRD
34.	Shri V.K. Wadhwa, Project Officer, Secretariat of Council of IITs
35.	Sh. Kundan Nath, Section Officer (IITs), MHRD

## ANNEXURE II

<b>Outgoing Members</b>	
1	Prof. V.S. Ramamurthi, Chairperson, BoG, IIT Ropar
2	Prof. M.M. Sharma, Chairperson, BoG, IIT-Madras
3	Sh. Analjit Singh, Chairperson, BoG, IIT-Roorkee
4	Dr. Shiv Nadar, Chairperson, BoG, IIT-Kharagpur
5	Prof. T. Ramasami, Ex-Secretary, DST (Visitor's Nominee)
6	Prof. Ashok Misra, Ex-Director, IIT-Bombay (Visitor's Nominee)
7	Ms. Amita Sharma, Additional Secretary (TE), MHRD
<b>New Members</b>	
1	Mrs. Lila Poonawalla, Chairperson, BoG, IIT-Ropar
2	Dr. Pawan Goenka, Chairperson, BoG, IIT-Madras
3	Prof. Ashok Misra, Chairperson, BoG, IIT-Roorkee
4	Dr. Srikumar Banerjee, Chairperson, BoG, IIT-Kharagpur
5	Prof. Vijayalakshmi Ravindranath, (Visitor's Nominee)
6	Dr. (Mrs.) Tessy Thomas, (Visitor's Nominee)
7	Sh. Amarjeet Sinha, Additional Secretary (TE), MHRD

**Board of Governors, IIT Kharagpur**  
**From 1<sup>st</sup> April, 2014 to 31<sup>st</sup> March, 2015**

Sl. No	Name & Address	Position
1.	Dr. Srikumar Banerjee DAE Homi Bhabha Chair Professor Room No. A 419, 4 <sup>th</sup> Floor Central Complex Bhabha Atomic Research Centre, Trombay Mumbai - 400085	Chairman
2.	Smt. Arundhati Bhattacharya (From 07.03.2015) Chairperson, State Bank of India Corporate Centre, 18 <sup>th</sup> Floor State Bank Bhavan, Madame Cama Road Mumbai-400021	<i>Member</i>
3.	Prof. B. B. Bhattacharya ( Upto 05.03.2015) Professor of Economics A-44, Sarve Sanjhi Apts. Plot No.8, Sector-9, Dwarka New Delhi-110077	Member
4.	Smt. Sudha N. Murty (From 06.03.2015) Chairperson, Infosys Foundation III Floor, Infosys Tower 27, Bannerghatta Road Bangalore-560076	
5.	Shri Sandipan Chakravorty (Upto 05.03.2015) Managing Director Tata Steel Processing & Distribution Limited (TSPDL), Tata Centre (Ground Floor), 43, Chowringhee Road Kolkata – 700071	Member
6.	Dr. Jai Pal Mittal (From 06.03.2015) M.N. Saha Distinguished Professor(NASI) 11-B, Rohini Coop. Housing Society Vashi, Navi Mumbai Maharashtra-40070	

7.	Prof. N. Balakrishnan Supercomputer Education and Research Centre Indian Institute of Science Bangalore - 560012	Member
8.	Shri Sanjiv Goenka Chairman, RP-Sanjiv Goenka Group CESC House 1, Chowringhee Square Kolkata - 700001	Member
9.	Prof. Partha P. Chakrabarti Director IIT Kharagpur	Member
10.	Prof. Rajendra Singh Dept. of Agricultural & Food Engineering IIT Kharagpur	Member
11.	Prof. Swagata Das Dept. of Chemistry IIT Kharagpur	Member
12.	Dr. T.K. Ghosal ( Upto 02.11.2014 ) Registrar IIT Kharagpur	Secretary
	Prof. Pallab Banerji ( From to 03.11.2014 ) Registrar IIT Kharagpur	Secretary



**Finance Committee, IIT Kharagpur**  
**From 1<sup>st</sup> April, 2014 to 31<sup>st</sup> March, 2015**

<b>Sl. No</b>	<b>Name &amp; Address</b>	<b>Position</b>
1.	Dr. Srikumar Banerjee DAE Homi Bhabha Chair Professor Room No. A 419, 4 <sup>th</sup> Floor Central Complex Bhabha Atomic Research Centre, Trombay Mumbai - 400085	Chairman
2.	Joint Secretary & Financial Adviser Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi -110115	<i>Member</i>
3.	Director(IITs) Govt. of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan, New Delhi -110115	Member
4.	Shri Sandipan Chakravorty (Tenure upto 05.03.15) Managing Director Tata Steel Processing & Distribution Limited (TSPDL), Tata Centre (Ground Floor), 43, Chowringhee Road Kolkata – 700071	Member
5.	To be nominated by the Board (in place of Shri Sandipan Chakravorty)	Member
6.	Prof. Partha P. Chakrabarti Director IIT Kharagpur	Member
7.	Prof. Rajendra Singh (From 28.04.2014) Dept. of Agricultural & Food Engineering IIT Kharagpur	Member
8.	Dr. T.K. Ghosal (Upto 02.11.2014) Registrar IIT Kharagpur	Secretary
9.	Prof. Pallab Banerji ( From to 03.11.2014 ) Registrar IIT Kharagpur	Secretary

**Building and Works Committee**  
**From 1<sup>st</sup> April, 2014 to 31<sup>st</sup> March, 2015**

1	Prof. Partha P. Chakrabarti Director IIT Kharagpur	
2	Superintending Engineer & Circle Manager Midnapore Distribution Circle West Bengal State Electricity Distribution Co. Ltd. (WBSEDCL) 190, S. K. Bose Road Paschim Medinipur PIN - 721101	Member
3	Superintending Engineer South Western Circle Public Works Department (PWD) Saheed Mangal Pandey Sarani Paschim Medinipur PIN - 721101	Member
4	Head Department of Civil Engineering IIT Kharagpur	Member
5	Head Department of Electrical Engineering IIT Kharagpur	Member
6	Head Dept. of Architecture & Regional Planning IIT Kharagpur	<i>Member</i>
7	Registrar IIT Kharagpur	<i>Secretary</i>

## Administrative Heads

Position	Name	Period	
		<u>From</u>	<u>To</u>
<i>Director</i>	Prof. Partha P. Chakrabarti	27.07.2013	27.07.2018
<i>Deputy Director</i>	Prof. Souvik Bhattacharyya	04.11.2013	03.11.2016
<i>Dean (Faculty)</i>	Prof. Pratim Kumar Chattaraj	01.10.2013	30.09.2016
<i>Dean (UGS)</i>	Prof. Rajendra Singh	16.08.2013	15.08.2016
<i>Dean (PGS&amp;R)</i>	Prof. Amar Nath Samanta	01.05.2012 01.05.2015	30.04.2015 31.08.2015
<i>Dean (SA)</i>	Prof. Nisit Ranjan Mandal	01-04-2012	30.03.2015
	Prof. Manish Bhattacharjee	01.04.2015	31.03.2018
<i>Dean (SRIC)</i>	Prof. Sunando Dasgupta	01.08.2013	31.07.2016
<i>Dean (CE)</i>	Prof. Om Prakash Sha	01.10.2013	30.09.2016
<i>Dean (AA&amp;IR)</i>	Prof. Siddhartha Mukhopadhyay	01.10.2013	30.09.2016
<i>Dean (P&amp;C)</i>	Prof. Biswajit Mahanty	01.10.2013	30.09.2016
<i>Acting Dean, VGSOM</i>	Prof. K.K.Guin	05.06.2012	U.F.O
<i>Associate Dean, VGSOM</i>		11.01.2005	U.F.O.
<i>Dean, RGSOIPL</i>	Prof. Khushal Vibhute	04.03.2013 04.03.2015	03.03.2015 03.03.2016
<i>Associate Dean, SRIC</i>	Prof. Pallab Dasgupta	07.10.2013	06.10.2016

### *Heads of the Dept./ Centre/School/Unit*

Aerospace Engineering	Prof. B. N. Singh	11.09.2013	10.09.2016
Agricultural & Food Engineering	Prof. P.B. S. Bhadoria Prof. V.K. Tewari	01.09.2011 01.09.2014	31.08.2014 31.08.2017
Architecture & Regional Planning	Prof. Subrata Chattopadhyay	01.08.2014	31.07.2017

Chemical Engineering	Prof. Narayan Chandra Pradhan	01.01.2012	31.12.2015
	Prof. Sirshendu De	01.01.2015	31.12.2017
Chemistry	Prof. Tanmaya Pathak	01.06.2014	31.05.2017
Civil Engineering	Prof. Subhasish Dey	01.01.2013	31-12-2015
Computer Science & Engineering	Prof. Rajib Mall	01.04.2013	31.03.2016
Cryogenic Engineering	Prof. Kanchan Chowdhury	01.01.2013	31-12-2015
Electrical Engineering	Prof. Siddhartha Sen	01.05.2013	30.04.2016
Electronics & Electrical Communication Engg	Prof. Swapna Banerjee	16.06.2012	31.12.2014
	Prof. Prabir Kumar Biswas	01.01.2015	31.12.2017
Geology & Geophysics	Prof. Debashish Sengupta	01.01.2013	31.12.2015
Humanities & Social Sciences	Prof. Vijai Nath Giri	01.10.2013	30.09.2016
Industrial & Systems Engineering	Prof. Manoj Kumar Tiwari	01.01.2013	31.12.2015
Mathematics	Prof. Umesh Chandra Gupta	01.10.2013	30.09.2016
Material Science Centre	Prof. Susanta Banerjee	08.05.2014	07.05.2017
Mechanical Engineering	Prasanta Kumar Das	01.10.2013	30.09.2016
Metallurgical & Materials Engineering	Prof. Gour Gopal Roy	01.04.2014	31.03.2017
Mining Engineering	Prof. K.U.M. Rao	17.10.2013	31.10.2014
	Prof. Khanindra Pathak	01.11.2014	31.10.2017
Ocean Engineering & Naval Architecture	Prof. Trilochan Sahoo	01.10.2013	30.09.2016
Physics	Prof. Arghya Taraphder	01.02.2014	31.01.2017
Rubber Technology Centre	Prof. Dipak Khastgir	01.10.2013	30.09.2016
Biotechnology	Prof. Tapas Kumar Maiti	01.01.2013	31.12.2015
School of Information Technology	Prof. Rajib Mall	01.04.2013	31.03.2016
School of Medical Science & Technology	Prof. Pranab Kumar Dutta	07.03.2012	06.03.2015
		07.03.2015	31.03.2015
	Prof. Suman Chakraborty	01.04.2015	31.03.2018
Reliability Engineering Centre	Prof. V. N. Achutha Naikan	01.12.2013	30.11.2016

Centre for Oceans, Rivers, Atmosphere & Land Sciences (CORAL)	Prof. Arun Chakraborty	29.06.2013	28.06.2016
GS Sanyal School of Telecom	Prof. Saswat Chakrabarti	01.04.2012	31.03.2015
Rural Development	Prof. P. B. S. Bhadoria	01.10.2013	Extn. upto 31.08.2014
	Prof. V.K. Tewari	01.09.2014	31.08.2017
Ranbir & Chitra Gupta School of Infrastructure Design & Management	Prof. U.K. Banerjee	01.09.2011	31-08-2014
	Prof. Joy Sen	01.09.2014	31.08.2017
School of Water Resources	Prof. Dhrubajyoti Sen	01.04.2013	31.03.2016
Computer & Informatics Centre	Prof. Prabir Kumar Biswas	10.03.2011	09.03.2014
		10.03.2014	31.03.2015
	Prof. Arobinda Gupta	01.01.2015	31.12.2017
Centre for Educational Technology	Dr. Bani Bhattacharya	06.07.2012	31-12-2013
		01.01.2014	31.12.2014
	Prof. Anupam Basu	01.01.2015	31.12.2017
Information Cell	Prof B. K Mathur	06.09.2002	U.F.O.
Head, Information Cell	Prof. Soumya Kanti Ghosh	17.04.2015	16.04.2018
Associate Head, IIC	Prof. Pralay Mitra	17.04.2015	16.04.2018
Adviser, IIC	Prof. B. K. Mathur	17.04.2015	U.F.O
Admin Computer Service Support Centre (ACSSC)	Prof. Debasis Bhattacharya	01.12.2013	30.11.2016
Advanced Technology Development Centre	Prof. Sunando Dasgupta	02.08.2013	01.08.2016
Rajendra Mishra School of Engineering	Prof. Partha Pratim Das	01.10.2013	30.09.2016
Entrepreneurship School of Bioscience	Prof. Amit Basak	18.02.2014	17.02.2017
School of Nano-Science and Technology	Prof. Samit Kumar Ray	18.02.2014	17.02.2017
School of Energy Science & Engineering	Prof. A K Sinha	19.02.2014	18.02.2017
School of Environment Science and Engineering	Prof. Jayanta Bhattacharya	03.03.2014	02.03.2017

**Chairman of the Various Centres / Committees**

Chairman (Civil Construction & Maintenance)	Prof. Baidurya Bhattacharya	01.10.2013	30.09.2016
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Hall Management Centre (HMC)	Prof. Pallab Banerji	04.08.2014	03.08.2017
Chairman, Career Development Centre (Previously - Training & Placement Section)	Prof. S. K. Barai	01.01.2014	31-03-2015
Central Library	Prof. Subrata Chattopadhyay	26.06.2012	25.06.2015
GATE	Prof. B. C. Meikap	12.05.2014	GATE-2015
	Prof. M. Ramgopal	01.06.2015	GATE-2016
JEE	Prof. M.K. Panigrahi	01.09.2013	JEE-2014
	Prof. Adrijit Goswami	09.09.2014	JEE-2015
JAM	Prof. B. C. Meikap	12.05.2014	JAM-2015
	Prof. M. Ramgopal	01.06.2015	JAM-2016
Enterprise Resource Planning (ERP)	Prof. Debasis Bhattacharya	01.12.2013	30.11.2016
I. Central Research Facility (CRF). Chairman, Materials Division	Prof. Rahul Mitra	01.12.2013	30.11.2016 (Extension)
II. Central Research Facility (CRF), Chairman, Life Science Division,	Prof. Amit Kumar Das	01.12.2013	30.11.2016
Central Workshop & Instruments Service (CWISS)	Prof. Asimava Roy Choudhury	10.08.2012	09-08-2015
Rajbhasha Vibhag	Prof. D.K.Gupta	01.10.2013	30.09.2016
Nehru Museum of Science & Technology	Prof. Dhruvajyoti Sen	01.10.2013	30.09.2015
Kalpana Chawla Space Technology Cell (KCSTC)	Prof. Dipanwita Roy Chowdhury	01.01.2013	31.12.2015
Staff Benefit Fund	Registrar	01.07.2002	U. F. O.
Students' Brotherhood Fund (SBF)	Dr. V. R. Desai	03.03.2003	U.F.O
House Allotment Committee (HAC)	Prof. Ashis Bhattacharjee	01.10.2013	30.09.2016
	Prof. A.K.Gupta	24.06.2015	23.06.2018
Commercial Establishments & Licencing Committee (CELC)	Prof. P.B.S. Bhadoria	20.05.2010	31.12.2013
		01.01.2014	31.12.2014
	Prof. Susanta Banerjee	01.01.2015	31.12.2017
Standing Consultative Committee on Community Issues (SCCCI)	Director (Ex-officio)		
Security and Transport Advisory Committee (STAC)	Deputy Director (Ex-officio)		

Space Allocation Committee (SAC)	Director (Ex-officio)		
Campus Schools Advisory (CSA) Committee	Prof. Biswajit Mahanty	20-02-2013	19.02.2015
Industrial Training Centre, Hijli	Dean, Continuing Education	18.02.2015	17.02.2016
Campus Green Cover (CGC)	Prof. Adinpunya Mitra	Ex-officio	
Canteen Management Com.	Prof. A. K. Deb	01.10.2013	30.09.2016
Technology Film Society	Prof. Somnath Sen	01.02.2013	31.01.2015
House Building Advance	Dean, Students' Affairs,	01.02.2015	31.01.2017
Scooter & Cycle Allowance	Registrar	<i>Ex-officio</i>	
Computer Purchase, Maintenance & Networking Committee	Registrar	01.08.1996	U. F. O.
Furniture *	Registrar	26.07.1993	U. F. O.
Budget & Allotment of Fund	Prof. P.K.Biswas	01.10.2013 to 31.03.2014	
	Prof. Arobinda Gupta	01.04.2014 to 31.03.2015	
	Deputy Director	01.01.2015 to 31.12.2017	
		<i>Ex-officio</i>	
	Deputy Director ,	<i>Ex-officio</i>	

#### ***Vice-chairmen/Others***

Vice-Chairman, GATE	Prof. M. Ramgopal	12.05.2014	GATE-2015
	Dr. K. S. Rao	01.06.2015	31.05.2016
	Prof. Ramkrishna Sen		(GATE-2016)
Vice-Chairman, JEE	Prof. Surjya Kanta Pal	01.09.2013	JEE-2014
Vice-Chairman, JEE	Prof. D. Chakravarty	.....	JEE-2015
Vice-Chairman, JAM	Prof. M. Ramgopal	12.05.2014	JAM-2015
	Dr. K. S. Rao		
	Dr. K. S. Rao	01.06.2015	31.05.2016
	Prof. Ramkrishna Sen		JAM-2016
Vice-Chairmen, Career Development Centre	Prof. Debasis Deb	01.01.2014	31.12.2015
	Dr. A Rajakumar		
	Dr. Sujoy Kumar Kar		
Vice-Chairman, Technology Aquatic Society (TAS)	Dr. T. K. Goswami	01.10.2013	30.09.2014
	Prof. Santanu Chattopadhyay	15.10.2014	14.10.2016
Vice-chairman, Technology Film Society (TFS)	Prof. Arnab Roy	01.10.2013	30.09.2016

Treasurer, TFS	Prof. Saikat Kumar Paul	01.10.2013	30.09.2016
President, Technology Students' Gymkhana (TSG)	Prof. Joy Sen Prof. Somesh Kumar	01.10.2013 01.09.2014	30.09.2016 31.08.2017
Treasurer, TSG	Dr. Somesh Kumar Prof. Kingshook Bhattacharyya	01.09.2011 01.09.2014	31.08.2014 31.08.2016
Head, NSS	Dr. P. K. Bhowmick Dr. Debasis Roy joined as Head NSS	01.07.2002 01.07.2013	30.06.2013 -----
Coordinator, EAA	Dr. S. C. Mahapatra	01.07.2002	U.F.O
Convener, Centre for Theoretical Studies (CTS)	Prof. Sayan Kar	07.10.2013	06.10.2016
Convener, Inst. Lecture Series Comm.	Dean, Continuing Education		<i>Ex – Officio</i>
Coordinator SC/ST	Prof. Partha Saha		2013-2014 and 2014-2015
Coordinator, PGDMOM	Prof. S. C. Misra	01.10.2007	30.09.2010
Coordinator, PGDST	Prof. P K Sen	01.10.2013	30.09.2015
Principal Medical Officer (Acting)	Dr. Semmar Roy	01.07.2014	U.F.O (till new PMO is appointed)
Chief Vigilance Officer	Prof. Balbir Kumar Mathur		
Managing Director, STEP	Prof. Indranil Sengupta Prof. Satyahri Dey	01.10.2013 04.02.2015	30.09.2016 03.02.2018
Executive Advisors to STEP	Prof. Satyahri Dey & Prof. Siddharta Das	04.02.2015	03.02.2018
Vice-Chairman (Civil Construction & Maintenance)	Prof. Sushanta Chakraborty	01.10.2013	30.09.2016
Vice-Chairman (Civil Construction & Maintenance, Architecture & Planning)	Prof. Shankha Pratim Bhattacharya,	01.10.2013	30.09.2016
Faculty Coordinator, Counseling Services	Dr. S.D. Bhattacharya	19.08.2013	18.08.2016
Coordinator, Vodafone Essar-IIT Centre of Excellence in Telecommunications (VEICET)	Prof. Saswat Chakrabarti,	19.04.2011	U.F.O.
Coordinator, National Knowledge Network (NKN)	Prof. P.K. Biswas	09.03.2010	U.F.O.
Vice Chairman, ERP & Co-PI, IER Project	Dr. Shyamal Kumar Das Mandal	28.05.2014	27.05.2017



Programme Cordinator, International Summer Winter Term (ISWT)	Prof. A Goswami	25.03.2014	24.03.2017
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**Professors-in-Charge**

Electrical Works	Prof. A. K. Pradhan	01.10.2013	30.09.2016
Associate Professor-in- Charge (Electrical Works)	Dr. Prabodh Bajpai	01.01.2014	31.12.2017
Refrigeration & AC Unit	Prof. M. Ramgopal	01.08.2011	31-07-2014
		01.08.2014	31.07.2017
Horticulture	Prof. Adinpunya Mirtra	01.10.2013	30.09.2016
Water Works	Prof. M. M. Ghangrekar	01.10.2013	30.09.2016
Institute Guest Houses	Prof. B. K. Sengupta	01.08.2011	UFO
	Prof. M.K. Panigrahi	01.09.2014	31.08.2016
Technology Telecom Centre	Prof. Raja Datta	04.02.2011	03.02.2014
		04.02.2014	03.02.2016
Time Table	Prof. Dilip Kumar Baidya	01.10.2013	30.09.2016
Audio Visual Cell	Chairman, CWISS		<i>Ex-officio</i>
Examinations	Prof. Madan Kumar Jha	01.10.2013	30.09.2016
Convocation	Prof A.N. Samanta, Dean(PGS&R)	For 60 <sup>th</sup> Conv.	
	Prof. Rajendra Singh	For 61 <sup>st</sup> Conv.	
Advanced VLSI Laboratory	Prof. T.K.Bhattacharyya	01.10.2013	30.09.2015
IPR & IR	Prof. Goutam Saha	07.10.2013	06.10.2016
IIT Kharagpur Kolkata Campus	Prof. A.P.Gupta	01.08.2013	31.07.2015
IIT Kharagpur Bhubaneswar Campus	Prof. G. C. Mitra	01.10.2013	30.09.2014
			Extended upto 30.09.2015
Advanced Laboratory for Plant Genetic Engineering	Prof. Sudip Kumar Ghosh	01.10.2013	30.09.2016
Incubation & Entrepreneurship Activities of SRIC along with TIETS	Prof. Indranil Sengupta	01.10.2013	30.09.2016
Automobile Section	Registrar	17-9-2010	U.F.O.
	Prof. Arun Kumar Majumdar	26.05.2015	25.05.2018

B.C.Roy Technology Hospital	Prof.Chhanda Chakraborti Extension	26.06.2012 26.06.2015	25.06.2015 25.06.2016
Centre for Railway Research (CRR)	Prof. Suvranshu Roy	10.02.2014	09.02.2017
Radiological Safety Officer	Prof. Ananta Kumar Ghosh	24.06.2010	U.F.O.
P. K. Sinha Centre for Bio Energy	Prof. Debabrata Das	01.02.2014	31.01.2017
Co-Professor in-Charge, Centre for Railway Research (CRR)	Prof. Arghya Deb	04.04.2014	03.04.2017
Co-Professor-in-Charge, Refrigeration & AC Unit	Dr. Parthasarathi Ghosh	01.08.2014	31.07.2017
Professor-in-Charge of Outsourced Manpower	Prof. Sabyasachi Sengupta	08.09.2014	07.09.2017
Professor-in-Charge, Counselling Centre – as an exigency measure	Prof. Manish Bhattacharjee	04.02.2015	U.F.O.

***Miscellaneous Assignment***

Faculty Coordinator, International Relations	Dr. Sanjay Gupta	22.10.2014	UFO
Programme Coordinator, NSS	Prof. Debashis Roy *NSS Programme Coordinator also performs the duty of Head, NSS till further order.	01.07.2013	UFO
Programme Coordinator, NSO	Prof. Sudipta Mukhopadhyay	25.07.2014	24.07.2017
Programme Coordinator, NCC	Prof. K.D. Raju	05.09.2013	04.09.2016
Institute's Representative at the Indian Member Council	Prof. Om Prakash Sha	26.05.2014	UFO
Coordinator for Rural Technology Action Group (RuTAG) Cell	Prof. P.B.S. Bhadoria	13.11.2014	12.11.2017

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**Deputy Director** - **Prof. Souvik Bhattacharyya**

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Prof. T. K. Goswami  
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- 2.Mr. Vipul Allawadhi, UG Representative
- 3.Mr. Meda Vamshi Krishna, PG Representative
- 4.Mr. Sourav Kumar Bagchi, RS Representative

**Secretary**

Sri Pradip Pyne

# DIRECTOR'S REPORT

Baharat Ratna Prof. C.N.R. Rao, eminent Chief Guest of this program, Dr. Srikumar Banerjee, Chairman of the Board of Governors, IIT Kharagpur and Director, Bhabha Atomic Research Centre, Members of the Board of Governors, Members of the Senate, Distinguished Guests, Faculty Colleagues, Degree and Award Recipients, Media Persons, Ladies and Gentlemen.

I welcome you all on the occasion of the 60<sup>th</sup> Convocation of our Institute.

Today as I stand here in the august presence of all of you, I am reminded of the story that my teacher at IIT told me of his experience as a young boy, watching the foundation stone of this Institute being laid. There he overheard someone say that “with the formation of this Institute Indian students would get the best quality engineering education for which one then needed to go abroad”. Almost six and half decades, since its inception, this Institute, *the torch bearer of the IIT system*, continues to represent “India’s Urges and its Future in the Making”. Over these years not only has IIT Kharagpur spearheaded setting up new standards in engineering education but also has put its best limbs forward in all spheres of national development from the strategic sectors of Defense, Space and Atomic energy to the Economic, Public and Development sectors that directly or indirectly touch the lives of all the citizens of India. IIT Kharagpur has been producing students who are global citizens over these years. Today, in addition to its continued academic excellence, the nation looks up to the IITs to address some of its major problems and to lead to a better and promising future. These include concerns about all round sustainability including safety and security, food and nutrition, shelter and habitat, energy and environment, economy and employment. Moreover, the IITs are now mandated to be able to spread their educational excellence beyond the boundaries of the Institutions and reach out to a much larger number of people requiring quality education. During the last year, we at IIT Kharagpur have responded to this challenge by taking up major projects related to Future of Cities, Food and Nutritional Sustainability, Signals and Systems in Life Science, Science and Heritage Initiative and other major research projects related to Clean Water, Bio-energy, Environment and the like. In parallel, we continue to pursue some cutting edge technology development in areas of Nano-Science, Bio-MEMS, Materials, Circuit Design and, Mathematical Methods, which produce research publications in top quality journals keeping us on par with the best in the world.

IIT Kharagpur’s major strength lies in its ability to recognize the continued need for achieving greater heights. In order to increase the scope for our international exposure, the Institute has set up successfully International Summer Winter Program which has brought several international faculty to this Institute enabling not only exchange of ideas in teaching and research but also fostering collaborations with Institutes of the highest repute. We have also embarked on an outreach program through which we are able to communicate with ten thousand teachers of college level institutions and help them in the pedagogy of imparting quality education. We have tried to instill competitive and collaborative excellence through promotion of Research Challenge Grants which have excited both our young and senior faculty members simultaneously. Attracting sufficient high quality faculty remains the biggest challenge of the IIT System and IIT Kharagpur is not an exception either. We have, therefore, embarked on a very aggressive recruitment process through which we screen quality applications and provide appointments as soon as possible. Special efforts are made to identify and induct brilliant faculty from industry and academia within the country and from abroad.

IIT Kharagpur maintains steadfast strides towards emerging directions to meet the increasing demands of future sustained growth and dissemination of scientific and technological knowledge during this year too as in the years bygone. We at the Institute have been very sensitive to the human resource development

needs of the Country and have initiated new academic programs and research ventures. In recent years we have introduced several new academic programmes both at PG and UG levels as detailed in this report. I am glad that the companies and institutes continue to welcome our graduates for their purposes in the endeavor of development. We are proud of our brilliant alumni who make important decisions that are pivotal to the world outside and within the Nation. They are our ambassadors whom we count on and I am happy to place on record their wholehearted cooperation and boundless support both financially and technologically in making the spectrum of endeavors of this Institute bright and brilliant. Let me take this opportunity to appreciate all the wonderful and selfless dedication that our professors and staff have graciously contributed, and call upon each and every degree recipient to *arise, awake, and stop not* until the dream India is actualised.

Before we move on to the various achievements and contributions of this Institute in the last one year, I would like to introduce our Chief Guest, Prof. C.N.R. Rao.

Professor C.N.R. Rao, born on 30 June 1934 in Bangalore, is the National Research Professor as well as Honorary President and Linus Pauling Research Professor at the Jawaharlal Nehru Centre for Advanced Scientific Research. He is also an Honorary Professor at the Indian Institute of Science, Bangalore. His main research interests are in solid state and materials Chemistry. He is the author of over 1600 research papers and 48 books. He received the M.Sc. degree from Banaras, Ph.D from Purdue and D. Sc from Mysore Universities, and received *honoris causa* doctorate degrees from 63 universities including Purdue, Bordeaux, Banaras, Calcutta, Shri. Venkateswara, Delhi, IIT Bombay, IIT Kharagpur, IISERs (Bhopal, Kolkata, Mohali, Pune), Northwestern, Notre Dame, Novosibirsk, Oxford, Stellenbosch, Grenoble, Uppsala, Wales, Wroclaw, Caen, Liverpool, St. Andrews and *Desikottama* from Visva-Bharati.

Prof. Rao is a member of many of the major science academies in the world including the Royal Society, London, the National Academy of Sciences, U.S.A., The Russian Academy of Sciences, French Academy of Sciences, Japan Academy as well as the American Philosophical Society. He is a Member of the Pontifical Academy of Sciences, Foreign Fellow of Academia Europaea, the Royal Society of Canada and Foreign Member of the Chinese Academy of Sciences. He is on the editorial boards of several leading professional journals and is a distinguished Visiting Professor of the University of California and Cambridge University.

Among the various medals, honors and awards received by him, mention may be made of the Marlow Medal of the Faraday Society (1967), Bhatnagar Award (1968), Padma Shri (1974), Centennial Foreign Fellowship of the American Chemical Society (1976), Royal Society of Chemistry (London) Medal (1981), Padma Vibhushan (1985), Honorary Fellowship of the Royal Society of Chemistry, London (1989), Hevrovsky Gold Medal of the Czechoslovak Academy (1989), Blackett Lectureship of the Royal Society (1991), Einstein Gold Medal of UNESCO (1996), Linnett Professorship of the University of Cambridge (1998), Centenary Medal of the Royal Society of Chemistry, London (2000), the Hughes Medal of the Royal Society, London, for original discovery in Physical Sciences (2000), Karnataka Ratna (2001) by the Karnataka Government, the Order of Scientific Merit (Grand-Cross) from the President of Brazil (2002), Gauss Professorship of Germany (2003) and the Somiya Award of the International Union of Materials Research (2004). He is the first recipient of the India Science Award by the Government of India and received the Dan David Prize for science in the future dimension for his research in Materials Science in 2005. He was named as Chemical Pioneer by the American Institute of Chemists (2005), *Chevalier de la Légion d'Honneur* by the President of the French Republic (2005) and received the Honorary Fellowship of the Institute of Physics, London (2006) and St. Catherine's College, Oxford (2007). He received the Nikkei Asia Prize for Science, Technology and Innovation (2008). He was awarded the Royal Medal by the Royal Society (2009) and the August-Wilhelm-von-Hoffmann Medal for his outstanding contributions to Chemistry by the German Chemical Society (2010). He received the Ernesto Illy Trieste Science Prize for materials research in 2011 and was Albert Einstein Professor of the Chinese Academy of Sciences in 2012. He received Bharat Ratna Award in 2014.

One can go on about Professor Rao's immense contributions. However, here, with this brief introduction, I extend a hearty welcome to you Prof. Rao. Your presence here today will inspire our brilliant students to follow your footsteps and to serve our Country and humanity through their contributions in technology and science.

It is also my great pleasure to welcome our Chairman of the Board of Governors Dr. Srikumar Banerjee, who is the Director of Bhabha Atomic Research Centre, Mumbai and a very eminent scientist. His wisdom, insights and learning will surely inspire all of us.

### **DOCTORATE OF SCIENCE (HONORIS CAUSA) AND DISTINGUISHED ALUMNUS AWARDS**

I am proud to announce that in this convocation the Senate and the Board of Governors of the Institute will confer the highest honor, the degree of **Doctor of Science (*Honoris Causa*)**, on the following distinguished personalities:

- **C. R. Rao** for his contribution to the foundations of Modern Statistics through the introduction of concepts such as Cramer-Rao-Inequality, Rao-Blackwellization, Rao-Distance, Rao-Measure and for introducing the idea of Orthogonal Arrays for the industry to design high quality products
- **Faqir Chand Kohli** for propagating computerization in India, for bringing the benefits of IT to India's rural masses and for advancing engineering education at undergraduate level to world standards
- **Koppillil Radhakrishnan** for leading ISRO to accomplish a quantum jump in the number of missions executed and for establishing new capabilities for satellite navigation, strategic communications, microwave radar imaging and tropical climate studies
- **Pradeep K. Khosla** for his leadership, teaching and research in the field of Electrical and Computer Engineering
- **Roddam Narasimha** for contributing in both Aerospace Science and atmospheric dynamics and for being instrumental in establishing major parallel computing initiative in the country
- **Azim Premji** for being one of the pioneers of entrepreneurship in modern India through the establishment of WIPRO, an organization deeply committed to values.

I am also happy to announce that in this convocation the **Distinguished Alumnus Award** will be conferred on

- **Diwakar Acharya**, Chairman and Managing Director, Uranium Corporation Limited of India
- **H. Harish Hande**, Managing Director, Board Member and Founder, SELCO Solar Light Private Ltd. and Chairman of Small Scale Sustainable Infrastructure Development Fund, India
- **Hem Shanker Ray**, Ex-Professor, IIT Kharagpur, Ex-Director, Regional Research Laboratory Bhubaneshwar, Vice President of the Indian Association of Productivity, Quality and Reliability, Kolkata
- **Krishen Meheta**, Member of the Advisory Board of Aspen Institute's Business and Society Program; Senior Global Justice Fellow, Yale University; Senior Advisor of the Tax Justice Network; Member of the Asia Advisory Council for Human Rights Watch



- **Krishnendu Chakrabarty**, William H. Younger Distinguished Chair Professor of Engineering in the Department of Electrical and Computer Engineering and Professor of Computer Science at Duke University
- **Manthripragada Sanyasi Raju**, Ex- Professor of XLRI Jamshedpur, NEU Boston; Gitam University, Vishakhapatnam and President of Vision Aid India
- **Niraj Kumar Jha**, Professor of Electrical Engineering, Princeton University **Pallab Chatterjee**, Managing Director and Operating Partner, Symphony Technology Group
- **Partha** Sarathi Ghosh, Senior Advisor, Schlumberger Business Consulting
- **K. S. Sajwan**, Professor, University of Georgia, Adjunct faculty, University of South Carolina Aiken; Alabama A and M University; Institute of Ecology, **Sanjay Paul**, **Managing Director** and Country-Head of Accenture Technology Labs
- **Sushil Kumar Soonee**, Chief Executive Officer, Power System Operation Corporation **Ltd.;**
- **Venugopal Govindaraju**, Furnas Memorial Chair Professor of Computer Science and Engineering at the State University of New York
- **Vinayak Lohani**, Founder of PARIVAAR, a model institution for caretaking and overall development of children from destitute backgrounds in a residential setting

Let me now present specifically what the Institute has achieved:

### **ACADEMIC PROGRAMS**

I begin with a summary of the highlights of our academic programs.

The Institute presently offers B. Tech (Hons) program in Seventeen different branches of Engineering, B. Arch (Hons) program in Architecture, Fifteen Dual Degree programs, Seven Integrated M. Sc programs, Four two-year Joint M.Sc - Ph.D programs, Fifty-one Postgraduate degree programs leading to Joint M. Tech. / MCP-Ph.D, MBM, MHRM, LLB and MMST degrees. The Curricula and Syllabi of these programs are periodically updated with focus on quality and excellence to meet the demands of the changing world.

The existing ERP System has also been strengthened. All academic issues including faculty recruitment, student's registration, enrollment, course allocation, examination results, students' feedback and sponsored project details are now available on-line through this system.

Today, at this function we will be conferring 203 Ph.D., 42 MS, 728 M.Tech., 32 MCP, 100 MBA, 10 MMST, 18 MHRM, 42 LLB, 376 Dual Degree, 530 B.Tech. (Hons), 31 B.Arch. (Hons.) and 252 M.Sc. degrees.

### **RESEARCH AND DEVELOPMENT ACTIVITIES**

I shall now outline the research and development activities being carried out by various Departments, Centers and Schools.

**Aerospace Engineering:** Research activities are being carried out 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, Large eddy simulation of turbulent flow, Flow-induced vibration and fluid-structure interaction, Development of micro-aerial vehicles.

**Agricultural and Food Engineering** : Current areas of research focus include the Application of GIS and neural network command area & watershed management, Ballast management of agricultural tractors, Biofiltration Technology, Bio-fuels from tree-based oils, Biosynthesis of phenolic fragrance and xanthenes, Climate change analysis & applications in water and crop management, Coal biotechnology, Design and development of continually variable transmission for tractors, Design and development of slip meter for two-wheel drive tractors, Design and development of automatic depth control system and noise and vibration reducing device for tractors, Design and development of noise and vibration reducing device for vertical conveyer reaper, Development of aseptic packaging system for milk, Development of environment-friendly aquaculture, Development of rice transplanter, Development of endless chain pressure dryer for orthodox tea, Development of Cashew nut sheller and peeler, Microwave assisted drying of high moisture food, Nutrient management, Polyhydroxyalkanoates from Cyanobacteria, Predicting traction performance using artificial neural network, Process technology for dehydration of mushrooms, Production and processing of tea, Production of tannase under solid state fermentation, Process technology for dahi powder & dahi powder based energy drink mix, Process technology for antioxidant rich RTE health food, Process technology for manufacture of RTE health food (herbal kurkure), Rainwater harvesting and groundwater recharge, Software development for machinery management, Spectral characterization of soils, Starch based edible and biodegradable film, Thermal analysis of food materials, Traction potential of bias-ply tyres used in agricultural tractors.

**Architecture and Regional Planning** : The focus of research is in the areas of Performance studies, 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, Indian Traditional Architecture and Heritage studies, Vernacular Architecture, Visual Communication, Visual Simulation, Product design and Industrial design, 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, Urban Development Management and Finance, Advanced Planning Informatics, Geographical Information Systems, Decision support systems and Expert systems, Urban Settlement and Systems Dynamics. Cultural studies, Media and Architectural journalism, Symbolism and Cultural sustainability.

**Biotechnology**: Research activities are being carried out in the following areas: Production of an anti-tumor biosurfactant, Alkaline lipase, Biodiesel, Bioremediation of heavy metals, radionuclides and organic pollutants, Development of methods of o-antigens and its relation with pathogenicity in Gram negative bacteria, Bioreactor strategies for the enhanced production of probiotic endospores for Nutraceutical formulations and their clinical evaluation, Molecular characterization of metronidazole activation and deactivation pathways in *Entamoeba histolytica*, Molecular cloning, expression and characterization of *E. invadens* encystation specific proteins, Structural and functional studies of protein from *M. tuberculosis* and *S. aureus* aiming at drug and inhibitor design, Biomicrofluidics and Biochip development, Microbial fuel cell. Molecular cloning, expression and characterization of *E. invadens* encystation specific proteins, Molecular analysis of cypovirus infecting tasar silkworm, Development of low fat content transgenic oilseed plant, Development of silk (fibroin and sericin) based Biomaterials and cell based tissue (skin and bone) engineering, Development of low fat content transgenic oilseed plant, Biomicrofluidics and Biochip development, Improvement of hydrogen production from industrial waste using hybrid bioreactor, and Characterization of Antarctic microbiota Probiotic nutraceutical development.

**Chemical Engineering**: Current research includes Chemical process development with special emphasis on greener alternatives, Utilization of non-edible oils for manufacturing of value-added chemicals, Steam reforming of petroleum feedstock in mini-and micro-reactors for production of Hydrogen, Advanced separation processes involving membranes with emphasis on water purification, dye removal, effluent

treatment processes, Simulation and modeling of coal & biomass combustion processes in pulverized and fluidized combustors, Multi-phase processes & reactions in gas-liquid, liquid-solid, solid-liquid and liquid-liquid systems using pipelines, ejector based systems, fluidized bed, column flotation, Development of innovative catalysts from fly ash for organic chemical synthesis (alkylation, isomerisation etc.), Plasma assisted surface modification for chemical engineering applications, Development & performance of novel bubble column scrubber/reactor for removal of SO<sub>2</sub> and fly ash, Technology of composite materials, Pattern Formation of Soft Materials utilizing Interfacial Instability, Microscale transport processes and microfluidics including droplet based digital microfluidics, Training of Personnel for construction and maintenance of Bio Gas Plants, Beneficiation of Coal and Mineral by Column Flotation Cell.

**Chemistry:** The Department's areas of research include Synthesis of bioactive natural products, Enzyme mediated synthesis, Isolation and characterization of an angiogenic protein, Supramolecular chemistry, Development of highly selective and green methodologies, Development of micellar, zeolite, and bimetallic catalysts, Synthesis of advanced functional materials for fuel cell application, Crystal engineering and electroanalytical chemistry, Development integrated biosensing platform for clinical and environmental applications, electron transfer processes with emphasis in dioxygen chemistry, Colloidal systems, especially vesicles formed by chiral surfactants and their potential applications in i.v drug delivery, Development of hydrogels and organogels for applications in transdermal drug delivery, Aqueous medium polymerization, metal nanoparticles, nanocrystalline ferrites, ceramics and composites, Materials for high temperature and superconducting applications, 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.

**Civil Engineering:** Research activities are being carried out in the following areas: 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, 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, Cell filled low cost rural roads, Analysis and Evaluation of Concrete and flexible pavements, Specifications for bituminous mixes and Urban transportation planning, Investigations of effect of lateral flow on turbulent submerged jets, Study of coherent turbulent structure over gravel beds and bed-forms, development and application of flood inundation and urban flood simulation models, drought characterization and forecasting, Erosion control and mechanical stabilization of soils using natural fibers, ground improvement, soil-microbe interaction, insitu testing, geotechnical earthquake engineering, landslides and slope stabilization.

**Computer Science and Engineering:** Current research includes Artificial Intelligence, Bioinformatics, Combinatorial and Computational Geometry, Computer Graphics, Digital Geometry, Design and Analysis of Algorithms, Graph / hypergraph theory and algorithms, Computer Networks, Cryptography, Hardware Security, Computer Architecture, 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, Complex Networks.

**Electrical Engineering:** Research is being carried out in Magnetic Levitation, Superconducting magnetic energy storage, Variable frequency AC-Drives, Resonant Converters, Design of integrated circuits for Power Management, Automotive Electronics, Diagnostic of drives, Drive fatigue analysis, Neuro-fuzzy controllers, Control of chaotic systems, Fault-tolerant control of aero-space systems, Attitude control of satellites and launch vehicles, Control of Variable Air-Volume Air-Conditioning Systems, Bifurcation theory of hybrid dynamical systems, Delta domain digital control analysis and design, Decentralized control of large scale systems, Wind turbines, Power system dynamics, Power system protection, Intelligent relaying, State estimation of power systems, Neural Net Application to Partial Discharge Phenomenon, Lightning Protection, Material Characterization, 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, Fault detection and diagnosis of analog circuits, Control and instrumentation of bio-reactors, Fiber-optic components and sensors, Biomedical signal processing, Analysis of ECG signals, Sensors fusion, Multimedia Security, Design and development of MEMS accelerometer, Seismic signal processing, active noise control, Fast algorithms for real time signal processing.

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

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

**Humanities and Social Sciences:** Research is being carried out in 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 Behavior, Interpersonal, Intercultural and Organizational Communication, Visual Aesthetics, Indian Aesthetics, Translation Studies, Literature and Communication, Business Ethics, Corporate Social Responsibility, Economics of

Biofuels, Bioethics and Public Health Ethics. Special focus is on studies involving End of Life Care, the Science of Generosity, Music and Audience Response, Indian Art and Aesthetics, Creative Economy, and Food Security.

**Industrial and Systems Engineering:** Research activities are being carried out in the following areas: Operations Management: Production Planning and Inventory Control, Logistics and Supply Chain Management, E-Business, Quality Engineering and Control, Facility Layout and Design, Total Quality Management and Six Sigma. Simulation and Soft Computing: Genetic Algorithms and its variants, Heuristics, System Dynamics, Discrete Event Simulation. Work System Design: Ergonomics/Human Factors Engineering, Occupational Safety and Health Management, and Probabilistic Risk Assessment, Data Analytics and different domains of Industrial Engineering.

**Mathematics:** The department focuses on Fuzzy Mathematics, Fluid Mechanics, Clifford Analysis, Fuzzy Mathematics, Soft Algebra, Bio-Mechanics, Dynamics of Nonlinear systems, Inventory Management, Graph Theory, Integral Equations, Cryptography, Queuing Theory, Statistical Decision Theory, Statistical Data Analysis, Compiler Design, Combinatorics, Fractional Calculus, Optimization Theoretical Computer Science, Information and coding Theory and Cryptology.

**Mechanical Engineering:** Research areas include Design and development of expert systems in robotics, manufacturing science, medical diagnosis and others using soft computing, Bio-micro-fluidics and microscale transport processes, Transport Phenomena in Phase Change Problems, Laser materials Processing, CFD/Lattice Boltzmann Method in Complex Flows, Rotor dynamics and dynamics of lubricated ball bearings, Numerical simulation on two phase flow pertaining to bottom injected gas stirred ladles, Multi Layer TiN-MoS<sub>2</sub> coating on cutting tools by unbalanced magnetron technique, Machinability study of Inconel 718, Development of control strategies for autonomous underwater vehicles, Model based fault detection and isolation, Simulation of liquid sloshing in a tank using numerical grid generation techniques, Prediction of fluid flow and heat transfer from wavy surfaces, 3-D printing, Noise and vibration engineering, Lab-on-a-chip based devices, Smart composite materials and structures, Micromechanics of novel radially aligned carbon nanotube reinforced composites.

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

**Mining Engineering:** The Department's current focus areas are 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 behavior related accidents in mines, Finite element analysis for long wall strata control problems, and design of shield supports, Assessment of Fly ash composites as a substitute fill material for underground mine voids, Risk analysis for the safety management of coalmines, Application of various grade estimation techniques namely kriging, cokriging, stochastic simulation and neural networks for estimation of mining blocks for quality control in mines, Investigation of different statistical quality control techniques including univariate and multivariate control charts for controlling the grade of mineral at various locations, Grade control aspects in limestone and bauxite operation, Integration of GPS & I.SAR ground deformation data over mining areas, Use of lasers for assessment of stability of dumps and Vision based semi-automatic mine navigation system.

**Ocean Engineering and Naval Architecture:** Research is being carried out in Ship structures, Dynamics of Marine Vehicles, Wave-Structure Interactions, Marine and Ocean Hydrodynamics, Marine design and Production, Numerical Hydrodynamics, Ocean Turbulence CFD, Coastal Marine Hazards, Ocean Structures, Marine Structural Analysis, Ocean Wave & Circulation Modeling, Marine Design and Production, Welding Technology, Coastal Processes and Engineering, Hydroelasticity, Storm Surge Prediction & Tsunamis, Suspended Sediment Dynamics, Marine Acoustics.

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

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

**Centre for Ocean, Rivers, Atmosphere and Land Sciences:** Areas on study include Ocean modeling for Bay of Bengal, Indian Ocean and North Indian Ocean, Observation and modeling of thunderstorm, Modeling and prediction of tropical cyclone, Study of Forest Biomass and Carbon Sequestration, Monsoon Meteorology, Air pollution study, Observations and modeling of land surface processes, Mesoscale and land surface data assimilation, Cloud Microphysics, Cryospheric Studies, Satellite Oceanography.

**Cryogenic Engineering Centre:** The Centre carries out a number of activities including teaching at UG and PG levels, sponsored research and consultancy on various areas, focus on Continuing Education through training engineers from industries, faculty from academic institutions, and scientists from R&D organisations in specialized areas like Cryogenic Engineering, Air Separation, Vacuum Technology etc.

**Materials Science Centre:** Research focus includes Novel polymers, ceramics and semiconductor materials, Polymer modification, Synthesis of new polymers for application as electronic materials, Membranes for gas separation, Nano-clay and carbon nano-tube reinforced composites for automobiles and other high performance speciality applications, Welding thermoplastics, Recycling waste polymers and direct fluorination of polymers, Synthesis of nano-crystalline shape memory materials for biomedical applications, Nano-fluids, nano-ceramics for drug delivery, nano-structured oxides for ceramic gas sensor

and cathode materials for lithium rechargeable batteries, 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., Synthesis and characterization of wide band gap materials like SiC, ZnO and nitride semiconductors and nano materials for device applications, Multiwall carbon nanotubes are also being synthesized by CVD on silicon substrates.

**Reliability Engineering Centre:** The Centre conducts research in Virtual Lab (under construction) on fault Diagnosis of Rotary Systems useful for virtually creating certain faults in rotating systems and then diagnose the fault and its severity, Remote monitoring system (under development) for fault diagnosis of industrial system which can be used for e-maintenance. Other activities include organizing short term courses on latest topics of Reliability Engineering for officers and engineers of the Industry, Defense Organizations and R & D Establishments, Safety and reliability studies of nuclear power plants and missile systems are other activities.

**Rubber Technology Centre:** The focus areas of research for the Centre are Polymer composites and nanocomposites, Chemical modification of rubbers, Thermoplastic elastomers based on novel blends and alloys, Recycling of rubber waste, Ionomers, Conductive rubber composites for electrical and electronics application, Electron beam modification of polymers, Rheology and processability of rubber compounds and polymer blends, Polymer foam and microcellular rubber composite for various critical and industrial applications, Development of rubber blends and composites for different industrial application like cable, oil seal, tank track pad, vibration isolators, high voltage insulators, Development of adhesives and coatings, Development of biodegradable polymer and recycling of rubber and polymer, Controlled radical polymerization, Development of polymers for biomedical application.

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

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

**Rajiv Gandhi School of Intellectual Property Law:** Research is in areas such as Corporate Legal Affairs with special reference to Corporate Governance under the IICA, River Basin Management-Development of Law and Policy framework with special reference to Ganga, Creation of Multimedia based Courseware for E&IT students to be implemented by IIT Kharagpur, Plant Metabolic Pathway Laboratory, Implementation of Feature in the Indian Patent Office Search Platform-IPATS, GI Registration and Post Registration Measures of Traditional Handloom Textiles from Orissa, Intellectual Property Education, Research and Public Outreach Program, Legal & Policy Framework in Renewable Energy Sector, Corporate Governance in Energy Sector in India, etc.

**Ranbir and Chitra Gupta School of Infrastructure Design and Management:** Planning, design, operation and management of highways, airport and seaport infrastructure, Planning, design, operation and management of water supply and waste management systems, Environmental Impact Assessment, Urban infrastructure planning and design, Facility programming and specialized building design, building automation systems design, building management systems, regional infrastructure planning and

construction, Planning, design, operation and management of Thermal, Hydel and Nuclear Power Plants, Renewable Power Plants, Power generation, transmission and distribution, power system planning and reliability, Infrastructure Project management Infrastructure Financing and Infrastructure Regulatory Issues are the School's key areas of research.

**School of Information Technology:** Research focus includes Development of architectures, protocols and algorithms for mobile ad-hoc networks, vehicular ad-hoc networks, wireless sensor networks and wireless mesh networks, smart grid communications, cloud computing, Enterprise-wide GIS database development and its policies and protocols, Development of user interfaces for the under privileged users such as language illiterate, physically disabled etc., Application of Information Communication Technology (ICT) for the mass such as multimodal interaction, multimodal text composition mechanism, user modeling, interface adaptation, personalization, Computational modeling to brain for informatics, cognitive behavior is also another active area of research, 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, Penetrating testing, development of new algorithms for cryptography, their efficient and attack-resistant hardware implementation etc., Survivable information system architecture to tolerant with potential information warfare attacks.

**School of Medical Science and Technology:** The School conducts research in various areas including Development of micro-fluidic Biochips / Bio-MEMS for medical application, Laser speckle imaging of blood-flow in microcirculation, Development of statistical analyzer & disease pattern recognizer for Oral Pre-cancer and cancer, Design of an intelligent diagnostic tool through the extraction of diagnostic rules for asthma, Proteomics and reproductive health, Vaccine preventable diseases in HIV infected children, Integrated macro & micro-imaging on various healing & non-healing wounds including oral & breast precancer & cancer for their early characterization through image processing & analysis, Physico-chemical characterization of natural wound healing agents for the development of wound dressing technology, Development of detailed database on respiratory rhythms for identifying their temporal & spatial characteristics in health & disease., Development of biodegradable scaffold for tissue engineering and wound research, In vitro screening of anti-diabetes molecules, Design of a three dimensional scaffold and drug delivery system in arthritic hip joint, Signal Transduction and cancer biomarker, Oxidative stress and Infertility, Development of natural antioxidant nanoparticles, Proteomics and Metabolomics in Reproductive Health, Nutraceuticals and Herbal medicine.

**School of Water Resources:** The School focuses on Surface and groundwater modeling of the Lower Ganga basin between Farakka and Ganga Sagar, Land Use and Land Cover dynamics study in Mahanadi River Basin, Urban water supply and waste water management, Development of a pollutant transport model for meso-scale application.

**Vinod Gupta School of Management:** Important areas of research for the School include Big data analytics including financial analytics, marketing analytics and HR analytics, Banking, Derivatives and risk management, Project management, Conducting management development programs and in-house training programs for various industries.

## **INFRASTRUCTURE DEVELOPMENT**

A core component of any technological institute is its infrastructure. The Institute constantly upgrades its existing facility and keeps on adding new ones. Listed below are some recent additions.

**Aerospace Engineering:** ePIV System including hardware and FLOWEX Software for Particle Image Velocimetry System meant for Laboratory demonstrations in Aerodynamics Laboratory, DataTaker DT80 Logger with accessories, which is a general purpose data acquisition system with 5 channels for strain measurements, 3 DOF Gyro Workstation (QPID/QPIDE)-Quanser for Flight Mechanics and Control Laboratory, Pulsejet Nozzle AA 10000 JJAU-VI, Spraying Systems Co., for Propulsion Laboratory.



**Agricultural and Food Engineering:** Microprocessor Controlled Testing Machine-5KN, Instron, USA.

**Architecture and Regional Planning:** Digital-cum-computerized Universal Testing Machine model MUTC- 60 Capacity 600KL.

**Biotechnology:** Mercury/ Hydride System, Horizontal High Pressure Steam Sterilizer, Laminar Flow, Sonicator and Ultra sonicator, Filtration System, PH Meter with Electrode, Typhoon, Spectrophotometer, Ice flaker, Millipore Water Purification System, Incubator Shaker, Akta Purifier UPC-10, CO2 Incubator.

**Chemical Engineering:** Cluster Computer, High speed parallel computing server, High speed camera, Stereo zoom microscope, Plasma source, Gas manifold purification system, Autolab, Ion Chromatograph.

**Civil Engineering:** Seismic piezocone, In situ testing vehicle, MASW system for shear wave velocity profiling, Resonant column for small strain dynamic testing system for soil, Digital direct shear apparatus for soil testing, Carry Eclipse Fluorescence Spectrophotometer, GC, Autolab potentiostat / Galvanostat, Online water quality analyzer, etc., Shaker table for earthquake simulation.

**Geology and Geophysics:** Two Stable Isotope Ratio Mass Spectrometers (IRMS), State of Art MC-ICPMS Laboratory, Ground Penetration Radar System (GSSI SIR-3000) with multi-low frequency (16-80 MHz) and 2000 MHz Bistatic antennas for geo-exploration, Low level Portable Gamma NaI (TI) based gamma ray scintillation equipment.

**Mathematics:** Dell Desktop computers - 60 units, Online UPS 30 KVA - 1 Unit, HP Heavy duty Photocopying Machine -1unit, HP Laserjet P3015 Printer -1unit

**Mechanical Engineering:** Micro Bath, PHD Ultra I/W Programmable Syringe Pump, ANSYS Academic Research Software, Experimental Module Optical Elasto-hydro-dynamics, CVC 10MR, Motorized Pendulum Impact Test M/C, Plasma Hand-held Gun, Zeiss Stereo Microscope, Micro Hardness Tester, Fiber Coupled Laser Diode System, Friction Stir Welding Machine, Portable TIG Welding Machine, Upgrade of Rapid Prototyping System, Micrometer, Climatic Chamber.

**Metallurgical and Materials Engineering:** Fully Automated Sequential WD X Ray Fluorescence Spectrometer, Vibratory Polishing Vibromet 2 Set-up, ECOMET 250 Grinder Polisher Set-up, 12 kW-80kV Electron Beam Welding Setup.

**Mining Engineering:** Total Kjeldahl Nitrogen Apparatus, Atomic Absorption Spectrophotometer (Graphite furnace), Thermal gradient-differential scanning calorimetry, Oblique shear Equipment, Electronic lateral extensometer and compressometer, Rock Classification hammer, Field density by Large Sand Pouring Cylinder, Pycnometer, Rapid moisture meter, Dynamic cone penetration test apparatus for determination of cohesion and angle of internal friction, Pocket penetrometer, Proctor penetrometer, Soil permeameter, Rock permeability apparatus, Rock cutting Machine, Diamond Cutting Saw, Field CBR Test Apparatus, CBR mould, Beam Mould, Portable Swelling Pressure and Heave Evaluating Apparatus, Universal Triaxial Cell, Digital Direct Shear Apparatus Hydrometer with Hydrometer Glass Jar, Respo CO analyser, LUX meter, Digital barometer, Anemometer, Pitot tube, Wireless sensor network application kit, Self-contained compressed oxygen breathing apparatus, Spirometer, Triaxial whole body and hand arm vibration meter, Depth perception meter, Eye fatigue tester, Bicycle ergometer, Anthropometer.

**Centre for Educational Technology:** The video studios are being updated to HD (High definition) system and new sets of instruments like camera, switcher etc are being installed, Upgradation of M Tech software laboratory, Upgradation of project laboratory, Installation of new pedagogy server.

**Materials Science Centre:** Solar Simulator System, Photoluminescence System, Differential Scanning Calorimetry, Thermogravimetric Analyzer, Probe Station, Thermal Conductivity Measurement System, Universal Tensile Testing Machine, Internal-Mixer, PE Loop, Keithley 4200, Gas Permeation Apparatus.

**Rajendra Mishra School of Engineering Entrepreneurship:** Monte Carlo simulation software, Work stations with 2X Intel Xenon processor, Heavy duty scanner and printer added to faculty facilities.

**Rubber Technology Centre:** DSC/TGA, Optical microscopy, Goniometer, Magneto Rheometer, GPC, Dynamic light scattering analyzer, Electrochemical Workstation, Modulated DSC.

**School of Water Resources:** Double Ring Infiltrometer, Automatic Raingauge

### **INFRASTRUCTURE DEVELOPMENT IN THE INSTITUTE**

As a part of the ongoing infrastructural development to cater to the needs of a growing student, faculty and staff population the following projects have been taken up by Estate Civil Head Office. Major developments in the recent months are outlined below.

- Student accommodation: 390 rooms of B. R. Ambedkar Hall of Residence opened to boarders. Renovation of 118 capacity Girls' Hostel in the existing Old Kendriya Vidyalaya is completed and 76 rooms have already been handed over to HMC.
- Nalanda classroom complex: 58 classrooms have been handed over & Furniture etc. further 30 more classrooms have been completed for use. Classes will be held from next semester in these 30 classrooms.
- J.C. Ghosh science block & P.C Roy laboratory block: Floor slabs for both the Blocks up to 7th floor have been constructed.
- A.J.C. Bose laboratory complex: Construction of extension portion is already expedited and all laboratories have been handed over for use.
- New water supply project: 8.40 km. of pipelines have been laid. Construction at river bed is going on.
- Development of Children's Parks in Campus: Six children's parks are developed within the Campus. One such Park near Gas Godown has been inaugurated by the Director on 5<sup>th</sup> June, 2014.
- Expansion work in academic buildings: The entire Expansion work of Department of IE&M, Chemical Engineering and New buildings for Department of Mechanical Engineering and Computer Science & Engineering has been completed. Expansion work of Department of Biotechnology is also complete. Expansion works of Department of Architecture & Regional Planning, Materials Science Centre, SMST, NCC etc. are in good progress.
- Construction of A-type faculty apartments: RCC frameworks are completed for Two Blocks. First Block with 28 apartments is scheduled to be complete in August, 2014 and the balance 28 Flats will be handed over in December, 2014.
- Construction of Nivedita Hall of Residence: Foundation work is going on for the new project.

### **INTERNATIONAL RELATIONS**

The Institute and the members of its faculty make active efforts in establishing relationships with universities abroad. Every year faculty members visit universities across the world on various academic programs. These result in signing of Memoranda of Understanding with them. During the academic year 2013-14 agreements were signed by the Institute with:

- University of Tokyo, Japan
- National Chiao Tung University, Taiwan
- University of Dublin, Ireland

The Institute also had a number of visitors from international universities with whom possibilities of active collaborations were discussed. Some of these were, Rhein Waal University of Germany, Melbourne University, Wollongong University, Queensland University and Curtin University of Australia, Southampton University, Warwick University and University of Hull of UK.

Significant student interactions also took place with Warwick Manufacturing Group, University of Warwick, UK and Curtin University of Australia.

### **RELATION WITH NATIONAL ORGANISATIONS**

The Institute maintains its relationship with a number of national organizations related to academic as well as professional matters. During the academic year 2013-14, the Institute has signed Memoranda of Understanding with the following national organizations.

- Confederation of Indian Industry, Eastern Region, Kolkata
- Tata Medical Centre, Kolkata
- Hindustan Aeronautics Limited
- Gujarat Mineral Development Corporation

### **SPONSORED RESEARCH AND INDUSTRIAL CONSULTANCY**

The academic excellence of an educational institution stands on its research capability, where learning and innovation complement each other. IIT Kharagpur has been committed to developing and maintaining the highest standards in both fundamental research as well as applied research. The wide variety of engineering sciences at IIT Kharagpur provides a unique environment that fosters inter-disciplinary research in areas of cutting edge technology such as energy, nanotechnology, semiconductors, bioengineering, and computational sciences. The diversity of in-house expertise at IIT Kharagpur has also catalyzed the development of a healthy ecosystem for large-scale industrial collaborations in multi-disciplinary areas such as automotive control software, railways research, steel technology, petroleum and biofuels research, industrial robotics, and many more. IIT Kharagpur's research programs reach across the campus and beyond, linking together 19 departments, 16 academic centers and a large number of advanced R&D laboratories, stimulating the integration of inquiry, new knowledge, and education.

The year 2013-2014 has been a landmark for IIT Kharagpur in terms of its outreach towards ambitious science and technology missions of national importance. The new research portfolio includes the following missions:

1. **Food Sustainability:** This includes technology for food production, processing and distribution logistics. This mission brings together researchers from agricultural engineering, biotechnology, operations research and industrial engineering.
2. **Future of Cities:** Technology for the development and maintenance of our cities and future cities. This includes building technology, road and pavement technology, waste and hygiene management, traffic, age friendliness, and governance. This mission brings together researchers from Civil Engineering, Architecture and City Planning, Industrial Engineering, Computer Science, and Law School.
3. **Signals and Systems for Life Sciences:** Technology for leveraging biometric signal processing for analysis, prognostics, diagnostics and affordable healthcare. This mission brings together researchers from Electrical, Electronics and Telecommunication Engineering, School of Medical Science and Technology, Biochemical Engineering, Computer Science and Information Technology and practicing medical professionals.

4. **Artificial Intelligence for Societal Needs:** Technology for knowledge discovery and intelligent decision making for solving problems in the sectors of energy, climate, water, disaster management and traffic. This mission brings together researchers from Computer Science, Electrical and Energy Engineering, Environmental Sciences, Geology and Geophysics, Civil Engineering, Humanities and Social Sciences, and Architecture.
5. **SANDHI-Science-Heritage and Creative Economic Projects:** Technology for preservation, archival, development and scientific exploration of our heritage. This mission brings together researchers from Architecture, Humanities and Social Sciences, Geophysical Sciences, Computer and Information Sciences, Electrical Sciences, and Management.
6. **Centre for Robotics:** Technology for robotics, unmanned intelligent vehicles, intelligent exploration and surveillance, biomedical and nano-robotics. This mission brings together researchers from Mechanical Engineering, Mining Engineering, Electrical Sciences, Computer and Information Sciences, Material Science and Architecture.
7. **Centre for Microfluidics:** Technology based on micro-fluidics for mechanical, biomedical, chemical and semiconductor processes. This Centre brings together researchers from Mechanical and Chemical Engineering, Biomedical Engineering, Material Sciences, and, Computer and Electrical Sciences.

The above initiatives have leapfrogged the intake of research students at IIT Kharagpur and have created new exciting brands of research and career building. In yet another iconic step having historic ramifications towards promoting research excellence, the institute has launched several types of challenge grants for developing individual and collaborative research infrastructure in the Institute. Seed grants towards infrastructure development for departmental and collaborative research include:

- Setting up an advanced membrane separation facility in the Department of Chemical Engineering
- Setting up an interdepartmental bio-informatics research facility combining wet labs and computational facilities
- Development of a facility for design, development and testing of next generation telecom gears at the School of Telecommunications
- Setting up an automated servo-controlled direct shear-cum-triaxial testing machine with computer control system and power pack at the Department of Mining Engineering

New research endeavors seeded under the new challenge grants include the following:

- Plant on a chip
- Next-generation secured Internet of Things (IOT)
- Design, synthesis, and advanced applications of new polymers and polymer composites
- Studies on ultrafast processes for electronic, spintronic, magnonic and photonic applications

In addition to the above projects awarded to groups of researchers, 19 individual seed grants were awarded on a competitive basis to individual faculty members in various areas, and 4 high-value research grants were awarded on a competitive basis for inter-departmental collaborative research problems of strategic significance. In order to promote social awareness and for the greater benefit of the Institute and its neighborhood, 15 challenge grants were awarded for research and development leading to service to the society.

The total funding received by IIT Kharagpur in the last 5 years is more than 630 Crores, through 1513 Research and Consultancy Projects. During the year 2013-2014 the Institute received from the Government, private and international funding agencies/enterprises 193 research projects for a total value

of Rs. 149.31 Crore and 125 consultancy projects worth Rs. 12.83 Crore aggregating a total of 318 projects for Rs. 162.14 Crore.

Some of the noteworthy research initiatives and collaborative research facilities created in the recent past in the Institute include:

- Centre for Railway Research
- P. K. Sinha Centre for Bio-energy
- Tea Engineering Research Center
- Centre of Excellence in Information Assurance
- National Program in Marine Hydrodynamics
- Vodafone-Essar-IIT Kharagpur Centre of Excellence in Telecommunications
- Rural Technology Action Group (RUTAG)
- Advanced VLSI Design Laboratory
- Intel Embedded Innovation Laboratory
- Synopsys CAD Laboratory

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

- Connectivity and role of inhibitory neurons in auditory perception
- Evaluation of the applicability of a dominant nuclear male sterility system in rice for hybrid seed production
- Measurement to Management (M2M): Improvised water use efficiency and agricultural productivity through experimental sensor networks
- Slope design and stability, production and paste backfilling
- Improving groundwater levels and quality through enhanced water use efficiency
- Development of remote educational centers in Eastern India
- Post disaster situation analysis and resource management using delay tolerant peer to peer wireless networks
- Indigenous design methodologies for elliptic curve cryptography on FPGAs
- Generation of insect resistant sweet sorghum plant
- Requirements for delivering RISUG pre-loaded syringes
- Clinical decision support system and self-learning tool for radiologists for lung CT using content based image retrieval
- Design and synthesis of coordination polymers and coordination induced gelating materials exploration of gas absorption
- Fundamental studies on the reduction kinetics, heat and mass transfer during reduction of iron ore coal composite pellets in rotary hearth furnace
- Asymmetric catalysis TOS/DOS of nitrogen hetero-cycles

- A study of the operation and control of a proposed voltage source converter based HVDC transmission highway with offshore wind power integration
- A study of hybrid controllers for transmission and high voltage distribution applications
- Generation and applications of photo addressed surface gaps.
- Industrial scale investigation for the fabrication of wear resistant ceramic tiles using coal ash
- Engineered silk matrices for optimization of in-vitro 3D tumor model
- Evaporative drying assisted meso-patterning under lateral confinement
- Tuning of metal and metal oxide nanostructures for super-hydrophobicity
- High resolution Bay of Bengal circulation using adjacent point source river discharge
- Exploration of microbial diversity and function in acid mine drainage and mine tailings
- Extensional rheometer for microscale samples
- Synthesis of Al-based bulk metallic glass composite with improved ductility via mechanical alloying and spark plasma sintering
- Study on mill tiling based composites as backfill material in uranium mines
- Improvement of energy recovery from waste water by dark fermentation followed by microbial fuel cells
- Development of membrane electrode based portable e-tongue device for rapid taste characterization of tea

**The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell** under SRIC is responsible for the licensing and the transfer of technologies developed by researchers at IIT Kharagpur to the commercial sector. Till date, more than 400 patents have been filed and more than 120 have been granted and a total of 19 technologies have been transferred. This year, the IPR&IR Cell under SRIC carried out a special patent drive on the lines of the “*100 Days 100 Patents*” initiative of the previous year. The Institute faculties, students and staff support and respond whole heartedly to this activity leading to submission of more than 200 abstracts. More than 100 patent applications have been sent out to patent attorneys for the filing applications to patent office under this drive.

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

Various student activities are encouraged and supported through SRIC. Notable activities include the following:

- **TeamKART** activity for design and implementation for single seat racing car. Formula Student (FS) is Europe's most established educational motorsport competition, run by the Institution of Mechanical Engineers. It seeks to challenge university students to conceive, design, build, cost, present and compete as a team with a small single-seat racing car in a series of static and dynamic competitions. Recently IIT Kharagpur team has participated in Silverstone track in UK.
- **RoboSoccer** activity for design and implementation of a team of soccer playing robots. The Federation of International Robo-soccer Association (FIRA) arranges the FIRA cup. The team from IIT Kharagpur participated in this competition last year under the MiroSot category, where participants need to devise artificial intelligence strategies, and develop sharp sensing and precise real-time control for the physical soccer-playing robots.

- **TeamAGV** activity for design and implementation of autonomous ground vehicles. The team has participated in the Intelligent Ground Vehicle Competition (IGVC).
- **TeamAUV** activity for design and implementation of autonomous underwater vehicle. The team participated in the 3rd National Students Autonomous Vehicle competition earlier this year.

In addition to the above, students participation is also taking place in several areas of innovation such as the green policy initiative that aims to reduce the carbon footprint of the campus through technology advances.

### **SCIENCE AND TECHNOLOGY ENTREPRENEURS' PARK, IIT KHARAGPUR**

Science and Technology Entrepreneur's Park, IIT Kharagpur, the core of IIT Kharagpur entrepreneurship ecosystem, is dedicated to extend every possible support to promote and development of innovation and entrepreneurship in this country. Since inception over 26 years ago, STEP has been engaged in various kind of activity to enhance the economic condition of this part of country through innovation and enterprise creation and gradually transformed itself as a sustaining innovation and entrepreneurship ecosystem as well as enterprise creation platform. It is the most active innovation and incubation activity within the entire IIT system. STEP provides leading edge financial, managerial, technical, legal and expert mentoring support to innovators and entrepreneurs in and around eastern India. In association with various departments of state and central government and nodal agencies, it facilitates various kind of financial support i.e., financial grants and seed loan facilities for product development and enterprise creation. STEP, IIT Kharagpur, is at present headed by Prof. Indranil Sen Gupta of the Department of Computer Science and Engineering. Prof. Sen Gupta is an eminent international figure in the field of cryptography and network security, VLSI design and testing, and mobile computing. STEP has achieved a great deal of success in the field of entrepreneurship and incubation in the last one year. A number of new incubators have roared into the scene due to immense infrastructural growth. STEP now offers 4,500 sq. ft of office space at its Gopali Campus which is now in use and proposes to create a Science Park at Gopali Campus for entrepreneurs who wish to venture into STEP. STEP Campus at IIT Kharagpur has also enriched itself by creating twenty new cubicles for entrepreneurs to incubate. Since June, 2013 a total of 18 new companies have been incubated with STEP. At present, 86 companies are at present incubated of various domains such as information and communication technology, health care, manufacturing, agriculture, electrical, electronics, chemical, waste management, renewable energy domain

STEP has always been an immense prospect for Start-up companies as it provides mentoring support to Start-up companies by tagging them with IIT Professors and to go with it, STEP provides technical knowhow and technology transfer facilities to its entrepreneurs. STEP IIT Kharagpur has facilitated various kinds of financial grants and seed support to innovators and entrepreneurs, such as, since June 2013, around Rs. 57 Lakh grant money to 4 innovators have been approved for funding through Promoting Innovations in Individuals, Start-ups and MSMEs (PRISM) supported by DSIR and Rs 11.25 Lakh grant money to 2 microenterprises by the Department of MSME, Govt. of India for scale up and also facilitate ample funds for technology transfer and commercialization through TIETS funding. Since June 2013, STEP and TIETS have disbursed around Rs 49 lakh of seed support to 4 startups like, M/s Suncraft Energy Pvt. Ltd., M/s Auro Robotics Pvt. Ltd. M/s Red Button Software Labs Pvt. Ltd.

A high-tech VLSI product design and testing lab is available for the *incubatees* which fulfills the fast prototyping, design and test measurement requirements of Techno Entrepreneurs.

STEP, IIT Kharagpur has organized a number of programs, such as TIFAC-SIDBI Technology Innovation Program (SRIJAN) on the 10th day of January, 2014; The Global Entrepreneurship Summit (GES) on 10 January 2014; TIETS-TIDE–Screening Committee Meeting & TDB Screening Committee Meeting on February 7, 2014; STEP Entrepreneurs' Meet & PRISM Awareness Camp on March 29,

2014. Prof. Paul Lillrank (Aalto University, Finland) visited STEP, IIT Kharagpur in the month of January, 2013 and delivered lectures on “Quality Management for Entrepreneurial ventures”.

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

#### **Department of Agriculture and Food Engineering:**

- CII-IIT Certified Food Professional Course on Food Safety & Quality Management (2 weeks)
- Farmers Field Day, Bishnupur, Bankura (September 25, 2013)
- Food Processing & Preservation – Food Grains / Fruit-Vegetable Processing (January 20-22, 2014)
- Greenhouse Management and Plasticulture in Horticulture (September 30-October 1, 2013)
- Micro-irrigation and Plasticulture Technologies for Horticultural Crops (May 25-26, 2013)
- On-site waste water treatment and management (June 31 to July 11, 2014)
- Plasticulture Applications in Horticultural crops (April 25-26, 2013)
- Precision Farming in Horticulture (December 16-17, 2013)
- Protected Cultivation Technology (October 22-23, 2013)
- Scope of Greenhouse and Plasticulture in Horticulture (January 16-17, 2014)

#### **Cryogenic Engineering Centre:**

- Cryogenic air separation-2014 (March 22-27, 2014)
- Cryogenic Technology: Materials, processes & equipment (February 17-21, 2014)
- Prevention of fire in oxygen-enriched systems-2014 (March 28-29, 2014)
- Two week course on Vacuum Technology and Process Applications (November 18- 27, 2013)

#### **Department of Civil Engineering:**

- Finite Element Analysis for RDSO Engineers (5 days)
- Inservice Training Program on Hydrology and Water Resources Engineering (April 25-27, 2013)

#### **Department of Computer Science and Engineering:**

- Computational Biology, Bioinformatics & Their Application to Healthcare (October 28, 2013 - November 1, 2013)
- Computational Systems Biology (March 31, 2014 - April 04, 2014)
- Data Mining and Image Analytics for Medical Informatics (April 8-20, 2013)

#### **Advanced Technology Centre:**

- Advanced DSP Design Techniques (June 27 - July 1, 2013)
- Electromagnetic Environmental Effects Management (E3) (Feb 17 - 27, 2014)
- One week Coordinator workshop on Fluid Mechanics (March 11 - March 15, 2014)
- One week Coordinator workshop on Signals and Systems (September 30 - October 4, 2013)
- One week Coordinators Workshop on Analog Electronics (April 1-5, 2013)



- Short term course on computation systems biology (March 31 - April 4, 2014)
- Short Term Course on Telecom Networks with State-of-the-art Hands-on Experiments (July 8-13, 2013)
- Two Week ISTE Main workshop on Analog Electronics (June 4-14, 2013)
- Two Week ISTE Main workshop on Signals and Systems (January 2 - January 12, 2014)
- VLSI Signal Processing (December 3-7, 2013)

**Department of Humanities and Social Sciences:**

- Emotional Intelligence and Organizational Excellence (June 5-7, 2013)
- Training for Trainers (18-20 September 2013)

**Department of Industrial Engineering and Management:**

- Executive Training Program on Project Management (May 11-14, 2013)
- One-Day Interaction Meet on 'UKIERI-sponsored Project on Environmental Performance of Industries (August 2, 2013)
- Project Management (May 11-14, 2013)
- Service Science (5 Days)
- Short-term course on Service Science (July 08-12, 2013)
- Three-Day Duration Short-Term Course on 'Continuous Improvement and Process Excellence (LMW Executives at LMW Limited, Coimbatore)
- Workshop on 'Current Industrial Problems and Workplace Stress Management (November 1, 2013)

**Department of Mechanical Engineering:**

- Power Plant Engineering for CESC Engineers (one week)

**Department of Mining Engineering:**

- Land Acquisition and Environmental Clearance of Projects (5 day)
- Risk Assessment and Accident Prevention in Mines (November 5-8)

**Materials Science Centre:**

- Materials Engineering & Industrial Applications: Hybrid Nanocomposites for Photonics, Energy & Elect (November 11-22, 2013)
- Materials for Advanced Applications (Sept 2-13, 2013)
- Materials for Advanced Applications (2 weeks)

**Department of Ocean Engineering & Naval Architecture:**

- In-house Training Program on Practical Shipbuilding (Mar.03-14, 2014)
- Integrated Coastal Zone Management with Gujarat perspective (20-27 February, 2014)

**Reliability Engineering Centre:**

- Reliability Modeling of Sensors Network System for Critical Applications IV (December 09-14, 2013)

**Vinod Gupta School of Management:**

1. 6-day Supervisory Development Program for L&T Construction (6 Days)
2. MDP for E2 & E3 Level Executives of UCIL (Two days)
3. Supervisory Training workshop for L & T (One week)

**Rajendra Mishra School of Engineering Entrepreneurship:**

- Big data analytics (Two weeks , Summer 2014)

**CONTINUING EDUCATION PROGRAM**

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

During 2013-2014 the Continuing Education Centre organized seven QIP short term courses with 210 participants while the number of self-sponsored short term courses conducted was 60 with as many as 1600 participants. Also, in this period 18 conferences/workshops were conducted with 800 participants. The centre also coordinates 3 year M.Tech programs for AICTE approved college teachers and industry professionals in which during the past four years 190 college teachers and professionals joined in the departments of Electrical Engineering, Electronics and Electrical Communication, and Information and Communication Technology. The three year executive MBA program organized by the unit had 25 and 4 students in its Kolkata and Bhubaneswar centers respectively. During this year seven QIP scholars were awarded Ph.D. degrees.

Under the scheme for empowerment of students and teachers through synchronous and asynchronous instruction (EIT) under NMEICT, MHRD, more than 600 faculty coordinators and 24000 engineering college teachers were trained.

Indian Institute of Technology Kharagpur from May 2014 started off with its first **International Summer and Winter Term (ISWT)** where the national and international participants will get an opportunity to seek knowledge and experience from reputed International faculty through intensive study of subjects and personal interactions. 19 subjects will be offered during the summer term (May-June-July) and 10 subjects during the winter term (December). These subjects are designed around current and multidisciplinary themes of Science, Engineering, Management and Law. The duration for each subject is of 2 weeks or 10 working days with a judicious blend of lectures and tutorials / practicals per day.

Recent facilities of the Centre include Video-Conferencing Studios for use as on-line classrooms at Kharagpur (5), Kolkata (3), Bhubaneswar (3) and Raipur (2) with seating capacity of 280, 140, 130 and 100 respectively.

**HIGHLIGHTS OF ACHIEVEMENT DURING THE PAST YEAR**

I would like to summarize some of our outstanding achievements over the past year. These may be listed as follows:

- Initiation of Schools and Centers: Four new Schools which were initiated during the past year includes (a) School of Energy Science; (b) School of Environmental Science and Engineering; (c) School of Nanoscience and Technology, and (d) School of Biosciences
- Creation of Dr. B. C. Roy Institute of Medical Science and Research. This institute is going to have: 1) 750 Bed Super-speciality Hospital, 2) Technology-enabled Medicine Teaching Clinic, 3) Bio-medical Innovation Centre, 4) Healthcare Outreach Centre and 5) Paramedic Training College.
- Research initiatives and collaborative research programmes started. These initiatives and advanced research laboratories include the following: P. K. Sinha Centre for Bio-Energy, Tea Engineering Research Centre, Centre of Excellence in Information Assurance, Research Laboratory in Electronics Controls and Software, Nano & Microfluidics Research Laboratory, Communication Empowerment Laboratory, Micro-Electronics & MEMS Laboratory etc.
- Innovative and socially relevant funded research activities. The Institute is funding seventeen innovative and socially relevant research projects in the areas of railway research, nanosensors, deep excavation, polymeric composite membranes, microbial fuel cells, expert system for blast furnaces, catalytic hydrolysis, sustainable waste water treatment, fast fixed point algorithms etc.
- International Summer Winter Term: Indian Institute of Technology Kharagpur started starting its first international summer and winter term (ISWT) where participants got an opportunity to seek knowledge and experience from reputed international faculty through intensive study of subjects and personal interactions.
- Alumni grant: Shri. Gopla Rajagarhia International Programmes have been initiated under which Rs. 10 Crore have been pledged of which Rs. 3.6 Crore have been received so far.

#### **LAURELS AND DISTINCTIONS AWARDED TO FACULTY**

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

#### **FELLOWSHIPS:**

- |                                    |   |
|------------------------------------|---|
| Dr. Kamlesh Narayan Tiwari (Ag&FE) | <ul style="list-style-type: none"> <li>• Elected to the Fellowship of The National Academy of Sciences, India, Allahabad, for the year 2013</li> <li>• Elected to the Fellowship of the Indian Society of Agricultural Engineers, New Delhi, for the year 2013</li> </ul> |
| Dr. Sudhindra Nath Panda (Ag&FE)   | <ul style="list-style-type: none"> <li>• Invited by The National Academy of Agricultural Sciences, New Delhi to join as a Fellow of the Academy from 1st January 2014</li> </ul>  |
| Dr. Pratim Kumar Chattaraj (CY)    | <ul style="list-style-type: none"> <li>• Elected to the Fellowship of The World Academy of Sciences (TWAS), Trieste, Italy, in recognition to his outstanding contributions</li> </ul>  |

on Chemical Sciences

Dr. Partha Pratim Chakrabarti (CSE)  
and Director

- Selected for the award of the J. C. Bose National Fellowship, by the Ministry of Science and Technology, Government of India, in clear recognition of his active outstanding performance and contribution to Science

Dr. Sankar Kumar Nath (G&G)

- Elected as a Fellow of the Indian Geophysical Union (IGU), Hyderabad

Dr. Subhasish Tripathy (G&G)  
(currently on lien to the School of Earth,  
Ocean and Climate Sciences, IIT  
Bhubaneswar)

- Elected to the Fellowship of The National Academy of Sciences, India, Allahabad, for the year 2013
- Elected as a Fellow of the Indian Geophysical Union, Hyderabad

Dr. Prasanta Kumar Das (ME)

- Elected to the Fellowship of The National Academy of Sciences, India, Allahabad, for the year 2013

Dr. V. N. Achutha Naikan (REC)

- Elected as a Fellow by The Institution of Engineers (India), Kolkata

Dr. Mahitosh Mandal (SMST)

- Elected to the Fellowship of the West Bengal Academy of Science and Technology in the year 2013 for his notable contributions in the field of Cancer Biology

#### **AWARDS:**

Dr. Madan Kumar Jha (Ag&FE)

- Awarded an Outstanding Book Award for the year 2013, by the Indian Society of Agricultural Engineers, New Delhi, for his book entitled "Hydrologic Time Series Analysis : Theory and Practice", published by Springer

Dr. Rintu Banerjee (Ag&FE)

- Selected as one of the most inspiring Women Engineers / Scientists for the year 2014, by the Engineering Watch
- selected for the "Rafi Ahmed Kidwai Award for Outstanding Research in Agricultural Sciences-2013" by Indian Council of Agricultural Research, New Delhi

- Dr. Satyahari Dey (BT)
- Received the Dr. Jagadish Chandra Bose Hindi Granth Lekhan Puraskar, awarded by the Department Biotechnology, Government of India, New Delhi, for Biotechnology Glossary in Hindi, published by Dunwoody Press, USA
  - Elected as the Deputy Secretary General in Asian Federation of Biotechnology
- Dr. Sirshendu De (ChE)
- Received the NASI-Reliance Industries Platinum Jubilee Award (2013), by The National Academy of Sciences India, Allahabad, for his contribution in application oriented innovations
- Dr. Rabibrata Mukherjee (ChE)
- Selected for the prestigious MRSI Medal for 2014 by the Materials Research Society of India, Bangalore
- Dr. Swagata Dasgupta (CY)
- Selected as one of the most inspiring Women Engineers / Scientists for the year 2014, by the Engineering Watch
- Dr. Modhu Sudan Maji (CY)
- Selected for the Innovation in Science Pursuit for Inspired Research (INSPIRE) Faculty Award by the Ministry of Science and Technology, Government of India, New Delhi
- Dr. Subhasish Dey (CE)
- Being within the top 100 authors worldwide in Civil Engineering (75th position)
- Dr. Animesh Mukherjee (CSE)
- Selected as ICTP Associate (Simons Associate), supported by funds from the Simons Foundation, Italy
  - Selected for the INSA Young Scientist Medal 2014, to be awarded by the Indian National Science Academy, New Delhi, for his significant contributions in language dynamics in cognition and perception
- Dr. Arindam Basu (G&G)
- Selected for the "GSI Sesquicentennial Commemorative Award" for the year 2013 in the field of Engineering Geology by the Council of the Geological Society of India, Bangalore
- Dr. Rabindra Kumar Pradhan (HSS)
- Selected for the "Best Teacher Award-2013", by the Indian Society for Training and

- Development (ISTD), New Delhi, for his outstanding contribution in the field of HR Training and Development
- Dr. Gourishankar S. Hiremath (HSS)
- Selected for Prof. M. J. Manohar Rao Young Research Award for the year 2013 by The Indian Econometric Society
- Dr. Manoj Kumar Tiwari (ISE)
- berated as the Number One author from among the top hundred authors in the International Journal of Production Research, published by Taylor and Francis, UK
- Dr. Jagadis Chandra Misra (MA) Former Professor
- Selected for the Outstanding Teachers Award-2013 by the Indian National Academy of Engineering, New Delhi
- Dr. Souvik Bhattacharyya (ME)
- Selected for the Outstanding Teachers Award-2013 by the Indian National Academy of Engineering, New Delhi
- Dr. Prasanta Kumar Das (ME)
- Accredited as recognized expert in the field of Advanced Heat Exchangers (Multistream), by the European Process Intensification Centre (EUROPIC)
- Dr. Suman Chakraborty (ME)
- Honoured with the prestigious Shanti Swarup Bhatnagar Award for 2013, by the Council for Scientific and Industrial Research (CSIR), New Delhi, recognizing his achievement in the field of Engineering Sciences
  - Selected as INAE Chair Professor for a period of two years (from June 01, 2014 to May 30, 2016), by the Indian National Academy of Engineering, New Delhi
- Dr. Indranil Manna (MME)  
(currently on lien as Director, Indian Institute of Technology Kanpur)
- Awarded with the TWAS Prize 2013, by The World Academy of Sciences (TWAS), Trieste, Italy, in recognition to his outstanding contributions in establishing microstructure-property correlations to nanometric materials
- Dr. Jyotsna Dutta Majumdar (MME)
- Recipient of the "Friedrich Wilhelm Bessel Award" by the Alexander von Humboldt Foundation, in recognition of her past accomplishments in research and teaching
- Dr. Ing. M. A. Ramlu (MinE)
- Recipient of the MEAI - Lifetime Achievement Award 2011, presented by the

- Former Professor
- Mining Engineers' Association of India, for his outstanding contribution to Mining Engineering Education and the Industry, besides significant contribution to Mining Engineers' Association of India during his lifetime
- Dr. Subir Kr. Mukhopadhyay (MinE)
- Selected for the Distinguished Alumnus Award-2014, by the Department of Mining Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi
- Dr. Jayanta Bhattacharya (MinE)
- Selected by The International Water Association, UK, to publish a book, to be entitled, "Synthesis of Nanomaterials and its Application in Wastewater Treatment" under its publishing house
- Dr. Khanindra Pathak (MinE)
- Selected for the "Life Time Achievement Award", by the Indian Mining and Engineering Journal, for his life time contribution in the field of Mining Engineering Education, Research and Innovation
- Dr. Debarati Sen (GSSST)
- Honoured with the "IETE-N V Gadadhar Memorial Award (2013)", awarded by the Institution of Electronics and Telecommunication Engineers, New Delhi, in recognition of her outstanding contributions in design and development of a bandwidth and energy efficient sub-band based radio technology for wideband communication
- Dr. Mahitosh Mandal (SMST)
- Awarded with the Shuva Mukherjee Memorial Award (2012), by The Physiological Society of India, Kolkata, in recognition to his outstanding contributions in Cancer Research
- Dr. Chandan Chakraborty (SMST)
- Selected for the DAE-Young Scientist Research Award 2013, by the Department of Atomic Energy, Government of India

#### **MEMBERSHIP OF EDITORIAL BOARDS:**

- Dr. Tanmaya Pathak (CY)
- Invited to join the Editorial Board of "Biochemical Compounds", an open access journal, published by Herbert Publications Limited, UK

- Dr. Sudhir Kumar Barai (CE)
- Invited to serve as an Associate Editor on the Editorial Board of Sadhana, proceedings of Indian Academy of Sciences, Bangalore, in engineering sciences
- Dr. Anjali Pal (CE)
- Considered as a Regional Editor of the journal "Recent Patents on Nanotechnology", published by Bentham Science Publishers
- Dr. Rajib Maity (CE)
- Invited to serve as an Associate Editor on the Editorial Board of the ISH Journal of Hydraulic Engineering, published by Taylor and Francis
  - Invited to the Editorial Board as an Associate Editor, for the international journal "Journal of Earth System Science", published by Springer (Indian Academy of Sciences, Bangalore)
- Dr. Partha Pratim Das (CSE)
- Invited by the Institution of Engineers (India), Kolkata, to be the Editor-in-Chief of the Journal of the Institution of Engineers (India) : Series B
- Dr. Abhijit Mukherjee (G&G)
- Invited to be an Associate Editor for the journal "Frontiers in Environmental Science : Water Resources Quality", published jointly by Nature Publishing Group and Frontiers, Switzerland
- Dr. Soumitra Paul (ME)
- Invited to be a Member of the Editorial Board of "Sadhana", published by Springer, on behalf of Indian Academy of Sciences
  - Invited to serve as an Associate Editor on the Editorial Board of Sadhana, proceedings of Indian Academy of Sciences, Bangalore, in engineering sciences
- Dr. Suman Chakraborty (ME)
- Invited to serve as an Editorial Board Member for "Scientific Reports", a journal from Nature Publishing Group
- Dr. Dilip Kumar Pratihari (ME)
- Appointed as an Associate Editor of International Journal of Computer Information Systems and Industrial Management Applications (IJCISIM), published by Machine Intelligence Research (MIR) Lab



- Dr. Tapas Kr. Bandyopadhyay (MME)
- Invited to serve as an Editorial Board Member of the journal “Recent Patents on Nanotechnology”, published by Bentham Science Publishers
- Dr. Debabrata Sen (OE&NA)
- Invited by the Editor-in-Chief, J. Ocean Engineering and Marine Energy, Springer, to become an Associate Editor of a new journal established very recently. Once he agrees to serve as an Associate Editor, he would be asked to submit a paper soon for the inaugural issue which will be in January 2015
- Dr. Samit Kumar Ray (PH)
- Invited to serve on the Associate Editorial Board of Frontiers in Optics and Minerals, a section of Frontiers in Materials
- Dr. Amreesh Chandra (PH)
- Invited to serve as an Editorial Board Member for Scientific Reports, a journal from Nature Publishing Group, the publishers of Nature
- Dr. Subhasish Basu Majumder (MS)
- Invited to serve as an Editorial Board Member for "Scientific Reports", a journal published by the Nature Publishing Group

## **ACHIEVEMENTS BY THE STUDENTS**

### **LAURELS:**

- Dr. Pijus Kundu  
Ex-Research Student  
08AT9703
- Innovative Student Projects Award 2013 by ITER, Siksha 'O' Anusandhan University, Bhubaneswar
- Dr. Chandan Karfa  
Ex-Research Student  
08CS9702
- Innovative Student Projects Award 2013 by ITER, Siksha 'O' Anusandhan University, Bhubaneswar
- Ms. Shahab Fatima  
Research Student  
10RE90R02
- International Student Travel Award by 20<sup>th</sup> International Congress on Sound and Vibration (ICSV20), Bangkok
- Ms. Sangita Singh  
Research Student  
11RT91P01
- Best Presentation (Oral) Award at International Elastomer Conference by Rubber Division of American Chemical Society (ACS), Cleveland, Ohio, US

- Shri Divij Sharma  
MBA Student Vinod Gupta School of Management  
12BM60046
- First prize in TCS Smart Manager Case Study Contest conducted by Tata Consultancy Services across B-schools in India & abroad
- Shri Sourav Kumar Bagchi  
Research Student  
11AG92P04
- Best Poster Award by the National Conference on “Frontiers in Algology and Algal Biotechnology”, Visva-Bharati, Santiniketan
- Shri. Rupam Biswas  
Research Student  
11BT92F07
- ‘Professor Kailasam Venkatesan Award’ by the Indian Crystallographic Association for the Best Oral Presentation, 2013
- Ms. Anuja Das,  
M. Tech student
- Late Lakshmi Nandakumar Award of IChE for Best Paper Presentation at SCHEMCON-2013
- Shri Partha Laskar  
Research Student  
10CY90P01
- Best Poster Award at the 5th Asian Conference on Colloid and Interface Science organised by Asian Society for Colloid and Surface Science at North Bengal University.
- Ms. Nagalaxmi  
M. Tech student
- First Prize for Oral Presentation in the 67th Annual Technical Meeting of the Indian Institute of Metals
- Shri. Manab Mallik  
Research Scholar
- Second Prize for Oral Presentation in the 67th Annual Technical Meeting of the Indian Institute of Metals
- Ms. Nitika Gupta  
Research Scholar
- Young Scientist Award for the Best Technical Presentation by the Central University of Odisha, Koraput.
- Shri Bharat Reddy Kunduru, Mr. Arun Kumar Kota and Mr. Bhargava Gorthy  
MBA Students  
Vinod Gupta School of Management
- First Prize in Finance Flagship Event 'Prometheus' of Ensemble 13 - The annual international management conclave of XLRI, Jamshedpur
- IIT Kharagpur team comprising Kausik Basak, Debdoot Sheet, Phani Krihna Karri of SMST and Tomaghna Ojha of SIT
- Won GE Edison Challenge 2013 with cash prize of Rs. 10 Lakhs

- Shri Rajiv Chandra Rajak  
Research Student  
12AT91F03
- Shri Srikanth Madala  
Research Student  
11CL91R02
- Shri Abhishek Dwivedi  
MHRM student
- Ms. Priyanka Dasgupta  
MHRM students
- Shri S. Abhilash (UG 1st Yr.)  
Shri Subham Vidyant (UG 1st Yr.)  
Ms. Priyanka Dasgupta (MHRM 1st Yr.)  
Shri Chetan Pandey (MHRM 1st Yr.)
- Shri Gaurav Jain  
B. Tech student  
12MT10013
- Shri Narendra Gogurla  
Research Scholar  
12PH90J01
- Ms. Akriti Kapoor,  
Ms. Preeti Karedy and  
Shri C. Paresh Ravindra  
Second year students of LLB
- Shri Bikas Kumar Arya  
Ex-Research Student, SMST  
09MM6003
- Shri Ranabir Dey  
Research Student  
10ME90R24
- Best Poster Award at Asian Congress on Biotechnology-2013 at India Habitat Centre, New Delhi
  - ‘Gold Medal for the Best Poster Presentation at the International Tropical Meteorology Symposium (INTROMET-2014)
  - Ranked 1<sup>st</sup> in the City Round and also in the State Round in the Campus2Corporate Contest, 2013
  - Ranked 2<sup>nd</sup> in the City Round and also in the State Round in the Campus2Corporate Contest, 2013
  - Won prizes for their exemplary entries in the All India Essay Event organized by the Shri Ram Chandra Mission
  - Governor's Medal at Governor's House for exceptional achievements and contribution as Cadet of 3 Bengal Tech Air Squadron NCC
  - Nanoscale Poster Prize, awarded by Royal Society of Chemistry for paper presentation at the International Conference on Nano Science and Technology, Chandigarh
  - First Position in 6th B. Krishna National Intellectual Property Rights Moot Court Competition, 2014 organized by Symbiosis Law School, Pune
  - Won “Robert Austrian Award” in Pneumococcal Vaccinology carrying a grant of \$25,000
  - Gandhian Young Technological Innovation Award/Appreciation 2014

- Shri Shantimoy Kar  
Research Student  
12AT91F01
- ‘Gandhian Young Technological Innovation Award/Appreciation 2014
- Shri Pijus Kundu  
Ex-Research Student
- Gandhian Young Technological Innovation (GYTI) Awards - 2014 with Technological Edge(TE) Award
- Ms. Raka Mukherjee  
Research Student  
12CH91R05
- Gandhian Young Technological Innovation Award/ Appreciation 2014
- Shri Aliba Ao  
Research Student  
10GG90F01
- Awarded the Certificate for Best Oral Presentation at the International Seminar on Magmatism, Tectonism and Mineralization at Kumaun University, Nainital, Uttarakhand,
- Shri Arijit Sarkar  
M.Tech. student  
12PH62R05
- Received 2nd best SPIE Student award of US\$200 at International Conference on Optics and Optoelectronics (ICOI-2014) , Dehradun
- Shri Narendar G.  
Research Student  
12PH90J01
- Awarded the "Excellent Paper Presentation Award" at International Conference on Optics and Optoelectronics (ICOL 2014), Dheradun
- Shri Vishwatosh Mishra  
Research Student  
12PH92F05
- Awarded the "Excellent Paper Presentation Award" at International Conference on Optics and Optoelectronics (ICOL 2014), Dheradun
- Shri Rao Rutwik Kishan,  
Shri Kamat Vighnesh Satish and  
Shri Bibhunanda Mishra  
2<sup>nd</sup> LLB students  
Rajiv Gandhi School of Intellectual Property Law
- Runner-up position in the prestigious Oxford University India Moot Court Competition (2013 – 14) organized by Oxford, Delhi
- Shri Amritanshu Anand,  
Department of Geology & Geophysics and  
Shri Anshul Singhle,  
Department Computer Science & Engineering.
- Won the Mercury Fund Investment Prize. The team also received several financial commitments totaling over \$1 million at the Rice Business Plan Competition (RPBC)

## **SCHOLARSHIPS:**

Shri Soumen Kar  
Research Student  
10CR90R02

- IEEE CSC Student Fellowship Award

Dr. Bikas Kumar Arya  
Research Student  
12MM91P03

- Fulbright Scholarship 2014

Ms Riya Bubna  
B.Tech. student  
13CS10041

- Aditya Birla Scholarship

Shri Santanu Pradhan  
Research Student  
10PH90R05

- Bhaskara Advanced Solar Energy (BASE) Fellowship

Ms. Sneha Rani  
Research Student  
11MI91R01

- Selected for IEAGHG International Interdisciplinary CCS Summer School, University of Texas at Austin, TX, USA

Ms. S. Fatima  
Research Student  
10RE90R02

- Schlumberger Foundation Faculty for the Future Scholarship for the year 2014

## **GANDHIAN AWARD**

To promote culture of innovation amongst the young minds of the country the Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) has established three national awards for innovative student/faculty projects in engineering, pharmacy, science and applied technologies.

IIT Khargpur is proud to report that two such awards have been bagged by its teams of students and faculty.

Pijus Kundu (Dept. of ECE) under the supervision of Prof. T. K. Bhattacharyya and Professor Soumen Das, has been awarded Gandhian Young Technological Innovation (GYTI) Awards - 2014 with Technological Edge(TE) Award for his work Performance Enhancement of Microthruster using Nano-engineered MEMS Structure for Long Term Space Mission.

A student team consisting of Ranabir Dey ,Ranabir Dey and Shantimoy Kar, under the supervision of Prof. Suman Chakraborty, have also received the award under Biomedical Engineering for development of Rapid Diagnostic Test (RDT) kits which are not commonly available for many diseases prevalent in India.

## **HEALTH CARE**

### **B C ROY TECHNOLOGY HOSPITAL (BCRTH)**

IIT Kharagpur provides primary health care and round the clock emergency services to the campus community through B C Roy Technology Hospital, which is a 32 bedded (including ICU and Isolation Wards) hospital located strategically within the campus. Approximately 7000 patients attend the Out Patient Department at B C Roy Technology Hospital every month. Constant efforts are on to upgrade and improve the existing facilities at the B. C. Roy Hospital. Health Care remains a top priority in the activities of the Institute. The hospital and its services are fully utilized by students and other institute beneficiaries. A round the clock pharmacy has been made available within the hospital. Medical Insurance coverage through the Institute is available for the students.

B C Roy Technology Hospital has a Pathology and Microbiology lab, and a Radiology unit. It has many modern diagnostic equipment such as Computerized Radiology Unit, Ultrasonography with Colour Doppler, Fully Automatic Biochemical analyzer, Telemedicine, Video Slit Lamp and Auto-Refractometer. In addition to General OPD service, special clinics are provided in General Medicine, Cardiology, Paediatrics, Chest, Skin, Psychiatry, General Surgery, Obstetrics & Gynaecology, Orthopaedics, Eye, ENT and Dental by appointing visiting consultants in the various disciplines. Immunization clinics are operated with the help of Consultant in Public Health and Paediatrician.

A Hospital Management Committee, comprising of representatives from all stake holders of the Institute and headed by Professor-In-Charge, B C Roy Technology Hospital as the Chairperson, meets regularly to overview the functioning of the hospital, listen to the grievances and suggest to the authority regarding all round development of the hospital and its services.

The following are some of the most recent major achievements at and by B C Roy Technology Hospital in 2013:

1. The referral procedure for referring patients to higher medical care centers is continuously examined and MOUs are drawn with suitable Corporate Hospitals in Kolkata, e.g. R N Tagore International Institute of Cardiac Sciences, Ruby General Hospital, Kothari Medical Center. In 2013, visits to reputed Super specialty Hospitals in Kolkata were organized by B C Roy Technology Hospital for the campus community representatives. Subsequently, MOUs have been drawn between IIT Kharagpur and the recommended reputed Super specialty Hospitals in Kolkata, such as B M Birla Heart Research Center, Medica Superspecialty, and Fortis Hospital.
2. A 120 kV Generator Set has been installed to ensure uninterrupted power supply to the B C Roy Technology Hospital.
3. The OPD Registration Counter at B C Roy Technology Hospital has been upgraded and relocated in the interest of better service to the community.
4. A new Operation Theater with all required equipments has been added to B C Roy Technology Hospital.
5. Air Conditioners have been installed in all the Indoor Wards to provide additional comfort to the patients.
6. A new USG Machine with Colour Doppler has been installed.

7. A proposal for installing a Bed Lift, to carry patients with the bed, was initiated and the work has started.
8. To improve the OPD service and to cater to the needs of the community, a number of visiting consultants in specialized fields such as Cardiology, General Surgery, Orthopedics, have been appointed. Advertisements for visiting consultants in other areas, such as Gynecology, have been sent out.
9. For community health care promotion, support from B C Roy Technology Hospital to NCC, NSS and other socially active units were extended for conducting Health Check up Camps and Blood Donation Camps in the Institute.
10. As part of Preventive Health Care initiative for campus community, B.C Roy Technology Hospital arranged special clinics, such as Bone Mineral Density Screening Clinic, Diabetes clinic.
11. As part of Public Health measures, regular immunization clinic has been organized with the help of Consultant in Public Health and Pediatrician.
12. Also, Halls of residence were regularly visited by a Public Health Consultant with special attention to cleanliness, and sanitation.

## **ALUMNI AFFAIRS**

The alumni contribute significantly towards upholding the name of the Institute and the country. They also contribute substantially to the evolution of their Alma Mater. The Institute is thankful to its alumni for the bountiful support it receives from them. It strives to maintain a close bond and share the various current events and policies with alumni. The Office of the Dean, Alumni Affairs & International Relations (AA&IR), the Institutional Development (ID) Programme Team and the Students Alumni Cell strive to create a platform for organizing the alumni interactions, relations and activities such as branding and fundraising. Some of the activities undertaken during 2013-14 are given below.

- Interactions with National and Global Alumni: The institute sent a delegation to the PAN IIT Meet at Houston, Texas, organized by the PAN IIT Alumni of USA. During and after the meet several interaction meetings with alumni took place at Houston, Washington DC and New York City. Back home meetings have been held between the Director and the Alumni chapters at Kolkata and also at Bangalore. Representatives of the Alumni Chapters from Delhi, Kolkata, Hyderabad, Chennai etc. also visited the institute during the Alumni Meet.
- Student - Alumni Regional Meets: Regional Student-Alumni Chapter Meets were organized in Delhi in December 2013 and in Bangalore in June 2014 which witnessed excellent participation of students as well as alumni. These regional Chapter meets are conducted to foster student-alumni interaction and provide a gateway for the alumni community to connect to their Alma Mater.
- Annual Alumni Meet at IIT Kharagpur: The 11<sup>th</sup> Annual Alumni Meet was organized during January 17 - 19, 2014 with high tempo both from the Institute and the visiting alumni. The special batches invited were those belonging to 1964, 1974 and 1989. This year saw a significant increase of about 50% in the number of visiting alumni. A total of 221 alumni including 52 family members were part of this reunion. The batches relived their golden days of college life with batch mates. They also experienced the growth of the Institute and interacted with present faculty members, students, and staff. The Students Alumni Cell received all round appreciation from the alumni for their excellent efforts and cordial behavior

during the meet. Alumni ID cards were given away to several alumni.

- **Foundation Day:** The 62nd Foundation Day was celebrated on August 18, 2013. The office coordinated the organization of the Foundation Day on behalf of the Institute. Mr. Amit Chatterjee of 1984 batch, General Manager at Microsoft India and a Distinguished Alumnus was the chief guest for the occasion. Faculty and staff members who completed 25 years of service were felicitated by the Director. The Nina Saxena Excellence in Technology Award was handed over to the recipients. Later in the day a debate, football competition and entertainment programme was organized by the students.
- **Awards:** Like every year the Distinguished Alumnus Award is to be given away by the Institute to the alumni during the Annual Convocation 2014. Fourteen distinguished alumni have been selected for the award in the current year. The IIT Kharagpur Alumni Association USA has indicated that it wishes to recognize Faculty and Student Excellence at the institute through several new awards funded individually and collectively by the US alumni. The Institute is currently in the process of setting up the norms and criteria for these awards to be given away in the years to come.
- **Guest Lectures:** Several alumni were invited for giving lectures this year: Mr. Arjun Malhotra (EC/1970), D.Sc. (Honoris Causa) of the Institute shared the challenges in his early entrepreneurial endeavors. Being the Chairman of IIT KGP Vision 2020, Mr. Malhotra also briefed the audience about various aspects of the program. Mr. Vinod Gupta (AG/1967), Distinguished Alumnus, vividly shared his experiences about how IIT Kharagpur has shaped him in life. He urged the students; never to forget what IIT Kharagpur has done for their life. Mr. Rajeev Agarwal (ME/1986), Founder and CEO, MAQ Software explained his transition from IIT Kharagpur to the outside world after graduation and what difficulties he faced during his constant quest for knowledge and fulfillment. Prof. Farrokh Mistree, Distinguished Alumnus along with his wife and colleague, Prof. Janet Allen inspired the students to take up an academic career.
- **Leadership Summit:** A Leadership Summit was organized on 10<sup>th</sup> November, 2013 for the students to draw inspiration from the alumni who have made it large in their lives. This year the following alumni were invited viz. Mr. Ashok Khemka (CS/1988), DG, Archives and Archaeology, Haryana; Mr. Arunabh Kumar (EE/2006), Founder and CEO, The Viral Fever; Mr. S.V Mani (EE/1974), Vice President, Tata Consultancy Services; Mr. Peshwa Acharya (CH/1989), CEO, Aasaanpay Solutions India Pvt. Ltd; Mr. Subrata Paul (ME/1974), CEO & Director, Bengal Aerotropolis Project Ltd and Mr. Tulsidas Banerjee (ME/1979), Vice President and Head-Strategy, TIL LTD Kolkata. The event received a very positive response from the students.
- **Mentorship Program:** Launched in 2010-2011 with only a limited number of mentors this has now grown into a full-fledged affair with around 330 alumni and 780 enthusiastic students. Under this program the esteemed alumni of our Institute provide guidance to the students on various professional and extra-professional matters to prepare them well before they step into the real world. The great success of this program holds testimony to its effectiveness.
- **My Imprint Programme:** This is a programme 'By the Students, For the Students' where, the outgoing students pledge their support towards the Institute initially by donating their caution money towards students' services. Last year around 274 outgoing students from the Class of 2013 contributed towards this cause. A portion of this money was utilized in funding international travel of talented students so that they could participate in various international competitions such as Hult Prize, GRIFTECH, TEAMKART Formula, Intelligent Ground Vehicle Competition, FIRA World Cup. This year the concept of a Class Gift has been introduced in which part of the outgoing students' donation shall be used towards a unique gift that the batch decides to make towards the future generation of students. This year the donating students have opted for "Financial Support for



International Travel” as “Class Gift from Class of 2013”. The rest of the money collected remains with the endowment fund of IIT-KGP.

- **Founding Batch Endowment Campaign:** This is one of the various fund raising campaigns initiated aiming to bring together alumni from individual batches and motivate them to donate collectively in the name of their batch. Each batch has a minimum target of INR 50 lakhs. Once it is achieved, the batch is honored by naming a classroom after them in the Nalanda Academic Complex. Till now 5(five) batches have already succeeded. A classroom endowed in the name of 1991 batch has already been unveiled on December 10, 2012. 1968 batch is the next one to receive it this year. An amount of Rs. 2.23 Crore was generated through various fund raising campaigns in FY 2013-14.
- **Shri Gopal Rajgarhia International Programmes:** This is a unique programme launched this year by IIT Kharagpur and facilitated by our alumnus Shri Gopal Rajgarhia of 1968 batch with a seed fund of 3.6 Crore endowment funding which will offer assistance to students and scholars who can exhibit their excellence on various international platforms. It also encourages talented scholars to conduct research at IIT Kharagpur thereby boosting exchange programmes and research activities and help the Institute to make its presence felt strongly across international academia which is correlated with the ranking of the Institute. Thus the programme is a significant step towards achieving the Vision 2020 programme of IIT Kharagpur to improve its global stature. It has few sub-programmes viz: SGR International Faculty Outreach Programme, SGR International Research Scholar Support Programme, SGR Student International Travel Programme, SGR International Student Scholarship and Internship Programme. The total money pledged for the above programmes is 10 Crores from Shri. Gopal Rajgarhia.
- **Brand Building:** An effective mass mailing system to update our alumni, students, faculty members, retired faculty members and parents regularly about the Institute news and progress is maintained. Seasonal Greetings and various fund-raising campaign updates were also sent via mass mails. Through various public relation activities, regular communication, social media and ranking data submission, the Institute has started taking small steps towards the big goal of Vision 2020 thus enhancing the IIT-KGP brand both internationally and domestically. Recently the ID team worked in close coordination with students and faculty members and developed a new website for JEE-Advanced Qualifiers to attract higher JEE rank holders to study at IIT Kharagpur. The connectivity of the institute with individual alumni also improved from 23000 to 33000 during this year.
- **Publications:** Like every year, the print publications including the KGPian – quarterly newsletter, Alumni Annual Report and the Annual souvenir “Yearnings of Yore” have been published during Alumni Meet. KGP Connection, an e-newsletter was circulated every fortnight. Additionally brochures for different campaigns, Foundation Day Celebrations, Alumni ID Cards, separate Yearbooks for UG, PG and Ph.D students were also published.
- **Hall of Fame:** The institute wishes to develop a Hall of Fame to preserve its history and achievements. It is planned that this work would be undertaken in two phases and in the first phase the Office of Alumni Affairs and the ID program would be modernized. Fund raising shall be undertaken to realize the necessary funds. An amount of INR 50 lakhs has been pledged towards this cause by Prof. Tapan Prasad Bagchi, an ex-Professor and an alumnus of the institute, of which about Rs. 27 Lakhs has already been donated.

## CAREER DEVELOPMENT CENTRE

The Career Development Centre (formerly known as Training and Placement Office) is responsible for arranging practical training for 3<sup>rd</sup> year B. Tech/Dual Degree and 4<sup>th</sup> year M.Sc. degree students and job placement of final year students graduating from the Institute. The Centre 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 CDC gives feedback to the Institute on the academic programs.

## SUMMER TRAINING DETAILS

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

A total of 1250 companies/organizations in India were contacted for training facilities for the current summer vacations in May-July 2014. Among these 78 in India had offered training facilities, out of which 48 organizations had extended out-of pocket allowances (covering 225 students) and many other extended subsidized transport, subsidized canteen, subsidized accommodation and to-and fro travel expenses (e.g. 3AC fare, air fare etc.) for our students. The highest out of pocket allowance of Rs. 60,000/- per month was paid by ITC Ltd. and Hindustan Unilever. Some other organizations such as Times Internet and American Express offered Rs. 50,000/- per month, Amazon and Adobe offered Rs. 30,000/- per month, Yahoo, Qualcomm, and Microsoft offered Rs. 20,000/- per month. There are about fifteen (15) companies offered stipend in the range Rs. 10,000/- to 20,000/- per month. In addition to the above some students arranged internship by themselves with good amount of stipend.

Out of 1282 third/fourth year B. Tech / Dual Degree / M. Sc students, 86 students will be attending summer internship abroad in many Institutes/organizations likes EPFL, Switzerland , University of Warwick, National University of Singapore , University of Tokyo, Max Plank Institute for Software Systems, Germany University of Alberta, Biotechnology & Bio Chemical Engineering, Belgium, Rhinewall University, Germany Bremen University Dong A University, Busan , etc. and foreign companies like Finisar ,Malaysia , Mitsubishi , Works Application , Japan , during May-July, 2014.

## PLACEMENT DETAILS

260 companies / organizations have considered our students for employment during 2013-2014. The details of number of students who had registered for placement and those actually placed through campus interviews including those who have opted either for higher studies or arranged job through off campus as on 30.06.2014 are as follows:

Course/Degree	No. of students registered	No. of students placed
B. Tech (Hons) & B. Arch	615	524
5-year Integrated M.Sc	138	113
2-year M. Sc	116	61
Dual Degree (B. Tech + M. Tech.)	387	329
M. Tech / MCP	710	448
MBA	70	65
MS/Ph.D	20	20
Total	2056	1560

The Overseas Highest salary received in 2013-14 is \$125000 per annum and the second highest is \$100000 per annum.

The Highest salary received in INR is Rs. 36.9 Lakh per annum and the second highest is Rs.28.5 Lakh per annum in 2013-14.

Average Salary for 2013-14 is as follows.

Courses	Average Salary ( CTC) Rs. Lakh per annum)
B. Tech.& B. Arch	11.21
Dual Degree	11.37
5yr. Integrated M.Sc.	10.71
2yr. M.Sc	6.6
M. Tech	7.9
MS/ Ph.D	8.3
Average Salary for all UG & PG Courses	9.97
VGSOM ( MBA )	11.78

Some companies have offered pre placement offers like ITC Ltd., Schlumberger, Hindustan Unilever, Qualcomm, Barclay's Capital, etc. Total numbers of Pre-Placement offers received are 113.

### **STUDENT PARTICIPATION**

Career Development Centre at IIT Kharagpur has taken an initiative to harness the students' management skills through a formal system during the placement season since 2005-2006. The system has progressed extremely well and from year 2010 onwards, the CDC has immensely benefitted from students participating in placement process. The organizational skill of students has helped CDC to conduct 12-15 companies' placement interviews per day and round the clock. During the placement season students play an active role from contacting the companies to the final selection at campus by providing complete logistic support.

### **STUDENTS' AFFAIRS**

The development of all-round activities of the students of IIT Kharagpur center around the Technology Students' Gymkhana which houses the following facilities, many of which have been added in the last few years:

- Modern Gymnasium
- Billiards
- Athletics Stadium
- Two Cricket Fields with two turf wickets with jogging track along with modern practice facilities in Tata Sports Complex
- Six Tennis Courts including four flood light Courts
- Three flood light Basketball (Cemented) Courts
- Three flood light Volleyball (Cemented) Courts
- Four wooden Indoor Badminton Courts
- Table Tennis room with four tables
- Yoga room
- Standard Swimming Pool
- One Squash court

The activities of the students of IIT Kharagpur are many and what follows is a brief summary of highlights.

#### **INTER IIT SPORTS MEET:**

The 49<sup>th</sup> Inter IIT Sports Meet was organized at IIT Guwahati. The first phase of Sports Meet began with the Inter IIT Aquatic Meet held on October 1<sup>st</sup> to 4<sup>th</sup>, 2013. IIT Kharagpur Secured 2<sup>nd</sup> in Swimming and 3<sup>rd</sup> in water polo. Extra ordinary performance in swimming was given by Shreyash Mahajan, a final year UG student. Shreyash was declared as individual champion. The second phase which includes all other games, started from December 16<sup>th</sup> to 23<sup>rd</sup> 2013. The men section IIT Kharagpur secured in Badminton Third Position, Basketball fetched First Position; Cricket got Second Position; Football having Third Position; Lawn Tennis securing Second Position; Squash getting Fourth Position, Table Tennis having Third Position, and finally, Volleyball in Fourth Position.

On the whole, in 49th Inter IIT Championship IIT Kharagpur after six long years secured overall Third Position in men section. In Women Section, there were achievements with securing First position in Lawn Tennis; and Third in Badminton. Mr. Inter IIT position was secured by Nitish Balal of IIT KGP. TSG finally felicitated to the medal winners Teams of Inter IIT Sports Meet, 2013.

#### **OUT-STATION PARTICIPATION:**

Basketball Boys and Girls Team had participated in IMG Reliance BFI Inter College Basketball League held at Kolkata and they stood First. IIT Kharagpur Boys Team Secured First Position and Girls Team Secured Third Position. Boy's basketball Team qualified and subsequently participated in National Inter College Basketball league held at New Delhi, which is the first national level participation in the history of IIT Kharagpur.

Besides, IIT students participated in various cricket, football and lawn tennis tournaments organized in different parts of the country.

#### **SPRING FEST 2014:**

The 55th edition of Spring Fest, the annual social cultural fest of IIT Kharagpur, was held on 23rd-26th January 2014. Eminent bands like Agnee, Swarathma, Underground Authority, Salim-Sulaiman, and Pentagram performed here. Under International Carnival, performers from various countries like Chris Cheong , a magician and mentalist from Malaysia, Jack Glatzer, a violinist from Portugal, Benny Prasad, a well travelled musician, Murray Molloy, a sword swallower from Ireland, Almost Trio, a juggling duo from Hungary and Jonathan Kay, an Indo- Jazz saxophonist from Canada participated.

#### **KSHITJ 2013-14:**

The Annual Tech Fest Kshitj 2013 was organized during 1st February to 4th February, 2013. The event occurred under the patronage of UNESCO, and is rated as Asia's biggest techno management fest with major state-of-the-art Scientific Events and certifications.

Some of the key events were as follow:

- Race pulse - Institution of mechanical Engineers
- Delta Surge - Institution of mechanical Engineers
- Laws of motion- Institution of mechanical Engineers
- Overnite - Association for computing machinery (ACM)
- Eureka - IEEE
- ASME-Student Design Exposition
- Speak Out for Engineering- Institution of mechanical Engineers
- IDP – GE

- Illuminate- E.B.A.I. , Drishti

The Principal Guest lecturers during the event were

- Dougal Jerram, British geologist/earth scientist, television and media presenter/contributor, and author.
- Nawazuddin Siddiqui, Critically Acclaimed Actor
- Shazia Ilmi, Journalist , ex-anchor at Star News
- Jonathan Forman, Scientific Advisor- OPCW (Nobel Peace Prize 2013)
- Rajiv Malhotra, Author, Multi Millionaire and Philanthropist
- Amitabha Ghosh, Chairman-Mars Rover Mission
- Roel Vertegaal, Pioneer in Human-Computer Interaction

#### **OTHER HIGHLIGHTS:**

Technology Students Gymkhana is active in launching a few Students' centric and participatory Cells in major Research and Development initiatives sponsored by the MHRD, Government of India. During the year 2013-14, few modules along this line of action has been opened to cater to 'The Future of Cities' initiative, projects under the Technology Robotics Society and the 'Science-Heritage' initiative called 'SanDHI'.

Important partnerships or exchanges are in the way. To name a few, Technology Students Gymkhana has developed a potential collaboration with the Cricket Association of Bengal (CAB) and the two associations look forward to organizing non-profitable matches in IIT Kharagpur and also at the regional level to augment the spirit of 'sports' amongst the Youth; another event is that of Hockey organized by Central Reserve Police Force in association with TSG.

TSG also played a major initiative in mobilizing the youth spirit of the Campus by organizing the 'Reach out week'; various adventure clubs and societies; and various spot based sports and arts activities like SPECTRA and many others.

#### **GRADUATES OF THE YEAR**

In this Convocation, we are going to confer degrees on outgoing students. I am very glad to announce that the following students are recipients of Institute Gold Medals for their academic excellence and all round performance in the year 2013-2014.

- **Shri Lakshya Jain** of the Department of Mechanical Engineering is the recipient of the *President of India Gold Medal 2013-2014* for the best academic performance among the outgoing B. Tech (Hons.) and B. Arch. (Hons.) students.
- **Shri Lakshya Jain** of the Department of Mechanical Engineering has won the *Dr. Bidhan Chandra Roy Memorial Gold Medal 2013-2014* for the best all-round performance among the B. Tech (Hons) and B. Arch (Hons.) outgoing students.
- *The Prime Minister of India Gold Medal 2013-2014* for the best academic performance among the Dual degree and Integrated M.Sc. outgoing students goes to **Shri Ahanjit Bhattacharya** of the Department of Chemistry.
- *Dr. Jnan Chandra Ghosh Memorial Gold Medal 2013-2014* for the best all-round performance among the outgoing Dual Degree and Integrated M.Sc. students is awarded to **Shri. Chander Chandak** of the Department of Electronic & Electrical Communication Engineering.
- **Ms. Saparya Chattaraj** of the Department of Chemistry has won the *Professor Jagadish Chandra Bose Memorial Gold Medal 2013-2014* for the best academic performance among the outgoing students of all 2-year M.Sc. courses in the Science Disciplines.

- **Shri Soham Roychowdhury** of the Department of Mechanical Engineering is the recipient of *The Director's Gold Medal* for the best academic performance among the students completing M. Tech and MCP courses.

The following students have received various **Endowment Gold Medals**:

- **Shri Soham Roychowdhury** of the Department of Mechanical Engineering is the recipient of *Dr. Shanker Dayal Sharma Endowment Gold Medal* for the best academic and all round performance among the students completing M. Tech courses.
- **Shri Karkhanawala Shehzad Moses** of Vinod Gupta School of Management is the recipient of the *Mrs. Shelu Sanyal Memorial Endowment Gold Medal* for the best academic performance among the students completing MBA.
- **Shri Samir Kumar Jena** of the Department of Civil Engineering has won the *A. C. Sarkar Memorial Endowment Gold Medal 2013-2014* for the best academic performance among the B.Tech (Hons.) outgoing students.
- **Shri Sarthak Subhankar** of the Department of Physics has won the *Prof. R. G. Chatterjee Memorial Gold Endowment Medal 2013-2014* for the best academic performance among the Integrated M.Sc. outgoing students.
- **Shri Vignesh Kumar R** of the Department of Rubber Technology is the recipient of the *Raghupati Singhanian Endowment Gold Medal* for all round performance among the students completing M. Tech courses.

Today, as I stand here, memories of more than thirty years flash across my mind and I remember myself sitting like of all you on my graduation day thinking what this degree means to me. Like all of you today, I was then firm on the belief that this degree empowers me to face and overcome challenges in my future endeavours. The education I received at this Institution has been the core strength of my life. The education not only meant the technical knowledge that was imparted to me but the fundamental principles that an IIT student stands for, which includes personal integrity, strength of character and the ability to strive constantly to learn, share and care. It is my great pleasure to inform you that, both Honourable Chief Guest, Prof. C. N. R. Rao and the Chairman, Board of Governors, Dr. Srikumar Banerjee, have memorable connections with this Institute.

I offer my heartiest congratulations to all the Medal Winners and graduating students.

Before concluding I wish to share what my parents told me on my graduation day. When I went home and showed my father my degree certificate, he smiled and told me “Remember my son that the people of India have paid for your IIT education; even the poorest of the poor who buys soap from a shop has contributed something for your IIT education. Remember this throughout your life”. Therefore my friends, while you go out and conquer the world please do so with tender care for our fellow countrymen who have supported your education in the sincere hope that you will make their world better. Please try your best to ensure a smile in the face of fellow citizens through whatever you do.

Jai Hind

Kharagpur  
July 26, 2014

Professor Partha Pratim Chakraborty  
Director, IIT Kharagpur

# Courses of Study

## **Advance Technology Development Centre**

- M.Tech. – Embedded Controls and Software

## **Aerospace Engineering**

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

## **Agricultural and Food Engineering**

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

## **Architecture and Regional Planning**

- B.Arch.
- Master of City Planning

## **Biotechnology**

- B.Tech.- Biotechnology & Biochemical Engineering
- Dual Degree - Biotechnology & Biochemical Engineering

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

### **Chemical Engineering**

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

### **Chemistry**

- M.Sc. - Chemistry (2Yr. M.Sc.)
- M.Sc. – Chemistry (5Yr. M.Sc.)
- Joint M.Sc.- Ph.D. in Chemistry

### **Civil Engineering**

- B.Tech.- Civil Engineering
- Dual Degree - Civil Engineering/ Hydraulic & Water Resources Engineering
- Dual Degree - Civil Engineering/ Transportation Engineering
- Dual Degree - Civil Engineering/ Geotechnical Engineering
- Dual Degree - Civil Engineering/ Structural Engineering
- Dual Degree - Civil Engineering/ Environmental Engineering & Management
- Dual Degree - Civil Engineering/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Hydraulic and Water Resources Engineering
- M. Tech. - Transportation Engineering
- M. Tech. - Environmental Engineering and Management
- M. Tech. - Geotechnical Engineering
- M. Tech. - Structural Engineering

### **Computer Science and Engineering**

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

### **Centre for Educational Technology**

- M. Tech. - Multimedia Information Processing



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

- M. Tech. - Earth System Science and Technology

## **Cryogenic Engineering**

- M. Tech. - Cryogenic Engineering

## **Electrical Engineering**

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

## **Electronics and Electrical Communication Engineering**

- B.Tech.- Electronics & Electrical Communication Engineering
- Dual Degree - Electronics & Elect. Comm. Engineering/ Fibre Optics and Lightwave Engineering
- Dual Degree - Electronics & Elect. Comm. Engineering/ Microelectronics & VLSI Design
- Dual Degree - Electronics & Elect. Comm. Engineering/ RF and Microwave Engg.
- Dual Degree - Electronics & Elect. Comm. Engineering/ Visual Information & Embedded System
- Dual Degree - Electronics & Elect. Comm. Engineering/ Telecommunications System Engg.
- Dual Degree - Electronics & Elect. Comm. Engineering/ Engineering Entrepreneurship/Financial Engineering
- M. Tech. - Fibre Optics and Light wave Engineering
- M. Tech. - Microelectronics and VLSI Design
- M. Tech. - RF and Microwave Engineering

- M. Tech. - Telecommunication Systems Engineering
- M. Tech. - Visual Information and Embedded Systems Engineering

### **Geology and Geophysics**

- M.Sc. - Exploration Geophysics (M.Sc. 5Yr.)
  - M.Sc. Applied Geology (5Yr. M.Sc.)
  - M.Sc. – Geophysics (2Yr. M.Sc.)
- M.Sc. - Geology (2Yr. M.Sc.)
- Joint M.Sc.- Ph.D. in Geophysics
- Joint M.Sc.- Ph.D. in Geology
- M. Tech. - Exploration Geosciences

### **Humanities and Social Sciences**

- M.Sc. - Economics (M.Sc. 5Yr.)
- Master of Human Resource Management

### **Industrial and Systems Engineering**

- B.Tech.- Industrial Engineering
- Dual Degree - Industrial Engineering/ Industrial Engineering & Management
- Dual Degree – Quality Engineering Design and Manufacturing (Quality Engineering Design and Manufacturing (Industrial Electronics Vertical)
- Dual Degree – Quality Engineering Design and Manufacturing (Quality Engineering Design and Manufacturing (Mechanical Engineering Vertical)
- Dual Degree - Industrial Engineering/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Industrial Engineering and Management

### **Materials Science**

- M. Tech. - Materials Science and Engineering.

### **Mathematics**

- M.Sc. - Mathematics & Computing (M.Sc. 5Yr.)
  - M.Sc. – Mathematics (2Yr. M.Sc.)
- Joint M.Sc.- Ph.D. in Mathematics
- M. Tech. - Computer Science and Data Processing

### **Mechanical Engineering**

- B.Tech.- Mechanical Engineering
- B.Tech.- Manufacturing Science & Engineering
- Dual Degree - Mechanical Engineering/ Manufacturing Science and Engineering

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

### **Metallurgical and Materials Engineering**

- B.Tech.- Metallurgical and Materials Engineering
- Dual Degree - Metallurgical & Materials Engineering / Metallurgical & Materials Engineering
- Dual Degree - Metallurgical & Materials Engineering/ Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Metallurgical and Materials Engineering

### **Mining Engineering**

- B.Tech.- Mining Engg.
- Dual Degree - Mining Engineering/ Mining Engineering
- Dual Degree - Mining Engineering/ Safety Engineering
- Dual Degree - Mining Engineering/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Mining Engineering

### **Ocean Engineering and Naval Architecture**

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

### **Physics and Meteorology**

- M.Sc. - Physics (5Yr. M.Sc.)
- M.Sc. – Physics (2Yr. M.Sc.)
- Joint M.Sc.- Ph.D. in Physics
- M. Tech. - Solid State Technology

**Rajendra Mishra School of Engineering Entrepreneurship**

- Dual Degree - B.Tech. in Parent Dept/ Entrepreneurship Engineering

**Rajiv Gandhi School of Intellectual Property Law**

- Bachelor of Laws - Intellectual Property Law (3 Years)

**Ranbir & Chitra Gupta School of Infrastructure Design and Management**

- M. Tech. - Infrastructure Design and Management

**Reliability Engineering**

- M. Tech. - Reliability Engineering

**Rubber Technology**

- M. Tech. - Rubber Technology

**School of Information Technology**

- M. Tech. - Information Technology

**School of Medical Science and Technology**

- Master of Medical Science and Technology (3 Years)
- M.Tech – Medical Imaging and Informatics

**School of Water Resources**

- M. Tech. - Water Engineering and Management

**Vinod Gupta School of Management**

- MBA - Business Administration (2 Years) • Executive MBA (3 Years)
- EMBA

# Department of Aerospace Engineering

## *Head*

Prof. Bhriugu Nath Singh

## *Professors*

Datta, Prosun Kumar

*Ph.D.(Georgia Tech)*, Aerospace Structures

Maiti, Dipak K

*Ph.D.(IIT Kharagpur)*, Aerospace Structures, Composite and Smart Structures, Structural Dynamics & Aeroelasticity, Design & Development of MR fluid damper & Landing Gear Dynamics, Structural Health Monitoring

Singh, Bhriugu Nath

*Ph.D.(IIT Kanpur)*, Smart and Composite Structures, Uncertainty Quantification in Aircraft Analysis & Design, Multi-scale Modelling, FGM Plates and Shells, Adaptive Nonlinear FEM, Aerospace Structures, Solid Mechanics

Singh, Navtej

*Ph.D.(IIT Kharagpur)*,

Sinha Mahapatra, Kalyan Prasad

*Ph.D.(IIT Kharagpur)*, Computational Fluid Dynamics, Aeroacoustics, Large Eddy Simulation, Fluid-Structure Interaction

## *Associate Professors*

Laha, Manas Kumar

*Ph.D.(IIT Kharagpur)*, computational fluid dynamics and flight mechanics

Pradhan, Suresh Chandra

*Ph.D.(IIT Kanpur)*, Aerospace structures, Nonlocal elasticity, FEM, FGM, Smart Structures, composite materials and nano-composites, Optimization

Roy, Arnab

*Ph.D.(IIT Kharagpur)*, Aerodynamics, Computational Fluid Dynamics

Sinha, Manoranjan

*Ph.D.(IIT Kanpur)*, Flight Dynamics Controls System-Identification Neural Networks

## *Assistant Professors*

Ghosh, Anup

*Ph.D.(IIT Kharagpur)*, Aerospace Structures, Composite Structures, Micro Air Vehicle

Ghosh, Somnath	<i>Ph.D. (T.U., Munich)</i> , DNS, LES, compressible turbulence, turbulence-radiation interaction, turbulent reacting flows, high performance computing
Joarder, Ratan	<i>Ph.D.(IISc. Bangalore)</i> , Numerical simulation of compressible and chemically reacting flows, Combustion Driven Shock Tunnel, Laser spectroscopy (new field), Two-Phase Flow Computations, Radiative heat transfer, Combustion
Karmakar, Srinibas	<i>Ph.D.(LSU, USA)</i> , Rocket and Gas Turbine Propulsion, Combustion, Combustion of Energetic Particles (Metals/Metalloids), Experimental Methods in Combustion, Atomization and Sprays
Kaushik, Mrinal	<i>Ph.D.(IIT Kanpur)</i> , Aero-acoustics studies on passive controlled axi-symmetric jets., Shock wave and boundary layer interactions studies in Ramjet Intakes., Shock wave and boundary layer interactions studies in Hypersonic vehicles., Passive controlled aerodynamic mixing studies on axi-symmetric jets.
Peyada, Naba Kumar	<i>Ph.D.</i> , System Identification/Parameter Estimation - Neural Networks, Flight Dynamics & Control and Flight Testing, Design Guidance and Control of Rockets Parafoil UAV MAV WIG-Craft etc.
Saha, Sandeep	<i>Ph.D.(Imperial College, London)</i> , Fluid Mechanics

### ***Thrust Areas***

1. Unmanned Aerial Vehicles and related Technologies
2. Smart and Composite Structure
3. Experimental and Computational Research on Turbulent Flows
4. Propulsion & Combustion
5. Flight Dynamics & 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. Large eddy simulation of turbulent flow. Flow-induced vibration and fluid-structure interaction. Development of micro-aerial vehicles

***Academic Performance***

Awards & Honours	2
Member - Professional Bodies	16
Member - Editorial Board	4
Visits Abroad by Faculty Members	1
Lectures by Visiting Experts	8
Doctoral and MS Degrees Awarded	6
Sponsored Research Projects	19
Seminars, Conferences and Workshops Organised	1
Short-Term Courses and Training Programmes organised	3
Papers Published in Journals	37
Papers Presented in Conferences	21

# Department of Agricultural & Food Engineering

## *Head*

Prof. Virendra Kumar Tewari

## *Professors*

Banerjee, Rintu	<i>Ph.D.(IIT Kharagpur)</i> , Food Biotechnology, Bioenergy, Enzymology & its Biotechnological applications, Protein Chemistry
Bhadoria, P B Singh	<i>Ph.D.(IIT Kharagpur)</i> , Development and Transfer of Rural Technlogy, Soil Science & Plant nutrition
Chatterjee, Chandranath	<i>Ph.D (IIT Kharagpur)</i> , Flood Forecasting, Design Flood Estimation, Flood Inundation Modeling and Hazard Assessment, Remote Sensing and GIS Applications in Surface Water Hydrology, Hydrological Modeling
Das, Bhabani Sankar	<i>Ph.D.(Kansas)</i> , Digital soil mapping and hyperspectral remote sensing, Pedotransfer functions and scaling, Water and solute transport, Unsaturated zone hydrology, Measurement and modeling in agricultural systems, Contaminant transport
Das, Susanta Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Mechanized Food Processing and Food Engineering, By-product utilization, Microwave application in popping of grain, Pneumatic polishing of rice
Datta, Ashis Kumar	<i>Ph.D.(Pennsylvania)</i> , Dairy and Food Process Engineering, Process Systems Analyses and Simulations
Dutta Gupta, Snehasish	<i>Ph.D.(Kalyani Univ)</i> , Plant Tissue Culture Engineering, Plant Image Analysis, Impact of LED on Plant Morphogenesis
Ghosh, Bijoy Chandra	<i>Ph.D.(IIT Kharagpur)</i> , Soil less culture Organic farming Tea production and processing
Goswami, Tridib Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Cold Storage, CA and MA storage of fruits and vegetables, Cryogenic grinding of spices, Discrete Element Analysis of grinding, CFD analysis of temperature distribution in precooler
Jha, Madan Kumar	<i>Ph.D.(Japan)</i> , Groundwater Management using RS-GIS and MCDM Techniques, Basin-wide Simulation-Optimization Modeling of Groundwater Systems, Inverse Modeling for Aquifer Parameter



	Estimation, Rainwater Harvesting and Artificial Recharge, Groundwater Investigation-Recharge Analysis and Seawater Intrusion
Mal, Bimal Chandra	<i>Ph.D.(IIT Kharagpur)</i> , Aquacultural Engineering
Mallick, Nirupama	<i>Ph.D.(BHU, Varanasi)</i> , Microalgal Biofuel, Biodegradable Polymers (Polyhydroxyalkanoates) from Cyanobacteria, Bioremediation with Microalgae, Bioactives from Microalgae, Cyanobacterial Biofertilizer
Mishra, Hari Niwas	<i>Ph.D.(IIT Kharagpur)</i> , Algal Food Biotechnology, RTE Health Foods & Nutraceuticals, Innovative Food Processing Technologies, Horticultural & Plantation Crop Products Processing, Food Safety & Quality Control, High pressure processing of high value perishables
Mitra, Adinpunya	<i>Ph.D.(East Anglia UK)</i> , Diversion from phenolics to volatile terpenoids biosynthesis in transformed roots of carrot, Understanding molecular oscillations of scent volatiles emission in evening blooming flowers, Evaluating metabolic perturbations in genetically-engineered root cultures of tobacco, Identification of flavour trait(s) in Darjeeling tea accessions by targeted metabolomics, Selection of superior scented rice cultivars through targeted metabolomics, Improvement of floral scent in evening-blooming plants by induced mutagenesis, Ultrastructural analysis of floral tissues for understanding scent volatiles emission
Panda, Rabindra Kumar	<i>Ph.D.(IARI Delhi)</i> , Watershed Management, Non-point Source Pollution of Soil & Water, Climate Change Effect on Agriculture, Rainwater Management
Panda, Sudhindra Nath	<i>Ph.D.(PAU, Ludhiana)</i> , Integrated Land and Water Resources Planning and Management, Water Conservation and Reuse for Climate Resilient Agriculture
Pandey, Keshaw Prasad	<i>Ph.D.(IIT Kharagpur)</i> , 1 Tractor power systems 2. Traction modelling 3. Precision agriculture
Raghuwanshi, Narendra Singh	<i>Ph.D.(California)</i> , Irrigation and Water Management, Hydrological Modelling, Watershed Management
Raheman, Hifjur	<i>Ph.D.(Bangkok)</i> , Development of farm Implements, Biofuel production and hybrid power generation, Traction and tillage performance improvement in walking tractor
Singh, Rajendra	<i>Ph.D.(IIT Kharagpur)</i> , Hydrological Modelling, Irrigation System

## Mangement

- Tewari, Virendra Kumar *Ph.D.(IIT Kharagpur)*, Farm Machinery & Power, Ergonomics & Safety, Precision Agriculture
- Thomas, E V *Ph.D.(IIT Kharagpur)*, Farm Machinery & Power, Rice Transplanter, Tea Process Machinery, Rural and cottage industries machinery
- Tiwari, Kamlesh Narayan *Ph.D.(IARI Delhi)*, Micro Irrigation, Greenhouse Technology, Remote Sensing & GIS Applications in Water Resources and Watershed Management

## ***Associate Professors***

- Das, Madhusweta *Ph.D.(Jadavpur Univ)*, Functional Foods, Starch based edible and biodegradable film, Utilisation and isolation of bioactive component from food waste
- Mishra, Ashok *Ph.D.(IIT Kharagpur)*, Hydrological modelling & Watershed management, Crop yield modelling, Climate change analysis & applications in water and crop management
- Mitra, Arunabha *Ph.D.(Calcutta Univ)*, Value based education, Waste utilization in aquaculture, Ecology and environmental pollution, Chemical-free farming, Mind and consciousness, Stress management and control
- Srinivasa Rao, Pavuluri *Ph.D.(IIT Kharagpur)*, Recirculatory Aquacultural Systems, Post Harvest & Food Process Engineering, High Pressure Processing of High Value Perishable Commodities, Grain Storage Structures and Stored Grain Quality, Non-thermal Methods of Food Processing, Water and Energy Conservation in Food Processing Industries
- Srivastav, Prem Prakash *Ph.D.(IIT Kharagpur)*, Food Science and Technology
- Swain, Dillip Kumar *Ph.D.(IIT Kharagpur)*, Sustainable & Precision Production Agriculture, Climate Change Adaptations & Mitigations, Crop Growth & Yield Simulation

## ***Assistant Professors***

- Guha, Proshanta *Ph.D.(IIT Kharagpur)*, 1.Agronomy 2.Post-harvest Technology 3.Forest and Wasteland Management 4.Weed & Water Management

Mailapalli, Damodhar Rao	<i>Ph.D.(IIT Kharagpur)</i> , Agricultural water and waste management, Irrigation hydraulics and modeling, Nonpoint source agricultural pollution, Nanomaterials in Agriculture
Mitra, Jayeeta	<i>Ph.D.(IIT Kharagpur)</i> ,
Mukherjee, Chanchal Kumar	<i>MS (New Jersey)</i> , Cage for mariculture
Nalavade, Parish Prakash	<i>D. Eng. (A I T, Thailand)</i> , Tillage and Traction, Soil-Tool Interaction, Precision Agriculture
Shrivastava, Shanker Lal	<i>Ph.D.(IIT Kharagpur)</i> , Post Harvest Engineering, Dairy & Food Process Engineering, Development of low cost - farm level processing equipment
Tripathy, Punyadarshini Punam	<i>Ph.D.(IIT Delhi)</i> , Heat and Mass transfer during drying of food products, Mathematical modeling and simulation in food drying process, CO2 mitigation in solar dryers, CO2 capture and storage

### ***Visiting Faculty***

Machavaram, Rajendra	<i>Ph.D.(IIT Madras)</i> , Design Optimization, Artificial Intelligence and Evolutionary Algorithms, Vibration based Structural Health Monitoring (SHM), Farm Machinery and Renewable Energy
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### ***Thrust Areas***

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

### ***Brief Description of on-going activities***

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

### ***Academic Performance***

Awards & Honours	10
Member - Professional Bodies	133
Member - Editorial Board	49
Visits Abroad by Faculty Members	22
Lectures by Visiting Experts	3
Doctoral and MS Degrees Awarded	15
Sponsored Research Projects	79
Consultancy Projects	27
Technology Transferred	24
Patents (filed / granted)	23
Seminars, Conferences and Workshops Organised	12
Short-Term Courses and Training Programmes organised	16
Books Published	4
Papers Published in Journals	129
Papers Presented in Conferences	80

# Department of Architecture & Regional Planning

## *Head*

Prof. Subrata Chattopadhyay

## *Professors*

- Banerjee, Uttam Kumar *Ph.D.(IIT Kharagpur)*, Facility Planning, Environmental Management, Disaster Management, Architecture and Urban Planning, Landscape Planning, Infrastructure Information Systems, CAD and GIS
- Barman, Jaydip *Ph.D.(IIT Kharagpur)*, Urban Design, Green Buildings and Eco Habitat, Tourism Planning and Management, Urban Waterfront Development, Crime Prevention through Landscape Design in Urban Public Spaces
- Chattopadhyay, Subrata *Ph.D.(IIT Kharagpur)*, Effect of transit on housing choice, peri urban dynamics, energy efficient intervention in affordable housing, identifying intangibles in Relief and Rehabilitation package, Indicators for mixed use development
- Datta, Rabindranath *Ph.D.(IIT Kharagpur)*, City Planning, Urban and Regional Transportation Planning
- Sen Gupta, Biplab Kanti *MCP(IIT Kharagpur)*, Architectural Design for Institutional Buildings, Development Management and Finance, Urban and Regional Planning, Architecture and Urban Design
- Sen, Joy *Ph.D.(IIT Kharagpur)*, Community and Regional Planning Analyses & Programming, Architecture and Planning related Heritage Studies and Documentation

## *Associate Professors*

- Basu, Sanghamitra *Ph.D.(IIT Kharagpur)*, Cultural Heritage Planning & Management, Urban Conservation & Heritage Management, Architectural Design and Pedagogy, Quality of Life in Residential Neighbourhoods with focus on needs of senior citizens, Traditional Architectural and application of Shape Grammar, GIS in Urban Planning, Post Modernism & Contemporary Architecture, Quality of Life and Social Cohesion in various types of built environment
- George, Abraham *Ph.D.(Calicut University)*, Architecture Design-Pedagogy-Sustainable

Age-friendly Designs-Landscape-Elderly Housing-Preservation

Mazumder, Tarak Nath

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

Pandit, Debapratim

*Ph.D.(Univ. of Tokyo)*, Transportation Planning, Urban Infrastructure utilities and services, Urban Environmental Planning & Management

Sen, Somnath

*Ph.D.(IIT Kharagpur)*, Environmental Planning, Land Use and Development Control Planning

***Assistant Professors***

Banerji, Haimanti

*Ph.D.(IIT Kharagpur)*, Barrier Free Architecture, Behavioral Architecture, Urban Design, Town Planning and Settlement Planning, Ergonomics and Product Design, Housing and Neighbourhood Planning

Bhattacharya, Shankha Pratim

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

Chakraborty, Banhi

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

Das, Sutapa

*Ph.D. (National University of Singapore)*, High performance and intelligent building, Building -occupant interaction, Construction project management, Building technology (systems\_services\_materials and construction methods), Maintainability and facilities management

Ghosh, Mainak

*M.Design(IIT Kanpur)*, Visual Communication Design and Architecture & Urban Design, Visual Thinking & Creativity, Interaction Design - Space. Form. Perception., New Media-Architecture-Urban Design

Gupta, Sumana

*Ph.D.(IIT Kharagpur)*, Neighbourhood Planning, Architectural Design, Service Quality Evaluation, Facility Planning

Majumdar, Tapan Kumar

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

Paul, Saikat Kumar

*Ph.D.(IIT Kharagpur)*, Computer Application in Built Environment, GIS and Remote Sensing in Planning, Urban and Regional Planning, Architectural Design, Environmental Planning

### ***Thrust Areas***

1. Green Architecture sustainable and Energy efficient designs
2. Urban information system
3. Universal Design in Built Environment
4. Advanced Housing Research
5. Transportation Research
6. Geo informatics

### ***Brief Description of on-going activities***

Architectural Design, Building Science and Environmental Planning: (Performance studies, 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)

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

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

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)

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

### ***Academic Performance***

Awards & Honours	2
Member - Professional Bodies	56
Member - Editorial Board	14
Visits Abroad by Faculty Members	2
Lectures by Visiting Experts	7
Sponsored Research Projects	34
Consultancy Projects	29
Seminars, Conferences and Workshops Organised	8
Books Published	2
Papers Published in Journals	30
Papers Presented in Conferences	18

# Department of Biotechnology

## *Head*

Prof. Tapas Kumar Maiti

## *Professors*

Das, Amit Kumar	<i>Ph.D.(Calcutta Univ)</i> , Structural Biology and Biochemistry, Crystallographic study of proteins from <i>M.tuberculosis</i> and <i>S. aureus</i> , Structural Bioinformatics
Das, Debabrata	<i>Ph.D.(IIT Delhi)</i> , Biohydrogen production processes, Algal Biorefinery, Microbial Electrochemical Cell
Dey, Satyahari	<i>Ph.D.(IIT Kharagpur)</i> , Bio-prospecting genes & molecules. Molecular profiling Antarctic flora. Nutraceutical Bioinnovation
Ghosh, Ananta Kumar	<i>Ph.D.(Calcutta Univ)</i> , Recombinant DNA Technology, Hybridoma Technology, Molecular Virology, Antimicrobial peptides
Ghosh, Sudip Kumar	<i>Ph.D.(Kalyani Univ)</i> , Plant Molecular Biology, Nanobiotechnology, Molecular and Cellular Parasitology
Kundu, Subhas Chandra	<i>Ph.D.(BHU, Varanasi)</i> , Cell based tissue engineering and regenerative medicine, Silk biomaterials and bioactive molecule delivery
Maiti, Tapas Kumar	<i>Ph.D.(Kalyani Univ)</i> , Plant lectins and lectin derived peptides in cancer therapy, Mushroom derived glucans as immunomodulators, Biomicrofluidics and biochip development, Tissue engineering through top down and bottom up approach
Sen, Ramkrishna	<i>Ph.D.(IIT Madras)</i> , Biosensor, Algal Biofuels and Bio-CCS, Microalgal & Microbial Biorefinery for Biorenewables, Bioprocess Development Modeling & Optimization, Marine Biotechnology, Biochemical Engineering, Enzymes and Biofuels Technology, Bioenergy, Probiotics and Nutraceuticals, Environmental Biotechnology

## *Associate Professors*

Bahadur, Ranjit Prasad	<i>Ph.D.(Jadavpur Univ)</i> , Bioinformatics and Computational Structural Biology
Ghosh, Anindya Sundar	<i>Ph.D.(Calcutta Univ)</i> , Microbial genetics, Antimicrobial



chemotherapy, Bacterial cell surfaces and biofilm formation, Physiology and Biochemistry of Penicillin-binding proteins (PBPs)

Maiti, Mrinal Kumar

*Ph.D.(Calcutta Univ)*, Metabolic engineering of plant and fungal storage-lipids, Functional genomics of rice crop for improved productivity, Bioprospecting of endophytic microbes for healthcare products

Sar, Pinaki

*Ph.D.(BHU, Varanasi)*, Geomicrobiology of arsenic contaminated Bengal delta aquifer, Metagenomics of petroleum hydrocarbon waste and bioremediation, Exploration of microbial diversity and biogeochemistry in deep biosphere, Microbial diversity and bioremediation of Acid Mine Drainage

### ***Assistant Professor***

Ganguly, Agneyo

*Ph.D.(IICB, Kolkata)*, DNA repair mechanisms in kinetoplastid parasites, DNA repair mechanisms in response to topoisomerase I poisoning

### ***Thrust Areas***

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

### ***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*. Characterisation of *E. histolytica* surface proteins. 8. Molecular cloning, expression and characterization of of *E. invadens* encystation specific proteins. 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 cytopovirus 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. Identification and characterization of immunomodulator from natural sources. 19. Microbial fuel cell 20. Characterization of Antarctic microbiota 21. Probiotic nutraceutical development

### ***Academic Performance***

Awards & Honours	3
Member - Professional Bodies	42
Member - Editorial Board	11
Visits Abroad by Faculty Members	15
Lectures by Visiting Experts	8
Doctoral and MS Degrees Awarded	13
Sponsored Research Projects	70
Consultancy Projects	3
Patents (filed / granted)	5
Seminars, Conferences and Workshops Organised	3
Short-Term Courses and Training Programmes organised	1
Books Published	1
Papers Published in Journals	77
Papers Presented in Conferences	39

# Department of Chemical Engineering

## *Head*

Prof. Sirshendu De

## *Professors*

Basu, Jayanta Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Adsorption and Separation Science, Waste Water Treatment, Reaction Engineering
Das, Gargi	<i>Ph.D.(IIT Kharagpur)</i> , Multiphase flow, Two phase instrumentation, CFD simulation, Process Intensification
DasGupta, Sunando	<i>Ph.D.(RPI, USA)</i> , Microscale Transport Process and Microfluidics
De, Sirshendu	<i>Ph.D.(IIT Kanpur)</i> , Membrane separations, Transport Processes, Flow through microchannels
Kundu, Gautam	<i>Ph.D.(IIT Kharagpur)</i> , Multiphase Operation, Mineral Beneficiation, Rheology of Suspension, Catalysis
Meikap, Bhim Charan	<i>Ph.D.(IIT Kharagpur)</i> , Industrial Environmental Pollution Monitoring & Control, Coal Beneficiation, CO <sub>2</sub> Capturing, Fluidization
Mukherjee, Dibyendu	<i>Ph.D.(IIT Kharagpur)</i> , Multi Phase Flow, Column Flotation, Modeling & Simulation
Neogi, Sudarsan	<i>Ph.D.(Ohio Univ., USA)</i> , Surface Modification And Engineering of Polymer Substrates For Biomedical Applications, Plasma Enhanced Chemical Vapor Deposition, Plasma Sterilization, Adhesive Development, Antimicrobial Coatings, Modeling And Simulation Of Chemical Process Plant, Environmental Pollution Control, Polymer Composites
Pradhan, Narayan Chandra	<i>Ph.D.(UDCT Bombay)</i> , Heterogeneous Catalysis, Chemical Process Development, Petrochemical Technology, Petroleum Refining, Separations Technology
Samanta, Amar Nath	<i>Ph.D.(IIT Kharagpur)</i> , Process Dynamics & Control, Nonlinear Process Control, Process Modeling & Simulation, Carbon Capture & Sequestration

***Associate Professors***

Chakrabarty, Saikat	<i>Ph.D.(Univ. of Houston)</i> , Chemical Reaction Engineering, Biomedical Engineering, Bioenergy
Chakraborty, Sudipto	<i>Ph.D.(IIT Kharagpur)</i> , Computer Aided Process Engineering, Heat Transfer, Ultra-fast cooling of steel
Ganguly, Somenath	<i>Ph.D.(Univ. of Kansas, USA)</i> , Flow in thin channel and porous media, Hydrogel, Improved recovery of hydrocarbon
Kar, Debdulal	<i>Ph.D.(IIT Kharagpur)</i> , Mineral Processing, Fluidization Engineering, Biogas Development
Mukherjee, Rabibrata	<i>Ph.D.(IIT Kanpur)</i> , Polymer Thin Film Instability, Soft Lithography, Structural Super Hydrophobicity, Colloidal Crystals, Soft Nano Fabrication, Sol - Gel Thin Films
Neogi, Swati	<i>Ph. D.(Ohio University)</i> , Innovative composite technology, Lifetime and reliability study, Materials development, Composite fabrication technology
Sengupta, Sonali	<i>Ph.D.(UDCT Mumbai)</i> , Reaction Engineering, Petroleum engineering, Heterogeneous and Homogeneous Catalysis

***Assistant Professors***

Atta, Arnab	<i>Ph.D. (IIT Delhi)</i> , Computational Fluid Dynamics, Multiphase Flow, Complex Fluids, Process Intensification, Interfacial Science and Engineering
Chakraborty, Jayanta	<i>Ph.D.(IISc., Bangalore)</i> , Particle technology, Population balance modeling, Synthesis of nanoparticles, Preparation of AZO coated glass., Manufacturing of nanomaterial based solar cells
Deshpande, Parag Arvind	<i>Ph.D.(IISc., Bangalore)</i> , Electronic structure calculations, Computational materials science, Mathematical biology
G, Harikrishnan	<i>Ph.D.(IIT Bombay)</i> , polymeric foams, polymer nanocomposites, rheology, polymeric coatings
Jana, Amiya Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Renewable energy, Process intensification, Nonlinear control, Modeling and simulation, Desalination, Fuel cell

Padmanabhan, Venkat	<i>Ph.D.(Columbia Univ.)</i> , Advanced Functional Materials, Polymer Nanocomposites, Bio-Mechanics of <i>C. elegans</i> , Organic Photovoltaics
Ray, Subhabrata	<i>M.Tech.(IIT Kharagpur)</i> ,
Sarkar, Debasis	<i>Ph.D.(IISc. Bangalore)</i> , Optimization and control of fed-batch bioreactors, Crystallization process engineering, Multi-objective optimization: Genetic Algorithms, Multivariate image analysis, Computational systems biology

### ***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. Microscale transport processes and microfluidics
13. Column Flotation

### ***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 SO<sub>2</sub> and fly ash 10. Technology of composite materials 11. Pattern Formation of Soft Materials utilizing Interfacial Instability 12. Microscale transport processes and microfluidics including droplet based digital microfluidics 13. Training of Personnel for construction and maintenance of Bio Gas Plants. 14. Beneficiation of Coal and Mineral by Column Flotation Cell.

### ***Academic Performance***

Awards & Honours	1
Member - Professional Bodies	51
Member - Editorial Board	5
Visits Abroad by Faculty Members	5
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	10
Sponsored Research Projects	70
Technology Transferred	1
Patents (filed / granted)	9
Short-Term Courses and Training Programmes organised	1
Papers Published in Journals	76
Papers Presented in Conferences	12

# Department of Chemistry

## *Head*

Prof. Tanmaya Pathak

## *Professors*

Bandyopadhyay, Sanjoy	<i>Ph.D.(IISc Bangalore)</i> , Protein folding, Theoretical and Computational Chemistry, Hydration properties of bio-molecules, Self-assembled molecular films at interfaces, Protein-ligand complexes, Phospholipid membranes, Cyclodextrin-guest interaction, Intrinsically disordered proteins
Basak, Amit	<i>Ph.D.(Cal),D.Phil.(Oxon)</i> , Bioorganic/Medicinal Chemistry/Selective protein capture/Synthetic Chemistry
Bhattacharjee, Manish	<i>Ph.D.(NEHU)</i> , Catalysis, Synthetic Inorganic Chemistry
Biradha, Kumar	<i>Ph.D.(Hyderabad)</i> , Gas sorption studies, Supramolecular Chemistry, Crystal Engineering, Polymorphism, Coordination Polymers, Structural Chemistry, Solid state reactions, Soft materials
Chattaraj, Pratim Kumar	<i>Ph.D.(IIT Bombay)</i> , Density functional theory, Chemical reactivity, ab initio calculations, Quantum chaos, Aromaticity in metal clusters
Dasgupta, Swagata	<i>Ph.D.(RPI New York)</i> , Protein-protein and Protein-small molecule interactions, Protein aggregation studies
Dey, Joykrishna	<i>Ph.D.(Kanpur)</i> , Molecular Self-assembly, Colloidal Drug Delivery Systems, Polymer- and Protein-Surfactant Interactions, Low-Molecular-Weight Amphiphilic Gelators
Hajra, Saumen	<i>Ph.D.(Pune Univ)</i> , Catalytic Asymmetric Reactions, Organocatalysis, Total Synthesis of Biologically Active Compounds
Mal, Dipak Ranjan	<i>Ph.D.(Missouri)</i> , Benzannulation and Hauser annulation, Lateral lithiation Michael-initiated ring closure, Total synthesis of bioactive natural products: angucyclines anthracyclines carbazoles quinonoids, Oxidative dearomatization, Carbonyl-ene reaction
Pal, Tarasankar	<i>Ph.D.(Burdwan Univ.)</i> , <i>D.Sc.(Visva Bharati Uni)</i> , Catalysis, Spectroscopy, Nanoscience

Pathak, Tanmaya	<i>Ph.D.(Uppsala Sweden)</i> , Carbohydrates. Nucleosides. Heterocycles. Carbocycles. Dinucleosides as Rnase A inhibitors
Pramanik, P	<i>Ph.D.(IIT Kharagpur)</i> , Nanoscience and Nanotechnology, Material Chemistry
Raj, C Retna	<i>Ph.D.(M.K Univ Madurai)</i> , Optical and electrochemical sensors, Electrocatalysis and fuel cell, Inorganic multifunctional nanomaterials, Energy conversion and storage devices
Ray, Debashis	<i>Ph.D.(Jadavpur Univ)</i> , High nuclearity coordination clusters of transition metal ions., Solution coordination chemistry and crystal structures., Coordination driven supramolecular metal complex chemistry., Cluster coordination chemistry., Synthesis of ferromagnetic and single molecule magnetic metal complexes., Interaction of DNA and cleavage by heterometallic alkali metal-transition metal clusters., Self-assembly of dinuclear copper(II) motifs and mechanochemical core conversions., Multimetallic constellation through ligand arm hydrolysis., Coordination driven fluorescence enhancement., Evaluation and fluorescence study of metal complexes., Catechol oxidation study using metal complexes.
Ray, Jayanta Kumar	<i>Ph.D.(Calcutta Univ)</i> , Synthetic Organic Chemistry
Sarkar, Nilmoni	<i>Ph.D.(Jadavpur Univ)</i> , Characterization of Ionic Liquid containing Microemulsion, Photoinduced electron transfer in RTIL and RTIL containing confined media., Photophysics and Photodynamics of biologically relevant molecules, Excited state intramolecular proton transfer in organized assemblies, Characterization of surface active ionic liquids, Fluorescence Correlation Spectroscopy, Fluorescence lifetime imaging microscopy in single molecular level
Sarkar, Tarun Kumar	<i>Ph.D.(Calcutta Univ)</i> , Synthetic Organic and Organometallic Chemistry
Srivastava, Suneel Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Semiconducting/Magnetic/Graphitic materials/Natural and Synthetic Clay, Polymer Nanocomposites, Thermoelectric Nanomaterials, Energy (Lithium Ion Battery, Environmental Pollution (EMI shielding and Water purification) and Sensors
Taraphder, Srabani	<i>Ph.D.(IISc Bangalore)</i> , Theoretical Physical Chemistry, Computer Simulation of Charge Transfer Processes, Theoretical Modelling of Functionalized Carbon Nanotubes



### ***Associate Professors***

Dhara, Dibakar	<i>Ph.D.(Osmania Univ. Hyderabad)</i> , Synthetic Polymer Chemistry, Colloids and Nanomaterials, Physical Chemistry of Macromolecules
Halder, Mintu	<i>Ph.D.(IACS Kolkata)</i> , Experimental Physical Chemistry, Biophysics, Photophysics of Nano-materials, Spectroscopy
Mahanty (Pathak), Amita	<i>Ph.D.(IIT Kharagpur)</i> , Synthesis and Characterization of Inorganic Nanomaterials and their Biological Application
Mani, Ganesan	, Main group and transition metal organometallics and catalysis
Nag, Ahindra	<i>Ph.D.(Jadavpur Univ)</i> , Isolation and characterization of natural products, Synthesis of important compounds ( enzymatically)
Nanda, Samik	<i>Ph.D.(IICT-Hyderabad)</i> , Application of enzymes and microorganisms in organic synthesis, Total synthesis of complex natural products, Asymmetric synthesis
Rajakumar Ananthkrishnan	<i>Ph.D.(M.K.Univ., Madurai)</i> , Analytical Methods for the detection of heavy metals/water pollutants/ROS (in AOP)., Preparation of hybrid/mixed metal oxides/nanomaterials for photocatalysis and surface applications, Green Methodolody for Selective Organic Transformation/photodegradation under visible light.
Singh, N D Pradeep	<i>Ph.D.(Madras Univ.)</i> , Development of fluorescent photoremovable protecting groups, Generation of Photoresponsive surfaces and their applications, Two photon induced nanocarrier for regulated drug delivery, Light induced controlled release of agrochemicals, Visible light induced photocatalysis for organic transformation, single component system for sensing and drug delivery

### ***Assistant Professors***

Ayyappan, Anoop	<i>Ph.D.(Univ. of Hyderabad)</i> , Computational Chemistry, Reaction Mechanisms, QM/MM studies of biological systems, Computational Photochemistry
Das, Madhab Chandra	<i>Ph.D.(IIT Kanpur)</i> , Porous Metal/Covalent Organic Frameworks (MOFs/COFs)
Jana, Partha Pratim	<i>Ph.D.(Univ. of Marburg, Germany)</i> , Solid State Chemistry &

crystallography

Maji, Modhu Sudan	<i>Ph.D.(Germany)</i> , Dual Catalysis & Asymmetric Synthesis (merging organo-catalysis with transition metal catalysis), Ru- and Rh-catalyzed selective C-H bond functionalization, N-tert.-butanesulfinyl imine in the synthesis of bio-active natural products, Multi Component Reaction in the light of Dual Catalysis
Mandal, Sukanta	<i>Ph.D.(IIT Kanpur)</i> , Synthetic Bioinorganic Model Chemistry, Bioinspired Redox Catalysis using Transition Metal Complexes, Development of Molecular Water Splitting Catalysts Based on Transition Metals
Mishra, Sabyashachi	<i>Ph.D.(Tech. Univ., Munich, Germany)</i> , Theory of Relativistic Vibronic Coupling in Molecular Physics, Relativistic Quantum Chemistry, Molecular Structure and Spectroscopy in Excited States, Reactive Processes in Biology, Network Dynamics in Bio-(chemical/physical) processes
Patra, Sanjib Kumar	<i>Ph.D. (IIT Kanpur)</i> , Inorganic Chemistry, Functional Polymer Chemistry, Organometallic Chemistry, Materials Chemistry
Samanta, Rajarshi	<i>Ph.D.(IICT, Hyderabad)</i> , Transition metal catalysis, Asymmetric synthesis, Total synthesis of natural products, Natural product inspired compound library

### ***Thrust Areas***

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

### ***Brief Description of on-going activities***

The department is actively pursuing research embracing both basic and applied aspects of chemistry. Currently, the department is handling over 40 sponsored projects from various agencies. The department is equipped with various sophisticated instruments: Bruker APEX SMART CCD Single Crystal diffractometer, Bruker AVANCE II 400 MHz and AVANCE II 200 MHz spectrometer, Shimadzu DT-40 model 883 IR Spectrometer, PW-17291710 X-Ray Diffractometer, Cyclic 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. Early transition metal based catalysts for aqueous medium polymerization and cationic ruthenium complexes as catalysts for various organic transformations. Synthesis of advanced functional materials for fuel cell application. Electrocatalyst for oxygen reduction and methanol oxidation. Development integrated biosensing platform clinical and environmental applications. In the field of Bioinorganic chemistry, research is being pursued on electron transfer processes with emphasis in dioxygen chemistry. Active research is also underway in the areas of crystal engineering and electroanalytical chemistry. Notable research on various aspects of nanochemistry involve development of metal nanoparticles, nanocrystalline ferrites, ceramics and composites. Materials for high temperature and superconducting applications and solar energy conversion is also underway. Catalysis involving photoactivation techniques and micelle stabilized nanoparticles are currently being investigated to solve environmental pollution related problems. Colloidal systems, especially vesicles formed by chiral surfactants and their potential applications in i.v drug delivery are being studied. Active research is also being carried out on the development of hydrogels and organogels for applications in transdermal drug delivery. Investigation of solution properties of a number of polymers using a variety of tools is in progress. Studies are also being conducted on the aggregation behavior of polyelectrolytes and block copolymers in aqueous media. Capillary electrophoresis is being employed for the chiral separation of drugs. Photophysical studies of different organic molecules in pure solution and organized assemblies are being investigated using fluorescence spectroscopy. Theoretical physical chemistry in the department includes studies relating to density functional theory, chemical reactivity, ab initio calculations, quantum chaos; chemical reaction dynamics in liquids and biological macromolecules, molecular modeling and computer simulation studies of complex biological systems such as: membranes, proteins etc. Protein structure analysis on the loop regions in proteins is also underway.

### ***Academic Performance***

Awards & Honours	9
Member - Professional Bodies	44
Member - Editorial Board	23
Visits Abroad by Faculty Members	7
Lectures by Visiting Experts	40
Doctoral and MS Degrees Awarded	23
Sponsored Research Projects	61
Seminars, Conferences and Workshops Organised	1
Papers Published in Journals	195
Papers Presented in Conferences	10

# Department of Civil Engineering

## *Head*

Prof. Subhasish Dey

## *Professors*

Baidya, Dilip Kumar	<i>Ph.D.(IISc Bangalore)</i> , Reliability in Geotechnical Engg Pile foundations Soil Dynamics
Barai, Sudhir Kumar	<i>Ph.D.(IISc Bangalore)</i> , Soft Computing Applications, Structural Health Monitoring, Recycled Construction Materials, Fracture in Concrete
Bhattacharya, Baidurya	<i>Ph.D. (Johns Hopkins Univ)</i> , Computational materials science, Risk and reliability analysis of infrastructure systems
Bhattacharyya, Sriman Kumar	<i>Ph.D.(IIT Kharagpur)</i> ,
Das Gupta, Shambhu Pada	<i>Ph.D.(IIT Kanpur)</i> , constitutive modelling Soil-Structure Interaction Foundation Dynamics
Desai, Venkappayya R	<i>Ph.D.(Clemson Univ)</i> , Integrated watershed/ water management & rainwater harvesting/ best management practices (BMPs), Surface water/ Groundwater Hydrology & combating climate change through Green Infrastructure, Hydraulics & Hydropower Engineering
Dey, Subhasish	<i>Ph.D.(IIT Kharagpur)</i> , Turbulence, Fluvial Hydraulics, Applied Hydrodynamics
Dhang, Nirjhar	<i>Ph.D.(IIT Kharagpur)</i> , Concrete, Dynamics and Control of Railway Bridges, Biomechanics
Ghangrekar, Makarand Madhao	<i>Ph.D (IIT Bombay)</i> , Microbial Fuel Cells, UASB reactor for anaerobic wastewater treatment, Water and Wastewater Treatment, Bioenergy recovery during waste management, Wastewater reuse
Gupta, Ashok Kumar	<i>Ph.D.(IIT Bombay)</i> , Water and Wastewater Treatment, Environmental Impact Assessment, Air Quality Management, Environmental Planning, Water Supply and Sanitation
Maitra, Bhargab	<i>Ph.D.(IIT Bombay)</i> , 1. Transportation Planning, 2. Traffic Operations and Management, 3. Public Transportation System, 4. Travel Behavior

Analysis and Demand Models

- Maity, Damodar *Ph.D.(IIT Kharagpur)*, Seismic Analysis of Dam, Health Monitoring of Structures, Cost Effective Housing
- Ramachandra, Lingadahally *Ph.D.(IIT Chennai)*, Stability of Structures, Nonlinear Vibrations, Impact Mechanics, Delaminations in Composites
- Reddy, Kusam Sudhakar *Ph.D.(IIT Kharagpur)*, Pavement analysis, Pavement Design, Pavement Evaluation, Pavement Materials
- Roy, Debasis *Ph.D.(Univ.of British Colo)*, Geotechnical Earthquake Engineering, Ground Improvement, Insitu testing of Geomaterials
- Sen Gupta, Aniruddha *Ph.D.(Illinois Univ)*, Geotechnical Earthquake Engineering, Landslide Hazard Mitigation, Mechanics of Materials, Soil-Structure Interaction
- Sen, Dhruvajyoti *Ph.D.(IIT Delhi)*, Water resources engineering, Numerical techniques in civil engineering hydraulics

***Associate Professors***

- Chakraborty, Sushanta *Ph.D.(IIT Kharagpur)*, Finite Element Model Updating and its application to FRP structures
- Dash, Sujit Kumar *Ph.D.(IIT Madras)*, Reinforced soil structures, Shallow foundation
- Deb, Arghya *Ph.D.(Princeton Univ)*, Failure and Debonding in concrete, Impact loading on concrete structures, Discrete Element Modelling
- Deb, Kousik *Ph.D.(IIT, Kanpur)*, Soil-Structure Interaction, Ground Improvement, Geosynthetic-Reinforced Earth, Numerical Modeling, Soil Arching, Foundation on Soft Soil, Geotechnical Earthquake Engineering, Optimization in Geotechnical Engineering
- Dubey, Brajesh Kumar *Ph.D.(Univ. of Florida, USA)*,
- Goel, Sudha *Ph.D.(Johns Hopkins Univ)*, Environmental Impact and Risk Assessment, Water Quality and Treatment, Solid and Hazardous Waste Management, Environmental Engineering

Maity, Rajib	<i>Ph.D.(IISc. Bangalore)</i> , Hydroclimatology, Water Resources Engineering, Stochastic Hydrology, Watershed Development, Soft Computing in Hydrology, Monsoon rainfall
Pal, Anjali	<i>Ph.D (Calcutta Univ.)</i> , Nanoparticle mediated wastewater treatment, Photocatalytic degradation of organic pollutants, Arsenic remediation in groundwater, Adsorption / adsolubilization for wastewater management
Reddy, M Amaranatha	<i>Ph.D.(IIT Kharagpur)</i> , Transportation Engineering
Verma, Shubha	<i>Ph.D.(IIT Bombay)</i> , Environmental Engineering, Air Pollution, Aerosol Modelling and Climate Impacts
<b><i>Assistant Professors</i></b>	
Banerjee, Biswanath	<i>Ph.D.(IISc., Bangalore)</i> , Computational Mechanics, Inverse Problems
Bhattacharya, Paramita	<i>Ph.D.(IISc. Bangalore)</i> , Computational Geotechnical Engineering, Soil Stabilization, Seismic Analysis of Underground Structures
Biligiri, Krishna Prapoorna	<i>Ph.D.(Arizona St. Univ. USA)</i> , Pavement Design & Analysis, Sustainable Materials in Highways & Environment, Advanced Pavement Materials Characterization, Transportation-Related Noise Evaluation & Modeling, Statistical Applications in Transportation Engineering & Constitutive Modeling, Pavement Performance & Management, Impact of Alternative Materials on Climate Change
Chakraborty, Debarghya	<i>Ph.D.(IISc Bangalore)</i> , Soil Dynamics, Computational Geomechanics, Reinforced Soil Structures, Geotechnical Earthquake Engineering
Dhar, Anirban	<i>Ph.D.(IIT, Kanpur)</i> , Groundwater Hydrology, Computational Hydraulics
Hossain, Shaikh Jahangir	<i>Ph.D.(IIT Kharagpur)</i> , computational mechanics, Finite Element Method, Nonlinear Mechanics
Mitra, Nilanjan	<i>Ph.D.(UW, SEATTLE)</i> , Earthquake loading of structures, Fluid Structure Interaction, Probabilistic modeling, MultiPhysics and Multiscale Mechanics of solids and fluids, High strain rate loading (shock waves and impact loading), Reinforced concrete and composite structures, Molecular dynamic simulations of shock loading of materials, Continuum Mechanics of defects in materials

Mitra, Sudeshna	<i>Ph.D.(ASU, Phoenix)</i> , Transportation Safety, Crash Data Analysis and Modelling, Statistical and Econometric Modelling of Transport data, Sustainable Transportation Planning, Traffic Engineering and Operations in heterogenous traffic
Reddy, Hanmaiahgari Prashanth	<i>Ph.D.(IIT Madras)</i> , Hydrodynamics, Turbulence, Sediment transport, Pipeline engineering, Unsteady flows
Shaws, Amit	<i>Ph.D.(IISc Bangalore)</i> , Computational Mechanics, Ballistic Response of Nano-Composite Armour, Impact Mechanics, Underwater blast

### ***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, slope stability, ground improvement, microbe-soil interaction, static and cyclic soil-structure interaction and foundation strengthening of monumental structures.

### ***Brief Description of on-going activities***

EnvE: Microbial Fuel Cells, wastewater treatment and energy recovery, on-site treatment of domestic sewage, granulation in UASB reactor treating low strength wastewater, water quality and health assessment, biological treatment of solid waste, nanoparticle synthesis, photodegradation of organic pollutants, adsorbilization/adsorption, modelling of tropospheric solid state polydisperse aerosols and ozone and assessment of pulmonary deposition; Monitoring and modelling of ambient air quality; 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<sup>+</sup> doped TiO<sub>2</sub>.

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

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

HWRE: Flow on turbulent submerged jets, Coherent turbulent structure over gravel beds and bed-forms, flood inundation models, drought characterization and forecasting, models for flood forecasting.

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

### ***Academic Performance***

Awards & Honours	5
Member - Professional Bodies	89
Member - Editorial Board	35
Visits Abroad by Faculty Members	8
Lectures by Visiting Experts	1
Doctoral and MS Degrees Awarded	3
Sponsored Research Projects	69
Consultancy Projects	59
Technology Transferred	1
Patents (filed / granted)	1
Seminars, Conferences and Workshops Organised	2
Short-Term Courses and Training Programmes organised	3
Books Published	2
Papers Published in Journals	108
Papers Presented in Conferences	50



# Department of Computer Science & Engineering

## *Head*

Prof. Rajib Mall

## *Professors*

Basu, Anupam	<i>Ph.D.(IIT Kharagpur),</i>
Chakrabarti, Partha Pratim	<i>Ph.D.(IIT Kharagpur), Artificial Intelligence, CAD for VLSI &amp; Embedded Systems, Design of Algorithms, Reliable and Fault Tolerant Systems</i>
Das, Partha Pratim	<i>Ph.D.(IIT Kharagpur), Image Processing, Software Engineering, Language Translation, Object-Oriented Analysis &amp; Design</i>
Dasgupta, Pallab	<i>Ph.D.(IIT Kharagpur), AI for Cyber-Physical Systems, Formal Methods, Electronic Design Automation</i>
Ganguly, Niloy	<i>Ph.D.(BESU, Calcutta), Peer-to-peer Networks, Online Social networks, Network Theory, Wireless Internet, Delay Tolerant Networks</i>
Ghose, Sujoy	<i>Ph.D.(IIT Kharagpur), System Intelligence, Networking, Algorithms</i>
Gupta, Arobinda	<i>Ph.D.(Iowa), Distributed Systems, Mobile Computing</i>
Kumar, Rajeev	<i>Ph.D.(Sheffield), Programming Language &amp; Software Engineering, Multiobjective Optimization &amp; Evolutionary Computing, EDA &amp; Embedded Systems, Multimedia Systems &amp; Video Transcoding, Education Standards &amp; Quality</i>
Majumder, Arun Kumar	<i>Ph.D.(Cal),Ph.D.(Florida), Database and Multimedia Systems, Information Security, Medical Informatics and Telemedicine</i>
Mall, Rajib	<i>Ph.D.(IISc Bangalore), program analysis and testing</i>
Mandal, Chittaranjan	<i>Ph.D.(IIT Kharagpur), VLSI CAD, Networking, Formal Verification</i>
Mukhopadhyay, Jayanta	<i>Ph.D.(IIT Kharagpur), Bio-Informatics, Medical Informatics, Image processing, Image Processing, Bio-informatics</i>

Pal, Ajit	<i>Ph.D.(Calcutta Univ)</i> , Embedded Systems, CAD for Low Power, Computer Networks
Pal, Sudebkumar Prasant	<i>Ph.D.(IISc Bangalore)</i> , Design and analysis of algorithms, Computational and combinatorial geometry, Graph theory and algorithms
Roychowdhury, Dipanwita	<i>Ph.D.(IIT Kharagpur)</i> , 1. Cryptography 2. Cellular Automata 3. Error Correcting Code
Sarkar, Dipankar	<i>Ph.D.(IIT Kharagpur)</i> , Formal Verification of circuits and systems, Logic and Automated theorem Proving
Sarkar, Sudeshna	<i>Ph.D.(IIT Kharagpur)</i> , Machine learning, Natural Language Processing, Data Mining, Information Retrieval
Sengupta, Indranil	<i>Ph.D.(Calcutta Univ)</i> , VLSI design and testing, Cryptography and network security, Reversible computing

***Associate Professors***

Bhowmick, Partha	<i>Ph.D.(ISI, Kolkata)</i> , Algorithmic Art, Geometric Algorithms, Computer Graphics, Visual Pattern Recognition, Digital Geometry, Combinatorial Image Analysis
Das, Abhijit	<i>Ph.D.(IISc Bangalore)</i> , Cryptography, Computational Number Theory, Parallel and Distributed Implementations
Mitra, Pabitra	<i>Ph.D.(ISI Calcutta)</i> , Machine Learning, Data Mining, Information Retrieval
Mukhopadhyay, Debdeep	<i>Ph.D.(IIT Kharagpur)</i> , Computer Architecture and Security, Cryptology, VLSI, Embedded systems for Cryptographic Systems, Side Channel Analysis

***Assistant Professors***

Bhattacharya, Sourangshu	<i>Ph.D.(IISc. Bangalore)</i> , Big Data Analytics, Machine Learning, Optimization, Internet Sciences
Chakraborty, R S	<i>Ph.D.(CWR Univ.USA)</i> , Hardware Security, Digital Watermarking, VLSI Design and Methodologies, Application of Novel Nano-devices to

## Hardware Security

Chakraborty, Sandip	<i>Ph.D. (IIT Guwahati), Wireless Networks, Mobile Computing, Distributed Computing</i>
Dey, Soumyajit	<i>Ph.D.(IIT Kharagpur), Formal Methods for Embedded System Design and Verification, High Performance Architecture, Assistive Technologies, For more information: <a href="http://cse.iitkgp.ac.in/~soumya/">http://cse.iitkgp.ac.in/~soumya/</a></i>
Goyal, Pawan	<i>Ph.D.(University of Ulster, UK), Natural Language Processing, Information Retrieval and Extraction, Sanskrit Computational Linguistics</i>
Mitra, Bivas	<i>Ph.D.(IIT Kharagpur), Technological network modeling, Complex and dynamic networks, Interdependent networks, Mobile networks</i>
Mitra, Pralay	<i>Ph.D.(IISc. Bangalore), Computational Biology, Bioinformatics</i>
Mukherjee, Animesh	<i>Ph.D.(IIT Kharagpur), Complex systems, language dynamics, social computation, web social media</i>

## ***Lecturer***

Dey, Partha Sarathi	<i>M.Tech.(IIT Kharagpur), Multi Core Architecture, Operating System, VLSI, Embedded Systems</i>
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## ***Thrust Areas***

1. Artificial Intelligence
2. VLSI Design and CAD tools
3. Cryptography
4. Hardware and Embedded Security
5. Natural Language Processing
6. Image Processing
7. Complex and Social Networks
8. Computational Biology and Bioinformatics
9. Algorithms Design and Analysis
10. Mobile and Wireless Network Research

***Brief Description of on-going activities***

Artificial Intelligence, Bioinformatics, Combinatorial and Computational Geometry, Computer Graphics, Digital Geometry, Design and Analysis of Algorithms, Graph/hypergraph theory and algorithms, Computer Networks, Cryptography, Hardware Security, Computer Architecture, 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, Complex Networks,

***Academic Performance***

Member - Professional Bodies	33
Member - Editorial Board	6
Visits Abroad by Faculty Members	10
Lectures by Visiting Experts	19
Doctoral and MS Degrees Awarded	30
Sponsored Research Projects	84
Consultancy Projects	11
Seminars, Conferences and Workshops Organised	3
Short-Term Courses and Training Programmes organised	1
Books Published	4
Papers Published in Journals	57
Papers Presented in Conferences	45

# Department of Electrical Engineering

## *Head*

Prof. Siddhartha Sen

## *Professors*

Barua, Alok	<i>Ph.D.(IIT Kharagpur)</i> , Fault Diagnosis of Analog and Mixed Signal Circuit Bio-reactor design and Instrumentation
Bhattacharya, Tapas Kumar	<i>Ph.D.(IIT Kharagpur)</i> ,
Chakraborty, Chandan	<i>Ph.D.(IIT Kharagpur)</i> , Electric Machines, Sensorless & Fault Tolerant Control of Industrial Drives, Power Electronics, Renewable Energy Systems, Solar Power Converters, Microgrid
Das, Debapriya	<i>Ph.D.(IIT Delhi)</i> , Microgrid Operation, Power System Operation and Control, Electric Power Distribution System.
Das, Sarit Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Control Systems
Dutta, Pranab Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Biomedical Image Processing, Signal processing, Optoelectronics and optical imaging, Pattern analysis and machine vision
Kastha, Debaprasad	<i>Ph.D.(Tennessee)</i> , Wind Electrical Systems, Switched Mode Power Supplies, Machine Drives
Kishore, N K	<i>Ph.D.(IISc Bangalore)</i> , Power and Energy Systems
Maka, Srinivasu	<i>Ph.D.(IIT Kharagpur)</i> , Control Systems & Instrumentation Engineering, Biomedical Engineering
Mohan, Bosukonda Murali	<i>Ph.D.(IIT Kharagpur)</i> , Computational Intelligence in Control Systems, Orthogonal Functions Applications in Control Systems, Control Systems
Mukhopadhyay, Siddhartha	<i>Ph.D.(IIT Kharagpur)</i> , Dynamic Systems Estimation and Control, Behavioral Modeling CAD and Testing of Analog and Mixed Signal VLSI Systems, Industrial Instrumentation Control and Automation, Aerospace Tracking Control and Guidance, Modeling Estimation and Control of Switching Circuits and systems, Failure

Diagnostics Prognostics and Tolerance for Vehicular and Industrial Systems, Validation of Cyber Physical Systems, Integrated Vehicle Health Management (IVHM), Electric and Hybrid Vehicles

Pal, Jayanta *Ph.D.(IIT Roorkee)*, Controller Design, Model Order Reduction, Power Systems Control, Genetic Algorithm Applications, Fractional Order Systems, Magnetic Levitation, Neural Networks

Patra, Amit *Ph.D.(IIT Kharagpur)*, DC Power Management, Embedded Control Systems, Fault Diagnostics and Prognostics, Analog and Mixed Signal VLSI Design

Pradhan, Ashok Kumar *Ph.D (Sambalpur Univ.)*, Power System Protection - Wide Area Measurement System- Smart Grid- Applied Signal Processing

Ray, Goshaidas *Ph.D.(IIT Delhi)*, Robust Stabilization, Time-Delay System, Decentralized Control and State Estimation, Intelligent Control, Network Control Systems

Routray, Aurobinda *Ph.D.(Sambalpur Univ)*, Cognitive Modelling and Human Monitoring, Embedded Systems Design for Real Time Signal and Image Processing, Data Driven Diagnostics and Prognostics

Sen Gupta, Sabyasachi *Ph.D.(IIT Kharagpur)*,

Sen, Siddhartha *Ph.D.(IIT Kharagpur)*, Fractional Order Circuits and Systems, Capacitive Sensors and MEMS, Control Allocation, Robust Control

Sinha, Avinash Kumar *Ph.D.(Pilani)*, Smart Grid, Electrical Energy Systems, Power Systems

#### ***Associate Professors***

Bajpai, Prabodh *Ph.D.(IIT Kanpur)*, 1. Renewable Energy Systems, 2. Power System Restructuring

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

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

Mukherjee, Anirban *Ph.D. (IIT Kharagpur)*, Machine learning for Healthcare

applications, Medical Signal/Image Processing

Poddar, Gautam

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

***Assistant Professors***

Bhattacharya, Tanmoy

*Ph.D.(IISc. Bangalore)*, Power Converters and Machine Drives, Power converter topology and control for HVDC and FACTS

C S, Anoop

*Ph.D.(IIT Madras)*, Sensors and Interface Electronics, Measurements and Instrumentation, Biomedical Electronic Systems

Chatterjee, Dheeman

*Ph.D.(IIT Kanpur)*, Power System Dynamics, Grid Integration of Wind Power, HVDC Transmission and FACTS controllers

Chattopadhyay, Souvik

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

Das, Sarasij

*Ph.D.(Univ. of Wester Ontario, Canada)*, Smart Grid, Power System Protection, Renewable Energy

Ghosh, Arun

*Ph.D.(IIT Kharagpur)*, Multivariable Control Systems, Periodic control, Robust control

Ghosh, Nirmalya

*Ph.D.(Univ. of California, Riverside, USA)*, Computer vision, Medical image informatics, Machine learning

Kapat, Santanu

*Ph.D.(IIT Kharagpur)*, High Performance Boundary Control in DC Nano-grid, Energy Efficient Ultra-fast Power Supply for LED Driving, Modeling and Analysis of Digitally Controlled DC-DC Converters, High-bandwidth Digital Power for Envelope Tracking Power Amplifiers, Digital Power Management Architectures for DVS-enabled Processors, High Performance Embedded Control in Switched Mode Power Supply

Maiti, Suman

*Ph.D.(IIT Kharagpur)*, Modular Multilevel Converters, Voltage Source Converter Based Multi-Terminal HVDC Grid, STACOM, Integration of Renewable Energy with the Grid, Modulation Methods of Voltage Source Converters, High Performance AC Machine Drives, Micro Grid Studies

Patra, Sourav

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

***Thrust Areas***

1. Efficient Power Converters & Drives.
2. Micro-grid & Renewable Energy.
3. Embedded Sensors & Systems.
4. Integrated Power Management.
5. Automotive Engineering.
6. Cyber Physical Systems.
7. Signal & Image Processing.
8. Machine Learning.
9. Advanced Control Theory & its Application.
10. Estimation & Control of Industrial & Aerospace Systems.

***Brief Description of on-going activities***

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

Machine Drives and Power Electronics: \* Magnetic Levitation \* Superconducting magnetic energy storage \* Variable frequency AC-Drives \* Simulation of power electronic circuits \* Resonant Converters \* Design of integrated circuits for Power Management \* Nonlinear phenomena in Power Electronics \* Automotive Electronics \* Diagnostic of drives \* Drive fatigue analysis.

Control and Dynamic Systems: \* Neuro-fuzzy controllers \* Control of chaotic systems \* Discrete event and hybrid systems \* Fault-tolerant control of aero-space systems \* Attitude control of satellites and launch vehicles \* Robust stabilization using periodic controllers \* Reduced order modeling \* Control of Variable Air-Volume Air-Conditioning Systems \* Bifurcation theory of hybrid dynamical systems \* Delta domain digital control analysis and design \* Neural networks applications in control \* Genetic algorithm applications in control \* Decentralized control of large scale systems \* Nonlinear dynamics \* Fractional order system and their applications.

Power and Energy Systems: \* Wind turbines \* Power system dynamics \* Real-time digital simulation of power systems \* Power system protection \* Intelligent relaying \* State estimation of power systems \* Condition and Diagnostic Monitoring of Power Apparatus \* Energy audit and management \* Power system planning and optimisation \* Wavelet Application to Power system Transients \* Neural Net Application to Partial Discharge Phenomenon \* Electric Field Computations, Lightning Protection, Material Characterization \* FACTS.

Instrumentation and Signal Processing: \* Laser based profile measurement \* Image based measurement systems \* Motion estimation using MRI and colour Doppler imaging \* Non-Linear and Statistical Signal Processing \* Real Time Algorithms for Detection and Diagnostics \* Condition monitoring of machines



and power apparatus \* Testing of analog and digital VLSI circuits \* Fault detection and diagnosis of analog circuits \* Control and instrumentation of bio-reactors \* Fibre-optic components and sensors \* Biomedical signal processing \* Analysis of ECG signals \* Sensors fusion \* Multimedia Security \* Convex Optimization and LMI applications to Signal Processing \* Design and development of MEMS accelerometer \* Seismic signal processing, active noise control \* Fast algorithms for real time signal processing.

***Academic Performance***

Awards & Honours	2
Member - Professional Bodies	40
Member - Editorial Board	13
Visits Abroad by Faculty Members	11
Lectures by Visiting Experts	13
Doctoral and MS Degrees Awarded	11
Sponsored Research Projects	53
Consultancy Projects	17
Technology Transferred	1
Patents (filed / granted)	7
Short-Term Courses and Training Programmes organised	7
Books Published	2
Papers Published in Journals	53
Papers Presented in Conferences	55

# Department of Electronics & Electrical Communication Engineering

## *Head*

Prof. Prabir Kumar Biswas

## *Professors*

Bandyopadhyay, Kalyan Kumar	<i>Ph.D.(Jadavpur University)</i> , satellite communication
Banerjee, Swapna	<i>Ph.D.(IIT Kharagpur)</i> , VLSI based embedded system design for signal/image processing, Biomedical Instrumentation, Device modeling, Low power circuits, Mixed-signal design
Basu, Prasanta Kumar	<i>Ph.D.(Calcutta University)</i> ,
Bhattacharyya, Tarun Kanti	<i>Ph.D.(Jadavpur Univ)</i> , MEMS and Microsystems, RF and Analog VLSI, Thinfilms, Nano- electronics, Nano-scale Biosystems Engineering
Biswas, Dhrubesh	<i>Ph.D. (Illinois USA)</i> , Gallium Nitride based high power RF switches for advanced multi-band front end applications., Integrated product design and development for low cost healthcare delivery system., Business architecture and product development strategies through effective technology interventions, Education enterprise model for developmental entrepreneurship for higher education institution., Social media based reduction of information asymmetry for health care service delivery., Nitride based MOS power devices with insulating heterostructures., Novel InAlN/GaN & AlGaIn/GaN heterostructures for resonant tunneling applications., Metamorphic buffer for monolithic integration of compound semiconductor RF devices on Silicon., Nonvolatile memory devices based on metal/insulator/compound semiconductor heterostructures., Graded barrier AlGaIn/GaN heterostructures for high power front end application.
Biswas, Prabir Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Image Processing, Computer Vision, Automated Visual Inspection, Multimedia Network, Pattern Recognition, Sensor Network
Chakrabarti, Indrajit	<i>Ph.D. (IIT Kharagpur)</i> , VLSI Design for Image and Video Processing and Communication
Chakraborty, Ajoy	<i>Ph.D.(IIT Kharagpur)</i> , EMI/EMC, Electromagnetics, Antennas

Chakraborty, Mrityunjoy	<i>Ph.D.(IIT Delhi)</i> , Digital Signal Processing, Adaptive Signal Processing, VLSI Signal Processing, Compressive Sensing
Chattopadhyay, Santanu	<i>Ph.D.(IIT Kharagpur)</i> , Network-on-Chip Design and Test, Low Power Digital Testing, Thermal Aware Testing, Fault Diagnosis
Datta, Raja	<i>Ph.D.(IIT Kharagpur)</i> , Computer Communication and Networks, Mobile Ad Hoc Networks, Optical WDM Networks, Distributed Systems, Wireless Sensor Networks, Inter Planetary Networks
Dhar, Anindya Sundar	<i>Ph.D.(IIT Kharagpur)</i> , VLSI Architecture Design
Dutta, Debasish	<i>Ph.D.(IIT Kharagpur)</i> , Optical Networks, Wireless Networks
Garg, Ramesh	<i>Ph.D.(IIT Kanpur)</i> , Electromagnetics
Maiti, Chinmay Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Microelectronics, Silicon Heterostructures, Online Laboratories, High-k Gate dielectrics, Memristors, Protein Electronics, Technology CAD, Graphene Electronics
Pathak, Sant Sharan	<i>Ph.D.(IIT Delhi)</i> ,
Rajakumar, Ratnam Varada	<i>Ph.D.(IIT Kharagpur)</i> ,
Ray, Ajoy Kumar	<i>Ph.D.(IIT Kharagpur)</i> ,
Saha, Goutam	<i>Ph.D.(IIT Kharagpur)</i> , Biomedical Signal Processing, Audio / Speech Signal Processing
Sanyal, Subrata	<i>Ph.D.(IIT Kharagpur)</i> ,
<b><i>Associate Professors</i></b>	
Bhattacharya, Amitabha	<i>Ph.D.(IIT Kharagpur)</i> , RF & Microwave Communication
Ghosh, Bratin	<i>Ph.D.(Univ. of Manitoba)</i> , Applied Electromagnetics
Mahapatra, Sudipta	<i>Ph.D.(IIT Kharagpur)</i> , Parallel and Distributed Systems, Video

Coding/Video Streaming, Optical and Wireless Networks

- Mandal, Pradip *Ph.D.(IISc Bangalore)*, Design Automation of CMOS Analog circuits and Systems, On-chip power management system, Analog Interface circuits for high speed data link, Analog circuits for signal acquisition system
- Mukhopadhyay, Sudipta *Ph.D. (IIT Kanpur)*, Medical Image and Signal Processing, Content based Medical Image Retrieval, Video Processing, Continuous Authentication
- Roy, Rajarshi *Ph.D (Brooklyn Univ.)*, Complex Communication Networks, Cooperative Communication, Queuing Theory Stochastic Processes and performance evaluation, Optimal resource allocation Optimization and network control, Learning and Self-organization and Emergent Phenomena in random environment, Network Coding, Cognitive Radio, Wireless communication and Geometry, Complex Networks like communication networks and social networks smart grid transportation network

***Assistant Professors***

- Bandyopadhyay, Sharba *Ph.D.(Johns Hopkins Univ.)*, Auditory Neuroscience, Neural Information Processing
- Chakraborty, Paritosh Kumar *Ph.D (IIT Kharagpur)*, 1. Solid State Science and Technology, 2. Multi-Valued Logic Algebra and Related Aspects
- Dan, Surya Shankar *Ph.D.(IISc., Bangalore)*, Computational nanoelectronics, Nano-scale electronic device physics, Simulation study of VLSI devices, Compact analytical modeling of nanoelectronic device operation, TCAD simulator development
- De, Arijit *Ph.D.(Syracuse Univ)*, Eelectromagnetics, EMI/EMC, RF/Microwave, Digital Signal Processing, Array Processing, Computatioanl Methods
- Dixit, Vivek *Ph.D.(National Univ. of Singapore)*,
- Guha, Prasanta Kumar , Sensor, MEMS, Interface Electronics, Integration with CMOS platform, Nano Electronics
- Halder, Achintya *Ph.D.(Georgia Tech., Atlanta)*,

Layek, Ritwik Kumar	<i>Ph.D., Texas A&amp;M Univ., College Station, Bacterial Motility, Whole Cell Modeling and Simulation, Wide-Field Imaging and Cellular Dynamics, Inter-Cellular Interaction, Control in Gene-Protein Regulatory System</i>
Mandal, Mrinal Kanti	<i>Ph.D.(IIT Kharagpur), Microwave and millimeter wave circuit and components.</i>
Mohan, Akhilesh	<i>Ph.D.(IIT Kanpur), Microwave Filters, Ultra-Wideband (UWB) Antenna and Filters, Metamaterials</i>
Roy, Rajat	<i>Ph.D.(Univ. of Mumbai), Numerical computation of wave functions</i>
Sharad, Mrigank	<i>Ph.D. (Purdue Univ. Indiana, USA), Nanoelectronics and VLSI Design (Digital/Mixed-Signal Circuit/Architecture), Application Specific Signal Processing, Bioelectronics and Neuromorphic Computing, Spintronics (Spin Memory and Logic)</i>
Varshney, Shailendra Kumar	<i>Ph.D.(University of Delhi), Quantum optical communication, Speciality fibers-Photonic crystal fibers, Fiber optic sensors, Photonic devices for next generation communication, Plasmonics, Nanophotonics</i>

### ***Thrust Areas***

1. Photonics and Broadband Communication Networks
2. Nanoelectronics Spintronics and VLSI Circuits and Systems
3. Design and Development of Embedded Systems for Computer Vision, Image, and Signal Processing
4. Computational modelling of forward and inverse radar problems and advanced antenna array processing
5. Systems Biology
6. Compressive Sensing and Sparse Signal Processing
7. Sensor Networks
8. Analog/Mixed Signal and RF Design

### ***Brief Description of on-going activities***

The following research activities are currently carried out in the department: a) Analog/Mixed Signal and RF Design. b) CNT and Graphene based sensors for environmental monitoring. c) Fault tolerant design of Network on Chip. d) Development of Bridge Health monitoring for Indian Railways with Wireless sensor Networks. e) Protocol Development for Interplanetary Network for deep space communication. f) Computational Electromagnetics and Modelling of Antennas above multilayered ground plane and

Microwave Circuits and study of EMI/EMC effects. g) Radar Signal Processing and advanced array processing for subsurface target detection. h) 3 D Imaging, VLSI Architecture for low bit rate Video Coding, Medical Image Processing, Gesture Recognition from Video Sequences, Face recognition, Image and Video Coding, Fuzzy Neural Network. i) Development of block floating point based schemes for implementing adaptive filters in digital hardware. j) Functional Imaging of Neural Activity. k) Systems Biology: Bacterial motion analysis, Biofilm dynamics, Control in Boolean Network, Inference of parameters in Biological Networks. l) Auditory Neuroscience and Neural information Processing

***Academic Performance***

Awards & Honours	4
Member - Professional Bodies	31
Member - Editorial Board	14
Visits Abroad by Faculty Members	15
Lectures by Visiting Experts	2
Doctoral and MS Degrees Awarded	21
Sponsored Research Projects	76
Consultancy Projects	6
Technology Transferred	1
Patents (filed / granted)	3
Seminars, Conferences and Workshops Organised	7
Short-Term Courses and Training Programmes organised	9
Books Published	4
Papers Published in Journals	85
Papers Presented in Conferences	51

# Department of Geology & Geophysics

## *Head*

Prof. Debashish Sen Gupta

## *Professors*

Bhattacharya, Abhijit	<i>Ph.D.(IIT Kharagpur),</i>
Bhowmik, Santanu Kumar	<i>Ph.D.(Jadavpur Univ), Metamorphic Petrology, Accessory Mineral Petrology</i>
Das, Subhasish	<i>Ph.D.(IIT Kharagpur), Sedimentology, Basin Tectonics</i>
Gupta, Anil Kumar	<i>Ph.D.(BHU, Varanasi),</i>
Gupta, Saibal	<i>Ph.D.(Cantab), Structural Geology, Metamorphic Petrology, Tectonics</i>
Mamtani, Manish A	<i>Ph.D.(MSU, Baroda), Structural Geology, Microtectonics</i>
Mishra, Biswajit	<i>Ph.D.(IIT Kharagpur), Ore Mineralogy and Geochemistry</i>
Mohanty, William Kumar	<i>Ph.D.(Delhi Univ.), Seismology, Seismic Hazard Assessment, Gravity &amp; Magnetic Methods of Prospecting, Reservoir Characterization</i>
Nath, Sankar Kumar	<i>Ph.D.(IIT Kharagpur), Earthquake and Engineering Seismology, Seismic Hazard Vulnerability &amp; Risk &amp; Loss Assessment and Microzonation, Seismic Prospecting, Geophysical Signal Processing, Geophysical Tomography, Computational Geophysics, Sequence Stratigraphy, Hydrocarbon Exploration, Computational Seismology</i>
Panigrahi, Mruganka Kumar	<i>Ph.D.(IIT Kharagpur), Economic Geology, Crustal Fluids, Computer Applications</i>
Sarkar, Anindya	<i>Ph.D (Gujrat Univ.), Stable Isotope Geochemistry, Sedimentology, Palaeoclimatology</i>
Sen Gupta, Debashish	<i>Ph.D.(PRL, Ahamdabad), Resource Evaluation of Unconventional Hydrocarbons and Modeling for TENORM &amp; NORM evaluation</i>

Sharma, Shashi Prakash *Ph.D.(BHU, Varanasi)*, Electrical and EM Geophysics, Integrated Geophysical Research, Modeling and Inversion, Groundwater Geophysics

Tripathy, Subhasish *Ph.D.(IIT Bombay)*, Environmental Geochemistry, Waste Utilization

***Associate Professors***

Basu, Arindam *Ph.D.(The Univ. of Hong Kong)*, Rock Mechanics, Engineering Geology

Ravikant, Vadlamani *Ph.D.(CSIR-NGRI, Hyderabad)*, Isotope geochemistry geochronology crustal evolution

Ray, Sanghamitra *Ph.D.(Calcutta Univ)*, Vertebrate paleobiology, Gondwana stratigraphy and sedimentation

***Assistant Professors***

Agrahari, Sudha *Ph.D.*, Application of electrical and electromagnetic methods to environmental problems, Helicopter-borne electromagnetics (for imaging shallow earth structures), Joint inversion of electrical and electromagnetic methods, Unconventional energy resources (reservoir potential evaluation through modelling and simulation)

Bera, Melinda Kumar *Ph.D.(IIT Kharagpur)*, Sedimentology, Sequence Stratigraphy, Stable Isotope Geochemistry, Paleoclimate

Ghosh, Sujoy Kanti *Ph.D.(Tohoku Univ. Japan)*, Experimental Petrology, Mineral Physics

Maiti, Sabyasachi *Ph.D.(IIT Kharagpur)*, Remote Sensing, Geographic Information System, Quantitative Geomorphology, Mineral exploration

Mukherjee, Abhijit *Ph.D.(Univ. of Kentucky, USA)*, Surface water-sea water-groundwater interaction, Mine-site hydrology, Physical Chemical and Isotope Hydrogeology, Contaminant Fate and Transport, Environmental Geochemistry, Effect of Climate Change, Modeling (groundwater flow and transport geochemical hydrostratigraphy and geosystems)

Pruseth, Kamal Lochan *Ph.D.(IIT Kharagpur)*, Sulfide Phase Equilibria, Experimental Petrology, Ore Geology



Sengupta, Probal	<i>Ph.D.(IIT Kharagpur)</i> , Seismology, Geoexploration, Seismic prospecting, Near surface geophysics
Singh, Arun	<i>Ph.D.(NGRI)</i> , Seismic anisotropy: Mantle deformation Patterns, Lithospheric Structure and geodynamics, Teleseismic tomography
Singh, Chandrani	<i>Ph.D.(NGRI)</i> , Reservoir Triggered Seismicity, Attenuation characteristics of seismic waves, Seismotectonics
Upadhyay, Dewashish	<i>Ph.D.(Univ. of Bonn, Germany)</i> , Geochemistry and Geochronology, Petrology and Crustal Evolution, Cosmochemistry

### ***Thrust Areas***

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

### ***Brief Description of on-going activities***

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

### ***Academic Performance***

Awards & Honours	3
Member - Professional Bodies	43
Member - Editorial Board	20
Visits Abroad by Faculty Members	5
Lectures by Visiting Experts	7
Doctoral and MS Degrees Awarded	10
Sponsored Research Projects	54
Consultancy Projects	7
Seminars, Conferences and Workshops Organised	2
Books Published	1
Papers Published in Journals	55
Papers Presented in Conferences	36

## Department of Humanities & Social Sciences

### *Head*

Prof. Vijai Nath Giri

### *Professors*

Basu, Partha	<i>Ph.D.(Calcutta Univ)</i> , Quantitative Economics with special ref. to Efficiency and Growth
Chakraborti, Chhanda	<i>Ph.D.(Univ of Utah)</i> , Bioethics, Business ethics, Philosophy of Mind, Logic and Philosophy of logic
Chatterjee, Suhita Chopra	<i>Ph.D.(Bombay)</i> , Sociology of Health /Medical Sociology
Chatterjee, Bani	<i>Ph.D.(BHU, Varanasi)</i> , Development Planning, Manpower Management, International Finance
Giri, Vijai Nath	<i>Ph.D.(IIT Kharagpur)</i> , Conflict Resolution and Negotiation, Organizational Communication, Intercultural Communication, Interpersonal Communication
Nayak, Narayan Chandra	<i>Ph.D.(Utkal Univ)</i> , Development and Macro Economics
Patnaik, Priyadarshi	<i>Ph.D.(Utkal Univ)</i> , Indian aesthetics, Visual Culture and Communication, Cultural Translation theory and practice, Media and Multimedia Studies, Emotions and nonverbal communication
Roy, Anjali	<i>Ph.D.(Bombay)</i> , Postmodern and Post-colonial Theory, Post-colonial Literatures in English and Indian Languages, Migration and Diaspora Studies, Partition 1947 and Punjab Studies, Transnationalism and Globalization Studies, Bhangra Music and Hindi Cinema
Srivastava, Kailash Bihari Lal	<i>Ph.D.(IIT Kanpur)</i> , Human Resource Management and Development, Organizational Behaviour, Knowledge management and innovation, Performance management, Sustainability Issues
Suar, Damodar	<i>Ph.D.(IIT Kharagpur)</i> , Social and organizational psychology, Neuropsychology and cognitive psychology
Tewari, Hare Ram	<i>Ph.D.(IIT Kharagpur)</i> ,

### ***Associate Professors***

Behera, Bhagirath	<i>Ph.D.(Univ. of Bonn, Germany)</i> , Environmental and Natural Resource Economics, Development Economics, New Institutional Economics, Green Economics
Chakraborty, Jayshree	<i>Ph.D.(IIT Kanpur)</i> , Semantics and Pragmatics, Discourse Analysis, Phonetics, Indian English, Communication
Das, Saswat Samay	<i>Ph.D.(Utkal Univ.)</i> , Postmodern and postcolonial studies, Critical Theory, Continental Philosophy with emphasis on Deleuze Zizek Negri and Badiou
Goswami, Kishor	<i>Ph.D.(IIT Kharagpur)</i> , Development Economics (Globalization - Gender and Trade - Poverty - Food Security), Agricultural Economics, Economics of Biofuels
Husain, Zakir	<i>Ph.D.(Univ. of Calcutta)</i> , Health Economics, Education, Ageing, Gender studies
Komalesha, H. S.	<i>Ph.D.(IIT Kharagpur)</i> , Translation, Indian Literatures in English, Poetry, Postcolonial Literatures, Cultural Studies
Mahakud, Jitendra	<i>Ph.D.(IIT, Bombay)</i> , Financial Modelling, Financial Markets, Financial Economics, Corporate Finance, Equity Research, Financial Econometrics
Mishra, Pulak	<i>Ph.D (Vidyasagar University)</i> , Industrial Economics, Public Economics and Policy, Economics of Rural Development
Pradhan, Rabindra Kumar	<i>Ph.D.(Utkal Univ.)</i> , Industrial & Organisational Psychology, Human Resource Development and Management, Business Values & Ethics and Morals, Organizational Behaviour, Health Psychology, Positive Psychology
Singh, Seema	<i>Ph.D.(BHU)</i> , English Language Teaching, Managerial Communication Styles, Communication Skills, Feminist Narratology, Indian Women Writing in English, Subaltern Writing

### ***Assistant Professors***

Aditya, Anwesha	<i>Ph.D.(Jadavpur Univ., Kolkata)</i> , Development Economics, International Trade
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Chattopadhyay, Siddhartha	<i>Ph.D.(Univ. at Albany, SUNY),</i> Econometrics, Macroeconomics, Dynamic Programing
Hiremath, Gourishankar S.	<i>Ph.D.(Univ. of Hyderabad),</i> Financial Economics - Efficiency of Financial Markets, Open Macroeconomics - International Capital Flows, Credit Cooperatives, Food Security
Sahoo, Bimal Kishore	<i>Ph.D.(IIT Roorkee),</i> Human Development, Labour Economics, Industrial Economics, Productivity and Efficiency Analysis, Food Security and Poverty, International Trade
Yadav, Inder Sekhar	<i>Ph.D.(Univ. of Hyderabad),</i> Financial Economics, Macroeconomics, Industrial Economics, Enterprise Risk Management

### ***Thrust Areas***

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

### ***Brief Description of on-going activities***

Research and Development on:

1. Quantitative economics, 2. Financial economics, 3. Economics of growth, 4. Industrial economics, 5. Development economics, 6. Environmental and resource economics, 7. Developing world bioethics, 8. Gender and trade, 9. Financial institutions and markets, 10. Sociology of health and medicine, 11. Human resource development, 12. Brain and behavior, 13. Interpersonal, intercultural and organizational communication, 14. Visual aesthetics, 15. Business ethics, corporate social responsibility, 16. Economics of biofuels, 17. Bioethics and Public Health Ethics.

Training and development programmes on: 1. Aesthetics 2. Interpersonal communication 3. Recent trends in human resource development 4. Strategic management 5. Emotional intelligence 6. Logic and applications of logic 7. Research methodology and data analysis 8. Financial modelling and risk management 9. Leadership and teambuilding 10. Language, cognition and communication 11. Understanding culture and practising cross-cultural communication 12. Creative writing, 13. Critical thinking, reading and writing skills

Course development on 1. Economics 2. Human Resource Management 3. Philosophy 4. Psychology

### ***Academic Performance***

Awards & Honours	3
Member - Professional Bodies	75
Member - Editorial Board	12
Visits Abroad by Faculty Members	16
Lectures by Visiting Experts	10
Doctoral and MS Degrees Awarded	10
Sponsored Research Projects	39
Consultancy Projects	6
Seminars, Conferences and Workshops Organised	10
Short-Term Courses and Training Programmes organised	4
Books Published	4
Papers Published in Journals	63
Papers Presented in Conferences	55

# Department of Industrial & Systems Engineering

## *Head*

Prof. Manoj Kumar Tiwari

## *Professors*

Mahanty, Biswajit

*Ph.D.(IIT Kharagpur)*, System Dynamics, Operations Research, Information Systems, Project Management

Maiti, Jhareswar

*Ph.D.(IIT Kharagpur)*, Quality management, Ergonomics & human factors engineering, Safety & risk management, Data analytics

Mohapatra, Pratap Kumar Jagadev

*Ph.D.(IIT Kharagpur)*, System Dynamics and Systems Thinking, E-Business and E-Governance, Production and Operations Management, Quality Engineering and Control, Quantitative Methods

Narasimhan, P. L.

*Doctorate (AMU)*,

Ray, Pradip Kumar

*Ph.D.(IIT Kharagpur)*, Ergonomics/Human Factors Engineering, Quality Design/Quality Management, Operations and Environmental Management, Performance/Productivity Analysis of Engineering/Service Systems, Healthcare Systems Management

Sarmah, Sarada Prasad

*Ph.D.(IIT Kharagpur)*, Reverse logistics, Supply chain management, Inventory and Operations Management

Tiwari, Manoj Kumar

, Manufacturing Planning and Scheduling, Logistics and Supply Chain Analysis, Computational Intelligence in Manufacturing and Logistics, Optimisation and Simulation

## *Associate Professors*

Jenamani, Mamata

*Ph.D.(IIT Kharagpur)*, Information System, E-Business

Thakkar, Jitesh J

*Ph.D.(IIT Delhi)*, Supply Chain Optimization, Lean & Sustainable Manufacturing, Project Management, Service Science, Quality Control and Engineering

### ***Assistant Professors***

Jha, Jitendra Kumar

*Ph.D.(IIT Kanpur)*, Supply Chain Management, Inventory Control, Facility Location

Kumar, Sri Krishna

*Ph.D.(Loughborough, UK)*, Non Linear Programming, Supply Chain and Logistics, Operations Research, Game Theory

### ***Thrust Areas***

1. Manufacturing and Supply Chain Management
2. Industrial Analytics
3. Production, Planning and Control
4. Human Factor and Safety Engineering
5. Optimization and Simulation
6. Quality, Safety and Reliability Engineering
7. Logistics & Supply Chain
8. Decision Support System
9. Big Data
10. Early Warning System
11. E-Business
12. Process Excellence
13. Manufacturing Systems
14. Disaster management
15. Healthcare System
16. Financial Engineering
17. Operations Analytics

### ***Brief Description of on-going activities***

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

Operations Management: Production Planning and Inventory Control, Logistics and Supply Chain Management, E-Business, Quality Engineering and Control, Facility Layout and Design, Total Quality Management and Six Sigma.

Simulation and Soft Computing: Genetic Algorithms and its variants, Heuristics, System Dynamics, Discrete Event Simulation.

Work System Design: Ergonomics/Human Factors Engineering, Occupational Safety and Health Management, and Probabilistic Risk Assessment. Data Analytics and different domains of Industrial Engineering.

The following are the current On-going/Up-coming activities this year: 1) ISWT on "Supply Chain Network - Modelling and Analysis" from June 15 - June 26, 2015. 2) Short-Term Course on "Data Analytics with SAS" during July 1-4. 2015. 3) Executive Training Programme in Process Excellence (with Sigma XL Software) during July 10-12 2015.

### ***Academic Performance***

Member - Professional Bodies	24
Member - Editorial Board	24
Visits Abroad by Faculty Members	8
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	5
Sponsored Research Projects	31
Consultancy Projects	23
Seminars, Conferences and Workshops Organised	2
Short-Term Courses and Training Programmes organised	11
Books Published	2
Papers Published in Journals	48
Papers Presented in Conferences	21



# Department of Mathematics

## *Head*

Prof. Umesh Chandra Gupta

## *Professors*

Bhattacharyya, Somnath	<i>Ph.D.(IISc Bangalore)</i> , Computational Fluid Dynamics, Micro-/nanofluidics Modeling
Biswal, Mahendra Prasad	<i>Ph.D.(IIT Kharagpur)</i> , 1. Multi Choice Programming, 2. Stochastic Programming, 3. Fuzzy Programming, 4. Game Theory and applications, 5. Uncertain Programming
Goswami, Adrijit	<i>Ph.D.(Jadavpur Univ)</i> , Data Mining, Operations Research, Cryptography and Network Security
Gupta, Dharmendra Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Numerical Analysis and Computer Science, Constraint Satisfaction Problems
Gupta, Umesh Chandra	<i>Ph.D.(IIT Delhi)</i> , Statistics, Stochastic Modelling, Queueing Theory
Jain, Vinay Kumar	<i>Ph.D.(IIT Delhi)</i> , Zeros of polynomials and analytic functions & Extremal problems of polynomials
Kumar, Somesh	<i>Ph.D.(IIT Kanpur)</i> , Reliability Estimation, Statistical Decision Theory, Reliability Ordering, Entropy Estimation, Estimation Theory, Quantum Information and Computation, Statistical Data Analysis, Experimental Designs, Robust Estimation, Classification under Restrictions, Estimating Parameters of Directional Distributions, Estimation under Constraints, Dependent Trials
Murthy, P V S N	<i>Ph.D.</i> , Bio-fluid Mechanics, Convective Heat and Mass Transfer in nanofluid
Pandey, Rajnikant	<i>Ph.D.</i> , Differential Equations (Ordinary), Theoretical Numerical Analysis, Singular Boundary Value Problems
Raja Sekhar, G P	<i>Ph.D.(Hyderabad Univ)</i> , Boundary integral methods for viscous flows, Hydrodynamic and thermocapillary study of viscous drops, Applications of binary mixture theory to biological tissues

Roy, Akhil Ranjan *Ph.D.(IIT Kharagpur)*, Theoretical Cosmology, Algebra and Application of Soft Set theory, Dynamics of Nonlinear Systems, inventory management

Sarkar, Anjan *Ph.D.(IIT Kharagpur)*, Probabilistic Robotics, Remote Sensing Image Analysis, Statistics

Srivastava, Parmeshwary Dayal *Ph.D.(IIT Kanpur)*, Functional Analysis & Cryptography, Fuzzy Sequence Space

***Associate Professors***

Chakraborty, Debjani *Ph.D.(IIT Kharagpur)*, Fuzzy Optimization, Fuzzy logic and its applications

Kumar, Jitendra *Ph.D.(Univ. of Magdeburg, Germany)*, Numerical mathematics, Monte-Carlo simulations, Particle technology

Kumar, Pawan *Ph.D.(IIT Kanpur)*, Graph Theory

Mukhopadhyay, Sourav *Ph.D.(ISI, Kolkata)*, Digital rights management, Cryptanalysis on symmetric cipher, Key management in wireless adhoc network, Algebraic attack on stream ciphers, Key Pre-Distribution (KPS) in sensor network, Time/Memory Trade-off Cryptanalysis, Cloud Computing

Nahak, Chandan *Ph.D.*, Applied Functional Analysis and Optimization, Variational and Complementarity problems, Frame Theory in Semi Inner Product Spaces, Fractional Calculus, Numerical Optimization, Set Valued optimization

Nelakanti, Gnaneshwar *Ph.D.(IIT Bombay)*, Inverse and ill-posed problems, Spectral approximation of integral operators, Approximate solutions of operator equations

Panda, Geetanjali *Ph.D.*, Optimization with uncertainty, Convex Optimization, Numerical Optimization, Portfolio Optimization

Panigrahi, Pratima *Ph.D.(Bangalore)*, Combinatorics, Graph Theory

***Assistant Professors***

Adhikari, Bibhas *Ph.D.(IIT Guwahati)*, Applied Linear Algebra, Complex

Networks, Quantum Entanglement, Strategic Network Formation

- Allu, Vasudeva Rao *Ph.D.(IIT Madras)*, Univalent Function Theory, Harmonic Mappings (in the Plane), Complex Analysis
- Bhowmik, Bappaditya *Ph.D.(IIT Madras)*, Geometric function theory (Complex Analysis), Harmonic and Quasiconformal Mappings, Several Complex Variables
- Biswas, Debapriya *Ph.D.(Leeds Univ)*, Functional Analysis, Lie Groups Lie Algebras and their Representation theory, Complex Analysis, Harmonic Analysis, Hyper-Complex Analysis including Clifford Algebras
- Dutta, Ratna *Ph.D.(ISI, Kolkata)*, Multilinear maps and their applications, Functional Encryption and Attribute Based Cryptosystems, Elliptic Curves and Pairing based Cryptography, Oblivious Transfer and Private Set Intersection Protocols, Lattice-Based Cryptography, Coding Theory and Combinatorial Applications in WSN, Network Coding, Obfuscation: constructions and applications
- Ganguly, Asish *Ph.D.(Calcutta Univ.)*, Mathematical & Theoretical Physics, Quantum Mechanics, Soliton Theory and Inverse Scattering Transformation, Non-linear Evolution Equation in Real & Complex Domain
- Gayen, Rupanwita *Ph.D.(Univ of Calcutta)*, Integral equations, Linear water waves
- Ghoshal, Koeli *Ph.D.(Jadavpur Univ.)*, Mathematical Modelling of sediment-laden turbulent flow, Grain-size distribution in suspension over erodible sediment bed, Secondary current, Study on different parameters of sediment transport
- Gupta, Nitin *Ph.D.(IIT Kanpur)*, Reliability Theory, Mathematical Statistics, Applied Probability
- Khare, Swanand Ravindra *Ph.D. (IIT Bombay)*, Functional data analysis, Data mining, Numerical linear algebra
- Nanduri, Ramakrishna *Ph.D.(IIT Madras)*, Commutative Algebra
- Sekhar, T.Raja *Ph.D.(IIT Bombay)*, Hyperbolic System of Conservation Laws, Lie Group Analysis for Quasilinear Hyperbolic System of Partial Differential Equations, Symmetry integration methods for differential equations

## ***Thrust Areas***

1. Functional Analysis, Fluid Mechanics and Cryptography

### ***Brief Description of on-going activities***

Besides extensive research in the thrust areas viz. Functional Analysis and Fluid Mechanics, significant contribution has also been made by the members of the faculty in the area of Computational Fluid Dynamics, Micro-Nanofluidics Modeling, Sediment Transport in Open Channel, Commutative Algebra, Applied Linear Algebra, Numerical Linear Algebra, Fuzzy Mathematics, Bio-Mechanics, Dynamics of Nonlinear systems, Inventory Management, Graph Theory, Integral Equations, Queuing Theory, Statistical Decision Theory, Statistical Data Analysis, Compiler Design, Combinatorics, Fractional Calculus, Optimization, Theoretical Computer Science, Information and Coding Theory and Cryptography, Complex Networks, Quantum Entanglement, Strategic Network Formation, Data mining, Functional Data Analysis, Image Processing. Faculty members of this department have published number of research papers in reputed international journals on those topics. Number of sponsored research projects are under taken by the faculty members.

Dr. Bappaditya Bhowmik organized a conference on "International Conference on Geometric Function Theory and its Applications" (ICGFTA-2014). Topics Covered: The conference program covered contemporary topics in complex analysis, including geometric function theory in one complex variable, harmonic univalent mappings, and several complex variables. Goal: Aim of this meeting was to bring together researchers from around the globe, working broadly in complex analysis and its most important applications, with an emphasis on informal interactions. Therefore, this kind of meeting will help younger researchers to share valuable thoughts with each other on their respective areas of research. In the process, they will increase the possibility of collaborating among themselves in the days to come. Further, the expertise of the international participants would really inspire the young researchers to go the extra mile in their research. Number of Participants: 55

### ***Academic Performance***

Awards & Honours	1
Member - Professional Bodies	35
Member - Editorial Board	9
Visits Abroad by Faculty Members	10
Lectures by Visiting Experts	12
Doctoral and MS Degrees Awarded	11
Sponsored Research Projects	32
Seminars, Conferences and Workshops Organised	1
Short-Term Courses and Training Programmes organised	3
Papers Published in Journals	133
Papers Presented in Conferences	39

# Department of Mechanical Engineering

## *Head*

Prof. Prasanta Kumar Das

## *Professors*

Bandyopadhyay, Partha Pratim	<i>Ph.D.(IIT Kharagpur)</i> , Thermally Sprayed coatings, Laser processing of materials
Bhattacharyya, Ranjan	<i>Ph.D.(Kentucky)</i> , Nonlinear Elasticity, Vibration, Dynamical Systems
Bhattacharyya, Sati Nath	<i>Ph.D.(IIT Kharagpur)</i> , Fluid Mechanics
Bhattacharyya, Souvik	<i>Ph.D.(Texas A &amp; M)</i> , Thermal science, Natural refrigerant based transcritical heating cooling systems, Thermodynamic modelling and optimization, Natural circulation loops (NCLs), Energy Engineering and Planning
Chakraborty, Suman	<i>Ph.D.</i> , Microfluidics and Nanofluidics, Interfacial Phenomena and Phase Change, Computational Fluid Dynamics (CFD)
Chattopadhyay, Ajay Kumar	<i>Ph.D.(Jadavpur Univ)</i> , Metal-Ceramic Joining, Machining, Grinding, Surface Coating
Das Gupta, Anirvan	<i>Ph.D.(Kanpur)</i> , Wave propagation, Dynamics of discrete and continuous systems, Mechanics of inflatable membrane structures, Vibration induced particle transport
Das, Manab Kumar	<i>Ph.D.(IIT Kanpur)</i> , Computational Fluid Mechanics Heat Transfer, Large Eddy Simulation, Turbulence Modeling
Das, Prasanta Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Thermal Engineering, Gas-liquid two phase flow-instrumentation and hydrodynamics, CFD for multiphase flow, Nano fluids, Thermo hydraulics of nuclear reactors, Liquid-liquid two phase flow, Experimental thermo-fluid science
Dash, Sukanta Kumar	<i>Ph.D.(IIT Kharagpur)</i> , pressure drop in gas solid flow, free surface flow
Guha, Abhijit	<i>Ph.D.(Cambridge)</i> , Fluid Mechanics, Thermal Science, Computational Fluid Dynamics (CFD)

Gupta, Sanjay	<i>Ph.D.(Delft)</i> , Biomechanics, Finite Element Analysis, Design Optimization
Kumar, Cheruvu Siva	<i>Ph.D.(IIT Kharagpur)</i> , Robotics and Intelligent Systems, Computer and Telecommunication Networks, Additive Manufacturing, Control Systems
Maiti, Biswajit	<i>Ph.D.(IIT Delhi)</i> ,
Maiti, Rathindranath	<i>Ph.D.(IIT Kharagpur)</i> , Mechanical and Fluid Power Transmission and Gear Engineering, Mechanical and Fluid Power Transmission and Gear Engineering
Mohanty, Amiya Ranjan	<i>Ph.D.(Kentucky)</i> , Natural Materials for Noise Control, Machinery Condition Monitoring, Acoustics and Noise Control, Underwater Acoustics, Building Acoustics, Mechanical Systems and Signal Processing, Automotive Diagnostics, More information at <a href="http://www.iitnoise.com">www.iitnoise.com</a>
Moulic, Sandipan Ghosh	<i>Ph.D.(Arizona)</i> , Theoretical and computational fluid dynamics and heat transfer, Hydrodynamic and thermal instability, Spectral methods in fluid dynamics, Perturbation methods in fluid dynamics, Mixed convection
Nath, Ashish Kumar	<i>Ph.D.(Bombay University)</i> , Laser material interaction and processing, Underwater laser processing, Nontraditional manufacturing processes
Pal, Surjya Kanta	<i>Ph.D (IIT Kharagpur)</i> , Manufacturing Process Modelling and Simulation, Friction Stir Welding
Paul, Soumitra	<i>Ph.D.(IIT Kharagpur)</i> , Machining and Grinding, Cutting Tool Coating
Pratihari, Dilip Kumar	<i>Ph.D.(IIT Kanpur)</i> , Soft Computing, Robotics, Manufacturing Science
Ramgopal, Maddali	<i>Ph.D.(IIT Madras)</i> , Refrigeration & air conditioning, Carbon dioxide based natural circulation loops, Solid sorption systems
Ray, Manas Chandra	<i>Ph.D.(IIT Kharagpur)</i> , Fuzzy Fiber Reinforced Composites, Smart Materials and Structures, Dynamics and Control of Composite Structures, Nanocomposites, Fluid-structure interaction, Active constrained layer damping, Flexoelectric Solids
Roy Chowdhury, Asimava	<i>Ph.D.(IIT Kharagpur)</i> , CNC machining of free form (curved)

surfaces, Direct slicing (without tessellation) for Rapid prototyping, Modification of bicycle to add body thrust

Roy Chowdhury, Samar Kumar

*Ph.D.(Birmingham)*, Tribology Bio-Tribology Nano-Tribology

Roy, Subhransu

*Ph.D.(Penn. State)*, Heat Transfer, Laser Processing of Materials, Optical diagnostics for flow and heat transfer, Train Aerodynamics

Saha, Partha

*Ph.D.(IIT Kharagpur)*, Laser processing of materials, Micro manufacturing, Nonconventional manufacturing, Rapid prototyping

Samantaray, Arun Kumar

*Ph.D (IIT Kharagpur)*, Systems and Control, Vehicle system dynamics, Rotor dynamics, Nonlinear Mechanics

Satyamurty, V V

*Ph.D.(IIT Kanpur)*, Flow and Heat Transfer in Porous Media, Solar Energy Thermal Systems, Numerical Heat Transfer and Fluidmechanics

Som, Sankar Kumar

*Ph.D.(IIT Kharagpur)*, Thermofluid Science and Combustion Science

#### ***Associate Professors***

Bhattacharyya, Kingshook

*Ph.D (IIT Kharagpur)*, Dynamics

Biswas, Kajal

*Ph.D.(IIT Kharagpur)*, Welding Fracture Mechanics

Chakraborty, Goutam

*Ph.D (IIT Kanpur)*, Multiscale mechanics of smart materials, Vibration and noise control, Dynamics of MEMS and NEMS devices, Machine Fault Diagnosis and Prognosis

Racherla, Vikranth

*Ph.D.(Univ. of Pennsylvania)*, Composite mechanics, Numerical modeling of thermo-mechanical processes, Friction stir welding, Railway engineering

Ray, Kumar

*Ph.D.(IIT Kharagpur)*,

Sarangi, Mihir

*Ph.D.(IIT Kharagpur)*,

#### ***Assistant Professors***

Das, Arup Kumar

*Ph.D.(IIT Kharagpur)*, Two phase flow, Microfluidics, Bubble and drop

dynamics, Heat transfer, Numerical methods, Fire engineering

Deb, Sankha

*Ph.D.(Univ. of Montreal, Canada)*, Computer Integrated Manufacturing, Computer-Aided Process Planning for Manufacturing and Assembly, Automation and Robotics, Intelligent Manufacturing Systems, Manufacturing Processes, Soft Computing techniques in Manufacturing, Flexible Manufacturing Systems

Jayaprakash, K R

*Ph.D.(Univ. of ILLINOIS)*, Nonlinear Dynamics and Vibrations, Wave Propagation, Nonlinear Waves in Granular Chains

Kalelkar, Chirag Deepak

*Ph.D. (IISc., Bangalore)*, Rheology, Fluid Dynamics

Lakkaraju, Rajaram

*Ph.D.(Univ. of Twente, Netherlands)*,

Panda, Sushanta Kumar

*Ph.D.(IIT, Delhi)*, Sheet metal forming processes, Sheet and tube hydroforming, Formability testing design and development, Plasticity for metal deformation modelling and simulation, Friction stir processing of sheet metal

Paul, Jinu

*Ph.D.(Nanyang Tech. Univ., Singapore)*, Material Processing & Characterization, Polymer Nanocomposites, Joining of Materials, More information: <https://sites.google.com/site/jpauliitkgp/home>

Ramanujam, S

*Ph.D.(IIT Kharagpur)*, IC Engines

Sidpara, Ajay Muljibhai

*Ph.D.(IIT Kanpur)*, For more information: <https://sites.google.com/site/sidajay80/>, Development of nanofinishing processes for complex surfaces, Magnetorheological fluid based finishing, Micro machining, Unconventional machining processes

### ***Thrust Areas***

1. High Speed Machining, Grinding and Development of Cutting Tools / Grinding Wheel
2. Micro Manufacturing and Microscale Transport Processes, Laser Materials Processing
3. Bio-mechanics, Bio-micro-fluidics and microscale transport processes
4. Microfluidics, lab-on-a-chip
5. Smart materials and composites

### ***Brief Description of on-going activities***

Expert systems and soft computing - various applications like robotics, manufacturing science, medical diagnosis



Bio-micro-fluidics and microscale transport processes, Transport Phenomena in Phase Change Problems, Lab on a chip devices

Material processing - Laser Processing, Non conventional macining,High Efficiency Deep Grinding, surface coating

CFD/Lattice Boltzmann Method in Complex Flows

Design and development of carbon di-oxide based power and refrigeration systems

Digital manufacturing, rapid prototyping, 3-D printing

Noise and vibration engineering

Smart composite materials and structures

Turbulence and instability

Multiphase flow, boiling and condensation

Friction stir welding, Metal forming

Systems and control, vibration induced transport

Rotor dynamics, tribology, wear and lubrication

Biomechanics, biomedical applications

Robotics, automation, flexible manufacturing systems

### ***Academic Performance***

Awards & Honours	1
Member - Professional Bodies	25
Member - Editorial Board	27
Visits Abroad by Faculty Members	8
Lectures by Visiting Experts	20
Doctoral and MS Degrees Awarded	17
Sponsored Research Projects	60
Consultancy Projects	14
Patents (filed / granted)	1
Short-Term Courses and Training Programmes organised	2
Books Published	1
Papers Published in Journals	148
Papers Presented in Conferences	21

# Department of Metallurgical & Materials Engineering

## *Head*

Prof. Gour Gopal Roy

## *Professors*

Chakraborti, Nirupam	<i>Ph.D.(Univ. of Washington, USA)</i> , Computational Materials Science Genetic Algorithms Extractive Metallurgy
Chakraborty, Madhusudan	<i>Ph.D.(IIT Kharagpur)</i> , Solidification Processing, Metal Matrix Composites, Ti Based Alloys
Das, Karabi	<i>Ph.D.(Wisconsin, USA)</i> , Metal Matrix Composites, Nanocomposites, Materials Characterization, Electrodeposition
Das, Siddhartha	<i>Ph.D.(Illinois, USA)</i> , Nano Materials, Composite Materials, Electron Microscopy, Surface Engineering, Energy Materials, Characterization of Materials, Lead Free Solder Materials
Dutta Majumdar, Jyotsna	<i>Ph.D.(IIT Kharagpur)</i> , Laser Materials Processing, Biomaterials, shape memory alloy, Advanced Welding of Materials, Surface Engineering, Plasma Processing of Materials, Corrosion and Environmental Degradation
Ghosh, Rabindra Nath	<i>Ph.D.(IIT Kharagpur)</i> , Physical Metallurgy, High temperature Materials, Failure Analysis, Mathematical Modelling
Ghosh, Sudipto	<i>Ph.D (IIT Kanpur)</i> , 1. Mathematical Modeling of Material pprocesses, 2.Solidification Processing Metal Matrix Composites, 3.Fabrication of Lithium Ion Batteries, 4.Deformation Behavior of Materials
Manna, Indranil	<i>Ph.D.(IIT Kharagpur)</i> ,
Mitra, Rahul	<i>Ph.D.(Northwestern Univ., USA)</i> , Mechanical Behaviour of Materials, Scanning and transmission electron microscopy, Materials for high temperature applications, Composite Materials, Nanocrystalline materials, Thin Film Processing and Characterization, Oxidation behavior of materials
Pabi, Shyamal Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Nanostructured materials Phase transformations

## Composites Modelling and simulation

- 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)*, Alternative Routes of Iron & Steel making, Modelling of Heat & Mass Transfer in Materials Processing, Electron Beam Welding
- Roy, Sanat Kumar *Ph.D.(IIT Kharagpur)*, Mineral Processing, Extractive Metallurgy, Environmental Degradation of Materials, Materials Processing by Laser, Electronic and magnetic nanomaterials
- Sen, Prodip Kumar *Ph.D. (Jadavpur Univ)*, Process metallurgy - Modeling and simulation of ironmaking processes-Design & scale-up
- Singh, Shiv Brat *Ph.D.(Cambridge Univ,UK)*, Physical metallurgy of steel
- Associate Professors***
- Acharya, Narendra Nath *Ph.D.(IIT Kharagpur)*, Artificial Intelligence, Powder Metallurgical Applications, Multi-Media, Educational Technology, Photography
- Aich, Shampa *Ph.D.(Univ.of Nabraska, USA)*, Rapid Solidification, Magnetic Materials, Shape Memory Alloys, Surface Modifications, Biomaterials
- Biswas, Koushik *Ph.D. (Univ.of Stuttgart, Germany)*, Energy materials (Hydrogen storage - Solid Oxide Fuel Cell - Lithium Ion Battery), Abinitio (DFT) and MD Modeling, Electroceramics (Ferroelectric - Pyroelectric - Relaxor - Multiferroics), Structural Ceramics (ZrO<sub>2</sub> - Al<sub>2</sub>O<sub>3</sub> - TBC - SiC), Ceramic Reinforced Metal Matrix Composites (steel and Al-based MMC with SiC - TiC-other Carbide), Sintering (Conventional - Microwave - SPS)
- Chakrabarti, D *Ph.D.(Univ. of Birmingham, UK)*, Microstructure property correlation in metals, Development of microstructure and texture in thermo-mechanical processing, Fracture toughness and fracture transition behaviour in metals, Development and effect of mixed grain structures in metals, Segregation during solidification and its effect on properties, Modelling based on dislocation theory, Defect initiation and its control in metals

Kar, Sujoy Kumar	<i>Ph.D.(The Ohio State Univ.), Physical and Mechanical Metallurgy, Processing-Microstructure-Microtexture-Property Relationship, Materials and property modeling, Materials systems: Ti alloys and Ni based superalloys for and steels for energy applications</i>
Kundu, Tarun Kumar	<i>Ph.D(Lulea univ of Tech,Sweden), Atomistic Simulations of Materials, Extractive Metallurgy, Computational Fluid Dynamics, Mineral processing, Modeling on Energy Materials</i>
Laha, Tapas	<i>Ph. D.(Florida Int.Univ., Miami), Nanocomposites - Processing &amp; Characterization, Interfacial Phenomena, Surface Engineering &amp; Coating, BMG Nanocomposites, Materials Processing via Spark Plasma Sintering</i>
Sant, Sudhindra B	<i>Ph.D.(Queen's Univ., Canada), Thin Film Electronic Materials and Nanostructures, Spintronic Thin Films, Defects in Thin Film Semiconductors, Wide band-Gap Semiconductors, MEMS devices, Photovoltaic Thin Films, Biomaterials and Biomimetics, Nanomaterials and Nanocrystalline Plasticity</i>
<b><i>Assistant Professors</i></b>	
Bandyopadhyay, Tapas Kumar	, Micro-structure Property Co-relation in Steel. Metal Matrix Composite. Intellectual Property
Bhaduri, Amit	<i>M.Tech.(IIT Kanpur), STRUCTURE-PROPERTY RELATIONSHIP.</i>
Biswas, Somjeet	<i>Ph.D.(IISc., Bangalore), Advanced Magnesium and Titanium alloys, Deformation and thermomechanical processing, Microstructure - crystallographic texture and mechanical property correlation, Severe plastic deformation and fracture mechanics, Ni-Ti shape memory alloys and dual phase steels</i>
Das, Jayanta	<i>Ph.D.(TU Dresden, Germany), Solidification and Non-equilibrium Processing, Metastable and Nanostructured Alloys, High Temperature Oxidation, Structure-Property Relationship, Phase Transformation</i>
Mandal, Sumantra	<i>Ph.D.(IIT Madras), Grain Boundaries and Interfaces, Hot Deformation and Workability Studies, Recrystallization and Grain Growth, Superplasticity, Constitutive Modeling, Thermo-mechanical Processing</i>
Roy, Mangal	<i>Ph.D.(Washington State Univ.), Biomaterials, Ceramics, surface</i>

modification

Sen, Indrani

*Ph.D.(IIS)*, Mechanical Behavior of Materials, Small scale deformation characteristics, Nanoindentation, Fracture and Fatigue of Materials, Failure Analysis, NiTi-based Shape memory alloys, Ti alloys, Steels

### ***Thrust Areas***

1. CLASSICAL METALLURGY AND MATERIALS SCIENCE i. Extractive metallurgy; ii. Solidification and nonequilibrium processing; iii. Metastable alloys and Phase transformation; iv. Deformation and fracture behavior; v. Joining of metals; vi. Corrosion behavior and high temperature oxidation; vii. Powder Metallurgy
2. COMPUTATIONAL MATERIAL SCIENCE i. Modeling and simulation in process metallurgy; ii. Modeling of phase transformation kinetics; iii. Molecular dynamics; iv. Design & scale-up of metallurgical processes; v. Modeling and simulation of iron making processes
3. IRON AND STEEL i. Raw material processing and mineral beneficiation; ii. Advanced auto-grade steel; iii. Improvement in mechanical properties like creep, fatigue, fracture and non-destructive testing
4. ADVANCED MATERIALS i. Composites & functionally graded materials; ii. Nanomaterials and nanocomposites; iii. Surface engineering & Interfacial phenomena; iv. Thin film coatings; v. Biomaterials; vi. Lithium ion battery; vii. Solid oxide fuel cells (SOFCs)

### ***Brief Description of on-going activities***

The Research and Development Program of the Department encompasses various areas like Corrosion Science and Technology, Extractive Metallurgy, Mechanical Metallurgy, Melting, Casting and Solidification Processing, Modeling, Simulation and Multimedia in Metallurgical Engineering, Physical Metallurgy, Powder Metallurgy, Surface Engineering etc. In the field of Extractive Metallurgy significant contributions for metal value extraction, particularly Cu, Ni and Co from sea nodules has been made. Direct reduction of iron ore using mine generated ore and coal fines is another major research area. Understanding CO<sub>2</sub> mitigation in steel industry through process models has emerged as a developed area of research. In the domain of Mechanical Metallurgy, a pioneering achievement has been the design and development of fatigue testing using rotating bending machine to study short, long and non-propagating crack behaviour in several steels. Investigations related to structure-property relationship of various ceramic and metal-matrix composites, high temperature materials and advanced alloys are thrust areas of activity. Development of newer grades of dual phase and micro alloyed steels through fracture based studies, correlation between fracture and wear characteristics of materials, development of thin sheet steel components are some important fronts in this direction. In addition, research is progressing in the area of mechanical behaviour of small volume materials. The major areas in the field of Melting, Casting and Solidification Processing include: development of cast micro-alloyed steels, studies on the hot tearing of long freezing range Al alloys, austempered ductile iron through non-conventional route, grain refinement of Al alloys and the development of cast metal matrix composites. Success has been achieved in improving the mechanical properties of some hypoeutectic and eutectic Al-Si alloys by combined grain refinement and modification treatment using indigenously developed Al-B and B rich Al-Ti-B master alloys and Sr, respectively. In addition to mathematical modeling works in the areas of surface engineering, phase transformation, solidification processing, fracture & fatigue, some more new areas have

surfaced and these are: application of genetic algorithm for the optimization of metallurgical systems, mathematical simulation of welding, iron and steel making, and other high temperature metallurgical systems by application of computational fluid dynamics, and heat and mass transfer, atomistic simulation of gas hydrates, molecular dynamic simulation of nanostructured materials etc. Several Al-Cu-TM and Al-TM-Si (TM = transition metal) Al-Ni-Ti ternary alloys, and Al-alloys containing rare earth metals have been synthesized and characterized to explore the possibility of developing bulk amorphous Al-alloy by mechanical alloying and identifying the criteria of selection of such amorphous alloy compositions. The present activities of the Powder Metallurgy group include synthesis of particulate reinforced mullite and their property evaluation, production of Al<sub>2</sub>O<sub>3</sub> reinforced Ni<sub>3</sub>Al thorough reaction sintering route, reaction sintering of silicon carbide, recovery of copper from printed circuit etchant sludge and production of silicon carbide from fly ash silica. Research has been initiated in the area of semi-solid processing for casting and forming operations of Al-alloy matrix composites. In addition, significant progress has been achieved in the synthesis of Fe-TiC, Fe-ZrC and Fe-TiB<sub>2</sub> composites from cheaper raw materials by aluminothermic reduction method. Development of low temperature copper based composites, steel matrix composites are also prominent areas in the area of composite materials. Activities related to surface engineering involves laser assisted surface modification, ion implantation and plasma spray deposition, development of nano-structured coating by electro-deposition. The research activities in the area of Environmental Degradation embraces fundamental studies relating to film/scale growth processes on different metal-oxygen and metal-halogen systems with emphasis on kinetics and growth mechanisms, defect structures of compounds, transport properties of different species, adhesion and protective properties of the scales etc. Studies on high temperature oxidation behaviour of multi-phase refractory metal-silicides like Molybdenum and Niobium Silicides are in progress. In the area of aqueous corrosion, the current activities are concentrated on the studies relating to corrosion behaviour of amorphous and nanocrystalline Zr-based binary alloys, corrosion and stress corrosion performance of aluminum based composites and Al-Ni alloys and stress corrosion cracking of nickel alloys in hydrogen fluoride environment. Development of lead free Sn based solder material, and solid oxide fuel cell are also some areas of active research. In the area of joining research on joining of similar and dissimilar materials using electron beam welding is getting prominence. Development of Lithium Ion Battery (LIB) Technology for applications in Electric Vehicles in India has taken the role of a prominent research area in the Department.

### ***Academic Performance***

Awards & Honours	4
Member - Professional Bodies	71
Member - Editorial Board	12
Visits Abroad by Faculty Members	6
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	13
Sponsored Research Projects	66
Consultancy Projects	15
Patents (filed / granted)	7
Seminars, Conferences and Workshops Organised	3
Books Published	1
Papers Published in Journals	89
Papers Presented in Conferences	30

# Department of Mining Engineering

## *Head*

Prof. Khanindra Pathak

## *Professors*

Bhattacharya, Jayanta	<i>Ph.D.(IIT Kharagpur)</i> , Mine Planning, Environmental Engineering, Environmental Nanotechnology, Wastewater Treatment Technologies and Process Developments, Management Social Impacts, Reliability Engineering
Bhattacharjee, Ashis	<i>Ph.D.(Penn-State)</i> , Occupational Health and Safety and Operations Research applications in mining
Das, Samir Kumar	<i>Ph.D.(ISM Dhanbad)</i> , Strata Control and Rock Mechanics, Mines Safety Engineering, Mine Environment
Deb, Debasis	<i>Ph.D.(Alabama Univ, USA)</i> , Rock Mechanics, Analytical and numerical methods in design of geo-structures, Mine Design, Ground Control, Extended Finite Element Methods in bolt mechanics and support design, Mesh-free numerical methods in geomechanics
Karmakar, Ganga Prasad	<i>Ph.D.(IIT Kharagpur)</i> , Reservoir Engineering Enhanced Oil Recovery Shale Gas.
Mukhopadhyay, Subir Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Mine Planning and Design, Underground Metalliferous Mining, Surface Mining (Open pit/ Opencast/ Quarry/ On & Offshore Placer), Mine Safety Mining Laws and Mine Management, Mine and Mineral Economics Valuation Trade & Stockpiling, Small-scale Mining and Sustainable Development in Mining
Pal, Samir Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Geomechanics - Roof fall prediction in underground coal mines, Mine Void Filling – Blind backfilling of abandoned mines using sand and other waste material, Wear of Elastomers in Mining – Abrasion of elastomers against different rock types.
Pathak, Khanindra	<i>Ph.D.(London Univ)</i> , Environmental Management in Surface Mining and Mine Site Restoration, Application of Remote Sensing and GIS, Vetiver System Implementation for CSR-EMP Integration, Oil Spill Management, Coal Bed Methane, Pedagogy and Educational Technology
Rao, Karanam Uma	<i>Ph.D.(IIT Kharagpur)</i> , Rock Mechanics, Mine

Maheshwar Development, Underground Metal Mining, Back filling of mine voids

Sastry, Bhamidipati Suryan *Ph.D.(Utah)*, Underground Environment, Aerosols Characterization

### ***Associate Professors***

Chakravarty, Debashish *Ph.D (IIT Kharagpur)*, Mine Mapping and Locational Surveillance using Digital Photogrammetry, GeoResource Exploitation using Geoinformatics and GPS & GIS, Mineral Resource Mapping using Geodesy and InSAR Technologies, Geotechnical Stability Analysis of Slopes using Numerical Modelling, Hyperspectral Imaging for Mineral Identification

Majumder, Arun Kumar *Ph.D.(Univ. of Queensland)*, Mineral Processing, Coal Washing, Solid-Fluid Interactions, Fine Particle Processing

Samanta, Biswajit *Ph.D.(IIT Kharagpur)*, Mine planning, Geostatistics, Mine environment and ventilation

### ***Assistant Professors***

Dey, Kaushik *Ph.D.(ISM, Dhanbad)*, Rock excavation by blasting and mechanised rock cutting Surface mining

Patra, Aditya Kumar *Ph.D.(Imperial College, London)*, Air pollution measurement and modelling, Greenhouse gas emissions from mines, Human vibration in mines and allied industries, Industrial safety assessment and audit

Prusty, Basanta Kumar *Ph.D.(Southern Illinois)*, Coalbed methane and shale gas, Geological Carbon Sequestration, Underground Coal Gasification

Verma, Abhiram Kumar *Ph.D.(IIT Kharagpur)*, Rock Mechanics and Ground Control, Slope Design, Numerical Modeling, Rock Fracture Mechanics

### ***Thrust Areas***

1. Rock Mechanics and Ground Control
2. Surface and sub-surface Environment
3. Mine Safety and Systems Engineering
4. Advanced Surveying and Geo-informatics
5. Safety Engineering
6. Clean Coal Technology



### ***Brief Description of on-going activities***

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

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

Mine Planning / Modeling- Application of various grade estimation techniques namely kriging, cokriging, stochastic simulation and neural networks for estimation of mining blocks for quality control in mines; Investigation of different statistical quality control techniques including univariate and multivariate control charts for controlling the grade of mineral at various locations; Grade control aspects in limestone and bauxite operations. Fault Tree Analyses and algorithm development for a Coal Handling Plant.

Advanced Surveying & Geoinformatics: Integration of GPS & I.SAR ground deformation data over mining areas. Use of lasers for assessment of stability of dumps. Vision based semi-automatic mine navigation system.

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.

### ***Academic Performance***

Awards & Honours	4
Member - Professional Bodies	61
Member - Editorial Board	6
Visits Abroad by Faculty Members	9
Lectures by Visiting Experts	2
Sponsored Research Projects	48
Consultancy Projects	76
Technology Transferred	1
Patents (filed / granted)	5
Short-Term Courses and Training Programmes organised	9
Books Published	3
Papers Published in Journals	13
Papers Presented in Conferences	24

# Department of Ocean Engineering & Naval Architecture

## *Head*

Prof. Trilochan Sahoo

## *Professors*

Bhaskaran, Prasad K	<i>Ph.D (Kurukshetra)</i> , Wind-Wave Modeling, Marine Acoustics, Coastal Processes, Coastal Sediment Dynamics, Physical & Dynamical Oceanography, Ocean Wave Climate Projections
Mandal, Nisith Ranjan	<i>Dr.Inz.(Poland)</i> , Wave and Tidal Energy, Computational Weld Mechanics and Welding Technology
Sahoo, Trilochan	<i>Ph.D.(IISc Bangalore)</i> , Coastal Hydrodynamics, Wave past porous structures, Boundary value problems, Hydroelasticity
Satsangi, Subir Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Ship Structures Structural Engineering Composite Materials Naval Architecture.
Sen, Debabrata	<i>Ph.D.(Canada)</i> , Free Surface Hydrodynamics, Marine Hydrodynamics, Dynamics of Marine Vehicles, Seakeeping and Maneuvering
Sha, Om Prakash	<i>Ph.D.(IIT Kharagpur)</i> , Marine Design and Production

## *Associate Professors*

Bhar, Ashoke	<i>Ph.D.(IIT Kharagpur)</i> , Marine Structural Engineering
Warrior, Hari V	, Turbulence Modeling in Oceanography, Computational Fluid Dynamics

## *Assistant Professors*

Bhattacharjee, Joydip	<i>Ph.D.(IIT Kharagpur)</i> , Marine Hydrodynamics, Wave-Structure Interaction, Wave Energy Converters
Datta, Nabanita	<i>Ph.D.(Univ. of Michigan, USA)</i> , Marine Dynamics, Vibrations, Hydroelasticity
Datta, Ranadev	<i>Ph.D.</i> , Numerical Ship Hydrodynamics, Hydroelasticity of Floating Structures and Ships, Computational Geometry
Mohammed Rabius Sunny	<i>Ph.D.(Virginia)</i> , Structural Engineering

Sarkar, Arunjyoti *Ph.D. (Univ. of Stavanger, Norway)*, Marine operation for subsea installation, Structural vibration control, Wave Structure Interaction

Vishwanath, Nagarajan *Ph.D.(Osaka Univ. Japan)*, Ship motions, Rudder systems, Mathematical modelling

### ***Thrust Areas***

The thrust areas of the Department includes: Marine and Ocean Hydrodynamics, Marine design and Production, Numerical Hydrodynamics, Coastal Marine Hazards, Ocean Structures, Marine Structural Analysis, Ocean Wave & Circulation Modeling, Marine Design and Production, Welding Technology, Coastal Processes and Engineering, Offshore Technology, Hydroelasticity, Storm Surge Prediction & Tsunamis, Suspended Sediment Dynamics, Marine Acoustics.

### ***Brief Description of on-going activities***

The Department is continuously changing the teaching courses as per the need of industry and trend in academics. Three new electives were introduced during the current academic session. Department is in the process of enhancing the ongoing research activities in the areas of marine hydrodynamics, design and production, Coastal processes and Engineering, marine structures. The Department has introduced the International summer and winter terms into the academic programs from the current academic year. The Department runs a National Program in Marine Hydrodynamics sponsored by Naval Research Board (DRDO) which aims to bridge the knowledge gap in Marine Hydrodynamics and develop indigenous R & D capabilities on Naval Systems. Apart from some of the ongoing training program, since January, 2014, the Department is providing training program involving faculty across various discipline within the Institute to Government officers of both Gujarat and West Bengal under integrated Coastal Zone Management Project in different batches. Department is organizing various outreach program like short-term courses/workshops for interacting with industry experts and researchers of sister Institutions in the broad area of Ocean Engineering. The Department is in the process of upgrading the infrastructure and augmenting the existing laboratory facilities taking into account the increase in students strength. Some of the old facilities are being upgraded during last one year which include upgradation of CL-1 into a seminar room and the renovation of British toilet into Marine Construction Laboratory -II. Further, faculty rooms are renovated. Dept. corridor is distempered and the floors are renovated with tiles.

### ***Academic Performance***

Member - Professional Bodies	13
Member - Editorial Board	5
Visits Abroad by Faculty Members	8
Lectures by Visiting Experts	2
Doctoral and MS Degrees Awarded	3
Sponsored Research Projects	14
Consultancy Projects	28
Seminars, Conferences and Workshops Organised	2
Short-Term Courses and Training Programmes organised	4
Papers Published in Journals	24
Papers Presented in Conferences	37

# Department of Physics

## *Head*

Prof. Arghya Taraphder

## *Professors*

Bharadwaj, Somnath	<i>Ph.D.(IISc Bangalore)</i> , Astrophysics, Cosmology
Datta, Prasanta Kumar	<i>Ph.D.(Burdwan Univ)</i> , Ultrafast Lasers and Nonlinear Optics, Photonics
Dhar, Achintya	<i>Ph.D.(Jadavpur Univ)</i> , Organic Semiconductors, Semiconductor Nanostructures, Heterostructure Devices, Organic Solar Cells
Kar, Sayan	<i>Ph.D.(IIT Kanpur)</i> , Gravitation and Geometry, High Energy Physics, Quantum mechanics
Kumar, Krishna	<i>Ph.D.(IIT Kanpur)</i> , Hydrodynamic flows, Pattern-forming instabilities
Mathur, Balbir Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Web Based Service and website, Microprocessor, ERP in PHP, Thin Films
Nath, Tapan Kumar	<i>Ph.D.(IIT Kanpur)</i> , Magnetic oxide thin films and multilayers, Spin electronics, Nanostructured Magnetic oxides, Magnetic Alloys, Multiferroics, Condensed Matter Physics (Low temperature Physics), Magnetism and Superconductivity, Magnetic semiconductors, Strongly Correlated System
Ray, Samit Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Semiconductor nanostructures, Condensed Matter Physics, Thin Films, Photovoltaics
Roy, Anushree	<i>Ph.D.(IISc Bangalore)</i> , Raman spectroscopy
Sharma, Shivcharan Lal	<i>Ph.D.(IIT Kanpur)</i> , Effect of Ionizing Radiation on Thin Films and Devices, Radiation Physics, Monte Carlo Simulation of Radiation Detectors, Semiconductor Physics and Physics of Semiconductor Devices, Fission Dynamics
Shukla, Pragya	<i>Ph.D.(JNU Delhi)</i> , Random matrix theory and Quantum Chaos, Condensed Matter Physics, Statistical Studies of Complex Systems, Theoretical Physics

Taraphder, Arghya *Ph.D.(IISc Bangalore)*, Condensed matter physics, Condensed matter physics

***Associate Professors***

Chandra, Amreesh *Ph.D.(I.T., B.H.U.)*, Multiferroics ceramics, Hollow nanostructures for catalysis, Experimental Condensed Matter Physics, Microbial Fuel Cells, Supercapacitors

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

Goswami, Dipak Kumar *Ph.D.(IoP Bhubaneswar)*, Surfaces and Interfaces Science, Nanoscale Science, Organic Semiconductors Thin Films and Nanostructures Growth, Organic Field-Effect Transistors (OFETs): Fabrication and Characterization, X-ray Physics, Ion-solid Interaction

Khastgir, Sugata Pratik *Ph.D.(IOP Bhubaneswar)*, Mathematical Physics/High Energy Physics

Majumder, Sonjoy *Ph.D.(IIA Bangalore)*, Computational Many-body physics, Atomic & Molecular Physics, Theoretical modelling of bulk and nano-materials, Astronomy and Astrophysics, Physics of Ultra-Cold atom

Panigrahi, Kamal Lochan *Ph.D.(IoP Bhubaneswar)*, String Theory, High Energy Physics, String Inspired Cosmology

Roy Chaudhuri, Partha *Ph.D.(IIT Delhi)*, Fiber & Integrated Optics and Optoelectronics, Experimental Bio-Photonics & Nano-Photonics

Singh, Ajay Kumar *Ph.D.(Calcutta Univ)*, Experimental Nuclear Physics, Double Beta decay studies

Srivastava, Sanjeev Kumar *Ph.D.(JNU, New Delhi)*, Materials Engineering using Ion Beams, Nuclear Condensed Matter Physics, Quantum Criticality

***Assistant Professors***

Banerjee, Debamalya *Ph.D.(IISc. Bangalore)*, Electron Paramagnetic Resonance (EPR), Supercooled liquid dynamics, Physics of photovoltaic materials

Bhaktha, Shivakiran B N	<i>Ph.D.(Univ of Hyderabad)</i> , Glass Photonics, Optofluidics, Random Laser
Burada, Poornachandra Sekhar	<i>Ph.D.(Univ. of Augsburg, Germany)</i> , Stochastic processes and transport, Active Brownian motion, Swimming of microorganisms
Choudhury, Debraj	<i>Ph.D.(IISc, Bangalore)</i> , Experimental investigations of magnetic - electronic - dielectric properties
Das, Baidya Nath	<i>Ph.D.(IIT Kharagpur)</i> , condense matter physics
Gupta, Amar Nath	<i>Ph.D.(JNU)</i> , Biophysics and Soft Matter Physics
Manoj, Brundavanam Maruthi	<i>Ph.D.(Hyderabad Univ.)</i> , Singular Optics, Applied Optics, Ultrafast Laser Filamentation
Ray, Tirtha Sankar	<i>Ph.D.(SINP, Kolkata)</i> , Supersymmetry Extra Dimensions and Composite Higgs Models, High Energy Physics, Beyond Standard Model Phenomenology
Roy, Nirupam	<i>Ph.D.(TIFR, Mumbai)</i> , Astronomy and Astrophysics, Radio Astronomy, Interstellar Medium, Astrophysical Turbulence
Roy, Samudra	<i>Ph.D.(Jadavpur Univ.)</i> , Silicon Photonics, Nonlinear Photonics, Plasmonics
<b><i>Scientific Officer</i></b>	
Chakraborty, Syamal	<i>Ph.D.(IIT Kharagpur)</i> , Condensed matter Physics
<b><i>INSPIRE facultys</i></b>	
Chatterjee, Swastika	<i>Ph.D.(SNBNCBS)</i> , Theoretical Condensed matter Physics
Mohakud, Sasmita	<i>Ph.D.(JNCASR, Bangalore)</i> , Theoretical Condensed matter Physics
<b><i>Post Doctoral fellows</i></b>	
Anathpindika, Sumedh V	<i>Ph.D.(Cardiff, UK)</i> , Astrophysics
Chakraborty, Monodeep	<i>Ph.D.(SNBNCBS)</i> , Theoretical Condensed matter Physics

### ***Thrust Areas***

1. Condensed Matter Physics
2. Optics and Photonics
3. Atomic, nuclear and high energy physics, Astrophysics.
4. Nonlinear dynamics and complex systems

### ***Brief Description of on-going activities***

The Department is engaged in a variety of academic and research activities through the active participation of undergraduate and post-graduate students, research scholars, post-doctoral fellows and faculty. The academic atmosphere of the Department is maintained through regular seminars by visitors as well as students and faculty. In research, apart from using in-house facilities, collaborative work is carried out with other departments, centres as well as with other institutes in India and abroad. The broad areas of research include: Astrophysics, cosmology and gravitation; Atomic and Molecular Physics; Biophysics; Condensed Matter Physics and Nano-Science; Mathematical Physics; Nonlinear dynamics and complex systems; Nuclear and High Energy Physics; Optics and Photonics.

### ***Academic Performance***

Member - Professional Bodies	46
Member - Editorial Board	17
Visits Abroad by Faculty Members	9
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	9
Sponsored Research Projects	35
Consultancy Projects	3
Seminars, Conferences and Workshops Organised	2
Papers Published in Journals	127
Papers Presented in Conferences	42

# Centre for Educational Technology

## *Head*

Prof. Anupam Basu

## *Associate Professor*

Bhattacharya, Bani *Ph.D.(IIT Kharagpur)*, Instructional Design Distance Education  
Technology Enhanced Learning Pedagogical Research

## *Assistant Professors*

Bhowmick, Plaban Kumar *Ph.D.(IIT Kharagpur)*, Natural Language Processing in Education,  
Artificial Intelligence in Education, Computer Aided Education

Das Mandal, Shyamal Kumar *Ph.D.(Jadavpur Univ)*, Speech and Signal Processing, Pedagogy of  
teaching learning process

Mohanty, Atasi *Ph.D.(Utkal University)*, Educational Psychology Teacher Education  
HRD, Cognitive Psychology Human Resource Development Health &  
Counselling Psychology, Educational Psychology Teacher Education

## *Thrust Areas*

1. The center has produced nearly 4,800 hours of video courses in various engineering subjects. These are in use in more than 250 engineering colleges, universities and R & D laboratories. These courses are primarily used for self-learning by faculty, staff and students. Significant demand for them exists in overseas markets also. CD & DVD versions of these courses are available. CET is now also making the courses available on HDDs – to be used in the Video-on-Demand (VOD) mode by institutions within their internal LAN. This allows access to any course on the LAN to a large number of users at any point of time along with the ability to control all normal play functions at will. More than 3700 users access these courses on any single day within the LAN of IIT Kharagpur.
2. Instructional Design; Technology Enhanced Learning; Teaching-Learning Process; Distance Education; Speech and Image processing; Speech Technology development for Indian Language and ICT application; Cognitive Psychology & Human Resource Development; E-learning; Natural Language Processing for e-Learning; Artificial Intelligence in Education;

## *Brief Description of on-going activities*

CET, IIT Kharagpur is offering an M.Tech Programme on “Multimedia Information Processing”. Students with B.Tech./B.E. or equivalent qualification in CSE/ECE/EE/Instrumentation Engineering /IT are eligible to apply. CET also offers Ph.D and M.S. programmes in both, areas related to educational pedagogy and in Speech and Image processing. Research scholars are already working in these areas. 12 research scholars are already working in the area of Educational Technology and Speech Processing.



Ongoing Sponsored Projects : 1) National Program on Technology Enhanced Learning - CET, IIT Kharagpur has already developed more than 200 courses as a part of NPTEL phase I & II. 2) Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning. 90 courses have been completed in the pilot phase. The main phase program with objective of development of 200 courses has been started. These courses consist detailed curriculum documents with instructional objectives, assessment and references to learning resource materials. 3) Language Technology for E-learning Applications 4) Centre organized several faculty development programs on "Faculty development Programme for Effective Teaching" under TEQIP-II

***Academic Performance***

Member - Professional Bodies	11
Member - Editorial Board	3
Visits Abroad by Faculty Members	2
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	2
Sponsored Research Projects	6
Seminars, Conferences and Workshops Organised	2
Short-Term Courses and Training Programmes organised	6
Papers Published in Journals	8
Papers Presented in Conferences	14

# Centre for Oceans, Rivers, Atmosphere and Land Sciences

## *Head*

Prof. Arun Chakraborty

## *Professor*

Gangopadhyay, Avijit ,

## *Associate Professors*

Behera, Mukunda Dev *Ph.D.(IIRS, DehraDun)*, Land/ Vegetation Cover and River Basin Dynamics, Biodiversity and Geoinformatics Modeling, Forest Biomass and Carbon Sequestration, Ecosystem Ecology and Climate

Chakraborty, Arun *Ph.D (IIT Delhi)*, Ocean Dynamics and Ocean Circulation Modeling of the Bay of Bengal, Data Assimilation

Dash, Mihir Kumar *Ph.D. (Gujarat University)*, Satellite Oceanography, Mesoscale Ocean Modeling, Cryospheric Studies

Mandal, Manabottam *Ph.D.(IIT Delhi)*, Observations and modeling of land surface processes, Modeling of extreme weather events - tropical cyclones and thunderstorms, Regional climate modeling, Cloud Microphysics, Mesoscale and land surface data assimilation

Satyanarayana, Achanta Naga Venkata *Ph.D (BHU)*, Atmospheric Boundary layer: Observations Modeling, Meso-scale Modeling of weather events (e.g. Thunderstorms Monsoon), Air Sea Interactions, Monsoon Meteorology, Air Pollution Modeling

## *Assistant Professors*

Jayanarayanan, K. *Ph.D.(Univ. Bremen, Germany)*, Numerical modelling of Ocean and Atmosphere, Atmospheric Chemistry and Physics, Physical Oceanography, Climate Change and Climate modelling

Shaji, C *Ph.D. (IIT Delhi)*, Climate Variations, Ocean Modeling and Analysis, Coastal Processes, Monsoon Oceanography

## *Thrust Areas*

1. Ocean modeling for Bay of Bengal, Indian Ocean and North Indian Ocean

2. Observation and modeling of thunderstorm
3. Modeling and prediction of tropical cyclone
4. Study of Forest Biomass and Carbon Sequestration
5. Monsoon Meteorology
6. Air pollution study
7. Observations and modeling of land surface processes
8. Mesoscale and land surface data assimilation
9. Cloud Microphysics
10. Cryospheric Studies
11. Satellite Oceanography

### ***Brief Description of on-going activities***

The Centre is established in March 2005 with a vision to impart quality education in Earth System Science & Technology and conduct advance research on the multi-disciplinary aspects of earth and climate sciences with major focus on Land-Ocean-Atmospheric sciences interactions. Since 2006, the centre is offering M.Tech. degree in Earth System Science and Technology. The Centre has been actively participating in various programs of research and application importance at national and international levels. Beside, M.Tech. degree in Earth System Science and Technology the Centre is also offering Ph.D. and MS degrees. The Centre has set its goals, made strategies to meet the goals in phases in corroboration with the Institute's broad vision. The Centre is leading Digital Earth Initiative of the Institute and gearing up for the development of a meso-scale Land-Ocean-Atmosphere coupled model, especially to suitable for Indian sub-continent for better understanding. The Centre aims at being a hub in the Global network of organizations involved in multi-disciplinary earth system studies and research; also contributing to the national development by informing the policymakers of the technological and scientific advancements in the field. The Centre has prepared a visionary road map and planned to execute in stages towards achieving the broad objectives; i.e., excellence in advanced teaching and research in earth system and climate studies.

### ***Academic Performance***

Awards & Honours	1
Member - Professional Bodies	24
Member - Editorial Board	5
Visits Abroad by Faculty Members	3
Lectures by Visiting Experts	3
Doctoral and MS Degrees Awarded	3
Sponsored Research Projects	17
Consultancy Projects	1
Short-Term Courses and Training Programmes organised	3
Papers Published in Journals	25
Papers Presented in Conferences	28

# Cryogenic Engineering Centre

## ***Head***

Prof. Kanchan Chowdhury

## ***Professors***

Bandyopadhyay, Syamalendu Sekhar *Ph.D.(IIT Kharagpur)*, Natural gas processing, Carbon dioxide capture and sequestration, Air breathing propulsion, Separation processes

Chowdhury, Kanchan *Ph.D.(IIT Kharagpur)*, Helium Liquefier and Refrigerator, Cryogenic Air Separation, Prevention of Fire in Oxygen-rich systems, Electrostatics and Safety, Heat Exchanger, Refrigeration Technology and Cold Storage, Closed Cycle Cryorefrigerator

Dey, Tapas Kumar *Ph.D.(Delhi Univ)*, Superconducting Levitation, Thermal Properties of Polymer Nanocomposites, Electrical and thermal properties of Superconductors, Magnesium Di-boride Superconductors: Critical Current density and Pinning mechanism.

Rao, Vutukuru Vasudeva *Ph.D.(IIT Madras)*, Vacuum Technology, Cryogenic Engineering, Applied Superconductivity

## ***Associate Professors***

Adyam, Venimadhav *Ph.D.(IISc. Bangalore)*, Multiferroics Spintronics Multicaloric cooling Nanomaterials and Thin film batteries

Ghosh, Parthasarathi *Ph.D.(IIT Kharagpur)*, Low Temperature Processes and equipment, Cryogenic rotating machines, Helium Refrigeration and liquefaction systems, Cryogenic storage and transfer, Thermodynamics and heat transfer of supercritical helium

## ***Assistant Professors***

Ghosh, Indranil *Ph.D.(IIT, Kharagpur)*, Compact Heat Exchangers, Heat Transfer in Porous Media, Sorption Cooling

Nandi, Tapas Kumar *Ph.D.(IIT Kharagpur)*, Perforated plate matrix heat exchanger, Cryogenic wave expander, Cryogenic rocket propulsion

Sandilya, Pavitra *Ph.D.(IIT Kanpur)*, Gas hydrates, Cryogenic transport Phenomena-based processes, CO<sub>2</sub> capture and sequestration, Space cooling

### ***Thrust Areas***

1. Cryogenic Engineering
2. Advanced Materials
3. Nonconventional 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 Seapartio, Vacuum Technology etc.

### ***Academic Performance***

Awards & Honours	2
Member - Professional Bodies	18
Member - Editorial Board	1
Visits Abroad by Faculty Members	2
Doctoral and MS Degrees Awarded	4
Sponsored Research Projects	9
Consultancy Projects	4
Technology Transferred	1
Papers Published in Journals	36
Papers Presented in Conferences	17

# Materials Science Centre

## *Head*

Prof. Susanta Banerjee

## *Professors*

Adhikari, Basudam	<i>Ph.D.(Calcutta Univ)</i> , Membrane Electrode Based Portable e-Tongue Device for Rapid Taste Characterization of Tea, Development of jute-cement concrete composites, Development of jute based geotextiles, Development of a suitable processing technique for rubber coating of jute, Development of conducting polymer based gas sensors, Polymer based drug delivery systems, Development of volatile compound based biosensor for pest control, Development of polymer based taste sensor, Development of jute based baby diaper materials, Development of jute based fully biodegradable green composite, Ramie plantation and processing of ramie fiber
Banerjee, Susanta	<i>Ph.D.(IIT Kharagpur)</i> , Fluorinated High performance polymers, Membrane based separation, Hyperbranched polymers, Light emitting polymers, Polymer synthesis and characterization
Banerji, Pallab	<i>Ph.D.(Jadavpur Univ)</i> , Low dimensional semiconductors: Structures & Devices, Materials for energy applications such as thermoelectricity and photovoltaics, Photonics, III-V and other compound semiconductors
Bhattacharya, Debasis	<i>Ph.D.(Calcutta Univ)</i> , Synthesis and processing of meso porous ceramics for catalytic applications, Nano HAP for biomedical applications, High proton conductor for application in solid oxide fuel cell
Das, Chapal Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Nanocomposites, Direct fluorination, Insitu Nanocomposites for supercapacitor Application, Polymer Blends and its compatibilization, Insitu Nanocomposites for Microwave absorbing Materials, Graphene Based Nanocomposites, Organic Inorganic Hybrid Nanocomposites, Hybrid Materials for Fuel Cell Applications
Jacob, Chacko	<i>Ph.D.(Case Western, USA)</i> , Materials Science/ Nanomaterials and Nanotechnology/Semiconductors
Majumder, Subhasish Basu	<i>Ph.D.(IIT Kanpur)</i> , Oxide gas sensors, Lithium rechargeable batteries, Natural fiber reinforced cement composites, Fly ash based ceramic products, Multiferroic thin films and composites
Ram, Shanker	<i>Ph.D.(BHU, Varanasi)</i> , Glasses and disordered solids, Alloys and

intermetallics, Nanoceramics and hybrid composites, Magnetics and magnetocaloric materials, Ferroics and applications, Porous materials and applications, Metallic foams for biological applications, Nanofluids and nanoglues, Films, Optical materials and applications, Biomaterials, Phase transformations and phase transitions, Photonics

### ***Associate Professors***

Khatua, Bhanu Bhusan	<i>Ph.D.(IIT Kharagpur)</i> , Polymer-clay and Polymer-CNT Nanocomposites, Polymer Blends and Composites, Polymer Blend-Clay nanocomposites: Morphology control, Polymeric PTCR composites, Polymer-Graphene Nanocomposites, polymer-carbon nanohorn nanocomposites, Polymeric Supercapacitors, Polymer Composites for EMI Shielding Applications, Polymeric Piezoelectric Materials
Pradhan, Debabrata	<i>Ph.D.(IIT Bombay)</i> , Nanostructured Materials, Physical Chemistry, Materials for Energy and Environment, Catalysis

### ***Thrust Areas***

1. Nanomaterials / Nanocomposites
2. Energy Materials
3. Electrically Conducting Polymer Nanocomposites
4. Polymer Membranes for Gas Separation and Proton Exchange

### ***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.

***Academic Performance***

Awards & Honours	1
Member - Professional Bodies	24
Member - Editorial Board	11
Visits Abroad by Faculty Members	1
Lectures by Visiting Experts	2
Doctoral and MS Degrees Awarded	25
Sponsored Research Projects	33
Consultancy Projects	5
Patents (filed / granted)	9
Seminars, Conferences and Workshops Organised	2
Short-Term Courses and Training Programmes organised	1
Books Published	1
Papers Published in Journals	99
Papers Presented in Conferences	48



# **P. K. Sinha Centre for Bio Energy**

## ***Head***

Prof. Debabrata Das

## **About the Centre**

P K Sinha Center for Bioenergy at Indian Institute of Technology-Kharagpur was incepted on August 31, 2009 at the hands of its founder **Dr. Prabhakant Sinha**, an IIT Kharagpur alumnus. PK Sinha Center for Bioenergy is India's first integrated Bioenergy center. The Center's activities include knowledge in action by partnering with the government, commercial organizations, knowledge dissemination through academia, industry and policy makers. The center's faculty members are currently working in the areas of Bio-ethanol, Bio-diesel, Bio-hydrogen, Bio-methane, Algal biorefinery and Microbial fuel cells and Genetic prospecting of energy crops.

## ***Academic Performance***

### **Research and Development Activities**

P K Sinha Center for Bioenergy at Indian Institute of Technology-Kharagpur was incepted on August 31, 2009 at the hands of its founder **Dr. Prabhakant Sinha**, an IIT Kharagpur alumnus. PK Sinha Center for Bioenergy is India's first integrated Bioenergy Center. The center's faculty members are currently working in the areas of Biohydrogen, Bioethanol, Biodiesel, Biomethane, Algal biorefinery and Microbial fuel cells and Genetic prospecting of energy crops. Recently, DBT PAN-IIT Center for Bioenergy at IIT Kharagpur has been started. Prof. Saikat Chakraborty, ChE is the Principal Investigator (PI). The Co-PIs of the Center are Prof. Debabrata Das, BT; Prof. M.M. Ghangrekar, CE; Prof. M.K. Maiti, BT and Dr. A. Basu, ALPGE. 10 m<sup>3</sup> biohydrogen pilot plant studies are in progress to find out the commercial viability of the process. Our research scholars published their research work in several reputed journals and also presented their research work in several international conferences. Some of them have already won best paper presentation awards e.g. Ms. Sinu Kumari received 1<sup>st</sup> prize for the oral presentation in Bioprocessing INDIA 2014 held at ICT, Mumbai. Several National and International collaborative research work are in progress. Some of the faculty members have written books which have already been published by the reputed publishers like CRC Press, Springer, etc.

### **Infrastructure Development and new Acquisitions**

All labs are presently air conditioned for carrying out research work in different microbial fermentation processes. Scale up bioreactors for Bioethanol, Biomethanation, Microbial Fuel Cell and Biohydrogen have already been established. Online monitoring system like pH, temperature, etc. for the custom make algal fermentation process has also been developed.

### **Title and duration of conferences organized**

1st Research Scholar day of the Center was organized on 14 July, 2014.

### **Laurels and Distinctions awarded to faculty**

- Prof. Debabrata Das received Biotechnology Research Society of India Malaviya Memorial Award for Senior Faculty for significant contribution in hydrogen research (2013)
- Prof. Debabrata Das has been elected as a Fellow of Indian National Academy of Engineering (INAE) for the year 2015 in recognition of your distinguished contributions to “Engineering”
- Prof. Rintu Banerjee received Rafi Ahmed Kidwai Award 2013 for outstanding contribution in the field of Natural Resource Management and Agricultural Engineering, ICAR, New Delhi (2014)
- Prof. M.M. Ghangrekar received Gandhian Young Technology Innovation (GYTI) Awards (2015).
- Prof. R.K Sen received Fulbright Visiting Faculty fellowship (Columbia University in the City of New York, Manhattan, NY 10027, USA) (2014)

# Reliability Engineering Centre

## ***Head***

Prof. V N Achutha Naikan

## ***Professor***

Naikan, V N Achutha      *Ph.D.(IIT Kharagpur)*, Reliability and Quality Engineering, Condition Monitoring, System Simulation

## ***Associate Professors***

Chaturvedi, Sanjay Kumar      *Ph.D.*, Maintenance Engineering, System Reliability Modelling and Analysis, Reliability Data Analysis, Reliability Estimation

Goyal, Neeraj Kumar      *Ph.D.(IIT Kharagpur)*, Software Reliability, System Reliability Analysis, Probabilistic Risk Assessment, Network Reliability, Accelerated Life Testing

## ***Assistant Professor***

Sarma, Monalisa      *Ph.D.(IIT Kharagpur)*, Software reliability, Big data analysis, Cloud computing, Reliable Assistive Technology

## ***Thrust Areas***

1. Software Reliability and Cloud computing
2. Condition Monitoring and Maintenance
3. Reliability Testing and Estimation
4. Probabilistic Risk and Safety Analysis

## ***Brief Description of on-going activities***

The Research activities are now focusing more on experimental research. Accelerated life testing on various engineering components and systems are being carried out in our laboratory. A new Electrical Fault Simulator system is being installed in the laboratory for doing experimental research on fault diagnosis of electrical motors. New sensors and data acquisition systems are now operational. Other activities include organizing short term courses on latest topics of Reliability Engineering for officers and engineers of the Industry, Defense Organizations and R & D Establishments. Safety and reliability studies of nuclear power plants and missile systems are other activities. Reliability Availability Maintainability and safety (RAMS) aspects of Indian Railways is another focus area.

***Academic Performance***

Member - Professional Bodies	11
Member - Editorial Board	12
Visits Abroad by Faculty Members	2
Lectures by Visiting Experts	5
Doctoral and MS Degrees Awarded	2
Sponsored Research Projects	4
Consultancy Projects	6
Short-Term Courses and Training Programmes organised	1
Papers Published in Journals	13
Papers Presented in Conferences	8

# Rubber Technology Centre

## **Head**

Prof. Dipak Khastgir

## **Professors**

Bhowmick, Anil Kumar *Ph.D.(IIT Kharagpur)*, Polymer Nanocomposites and Nanomaterials, Thermoplastic Elastomers and Polymer blends, New Polymer from Renewable Sources, Polymer Modification, Rubber Technology, Failure and Degradation of Rubbers, Adhesion and Adhesives, Waste Rubber Recycling

Chaki, Tapan Kumar *Ph.D.(IIT Kharagpur)*, Electron beam modification of polymers, Polymer nanocomposites, Conductive rubber composites for EMI shielding application of Mobile phones and mobile towers, Waste plastics modified bitumen for highway application, Dielectric elastomer for smart functions, High Performance composite as friction materials, Shape Memory Polymer Nanocomposites

Khastgir, Dipak *Ph.D.(IIT Kharagpur)*, Development of Polymer & Composites for Graded Dielectrics and High Voltage Insulation application, Polymer Composites & Nano Composites for Electrical and Electronic applications, Textile Technology for Rubber Product and Protection against Biodegradation

Nando, Golok Behari *Ph.D.(IIT Kharagpur)*, Rubber Blends and Polymer Alloys through Reactive Processing, Chemical modification and Grafting of Rubbers and rubber additives, Nano Material Development and Rubber Nano Composites, Rubber in strategic areas of applications such as in Automotive tyres Cables and Biomedical applic, Guayule Natural Rubber Compounding Vulcanization and testing, TPEs and TPVs from virgin and waste polymers

Singha, Nikhil Kumar *Ph.D (IIT Bombay)*, Tailor-made polymers via Controlled Radical Polymerization, Block (AB & ABA) & graft copolymers, Smart self-healing and self-cleaning polymeric materials, Tailor-made polymer nanocomposites, Polyurethane, Tailor-made modification on elastomers

## **Associate Professors**

Chattopadhyay, Santanu *Ph.D.(IIT Kharagpur)*, Viscoelasticity and magneto-rheology of rubber composites and polymer based nanocomposites, Preparation and evaluation of thermoelectric / stimuli-responsive nanocomposite materials, Synthesis and preparation of self-assembled nanostructures from block copoly for controlled delivery

Das, Narayan Chandra *Ph.D.(IIT Kharagpur)*, Polymer nanocomposites, Conductive polymer/polymer composites and EMI shielding materials, Biodegradable polymer and polymer composites, Rheology/morphology and phase behaviour of polymer

blends, Small angle X-ray and neutron scattering (SAXS/SANS) on polymers/ nanomaterials/ protein/virus, Carbon nanotubes: synthesis/ characterization/ processing, Thermoplastic elastomers, Conjugated polymers for renewable energy application, Polymer nanocomposites for food packaging

Naskar, Kinsuk

*Ph.D.(Univ.of Twente, The Netherlands)*, Rubber based nanocomposites, High performance Thermoplastic elastomers (TPEs) and Thermoplastic vulcanizates (TPVs), Electron beam (EB) processing of polymers and elastomers, Green Tyre Technology, Shape memory polymer alloys

### ***Thrust Areas***

i) Rubber product design & development ii) Polymer blends and polymer (nano)composites iii) Synthesis of tailor-made polymers and modification polymers/rubbers iv) Green approach in polymer synthesis and technology v) Smart polymer & nanocomposites in novel applications; electrical, self-healing & biomedical applications vi) Recycling 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 composites and nanocomposites (2) Chemical modification of rubbers, (3) Thermoplastic elastomers based on novel blends and alloys, (4) Recycling of rubber waste (5) Ionomers, (6) Conductive rubber composites for electrical and electronics application, (7) Electron beam modification of polymers (8) Rheology and processability of rubber compounds and polymer blends, (9) Polymer foam and microcellular rubber composite for various critical and industrial applications, (10) Development of rubber blends and composites for different industrial application like cable, oil seal, tank track pad, vibration isolators, high voltage insulators (11) Development of adhesives and coatings. (12) Development of biodegradable polymer and recycling of rubber and polymer (13) Controlled radical polymerization, (14) Polymer nanocomposites for food packaging, (15) Phase behaviour of polymer blends, (16) Green Tire Technology, (17) Early stage crystallization of polymer in the melt and solution, (18) Development of polymers for biomedical and electronic applications.

### ***Academic Performance***

Awards & Honours	2
Member - Professional Bodies	32
Member - Editorial Board	9
Visits Abroad by Faculty Members	6
Lectures by Visiting Experts	2
Doctoral and MS Degrees Awarded	6
Sponsored Research Projects	22
Consultancy Projects	7
Patents (filed / granted)	7
Seminars, Conferences and Workshops Organised	1
Short-Term Courses and Training Programmes organised	1
Papers Published in Journals	69
Papers Presented in Conferences	39

# Rural Development Centre

## *Head*

Prof. Virendra Kumar Tewari

## *Associate Professors*

Bhowmick, Pradip Kumar      *Ph.D.,D.Litt.*, Tribal & Rural Development Planning, Tribal & Rural Development Planning

Mahapatra, Subhash Chandra      *Ph.D.(IIT Kharagpur)*, Crop Production and Development Transfer & Management of Rural Technology

## *Thrust Areas*

1. Development and Transfer of Technology, Resource Planning and Marketing, Tribal Development

## *Brief Description of on-going activities*

A. Teaching: two courses viz. RD30002 and RD30004 at undergraduate level as professional breadth

B. Research and Development: 1. Essential oil production technology; 2. Fish feed production from non-conventional biological sources; 3. Farm level technology for processing of agricultural products.

C. Extension: 1. Transfer of agricultural products processing technology; 2. Organization of training and workshops on rural technology application

## *Academic Performance*

Member - Professional Bodies	15
Member - Editorial Board	2
Lectures by Visiting Experts	1
Sponsored Research Projects	4
Technology Transferred	5
Seminars, Conferences and Workshops Organised	1
Papers Presented in Conferences	1

# G S Sanyal School of Telecommunication

## **Head**

Prof. Saswat Chakrabarti

## **Professor**

Chakrabarti, Saswat

*Ph.D.(IIT Kharagpur)*, Wireless Communication and Networking, Optical communication and networking, Statistical signal processing and statistical modeling of high dimensional data

## **Assistant Professors**

Das, Goutam

*Ph.D.(Univ. of Melbourn)*,

Das, Suvra Sekhar

*Ph.D.(Aalborg Univ., Denmark)*, Broadband Mobile Communications, Physical & MAC Layer, 4G, OFDM, MIMO, Packet Scheduling, Link Adaptation, Femto Cells

Marchetti, Nicola

*Ph.D.(Univ. of Aalborg, Denmark)*, Multiple Antenna Systems, Waveforms, 5G Wireless Communication Systems, Radio Resource Management, Integrated Optical-Wireless Networks, Complexity Science, Small Cells and HetNet, Cognitive Radio and Dynamic Spectrum Access

Ray, Priyadip

*Ph.D. (Syracuse Univ., New York)* , <http://pray.mysite.syr.edu/>, Detection and estimation theory wireless communication wireless sensor networks cognitive radio

Sen, Debarati

*Ph.D.(IIT Kharagpur)*, Wireless Communication, 4G and Beyond, PHY and MAC Layer, Short Range Communication, Green Communication, Coherent Optical Communication

## **Thrust Areas**

1. Wireless communications and networking
2. Optical communications and networking
3. Statistical signal processing

## **Brief Description of on-going activities**

First phase of VICET activities successfully completed in late 2013 resulting in 11 patents and more than 39 technical publications. The activity has now been extended till October 2015.



Taking all steps to ensure the introduction of a specialized MTech program in the areas of wireless communications and networks. Seven new subjects have already been launched towards this goal.

Have embarked on an ambitious program of creating a futuristic wireless test-bed with support from IIT Khargpur (SGDRI program - Rs. 2.5 crores), and multiple industry partners with a total projected budget of Rs. ~ 18 crores.

*Academic Performance*

Member - Professional Bodies	7
Member - Editorial Board	1
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	2
Sponsored Research Projects	6
Papers Published in Journals	20

# Rajendra Mishra School of Engineering Entrepreneurship

## *Head*

Prof. Partha Pratim Das

## *Associate Professor*

Dan, Pranab Kumar *Ph.D.(Jadavpur Univ., Kolkata), Technology Entrepreneurship, Product Development and Manufacturing*

## *Assistant Professors*

Bhattacharjee, Titas *Fellow of IIM Calcutta, Entrepreneurial Finance, Corporate Governance*

Bhowmick, Bhaskar *FPM (IIM, Ahmedabad), Leadership and succession Strategies, Business Environment and Identifying Measures, Grass-root Innovation and Entrepreneurship*

Chakraborty, Basab *Ph.D.(IIT Madras), Smart Grid management in India, Energy Management & Entrepreneurship*

Prabha Bhola *Ph.D.(IIT Kharagpur), Quality Management and Performance Measurement, Venture creation, Business Analytics, Development Economics & Growth*

Roy, Ram Babu *Fellow, IIM Calcutta (Ph D), Big Data and Business Analytics, Healthcare Operations Management, Complex Networks*

## *Visiting Faculty*

Mondal, Majoj Kumar *Ph.D.(IIT Kharagpur), Financial Economics, Banking, Product Development, Bio-Energy, Entrepreneurship*

## *Thrust Areas*

RMSoEE has identified four thrust areas of research and project implementations based on the strength and skill sets of faculties in the department;

- A. Business Analytics
- B. Health care Service delivery
- C. Energy Management and Entrepreneurship
- D. Start up Environment and ecosystem Analysis
- E. Product Design and Analytics

The school is committed to design new courses in regular offerings and in Summer-Winter term schools in supporting to build up these areas. Faculties are also writing projects for in-house, national level and international level funding to strengthen the application areas. The academic team is designing teaching labs, research labs, and application labs to support the research and teaching activities in these identified and related fields.

### ***Brief Description of on-going activities***

1. Entrepreneurial outreach: RMSOEE being a department of entrepreneurship works in tandem with the aim of providing facilities to the entrepreneurs, with the help of STEP/TBI, TIETS and E-Cell, the different supporting agencies and numerous programs organized at IIT-Kharagpur. -STEP-TIETS-TBI works as a conduit between IIT KGP and external world to facilitate technology transfer and convert research outcomes of entrepreneurs to commercially viable propositions. This year TIETS, PRISM and MSME funded 9 start up companies/innovators of amount Rupees 31 Lakh. -The school provides the entrepreneurship training to faculties and students of other engineering schools. This year school conducted 2 FDP and 4 TEDP programs updating 64 faculties and 120 students.

2. Global Entrepreneurship Summit: It is the largest student-level entrepreneurial summit in India. The latest GES 2015 was scheduled at IIT Kharagpur from 16th-18th January, 2015. -700 students from all over India participated.

Programs included:

Start-up Camp, Connect the Dots, Elevator pitch, Empressario, Innovation Exhibition, Founder's Meet

3. RS Day: Rajendra Mishra School of Engineering Entrepreneurship, IIT Kharagpur has celebrated its second Research Scholars' Day "Insight 2015" on March 25, 2015 at Maitreyee Auditorium, IIT Kharagpur. The occasion was graced by the esteemed presence of Dr.V. K. Singh, Rear Admiral (retd.), Director, Healthcare Asia at Simpler Consulting and Adjunct Research Professor, Ivey School of Business University of Canada as the Chief Guest. Prof. A. N. Samanta, Dean(PGS&R), IIT Kharagpur presided over the function. he students presented their research through posters which evoked a lot of interest. The day closed with a debate on "Entrepreneurship Education is essential for the success of Make in India".

4. The School has organized a communication workshop ('Exploring Me') for research scholars on March 31-April 01, 2015. During these two days, the participating research scholars explored their hidden strength areas through practicing a set of activities designed for this workshop.

5. A workshop on Stress Management through Performing Arts organized in the School on 10th April, 2015. This was aimed at research scholars and Dual Degree M.Tech students in managing their stress better through performing arts. A consulting team from Rabindra Bharati University conducted the workshop, with full of participation and activities for half a day.

6. International exchanges: Prof Paul Lillrank of Alto University, Finland visited the school and shared his research with scholars in the department as a part of international research exchange process. In summer term 2014, Prof. Ram Babu Roy, RMSoEE along with Prof. I J Chiang, Associate Professor, Graduate Institute of Biomedical Informatics, Taipei Medical University conducted a course on Big Data Analytics. The course covered various technical aspects of big data analytics and its applications in business.

### ***Academic Performance***

Member - Professional Bodies	4
Member - Editorial Board	2
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	1
Sponsored Research Projects	14
Papers Published in Journals	7
Papers Presented in Conferences	3

# Rajiv Gandhi School of Intellectual Property Law

## *Head*

Prof. Khushal Vibhute

## *Associate Professors*

Dube, Dipa *Ph.D.(Calcutta University)*, Gender Violence, Protection of Child Victims

Dube, Indrajit *Ph.D.(Calcutta University)*, Corporate Law & Governance, Environmental Governance, Competition Law

M. Padmavati *Ph.D.(Central Univ. Hyderabad)*, Plant Metabolic Pathways Drug regulation Biodiversity Bioenergy IP and commercialisation

Raju, K. D. *Ph.D.(JNU)*, International Law, Intellectual Property Law, International Trade Law

## *Assistant Professors*

Basu, Arindam *L.L.M.(NALSAR)*, Law and Economics, Social Ecology, Green Patent, Carbon Trading, Law of Contract

Shankar, Uday *L.L.M.(Univ. of Delhi)*, Constitutional Law, Energy Law, Labour and Industrial Law, Socio-Economic Rights

Shreya, Matilal *LL.M.(Case Western)*, Copyright, Legal Theory, Music Licensing

Shukla, Gaurav *L.L.M (D.A.V.V. Indore)*, Direct & Indirect Taxation, International Taxation, Civil Laws, Direct & Indirect Taxation

Subramanian *LLM (Germany), Ph.D.(Nagpur Univ.)*, International law, International Human Rights law, International Investment law

## *Thrust Areas*

1. Intellectual Property Law
2. Corporate Laws
3. Environmental Laws
4. Criminal Law

5. Public Law
6. International Law
7. Energy Law

***Brief Description of on-going activities***

Research in Corporate Legal Affairs with special reference to Corporate Governance under the IICA  
 Riven Basin Management- Development of Law and Policy framework with special reference to Ganga.  
 Plant Metabolic Pathway Laboratory  
 Intellectual Property Education, Research and Public Outreach Program  
 Governing Framework of Future Cities, Ministry of Human Resource Development, Govt. of India.

***Academic Performance***

Member - Professional Bodies	32
Member - Editorial Board	14
Visits Abroad by Faculty Members	4
Lectures by Visiting Experts	9
Doctoral and MS Degrees Awarded	2
Sponsored Research Projects	11
Consultancy Projects	2
Seminars, Conferences and Workshops Organised	4
Books Published	5
Papers Published in Journals	5
Papers Presented in Conferences	23

# **Ranbir and Chitra Gupta School of Infrastructure Design and Management**

## ***Head***

Prof. Joy Sen

## ***Thrust Areas***

1. Transportation engineering (Planning, design, operation and management of highways, airport and seaport infrastructure) Environmental Engineering (Planning, design, operation and management of water supply and waste management systems, Environmental Impact Assessment) Facilities Infrastructure (Urban infrastructure planning and design, Facility programming and specialized building design, building automation systems design, building management systems, regional infrastructure planning and construction) Power systems (Planning, design, operation and management of Thermal, hydel and Nuclear Power Plants, Renewable Power Plants, Power generation, transmission and distribution, power system planning and reliability) Infrastructure Project management Infrastructure Financing and Infrastructure Regulatory Issues
2. The school is focusing on six principal thrust areas namely, a) Smart urban Health, education and economy-generating Social infrastructure; b) Transport-oriented-development (TOD) based infrastructure; c) Water resources based Economic Zone based Logistics infrastructure; d) Climate-based and disaster responsive mitigation infrastructure; e) IT-enabled and ICT driven regulatory and governance infrastructure and f) Smart Micro-Electro-Mechanical-systems driven intelligent infrastructure. The school is planning to set up an advanced Infrastructure Lab with large scale data analytic systems and a Hub for Immersive Visual research and e-applications (HIVE) in collaboration with experts from MIT, USA and the Curtin University, Australia.

## ***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

## ***Academic Performance***

Lectures by Visiting Experts	3
Doctoral and MS Degrees Awarded	2

# School of Bio Science

## *Head*

Prof. Amit Basak

## **Focus of the School with regards to academics and research**

Indian Institute of Technology Kharagpur has long standing interests in research and education at the interface areas life science and technology. Considerable amount of interdisciplinary research is underway involving various Departments/Centres/Schools like Biotechnology, Medical Science & Technology, Advanced Laboratory for Plant Genetic Engineering, Agriculture & Food Engineering, Mechanical/Chemical Engineering and various other engineering disciplines besides some of the basic science departments of Chemistry and Physics. To integrate these research activities and to give a boost to a comprehensive Bioscience Education and Research, the Institute has recently established a School of Bioscience. The School will add further momentum to the growth of academic and research programmes in Cellular and Molecular Biology, Health-care Technology, Computational biology and Drug Design and Delivery and to initiate new research activities in areas interfacing bioscience and other engineering disciplines. The School has a mandate to produce new breed of trained manpower for educational institutions, R & D organisations and pharma-industries.

## **Infrastructural scopes for the School**

The School will be housed in the proposed Diamond Jubilee Tower along with the ATDC Life Science group and Medical Science and Technology. It will have the state-of-the-art facilities/Laboratories which include the following:

## **Research Facilities**

- High end Instrumental facilities NMR/MRI, X-ray Crystallography, GC-MS, LC-MS/-MSMS, Next Gen Sequencing machine; Microscopy (confocal, fluorescence, etc.) and imaging facilities

## **Research laboratories:**

- Computational biology lab
- Molecular biology and Genetic engg. Lab
- Plant cell and Tissue culture lab
- Microbiology lab
- Biochemistry lab
- Cold room
- Bio safety labs (BSL-II)

### **Courses will be taught in the school**

- The School will offer a joint MSc-PhD programme. The course curriculum, to be approved by the senate, is being made in consultation with external experts.
- The School is currently offering a compulsory bio-science course on “Science of Living Systems” to all students of B. Tech, Dual Degree M. Tech and 5 Year Integrated M. Sc. Courses. The course components comprise cellular biology, chemical biology and bio-engineering

### **Current Location**

The School is now temporarily housed in the 2<sup>nd</sup> floor of J. C. Bose Lab Complex. The laboratory facilities are being created there. Recruitment of faculty in the School will start soon. The joint MSc.-PhD programme is expected to start from the academic year 2015-16.

### **Research Activities**

Research activities will be initiated by the next academic year focussing on the following areas:

- Cellular & Molecular Biology
- Biochemistry & Biophysics
- Drug Design & Development
- Computational Biology
- Biosystems Engineering / Bioscience Engineering



# School of Energy Science and Engineering

Head of the Department: Professor Avinash Kumar Sinha

## *Assistant Professor*

Bhattacharya, Jishnu Ph.D.(Univ. of Michigan, AnnArbar)

## *Faculty Appointments*

Dr J N Roy Visiting Professor

## *Faculty Resignation*

Jishnu Bhattacharya Assistant Professor (Visi

## *New Academic Programmes*

1. Research Program started in the area of Microgrid, Solar Thermal and Solar PV. Five Ph.D. students have been admitted.
2. M. Tech in Energy Engineering to be started from 2015-16. Course curricula have been approved by the senate.

## *Brief Description of ongoing activities*

Energy Science & Engineering is newly formed school to consolidate the research and academic activities of the Institute in the interdisciplinary area of Energy Science and Engineering. Initial emphasis has been on setting up labs for research activities of various area of Energy. A high end Solar Simulator has already been installed. The recruitment of faculties have been initiated and two of them are expected to join soon. Ph. D. programs have been started and already five Ph.D. students are on roles.

Prof J N Roy is a part of Scientific Committee of EUPVSEC 2015 to be held at HamburgGermany. Prof J N Roy is a member of INAE Sectional CommitteeVI.

A M.Tech program is expected to start from 201516 academic session and the course curriculum for the same has been approved by the Senate. A 40KWp Solar PV (SPV) system is being installed using various type of technologies. Laboratory setups for research in the areas of Bioenergy, Solar PV cells and systems, wind energy etc. are getting ready.

## *Thrust Areas*

Conventional Energy: Mechanical, Chemical, Electrical and Renewable Energy: Solar PV, Solar Thermal, Wind, Bio and Organic Storage Technology

# School of Environmental Science and Engineering

## *Head*

Prof. Jayanta Bhattacharya

## **Objectives**

- To develop an international, state-of-art facility for environmental and allied research.
- To work closely with the Indian Industry in particular and the government to participate in technological and engineering development.
- To provide an unparalleled analytical facility in one floor for environmental measurements of air, soil and water across different regimes.
- Student friendly atmosphere for research with guidance from supervisors of international capability

## **Focus:**

Engineering and Technology Development for the following Indian Industries ( to start with):

- Ferrous and Non-ferrous mining and metallurgical industry.
- Paper and Pulp industry.
- Petroleum & Natural Gas ,and Petrochemicals Industry.
- Power Industry.
- Textile Industry.
- Water purification and Treatment Industry

# School of Information Technology

## *Head*

Prof. Rajib Mall

## *Professors*

Ghosh, Soumya Kanti      *Ph.D.*, Geospatial Database and Web Services, Cloud Computing

Gupta, Arobinda      *Ph.D.(Iowa)*, Distributed Systems, Mobile Computing

Sural, Shamik      *Ph.D.*, Data and Application Security, Image and Video Processing

## *Associate Professors*

Misra, Sudip      *Ph.D.(Carleton Univ., Canada)*, Wireless Ad Hoc and Sensor Networks, Internet of Things and Cyber Physical Systems, Computer Networks, Smart Grid Communication, Cloud Computing, Bio-Sensor Networks

Samanta, Debasis      *Ph.D.(IIT Kharagpur)*, Biometric Based Security, Big Data Analysis, Human Computer Interaction, Computational Intelligence, Brain Computing Interaction

Sreenivasa Rao, Krothapalli      *Ph.D.(IIT, Madras)*, Speech Processing, Multimedia Signal Processing, Pattern Recognition, Neural Networks

## *Assistant Professor*

Sahay, Rajiv Ranjan      *Ph.D.(IIT Madras)*, Image Processing, Computer Vision, Multimedia

## *Thrust Areas*

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

## *Brief Description of on-going activities*

Computer and Communication Networks: Development of architectures, protocols and algorithms for mobile ad-hoc networks, vehicular ad-hoc networks, wireless sensor networks and wireless mesh networks, smart grid communications, cloud computing. Geographical Information System: Enterprise-wide GIS database development and its policies and protocols to make it accessible as platform independent and

support for decision making are under research and development. Human Computer Interaction: Development of user interfaces for the under privileged users such as language illiterate, physically disabled etc. Application of Information Communication Technology (ICT) for the mass such as multimodal interaction, multimodal text composition mechanism, user modeling, interface adaptation, personalization, evaluation are the some areas of research. Computational modeling to brain for informatics, cognitive behavior is also another active area of research. Speech Processing: Researchers working in this area are focusing on characterization and incorporation of emotions in speech, speaker recognition system for handheld devices in varying background environments and development of Text-to-Speech (TTS) system for Indian languages. Network Security: Various areas of network security are being explored, like penetrating testing, development of new algorithms for cryptography, their efficient and attack-resistant hardware implementation etc. Systems Security: Survivable information system architecture to tolerant with potential information warfare attacks is under development. Such systems are typically characterized by the presence of a large repository of sensitive data in a distributed environment. The architecture takes into account the presence of multiple operating systems and database platforms, their known and potential vulnerabilities as well as possibilities of simultaneous attacks from adversaries. It will be developed as a generic model which can be used to build specific information systems in a number of application domains like e-governance, finance and insurance, education, etc.

### ***Academic Performance***

Member - Professional Bodies	14
Member - Editorial Board	2
Visits Abroad by Faculty Members	3
Lectures by Visiting Experts	3
Sponsored Research Projects	23
Consultancy Projects	1
Patents (filed / granted)	7
Seminars, Conferences and Workshops Organised	2
Books Published	4
Papers Published in Journals	36
Papers Presented in Conferences	56

# School of Medical Science & Technology

## *Head*

Prof. Suman Chakraborty

## *Professor*

Guha, Sujoy K

## *Associate Professors*

- |                            |   |
|----------------------------|---|
| Bhattacharya, Sangeeta Das | <i>MD (Johns Hopkins Univ.)</i> , Evidence Based Health Policy, Internal medicine and pediatrics, Vaccine preventable diseases in HIV infected children, Global Health, Development of College Mental Health Programs in the Indian Scenario  |
| Chatterjee, Jyotirmoy      | <i>Ph.D.</i> , Multimodal Imaging -Analysis for Wound & Cancer Theranostics and Regenerative Medicine Research  |
| Chaudhury, Koel            | <i>Ph.D.(Delhi)</i> , Women's Health, Oxidative stress and Infertility, Proteomics and Metabolomics for Biomarker Discovery and Understanding Disease Pathogenesis, Nanomedicine, Omics integrated Systems Biology  |
| Das, Soumen                | <i>Ph.D (IIT Kharagpur)</i> , Microsystem Technology, MEMS BIOMEMS and Microfluidic devices, Electro-physiological characterisation of biospecies, Medical electronics  |
| Dhara, Santanu             | <i>Ph.D.(IIT Kharagpur)</i> , Biomaterials and Regenerative Medicine: Fabrication-Bioactivation-Biological assay, Customized implant development, Bioactivation of Implant, Tissue Engineering, Near Net Shape Forming, Green machining, Medical Textile, 3D printing and Patterning, Dense and Porous Implants |
| Mandal, Mahitosh           | <i>Ph.D.(Jadavpur Univ.)</i> , Cancer Biology, Signal Transduction, Apoptosis, Cell Cycle, Angiogenesis, Drug Delivery, Multi Drug Resistance, Cancer Stem Cell   |
| Manjunatha M               | <i>Ph.D. (IIT Madras)</i> , Bioinstrumentation and Biosensors, Functional Electrical Stimulation of Nerve and Muscle, Medical Imaging / Bio-Signal Processing, Neural Engineering and Retinal Prosthesis, Bio-Robotics & Neurorehabilitation  |

Mitra, Analava

*Ph.D.(IIT Kharagpur)*, Natural Products Research, Drug encapsulation, Signals in disease control, Pharmacoepidemiology

***Assistant Professor***

Chakraborty, Chandan

*Ph.D.(IIT Kharagpur)*, Biostatistics & Medical Informatics, Computer-Aided Disease Screening & Diagnosis, Computational Medical Imaging (Pathology & Radiology), Machine Learning for Medical Diagnosis, Point-of-Care Diagnostic Methods

***Thrust Areas***

Medical Imaging & Image Processing - Medical Instrumentation

Microfluidics for healthcare applications - Bio-MEMS - Biomedical sensors

Medical Statistics & Pattern Recognition - Medical Expert System - Tissue Engineering

Bio-Materials - Signal Transduction - Proteomics and reproductive health - Signals in disease and health

Cognitive function study - Genetics & Molecular Profiling of Pre-cancer-Cancer & Wounds

Pediatrics HIV - Regenerative medicine - Stem cell biology - Customized implant fabrication

Early detection of cancer - Wound healing and regenerative medicine

Multimodal imaging and analysis for theranostics

Molecular mechanisms of chemo and radio resistance in cancer - Cancer stem cell

Cancer Therapeutics and Targeted drug delivery

***Brief Description of on-going activities***

- Development of micro-fluidic Biochips / Bio-MEMS for medical application.
- Laser speckle imaging of blood-flow in microcirculation.
- Development of statistical analyzer & disease pattern recognizer for Oral Pre-cancer and cancer.
- Design of an intelligent diagnostic tool through the extraction of diagnostic rules for asthma.
- Proteomics and reproductive health
- Vaccine preventable diseases in HIV infected children
- Bioimpedance based toxin detection
- Polymer based flexible electronics for healthcare application
- Integrated macro & micro-imaging on various healing & non-healing wounds including oral & breast precancer & cancer for their early characterization through image processing & analysis
- Development of detailed database on respiratory rhythms for identifying their temporal & spatial characteristics in health & disease.
- Development of biodegradable scaffold for tissue engineering and wound research.

- In vitro screening of anti-diabetes molecules.
- Design of a three dimensional scaffold and drug delivery system in arthritic hip joint.
- Signal Transduction and cancer biomarker
- Oxidative stress and Infertility
- Development of natural antioxidant nanoparticles
- Proteomics and Metabolomics in Reproductive Health
- Nutraceuticals and Herbal medicine
- Fiber-Cell construct/Tissue Analogues Comprising Cell Laden unit and Process for Manufacturing thereof
- Net Shape Forming via Plastic Dough Processing of Polymer-Metal Powder Blend and applications thereof
- Deciphering the molecular mechanism of chemo & radio resistance in cancer with special thrust on novel avenues like cancer stem cell, autophagy & epigenetics
- Novel targeted drug delivery systems like liposome, exosome and nano-particles. • Multimodal evaluations of precancers and cancers
- Wound healing using natural healing agents (e.g. honey incorporated silk fibroin/ honey dilutions) both in vitro and in vivo
- Exploring molecular attributes in wound healing and oral cancer and pre- cancer progression related to cancer hallmarks.
- Live tissue Printing, Placenta derived extracellular matrix, Near Net shape forming of Titanium implants

### ***Academic Performance***

Awards & Honours	7
Member - Professional Bodies	42
Member - Editorial Board	20
Visits Abroad by Faculty Members	4
Lectures by Visiting Experts	19
Doctoral and MS Degrees Awarded	5
Sponsored Research Projects	57
Consultancy Projects	1
Patents (filed / granted)	8
Seminars, Conferences and Workshops Organised	3
Papers Published in Journals	94
Papers Presented in Conferences	44

# School of Nano Science and Technology

## Head

Prof. Samit Kumar Ray

## About the Centre

About forty faculty members across 12 different Departments/Centres are associated with the newly created School of Nano-Science and Technology (SNST).

The faculty members are involved in the research activities of

- (a) Nanofabrication / Nanoelectronic & Photonic Devices / NEMS / Nanosensors;
- (b) Bulk nanostructured materials for structural applications,
- (c) Novel nanomaterials: Synthesis, self-assembly and applications;
- (d) Nanostructured coatings for energy conversion/storage and surface engineering,
- (e) Nano-biotechnology,
- (f) Computational nanostructures etc.

## New Facilities

The school has recently established two new facilities, viz. Spark Plasma Sintering (SPS) of nanopowders for fabrication of compacts and electron Beam Lithography (EBL) System for fabricating Nanoelectronic devices. In addition, the existing facilities in different laboratories of the institute are currently being utilized by the faculty members for the research in the broad area of nanomaterials and devices.

## New Programs

The school will admit a number of Ph.D. and MS students from the autumn semester of 2014. Several electives for undergraduate, postgraduate and Ph.D. levels are proposed to be offered by the faculty members of the school in new academic sessions. In near future, the school is planning to recruit core faculty members for offering several core and Mater's level courses.



# School of Water Resources

## *Head*

Prof. Dhrubajyoti Sen

## *Assistant Professors*

Sahoo, Bhabagrahi

*Ph.D.(IIT Roorkee)*, Water Management, Flood Analysis, Open Channel Hydraulics, Meso-scale Solute Transport Dynamics, River Basin Management, Hydro- and Agro-meteorology, Soft Computing in Hydrology

Tiwari, Manoj Kumar

*Ph.D.(IIT Kanpur)*, Fate and transport of pollutants in water and soil mediums, Treatment of hazardous and persistent pollutants in surface and ground waters, Contaminated site management, Water/Wastewater treatment, Development of analytical protocols, Water Supply and Distribution

## *Thrust Areas*

1. Hydroinformatics in Urban water supply and waste water disposal / flood management; and real-time flood prediction over small, medium and large-scale domains
2. Water quality management at river basin and urban scales
3. Impact of anthropogenic activities and possible climate change on water resources
4. Surface water – groundwater interaction (Conjunctive water use and management in irrigation, seawater – surface water – groundwater interaction, impact of over extraction of groundwater on the base flows of rivers)
5. Urban water management (water distribution, waste water disposal, disposal of runoff generated from rainfall)

## *Brief Description of on-going activities*

A sponsored network project entitled "Land Use and Land Cover (LULC) Dynamics in Relation to Human Dimensions and Climate in Mahanadi River Basin, Orissa", funded by NRSC, Hyderabad, 2009-2014

A sponsored network project entitled "Interdisciplinary network for holistic environment system analysis, eco-system services, integrated modelling and sustainable resources management (INNO-ASIA)", funded by the German Federal Ministry of Education and Research (BMBF), 2010-2014

A research project on "Development of a 1-D Transient Conservative Pollutant Transport Model for Meso-scale Application" is sponsored by SRIC, IIT Kharagpur under ISIRD to Dr. B. Sahoo, Assistant Professor for Feb. 2013 – Jan. 2015.

"Preparation of Ganga River Basin Management Plan" (Principal Investigator : Joint Project of 7 IITs; Sponsor: National River Conservation Directorate, MOEF, India; Duration: 2010 – Dec. 2013).

***Academic Performance***

Member - Professional Bodies	7
Member - Editorial Board	1
Visits Abroad by Faculty Members	1
Lectures by Visiting Experts	1
Sponsored Research Projects	6
Short-Term Courses and Training Programmes organised	1
Papers Published in Journals	5
Papers Presented in Conferences	3

# Vinod Gupta School of Management

## **Head**

Prof. Kalyan Kumar Guin

## **Professors**

Guin, Kalyan Kumar	<i>B.Tech.(IIT Kharagpur),</i>
Rajib, Prabina	<i>Ph.D.(IIT Kharagpur), Corporate Finance, Derivatives ( Financial &amp; Commodity), Indian Capital Market</i>
Sinha, Gautam	<i>Ph.D.(IIT Kharagpur),</i>
Teltumbde, Anand	,

## **Associate Professors**

Datta, Biplab	<i>Ph.D (IIT Delhi), Marketing Management, Leadership and Teamwork, Services Marketing</i>
De, Sadhan Kumar	<i>Ph.D.(UK),</i>
Mishra, Chandra Sekhar	<i>Ph.D.(Utkal University), Financial Reporting and Analysis, Mergers and Acquisitions, Business Valuation, Financial Markets</i>
Misra, Arun Kumar	<i>Ph.D.(IIT,Mumbai), Capital Market, Financial Markets, Commercial Banking, Corporate Finance, International Finance, Risk Management, Financial Economics, Competition Assessment</i>
Pradhan, Rudra Prakash	<i>Ph.D.(IIT Kharagpur), Development Finance, Infrastructure Finance, Financial Markets, Financial Analytics, Financial Econometrics</i>
Sahney, Sangeeta	<i>Ph.D.(IIT Delhi), Quality in Education, Sales and Distribution Management, Services Marketing, Services Quality, Organizational Behavior, Marketing Management, Consumer Behavior</i>

## **Assistant Professors**

Ahmad, Wasim	<i>Ph.D. (Univ. of Delhi), Macroeconomics, International Trade and Finance, Energy Economics, Applied Econometrics</i>
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Barai, Parama	<i>Fellow (XLRI, Jamshedpur),</i>
Bhattacharya, Sujoy	<i>Ph.D.(IIT&amp;Mgt, Gualior), Data Analytics, Option Pricing, Quantitative Marketing</i>
Chandra, Abhijit	<i>Ph.D. (Jamia Millia Islamia, New Delhi), Corporate Finance, Behavioral Finance, Asset Pricing, Financial Markets</i>
Malik, Aradhna	<i>Ph.D.(Univ of Denver), Communication Disorders, Intercultural Communication, Human Technology Interaction, Management of Public Health, Neuro Linguistic Programming (NLP), Ageing, Orality</i>
Mukherjee, Srabanti	<i>Ph.D.(IEST, Shibpur), Marketing to the Bottom of the Pyramid, Service Quality Measurement, Consumer Based brand Equity, Choice Heuristics</i>
Mukherjee, Tuheena	<i>Ph.D.(IIT Delhi), Social Psychology, Industrial Psychology and Human Resource Management</i>
Mukhopadhyay, Susmita	<i>Ph.D.(Calcutta Univ.), Organizational Health and spiritual health, Human Resource Management, Business Ethics, Organizational and behavioural issues Microfinance, Competency Mapping</i>
Sarkar, Ashutosh	<i>Ph.D.(IIT Kharagpur),</i>

### ***Visiting Faculty***

Ghosh, Kunal Kanti	<i>M.Tech.(IIT Kharagpur), Supply chain management</i>
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### ***Thrust Areas***

- 1.Big Data Analytics including Financial Analytics, Marketing Analytics and HR Analytics
- 2.Banking, Derivatives and Risk Management, Micro finance
- 3.Management of Family Businesses and Start-ups

### ***Brief Description of on-going activities***

Currently offering MBA, EMBA, MS, Dual Degree (B Tech + MS in Financial Engineering) and Ph.D. degrees.

Launched VGSoM Working Paper Series in February 2010.

Conducting Management Development Programs and In-House Training Programs for various industries.

VGSOM has been selected as the coordinating department for Post Graduate Diploma in Business Analytics (PGDBA) programme be offered from 2015-16 jointly by IIT Kharagpur, IIM Calcutta and Indian Statistical Institute.

Conducting FDPs, AICTE - QIP for faculty members of other institutes

Micro and thin specialisation subjects in business analytics

### *Academic Performance*

Awards & Honours	2
Member - Professional Bodies	42
Member - Editorial Board	51
Visits Abroad by Faculty Members	1
Lectures by Visiting Experts	20
Doctoral and MS Degrees Awarded	6
Sponsored Research Projects	11
Consultancy Projects	2
Seminars, Conferences and Workshops Organised	2
Short-Term Courses and Training Programmes organised	3
Papers Published in Journals	28
Papers Presented in Conferences	6

# Advance Technology Development Centre

## HEAD

Prof. Sunando DasGupta.

## ASSOCIATED FACULTY

### Professor:

Name	Degree	Specialization
Prof. S. DasGupta, ChE	Ph.D.	Microscale Transport Process and Microfluidics
Prof. P.P. Chakrabarti, CSE	Ph.D.	<u>Artificial Intelligence, CAD for VLSI Design of Algorithms, Formal Verification</u>
Prof. S.K. Lahiri, Advisor, SRIC	Ph.D.	Microelectronics, VLSI, MEMS, Integrated optics
Prof. S.K. Sen, Advisor SRIC	Ph.D.	Advanced Plant Genetics.
Prof. S. Sengupta, E & ECE	Ph.D.	Computer vision, Multimedia
Prof. D. Biswas, E & ECE	Ph.D.	III-V Semiconductor Device Technology
Prof. A. Patra, EE	Ph.D.	VLSI Design of Power Converters, Industrial Information Technology
Prof. A. Basu, CSE	Ph.D.	Embedded Systems, Artificial Intelligence application
Prof. S. K. Roy, Physics	Ph.D.	Solid State Physics, thin film, nanotechnology
Prof. S. P. Pal, CSE	Ph.D.	Computational geometry, Design and analysis of algorithms
Prof. B. Bhattacharya, CE	Ph.D.	<u>Structural Engineering, Reliability</u>
Prof. A. Ghosh, BT	Ph.D.	Virology and Molecular Biology
Prof. Pallab Dasgupta, CSE	Ph.D.	VLSI CAD & Electronic Design Automation
Prof. S. Chakraborty, ME & ATDC	Ph.D.	Micro fluidics
Prof. R. Banerjee, AFE	Ph.D.	Food Biotechnology, Bioenergy, Enzyology and its biotechnological applications, Protein chemistry.
Prof. S. Mukhopadhyay, EE	Ph.D.	Failure Diagnostics and Prognostics and Tolerance for Vehicular Systems, Industrial Instrumentation and Control and Automation.
Prof. P.K. Chattaraj, Chem	Ph.D.	Density functional theory, Chemical reactivity, ab initio calculations, Quantum chaos, Aromaticity in metal clusters.
Dr. T.K. Bhattacharyya, E & ECE and ATDC	Ph.D.	Microelectronics, VLSI, MEMS

Dr. J.N. Roy, ATDC & EE	Ph.D.	Advance MOSFET Device and Design Issues, a-Si Tandem and Micro-morphed Solar cell.
Dr. Chacko Jacob, Mat. Sc.	Ph.D.	Wide Bandgap Semiconductors/ Nanomaterials/ Direct Fluorination of Materials/Oxide semiconductors
Dr. Pallab Banerjee, Mat. Sc.	Ph.D.	Semiconducting materials, Materials for energy conversion: Photovoltaic and Thermoelectric, III-V and II-VI MOCVD, Organic semiconductor

**Associate Professor:**

Name	Degree	Specialization
Dr. S. Das, SMST & ATDC	Ph.D.	Microsystem Technology, BIOMEMS, Electro-physiological characterisation of biospecies, Medical electronics.
Dr. A. Dhar, Physics	Ph.D.	Condensed matter Physics, nanotechnology

**Officer:**

Name	Degree	Specialization
Dr. Pranabendu Gangopadhyay , Senior Scientific Officer	Ph.D.	Microphotronics, Integrated Optics, Fiber Optics, MOEMS.

**Thrust Areas**

Inertial MEMS, Micro Sensors and actuators for automobile, space, and defense applications, Micropropulsion device for micro/nano satellite application, RF-MEMS, Bio-MEMS, Optical-MEMS, Semiconductor devices, Nanotechnology, Photonics, Integrated Optics, Microfluidics, Biophotonics, Nonlinear Sciences, Theoretical condensed matter physics, Wireless communication and Baseband processing, Analog and RF circuits, Plant biotechnology.

**Academic Performance**

Awards & Honours	2
Sponsored Research Projects	12
Consultancy Projects	1
Collaborative Efforts	5
Papers Published in Journals	92
Papers Presented in Conferences	16

**New M. Tech. Course**

Apart from Ph.D. and M.S. degrees the centre has started a new M. Tech. course on embedded control and software (ECS). The course covers Design, Analysis and Implementation of high quality, functionally accurate embedded software incorporating complex intelligent control mechanisms across a wide range of hardware and software platforms. The methods address issues to Performance, Power / Energy, Fault Tolerance, Real-Time Operations, Safety-Criticality, Communication, Security, Parallel / Distributed

Implementations, Software Engineering, etc. It will incorporate important applications, development of CAD tools and include Laboratory and Industry experience. The course is Interdisciplinary and Collaborative in nature and faculty members from several departments along with industry and other external experts are taking classes. It includes possibilities of industry based projects, sponsored candidates and participation in national level programmes. Research-orientation is a focus of this course which aims at developing new methods of intelligent control and software technology.

#### **New Addition of Facilities**

- Deep Reactive Ion Etching (DRIE) System
- Diffusion Furnace.
- Nano Enabler for Bio-Assay Preparation.
- Bio Safety Cabinet.
- UV Ozonizer for Surface Oxidation.
- Precision Crystal Cutter.
- Micro particle image velocimetry (micro-PIV)
- High Resolution Microscope Camera
- Focused Ion Beam Lithography
- Precision Polishing Machine
- Spin coater
- Ultrasonic Bath



## **Alumni Affairs and Institutional Development (ID) Program**

Alumni of IIT Kharagpur are our global brand ambassadors. Their accomplishments across various domains have brought the Institute global recognition.. The Institute is thankful to its alumni for the spontaneous contribution and support it receives from them. It strives to maintain a close bond and share the various current events and policies with alumni. The Office of the Dean, Alumni Affairs & International Relations (AA&IR), the Institutional Development (ID) Program Team and the Students Alumni Cell strive to create a platform for organizing the alumni events, connectivity and activities such as branding and fundraising. The major activities undertaken during 2013-14 are given below.

- **Alumni Connectivity:** The alumni website [iitkgp.org](http://iitkgp.org) along with the mass mailing system to update is an effective way to connect our alumni, students, faculty members, retired faculty members and parents regularly and share with them new about the Institute and its stakeholders. Seasonal Greetings and various fund-raising campaign updates were also sent via mass mails. The connectivity of the institute with individual alumni has gone up considerably. We have mailing connectivity to 42000 people up from 34000 last year. On LinkedIn we are connected to about 36000 alumni through the University Page. The registrations on the Alumni Web Portal [iitkgp.org](http://iitkgp.org) have crossed the 11000 mark.
- **Branding:** The Institute has been taking conscious and planned steps to improve its global branding. The Institute has been publishing news and information to the media frequently keeping the updated the public at large about the research, academics and other happenings at IIT Kharagpur. The Institute launched a website [why.iitkgp.ac.in](http://why.iitkgp.ac.in) for IIT aspirants and JEE qualifiers to help them know more about the Institute academics, student life and facilities.
- **Publications:** Like every year, the print publications including the KGPIan newsletter, Alumni Annual Report and the Annual souvenir “Yearnings of Yore” have been published during Alumni Meet. KGP Connection, an e-newsletter was circulated every fortnight. Additionally brochures for different campaigns, Foundation Day Celebrations, Alumni ID Cards, separate Yearbooks for UG, PG and Ph.D students were also published.
- **Awards:** Like every year the Distinguished Alumnus Award is given away by the Institute to the alumni during the Annual Convocation 2014 to twelve distinguished alumni. Among the awardees were Shri Diwakar Acharya, (B Tech/MI/RP/79), Chairman and Managing Director, Uranium Corporation of India Limited, Dr.H Harish Hande, (B Tech/EN/NH/90), Managing Director, Board Member and Founder, SELCO Solar Light Private Ltd., Prof. Hem Shanker Ray, (B Tech/MT/NH/62), Adjunct Professor, The Indian Institute of Engineering, Science and Technology, Shibpur, Prof.Krishen Mehta, (B Tech/CE/NH/69), Senior Global Justice Fellow, Yale University, Prof.Krishnendu Chakrabarty, (B Tech/CS/RK/90), William H. Younger Distinguished Chair Professor, Department of Electrical and Computer Engineering and Professor of Computer Science, Duke University, Manthripragada Sanyasi Raju, (B Tech/EE/NH/56), President, Vision Aid Charitable Services Society, Prof. Niraj Kumar Jha, (B Tech/EC/NH/81), Professor of Electrical Engineering, Princeton University, Dr. Pallab Chatterjee, (B Tech/EC/AZ/72), Managing Director and Operating Partner, Symphony Technology Group (STG), Shri Partha S Ghosh, (B Tech/CH/RP/71), Senior Advisor, Schlumberger Business Consulting, Prof Kenneth Shane Sajwan, (Ph D/AG/JCB/80), Professor and Coordinator Environmental Science Program, Department of Natural Sciences and Mathematics, Savannah State University, Dr. Sanjoy Paul, (B Tech/EC/RK/85), Managing Director and Country-Head, Accenture Technology Labs, Shri Sushil Kumar Sonee, (B Tech/EE/PH/77), Chief Executive Officer, Power System Operation Corporation

Ltd., Prof. Venu Govindaraju, (B Tech/CS/AZ/86), Founding Director of the Center for Unified Biometrics and Sensors, Shri Vinayak Lohani, (B Tech/MI/LLR/2000), Founder of Child Welfare Organization Parivaar.

- **Fundraising Campaign:** Various fund raising campaigns are being managed by the Institutional Development (ID) team to create an endowment corpus which will ensure self-sustainability in the years to come. Under the Founding Endowment Batch campaign the team connects to alumni batches and motivates them to raise fund collectively. . Each batch has a minimum target of INR 50 lakhs. Once it is achieved, the batch is honored by naming a classroom after them in the Nalanda Academic Complex. Till now 5 (five) batches have already succeeded. Two new campaigns were launched in 2014-15 – Hall Endowment campaign and Student Innovation Endowment campaign. Both these campaigns have a direct influence on student life. The Hall Endowment campaign is where alumni from a Hall can collectively donate towards it for improving their living experience in the hall. The Students Development campaign facilitates the students to opt for innovative research and entrepreneurial projects.
- **My Imprint Program:** This is a program ‘By the Students, For the Students’ where, the outgoing students pledge their support towards the Institute initially by donating their caution money towards students' services. This year the concept of a Class Gift has been introduced in which part of the outgoing students' donation shall be used towards a unique gift that the batch decides to make towards the future generation of students. This year the donating students have opted for “Financial Support for International Travel” as “Class Gift from Class of 2014”. The rest of the money collected remains with the endowment fund of IIT-KGP.

## Events

- **Annual Alumni Meet at IIT Kharagpur:** IIT Kharagpur along with the office of alumni affairs and international relations hosted the 12th annual alumni meet from 9th-11th January, 2015. The special guests of honor were the graduating batches of 1965, 1975 & 1990. The meet was attended by nearly 230 alumni along with their families.
- **Foundation Day:** The 63rd Foundation Day was celebrated on August 18, 2014. The office coordinated the organization of the Foundation Day on behalf of the Institute. Prof. Pradeep Khosla, Chancellor of University of California, San Diego and Distinguished Alumnus Awardee was the Chief for the occasion. Faculty and staff members who completed 25 years of service were felicitated by the Director. A short film on the history of the Hijli Detention Camp and the inception of IIT Kharagpur was premiered during the occasion. The Foundation Day Debate was on a unique topic – Foundation for Excellence: GURU COOL! Not GURUKUL. The participants were faculty members and students. Entertainment programs and fancy dress football were organized in the evening.
- **Guest Lectures:** Several alumni were invited for giving lectures this year: Mr. Arjun Malhotra (EC/1970), Life Fellow, of the Institute shared the challenges in his early entrepreneurial endeavors. Being the Chairman of IIT KGP Vision 2020, Mr. Malhotra also briefed the audience about various aspects of the program. Mr. Vinod Gupta (AG/1967), Distinguished Alumnus, vividly shared his experiences about how IIT Kharagpur has shaped him in life. He urged the students; never to forget what IIT Kharagpur has done for their life. Mr. Rajeev Agarwal (ME/1986), Founder and CEO, MAQ Software explained his transition from IIT Kharagpur to the outside world after graduation and what difficulties he faced during his constant quest for knowledge and fulfillment. Prof. Farrokh Mistree, Distinguished Alumnus along with his wife and colleague, Prof. Janet Allen inspired the students to take up an academic career.

- Leadership Summit 2: Innovation and Entrepreneurship was organized by Students' Alumni Cell, on the 4th of November, 2014. About 800 eager students filled the auditorium to draw inspiration from the alumni who have made it large in their professional lives. 7 enthusiastic alumni took to the podium to share some of their success secrets. They were from various fields of interest and work but shared a common avidity to excel. They were: Life Fellow and Distinguished Alumnus Awardee Mr. Arjun Malhotra (1970/EC/RP), Co-founder and Chairman, HCL, Shri Gopal Rajgarhia (1968/CH/NH), Managing Director, Orient Abrasives Limited, Distinguished Alumnus Awardee Mr. Prasad Menon (1968/CH/NH) Managing Director, Joint Venture of Tata & Singapore Airlines, Prof. Anjan Roychoudhury (1968/CH), Mr. Manohar Dey (1970/AR/NH), Mr. Subhas Chander Sarin (1968/CH), Mr. S. S. Roy (1968/AR)
- Institute Lecture Series: Prof. Avadhesh Surolia, Ph.D, FNA, FASc, FNASc, Honorary Professor and CSIR Bhatnagar Fellow, Molecular Biophysics Unit, Indian Institute of Science Bangalore presented lecture on Gene Beans on Lectins- a Binding, Folding and Function Perspective. Another lecture was by Professor V.Chandrasekar, University Distinguished Professor of Colorado State University, USA on Dual-polarized Doppler Weather Radar: Fundamental Principles and Applications. Professor V. Ramamurthy lectured on Supramolecular Photochemistry: Controlling Excited State Behavior of Guest Molecules via Confinement.
- Grand Reunion: A special reunion was organized on January 23 – 25, 2015, to celebrate the giving back initiative of the Class of 1970. Several alumni from the batch have made major donations towards the advancement of the Institute, be it G S Sanyal School of Telecommunication and M N Faruqui Innovation Center by Shri Arjun Malhotra, P K Sinha Center for Bioenergy by Dr. Prabha Kant Sinha, Ranbir or Ranbir and Chitra Gupta School of Infrastructure Design and Management and Uday Agnihotri Chair Professorship by Shri Ranbir Gupta's batch with its 300 strong members the batch is closing a collective donation of Rs. 1 Crore. A classroom will be endowed in their honor in the Nalanda Academic Complex of IIT Kharagpur with all 300 names displayed on its wall. The Reunion was a fun-filled fare for the alumni who graduated more than 45 years back but the cause is a noble one, unique and appealing.

### **New Programme Launches**

- M N Faruqui Innovations Centre: The Centre is funded by our distinguished alumnus Shri Arjun Malhotra in the name of Late Professor M N Faruqui, also an alumnus and former faculty of IIT Kharagpur. An endowment of USD 1 million has been provided to the institute for this purpose which is being utilized to support student innovations projects from the interest earned. Interdisciplinary student teams are being supported by this centre with approved projects. They are expected to come up with end-use application products which will be taken for real-life tests by the project teams as an innovative product.
- Transdisciplinary Programme on Petroleum Engineering: This programme is launched under the patronage of alumni Ashok Deysarkar and Ruma Acharya who have seed funded it. The Dual Degree in Applied Petroleum Engineering is largely a trans-disciplinary programme combining inputs from Geology and Geophysics, Mining Engineering, Chemical Engineering, Mechanical Engineering, Humanities, Management and Law. One can opt for a five-year integrated programme with B.Tech. Degree in Chemical, Mechanical or Mining Engineering and an M.Tech. in Petroleum Engineering with specialization in Petroleum Production. Students can also enroll for a six-year integrated Dual Degree. programme comprising an MSc in Applied Geology or Exploration Geophysics and an M.Tech. in Petroleum Engineering with specialization in Petroleum Exploration.

## **International Relations**

### **Inbound Students Visits**

The following students visited IIT Kharagpur during the period April 2014 – March 2015

- Iaroslav Zarudnii, PhD Scholar, Georgii Stepanov, PhD Scholar, Sergei Safronov, Post Doctoral Scholar from Volgograd State Technical University, Russia visited the Rubber Technology Centre.
- Josef Knapp, M.Tech. student from TUM Germany visited the Dept. of Electronics & Electrical Communication for specialization in RF and Microwave Engineering Programme
- Bertille Edith Bella Nke, PhD Scholar, Geology & Geophysics from Laboratoire de Geologie de l'Environnement (LGE) Departement des Sciences de la Terre, Universite de Dschang (Cameroon) visited the Dept. of Geology & Geophysics Cameroon under Sandwich Program
- Tomasz Ozanski, from Wroclaw University of Technology, Poland, visited to conduct collaborative research, took classes on Complex Network Courses and participated in the Workshop on "Machine Learning and Complex Network" organised by CSE department

### **Students Outbound Visits**

Students International Internships: Undergraduate Students are mandated for at least one internship during their B.Tech. courses. Many students also go for optional summer internships. The students at IIT KGP spread across the world in top universities and institutions for global exposure in academics, research and industry orientation. In 2014-15, more than 70 students went for international internships. The visits were primarily concentrated in USA, Canada, UK, Germany, France, Italy, Australia, China, Japan, Malaysia, Singapore, Saudi Arabia.

Participation in International Contests: International Travel of more than 30 students were funded by the Institute for participating in international contests and conferences of repute such as Hult Prize Competition in USA, Petropharaoh, Egypt Petroleum International Conference; EPIC 2015, Student Design Competition & National Mining Competition in USA, Harvard Project for Asia and International Relations (HPAIR) 2014 in USA, Innovative Design Simulation Challenge (IDSE) by American Society of Mechanical Engineers (ASME) in USA and many more.

Visit to International Conferences: More than 300 students and research scholars participated in international conferences for presentation of papers. The Institute funds the international travel of these scholars.

Exchange Students: Several students visit foreign universities under DAAD Scholarship and WMG programmes.

### **Faculty Visits**

33 international faculty visited the Institute under the International Summer and Winter Term. The faculty visited from reputed foreign universities such as University of California, Berkeley, Florida State University, University of North Carolina, University of Bristol, Virginia Polytechnic Institute and State University, University of London, University of Bremen, University of Wisconsin, Texas A and M University, University of Ottawa, University of Illinois, University of Western Australia, Osaka University and many more.

### **MoUs with International Organizations**

The Institute had the following International MoUs during the period April 2014 – March 2015

Institute of Engineering, Tribhuvan University, Nepal and IIT Kharagpur (MoU)	Signed on 17.1.2006 Renewed on 11th June, 2015 Validity : 5 years	2015 2006
IIT Kharagpur and The University of Warwick, as represented by WMG, UK (MOU)	Signed on 18th April, 2008 Validity : 5 years Renewed on 4th March, 2015 Validity: 5 years	2015
TOTAL France and IIT Kharagpur (MOU)	Signed on 18th February, 2009 Validity : 3 years initially Renewed on 16th March, 2015 Validity : 3 years	2015
University of Southampton, UK and IIT Kharagpur (MOU)	Signed on 17th April, 2008 Validity : 5 years Signed on 5th March, 2015 Validity: 5 years	2015
MoU with University of Twente, Enschede, Netherlands.	Signed on 21-01-2015 Validity: 5 years	2015
MoU with University of Alabama, USA.	Signed on 30-03-2015 Validity: 5 years	2015
MoU with Edward Food Research & Analysis Centre Ltd. (EFRAC).	Signed on 18th July, 2014 Validity: 5 years	2014
Academic Collaboration between RIKEN Brain Science Institute (RIKEN BSI), Japan.	Signed on 20th August, 2014 Validity: 5 years	2014
MoU with University of Queensland, Australia.	Signed on 13 October, 2014 Validity: 5 years	2014
MoU with University of Wollongong, Australia.	Signed on 8 October, 2014 Validity: 5 years	2014
MoU with University of Melbourne, Australia.	Signed on 26 November, 2014 Validity: 5 years	2014

### MoUs with National Organizations

The Institute had the following National MoUs during the period April 2014 – March 2015

MoU with Hindustan Aeronautics Limited (HAL), Bangalore.	Signed on 30th April, 2014 Validity: 3 years	2014
Donation by Professor Tapan Prasad Bagchi to IIT Kharagpur (Agreement)	Signed on 25th June, 2014 Validity :	2014
MoU with SAP Lab India Doctoral Fellowships at IIT Kharagpur	Signed on 3rd July, 2014 Validity: 2 years	2014
MoU with Rajasthan University of Veterinary and Animal Science (RAJUVAS), Bikaner.	Signed on 5th August, 2014 Validity: 5 years	2014
MoU with Delhi Mumbai Industrial Corridor Development Corporation (DMICDC).	Signed on 21st August, 2014 Validity: 5 years	2014
MoU with Indian Institute of Engineering Science and Technology (IEST).	Signed on 10 November, 2014 Validity: 5 years	2014
MoU with Power System Operation Corporation Limited (POSOCO), New Delhi.	Signed on 14 November, 2014 Validity: 5 years	2014

## Central Library

The Central Library is regarded as the heart of our institute to fulfil the informational needs of the users mainly towards the completion of their academic programmes as well as the research activities. At present, the Library is catering to the needs of more than ten thousand students of undergraduates, postgraduates, research scholars, seven hundred faculty members and more than one thousand staff members of the Institute. The Central Library is having two internally connected buildings (main and annex) with a carpet area of about **8000 sq.m.** Its a matter of prestige that the Central Library has been certified with **ISO 9001:2008** since 2014 and the certification has been extended for one more year after satisfactory quality audit by the external auditors. MHRD, under its NMEICT mission, has entrusted IIT Kharagpur to host, coordinate and set-up National Digital Library (NDL) towards building a national asset. In this connection, the Central Library has set up National Digital Library (NDL) Project at Annex Building of the Library for smooth functioning of the project.

The Central Library has also organized the 10<sup>th</sup> Technology Book Fair during January'2015 which has been also regarded as one of the major events of the Institute since 1999.

The Library is using **LIBSYS**, an integrated library management software package, with all the modules for automated library operations. The Central Library houses and maintains nearly 3.9 lakh of print documents comprising of books and bound volume journals. The Library procured 3700 print books for the academic year 2014-2015. As far as e-resources are concerned, there are huge collection of e-resources comprising of full text e-journals, e-books, online databases (full text and bibliographic) etc. The Central Library has an access to more than 20,000 full text e-journals, 122, 744 e-books and 28,638 conference proceedings.

As far as facilities are concerned, the Central Library has six air-conditioned reading halls with 1500 seating capacity for the users. The Central Library introduced the facility of 24 x 7 hours reading room facility for 15 days during Semester Examinations of the Undergraduate Students and Post Graduate Students. Library users can make payment for their Library fines, photocopying, printing and scanning through debit and credit card. Web scale discovery service has been introduced in our library where the users can search and browse the full text subscribed e-resources using open source software vufind integrated with Summon Solution from ProQuest.

Besides, the regular support to the users, Central Library also had taken initiatives to organize several 'Author workshop' to motivate researchers to publish research articles in reputed journals. Regular Library orientation programmes as well as three technical workshops have also been organized by the library during the period to increase awareness and optimum utilization of resources.

# Central Research Facility (CRF)

## Head

Prof. Rahul Mitra (Materials Division)

Prof. Amit Kumar Das (Life Science Division)

## Infrastructure Development and new Acquisitions

- Small Angle X-Ray Scattering (SAXS) Instrument (Model: Xeuss 2.0 SAXS/WAXS, Model HR 300-fm, Manufacturer: Xenocs Ltd, France).
- Field Emission Scanning Electron Microscope with needle-based charge compensation, Energy Dispersive Spectroscopy and Electron Backscattered Diffraction Facilities. Model Merlin, Manufacturer: Carl Zeiss, Germany.
- Charge Coupled Device (CCD) Camera (4.2 Mega Pixel) for JEM 2100 HRTEM Facility Model: SC600 Camera, Manufacturer: Gatan Inc., USA.
- Trinocular Stereozoom Microscope: Trinocular stereozoom microscope with 150 watt fiber optic cold light source (Model: Stereo discovery. V8, Carl Zeiss, Germany).

## Title and duration of conferences organized

- Workshop on Electron Backscattered Diffraction by Dr. Stuart Right, Senior Scientist, EDAX corporation, USA on 18-04-2015.

## Laurels and Distinctions awarded to faculty

- Prof. Rahul Mitra – Metallurgist of the year award (Metal Science Category) -2014 from Ministry of Steel, Government of India (award received from Union Minister of Steel and Mines at National Metallurgist Day held in Pune on November 14, 2014)

# Central Workshop and Instruments Service Section (CWISS)

## Head

Prof. Asimava Roy Choudhury

## CWISS Sections and Facilities

1. **Mechanical Fabrication** – Manufacture of laboratory specimens, experimental set-ups, new equipments and development of existing set-ups as per order. Includes conventional and CNC divisions. A 5-axis CNC machine has been procured recently.
2. **Glass Blowing** – This section caters to the development of glass laboratory apparatus and has been recently revived. One permanent staff has been kindly assigned by the institute.
3. **Electronics Repair Section**- This facility of electronic fabrication and repair has been revived recently.
4. **Carpentry Shop** - Providing wooden furniture with or without steel frames, wooden nameplates for various units of IIT.
5. **Audio Visual Cell** – Providing audio-visual support through skilled manpower in classrooms, meetings, seminars, conferences, symposia, workshops, cultural programmes etc at the following locations : 30 rooms at NCRC, Raman and Bhatnagar auditoria, F-127, F-232, F-244, Netaji Auditorium, Committee room, S N Bose Auditorium in the main building complex, Kalidas auditorium, Gargi and Maitrayee seminar halls, V1-V4 at the Vikramshila complex.
6. **Supervision** and support for various activities at various levels.
7. **Outreach** – Consultancy, collaboration and short term courses as a recently started future growth plan.
8. **Coordination** of AV installation in NCRC, Digital Conference system in Senate hall. Coordination and support in the purchase of NCRC Classroom furniture.



# Centre for Theoretical Studies

## Research and Development Activities

- CTS Visitors Programme has been reviewed and recommended by the BOG with an enhanced budget, primarily to take care of the increase in number of applicants from various institutions across India.
- A DAAD faculty exchange Programme to be hosted through CTS submitted and approved.
- Prof. Sourav Pal and Prof. Manjul Bhargava will be associated with CTS (as well as other Departments/Centres) as Distinguished Visiting Professors.
- Research on the theoretical/computational aspects of science and engineering in areas of astrophysics and gravitation, chemistry, condensed matter science, mathematics and mathematical physics, nonlinear science, high energy physics etc. continues, through sponsored projects, individual/group activity and with participation from faculty in various departments, as well as research scholars.
- Exclusive Ph.d. Level courses on mathematical methods, simulation methods, quantum computation, wave propagation and dynamics continues to be offered through CTS, every semester.
- Several new faculty members across Departments are now involved with CTS through the Associate programme.

## Infrastructure Development and new Acquisitions

- A HP DL585 G7 BC NIC CTO Server for high end computation has been purchased. The main configuration has AMD Opteron 6380 Processor ( 64 cores), 1TB RAM, 24TB HDD.

## Title and duration of conferences organized

- The Topical Conference on Gravity and Cosmology (Eastern Region) was organized through CTS on February 28, 2015.
- The S. Datta Majumdar Memorial Lecture for 2014 was delivered by Prof. Deepak Dhar of TIFR, Mumbai.

# Computer and Informatics Centre

## HEAD

**Prof. Arobinda Gupta**

## CONCERNED FACULTY/OFFICERS (with degrees and specialization)

Name	Degree	Specialization
Dilip Kumar Nanda	M.Sc, DIIT, PhD (IIT Kharagpur)	IT Infrastructure Management and Operations, Application Software & Numerical Techniques
Partha Goswami	BTech (C.U), M.Tech (IIT Kharagpur)	Wireless & Optical transport network
Alok Baran Das	B.Tech (CU)	Networking, Hardware
Surid Kumar Das	B.Tech, MTech (Rajasthan Vidyapith Deemed University)	Wireless, Computer Network
A. Chattopadhyay	M.Sc, M.S (IIT Kharagpur)	Wireless, OS, Network Security & Applications
Sudipto Das	B. Tech, MTech (Rajasthan Vidyapith Deemed University)	Network Applications and Security
Deepan Banerjee	B.Tech (WBUT)	Networking, Routing Switching & Wireless
Tanumoy Ghosal	B.Tech (WBUT)	Networking & Security Aspects
Subhasish Chattopadhyay	B Tech (WBUT)	Networking & FTTH

## FACILITIES

### Networking Facilities in the Institute

The Quadruple Play Network (QPN) facility provided in the Institute campus is extended to several other locations particularly to the newly constructed residential quarters. The Wi-Fi facility provided in the student's hostel is being strengthened due to the increased use of the facility by the student community. The placement activities carried out by the CDC in the Nalanda Class room complex was heavily supported by the Wi-Fi network provided and supported by CIC which was greatly appreciated by the Chairman, CDC.

Networking facilities have been extended to the following location during the year under review. Some of the location where major networking has been undertaken is given below:

- Dr B R Ambedkar hall of Residence
- Lal Bahadur Sashtri hall of Residence
- Sister Nivedita ladies hostel
- Sir J C Bose Laboratory Complex
- Nalanda CCR-2 class Room Complex

- New Building of School of Medical Science & Technology
- Computer Laboratories of Computer Science & Engineering Department
- New building for Integrated Information Service (IIS)
- Extension of SRIC office
- Faculty accommodation G + 7 A-type quarters
- Upgradation of the network of New Guest House
- Networking of ARP, Bio Technology, Bio Science, Civil Engineering, Chemistry, and Electrical Engineering departments also have been provided with significant networking facilities

### ***Laboratory Facility***

- The laboratories in CIC (5 Nos) have been utilized for the Institute academics purposes for conducting Institute laboratory classes along with other student related activities like registration of students in both semesters, Career Development Centre's place men initiatives, short term courses and International seminars, tech festival like Kshitij, Spring festival and other computer contests organized by Department/Centers/Schools of the Institute.
- The CIC PC laboratories have also provided support for GATE 2014 online examinations as a test centre.

### ***Other Facilities (Software & Hardware)***

- Institute has renewed the existing antivirus software "Trend Micro Enterprise Security Suite with Advanced Reporting Module" for 20000 User licenses. This software would be protecting the Endpoint Security, Gateway security, Web Gateway, Messaging Gateway, Mail Servers, File Servers and also be capable of providing advanced reporting on possible threats.
- Other software available to the user community include, Microsoft campus wide licensing, Abacus (for finite element modeling and analysis), MATLAB (for integrated technical computing), Solid Works (for engineering drawing), PASW (statistical package) and ANSYS etc.
- Software for Mail Messaging Solution for 20000 users is also in use by faculty, staff and students of the Institute.
- VPN support is being provided to users for connecting to Institute network from any outside network

### ***Research Publication***

P. Goswami, S. K. Ghosh, D. Datta, "On methodologies to estimate optical-layer power consumption and cost for long-haul WDM networks with optical reach constraint," Photonic Network Communication, Springer, vol. 29, no. 1, pp. 12-31, February 2015.

# Continuing Education Center

**Dean**

Prof. Om Prakash Sha

## Short Term Courses Organized by the Unit

Sl. No.	Short term courses organized under	No. of Courses	No. of participants	Duration
1.	QIP (AICTE) Short Term Courses	08	240	12 Weeks
2.	Sponsored/Self finance Short term courses	52	1500 (approx.)	1 week for each course (approx.)
3.	Workshop/ National & International Conference	4	160 (approx.)	3-4 days for each conf.
Total =		64	1900	

## 3-Year M. Tech Programme organised by the Unit:

Sl. No.	Name of the Subject	No. of Students Completing	Duration
1.	Electrical Engineering	24	3 Years
2.	Electronics and Electrical Communication Engineering	14	3 Years
3.	Information & communication Technology	13	3 years

## 3-Year Executive MBA Programme organised by the Unit:

Sl. No.	Name of the Campus	No. of Students Completing	Duration
1.	Kolkata campus	31	3 Years
2.	Bhubaneswar campus	11	3 Years

## Empowerment of Students and Teachers through Synchronous & Asynchronous Instruction (EIT) under NMEICT, MHRD

Sl. No.	Title of Workshop	No. of trainers/ participants	Duration
1.	Control Systems	241 / 7398	1 week / 2 weeks
2.	Introduction to Design of Algorithms	221	1 week

## International Summer and Winter Term

Indian Institute of Technology Kharagpur started its first international summer and winter term (ISWT) in 2014 where national and international participants got an opportunity to seek knowledge and experience from reputed International faculty through intensive study of subjects and personal interactions. By bringing together participants and faculty from India and around the world, ISWT was not only academically stimulating but also offered an opportunity to make new friends and interact with international experts.

Participants from Industry, Research Organisations, Faculty and Students from all over the world were welcome to register for the 17 subjects offered during the summer term and 9 subjects during the winter term. These subjects were designed around current and multidisciplinary themes of Science, Engineering, Management and Law. The duration for each subject was of 2 weeks or 10 working days with a judicious blend of lectures and tutorials per day. A lecture series by renowned theoretical physicist Sir Prof. Michael Berry was also conducted as part of the International Summer & Winter Term (ISWT) programme.

IIT Kharagpur issued a course completion certificate to all participants who attended classes regularly. The students registered for these courses, optionally had the opportunity to obtain additional academic credits based on the evaluation and grading process. His/her home university/Institute was mainly responsible for transferring ISWT academic credits. IIT Kharagpur only provided information on the grading system, subject syllabus, and the academic policy.

<b>International Summer Winter Term (ISWT)</b> <b>1st April 2014 to 31st March 2015</b>				
<i>Sl. No.</i>	<i>Subject Code</i>	<i>Name of the Subject</i>	<i>No. of Students</i>	<i>No. of Days</i>
1	IL0101	Lecture Series by Prof. Sir Michael Berry (IL0101)	46	9
2	IST0101	Geological Exploration by Ground Penetrating Radar (IST0101)	46	12
3	IST0102	Introduction to Global Spectral Modelling (IST0102)	26	16
4	IST0103	Portfolio Optimization (IST0103)	65	12
5	IST0104	Thermal Processing of Foods (IST0104)	26	12
6	IST0105	Advanced Technologies for Waste Water Treatment and Recycling (IST0105)	32	13
7	IST0106	Modelling in Fluvial Processes (IST0106)	33	12
8	IST0107	Engineering Asset Management (IST0107)	31	12
9	IST0109	Advanced Formal Techniques in Design, Verification and Testing of Digital Integrated Circuits (IST0109)	38	12
10	IST0111	Geospatial Technologies in Hydrological Modelling (IST0111)	32	12
11	IST0112	Numerical Ocean Modelling (IST0112)	23	13
12	IST0113	Biofuels : Policy and Law (IST0113)	34	12
13	IST0114	Distortion Prediction and Control of Large Ship Structural Units (IST0114)	47	12
14	IST0115	On-sites waste water treatment and Management (IST0115)	23	12

15	IST0116	Big Data Analytics (IST0116)	55	12
16	IST0117	Hydrology and Climate Change (IST0117)	53	11
17	IST0118	Methods & Techniques in Cognitive and Clinical Neuroscience (IST0118)	35	11
18	IST0119	Communication Strategies for Change (IST0119)	41	11
19	IWT0120	Geostatistics in Ecological Modelling (IWT0120)	11	13
20	IWT0121	Introduction of Geophysical Fluid Dynamics (IWT0121)	26	16
21	IWT0122	Geonomics, Metagenomics and Metabolic Engineering (IWT0122)	28	11
22	IWT0123	Micro & Nano-scale Transport for Bio and Engery Applications (IWT0123)	23	12
23	IWT0124	Spatial Ecology & Remote Sensing (IWT0124)	14	13
24	IWT0125	Aircraft Design Practices (IWT0125)	50	10
25	IWT0126	Multi-Scale Modeling of Advanced Materials (IWT0126)	35	10
26	IWT0127	High Power Microwaves (IWT0127)	23	11
27	IWT0129	Program for High Speed Rail System (IWT0129)	62	10

**Facilities:**

Video-Conferencing Studios at Kolkata (3), Bhubaneswar (3) and Kharagpur (4) & Raipur (2) Seating Capacity (60 + 40 + 40 + 40 +40)

**Seminars/Workshops/Conferences Organized by the Unit**

Total No. of Workshops/Conferences/Short-term courses/  
Symposia Organized : 99

Total No. of participants attended : 1672 +

**Particulars of M.Tech and Ph.D scholars joined/completed under QIP**

- A. No. of Teachers completed Ph.D degree under QIP : 05
- B. No. of Teachers completed M.Tech programme under QIP : 07
- C. No. of Teachers joined Ph.D programme under QIP : 08
- D. No. of Teachers taking advance admission to  
Ph.D programme under QIP : 08
- E. No. of Teachers joined M.Tech. programme : 06

## **Estate (E&M) Works Section**

1. Installation of 100 kWp solar power plant in the roof top of the Mathematics Department of the Institute.

The power generated is being fed to the Grid. Total energy generated is 80,000 units in 6 months.

2. Installation of occupancy sensor for automatic switching operation of light & fan loads in various classrooms V1, V2, V3, V4 , S N Bose, Bhatnagar, Raman Auditorium and F-132 at IIT Kharagpur. This has enabled the disconnection of light and fan loads in the absence of student occupancy in the classrooms.
- 3a) The website of the Section was launched on 7<sup>th</sup> March 2014. It is an interactive portal giving vivid details of our Substations, HT and LT lines interconnecting the Substations and load centers, the organization of the Section with responsibilities delegated to the supervisors.
- 3b) An online Data Acquisition system has been installed by the Section which gives the Instantaneous voltage, current, power factor, Maximum Demand at 33kV and 11kV voltage levels at the main 33kV Substation. The historical data is also saved in the system for graphical and tabular demonstration.
4. Installation of Machine room less elevators in Sir J.C.Bose Lab Complex, Computer Science Dept., B.C.Roy .Technology Hospital patient elevator and LBS Dumb waiter.
5. Installation of modern advanced new generation ESE Type lighting arresters have been installed in the Institute Main Building, Old Building, Residential area like (G+7) Faculty blocks and also in five nos. of Halls.

This will protect the large area of the Institute residential and academic area from lightning.

## Civil Construction and Maintenance Section

As a part of the ongoing infrastructural development, various construction projects have been taken up by Civil Construction and Maintenance Section. Current status of those projects is as follows:

A. Students Accommodation:

1390 rooms of B.R. Ambedkar Hall of Residence have already been handed over to HMC.

B. Nalanda Classroom Complex:

Furniture for another 30 class rooms are being ordered. Air Conditioning work for ducting is in progress.

C. J.C. Ghosh Science Block & P.C Roy Laboratory Block:

Finishing work of the project are in progress.

D. New Water Supply Project:

Jack pushing at bottom tier has been completed. 200 m. (approx.) of 300 mm. dia MS Strainer has been pushed till date.

E. Development of Children Parks at Campus:

One new Children Play Ground has been developed in front of VSRC. Two Other Children Parks have been renovated thoroughly with new play items.

F. Expansion Work in Academic Buildings:

SMST (NCC) work has been completed. Work for construction of Aerospace Engineering building has already been awarded.

G. Construction of A-Type Faculty Apartments:

56 Flats has been completed and handed over. 24 Flats are already occupied.

H. Construction of B-Type Faculty Apartments:

Foundation work is under progress.

I. Construction of Married Scholars Accommodation:

Structural work is under progress.

J. Construction of Faculty Transit Apartments:

Structural work is under progress.

K. Expansion of Vikram Sarabhai Residential Accommodation:

Structural work is under progress.

L. Construction of Super Speciality Hospital:

The work for construction of the Main Hospital Building for the Dr. B.C. Roy Institute of Medical Science & Research has been awarded to M/s. Larsen & Toubro Ltd. by our PMC, HSCC (I) Ltd. on 08.06.2015. The site has been handed over to M/s. Larsen & Toubro Ltd. on 01.07.2015.



M. Construction Of Research Park At Rajarhat Kolkata:

The work order for the (B+G+9) Main Building along with Auditorium, Sub Station building and services has been issued by CPWD to M/s. NCC Ltd. on 30.12.2014. The piling work for the Auditorium part has been completed and about 70% of the piles for the Main Building has also been completed. The pile caps for the Auditorium part are in progress.

N. Construction of Nivedita Hall of Residence:

All the slab casting have been completed in Block 1 & 2. Brick work is in progress in Block 1 & 2. Third floor slab completed in block 4. In block 3 first floor slab ready for casting. Foundation work completed in Kitchen and Dining Hall.

O. Academic Campus Roads:

1 km. of concrete walk way and cycle way has been constructed in the academic campus.

P. Old ISRO Building:

Renovation of Old ISRO Building has been completed and handed over to ERP.

## **Extra Academic Activities**

### **NSO Health and Fitness**

The Health and Fitness program of IIT Kharagpur served 980 UG students in the year 2014-2015 as a part of institute's mandatory extra academic activity. The program was supervised by ten faculty members who serve as program officers of individual units comprising of about 100 students each, and another faculty as program coordinator.

Every Wednesday and Saturday, the students assembled in the Jnan Ghosh stadium at sunrise for work out sessions. In this, physical training was conducted under strict supervision of qualified physical training instructors drawn from Students' Gymkhana. Apart from routine activities, the students were introduced to Yoga and Karate through special sessions. The students organized awareness rallies and published newsletter on healthy living at regular intervals. There were cleaning drives by students to improve the health and hygiene aspect of our campus life, and also to inculcate among student members a sense of cleanliness. In addition to these, to serve a greater cause of spreading the message of health and fitness beyond the physical reach of IIT Kharagpur,

A blog with URL <http://healthandfitnessiitkgp.blogspot.in/> and a youtube channel with URL: <http://www.youtube.com/user/iitkgpnso> are maintained under this program.

# BENGAL TECH AIR SQN NCC

## Commanding Officer

WG CDR D ROY

Associate NCC Officer (ANO)

Flying Officer Sudhir Kumar

## INTRODUCTION

3 Bengal Tech Air Sqn NCC is a prestigious unit of NCC under West Bengal & Sikkim Directorate, established in 1979 under the authority of Govt of India Min of Def letter No. 7899/DGNCC/PLG/1785/A/D (GS-VI) dated 26 Jun 1979. This unit has been imparting NCC Training to Indian Institute of Technology, Kharagpur Students now for more than 51 years. 3 Bengal Tech Air Sqn NCC is dedicated NCC units exclusively established for Indian Institute of Technology, Kharagpur. The unit is sponsored and funded by IIT, Kharagpur. This unit is designed to impart NCC training to 200 cadets of Air Wing senior division cadets as a mandatory EAA (Extra Academic Activity) subject for undergraduate students (I<sup>st</sup> & II<sup>nd</sup> Year) of IIT Kharagpur. All vacancies are fully utilised. During the training year 2014-15 a total number of 200 students were enrolled as SD cadets.

Various training activities considering their importance and requirement were conducted by this unit for first and second year cadets. Activity details are as mentioned below:-

### (a) Institutional Training

i) Drill	:	35 Periods
ii) NCC & Aircraft Technical subjects	:	150 Periods
iii) Personality Development and life skill training	:	10 periods
iv) Camp Training (29 Nov 14 to 08 Dec 14)	:	CATC-2014
v) Aeromodelling	:	Fridays to Sundays
vi) Independence Day parade	:	15 Aug 14
vii) Range Firing (.22" Rifle)	:	30 Aug 14
viii) Skeet Shooting	:	30 Aug 14
ix) Republic Day Parade	:	26 Jan 15
x) Defence Service Awareness Pgme	:	14 Mar 15
xi) 'B' Certificate examination	:	28 Mar 15

### (b) Social Service and Community Development activities conducted

(i) Eco-conservation Drive, cycle rally and Tree plantation	-	02 Aug 14.
Conducted at Village Tangasol, Kharagpur		
(ii) Rajiv Gandhi Sadbhavna Run at IIT Kharagpur	-	23 Aug 14
(iii) Water Body Conservation at IIT Kharagpur	-	06 Sep 14.
(iv) Youth Development Programme (Lecture by Swami Suddhidananda of RK Mission) at IIT Kharagpur	-	11 Sep 14.
(v) Anti dowry & Anti-female foeticide campaign at IIT Kharagpur	-	13 Sep 14.
(vi) Blood donation Camp at IIT Kharagpur	-	11 Oct 14.
(vii) Lecture on International Disaster day at IIT Kharagpur	-	18 Oct 14.

(viii)	Eye Donation campaign at IIT Kharagpur	- 01 Nov 14.
(ix)	Cycle Rally and Rural Sanitation Programme at Balrampur village, Kharagpur	- 15 Nov 14.
(x)	World AIDS Day during CATC at IIT Kharagpur	- 01 Dec 15.
(xi)	Awareness on National Voters day at IIT Kharagpur	- 25 Jan 15.
(xii)	Pulse Polio Drive at Ten villages of Kharagpur	- 18 Jan 15.
(xiii)	World Cancer Day- Cancer awareness Lecture, Anti-tobacco pledge and Cycle Rally at CR Nagar, Kharagpur	- 07 Feb 15.
(xiv)	Swachh Bharat Abhiyaan and Rural Sanitation activities at Purabapatri Village.	- 14 Mar 15
(xv)	Observance of World Forestry Day	- 21 Mar 15
(xvi)	Thalassemia awareness and detection camp	- 04 Apr 15
(xvii)	Observance of World Haemophilia Day	- 18 Apr 15

**(c) Seminars/Workshops/Conferences/Symposia Conducted**

- (i) **Eye Donation Campaign.** 3 Bengal Tech Air Sqn NCC, IIT Kharagpur organised an awareness campaign on ‘Eye Donation’ on 01 Nov 14. Aim of the campaign was to spread the importance of ‘Eye Donation’ to make one’s life more meaningful. A person who wishes to donate his/her eyes after death has to go to an eye hospital and needs to register his name there. As a part of this event, a team of three members from Sankara Nethralaya Eye Bank, Kolkata was invited to spread awareness of eye donation and also about the functioning of the Institute for eye donation campaign. Dr Amitabh Kumar and Mrs Jayeeta Ghosh from the team delivered awareness lecture regarding the ‘Eye Donation’ procedure and the functioning of Sankara Nethralaya Eye Bank, Kolkata through a power point presentation. Various activities conducted for this social service was highlighted along with the details of people benefited.
- (ii) **Environment Conservation and Tree Plantation Drive.** On 02 Aug 14 a tree plantation drive was conducted by 3 Bengal Tech Air NCC, IIT Kharagpur. Group Captain Trilok Bandhu Gupta, Commanding Officer 3 Bengal Tech Air NCC with 182 cadets, Fg Officer Sudhir Kumar ANO and all unit personnel were present. Prof NR Mondal (Dean SA) IIT Kharagpur delivered a lecture on ecosystem and its importance and need of conservation. A short cycle rally was also organised after the lecture from Unit premise to GYWS School, Gopali and creating awareness through placards, banners and slogans of environmental conservation. After that 200 sapling were planted by this unit.
- (iii) **Seminar on developing Will Power and Secret of Success by Swami Suddhidananda of Belur Math.** This unit organised a Youth development Seminar in association with NGO Gopali Youth Welfare Society Kharagpur. On this occasion a lecture was delivered by Swami Suddhidananda of RK Mission Belur Math on 11 Sep 14 at Kalidas Auditorium, IIT Kharagpur for the cadets of this unit in particular and other students in general. Members form IIT Faculty, staff and students of IIT Kharagpur were also invited. The topic of the seminar was “Developing Willpower – Secret of Success”.
- (iv) **Air Force Day Celebration:** On 08 Oct 14, 83<sup>rd</sup> Air Force day was celebrated by 3 Bengal Tech Air NCC, IIT Kharagpur with full enthusiasm. Guests from IIT Kharagpur, Dr Rajeev Kumar Rawat, Hindi Officer IIT Kharagpur, ANO Flying Officer Sudhir Kumar, all Ex-servicemen from IAF employed in IIT and all staff of unit were present. Oath taking ceremony was conducted for all IAF serving personnel. AF Day message from President, Vice President, Defence Minister and Chief of Air Staff was read by the Group Captain Trilok Bandhu Gupta, Commanding Officer 3 Bengal Tech Air NCC, IIT Kharagpur.

- (v) **Swachh Bharat Abhiyaan.** As a part of Swachh Bharat Abhiyaan a Rural Sanitation programme was conducted on 15 Nov 14. In this activity at Balrampur village cadets in group visited the homes of local people and explained to them about importance of sanitation and how to keep necessary hygiene with the available resources. A separate group of cadets led by Cadet Pritam Mondal along with ANO Fg Offr Sudhir Kumar and PI staff went to Senior Secondary School at Balrampur village to create awareness about Hygiene & Sanitation amongst the school children. An excellent lecture was delivered by Cadet Pritam Mondal on Hygiene and sanitation. This lecture was applauded by school staff and school children and they all pledged to keep home and nearby places clean.
- (vi) **Visit to Air Force Station Kalaikunda and Interaction with Pilots for NCC Cadets and Aero Space Department Students of IIT KGP.** One workshop was conducted on the request of Aero Space Department IIT Kharagpur on 28<sup>th</sup> March 2015. Approx 83 students along with one Professor of the Dept. participated in this session on the specific topics, “Operation of an Air Force Base” and “Air Traffic Control Tower”. An interactive session with Fighter Pilot also was conducted in this workshop.
- (vii) **Blood Donation Camp.** The Voluntary blood donation camp was organised by this unit jointly with Voluntary Blood Donor’s Organization on 11 Oct 14 under overall supervision of West Bengal State Government Blood Bank, State Blood Transfusion Council at IIT Student Gymkhana. Dr Rajiv Rawat delivered the lecture on importance of blood donation. A total of 140 Blood donors took part in the event from all sections of IIT.
- (viii) **Workshop on Aeromodelling.** Workshop on Aeromodelling was regularly conducted at this unit under the guidance of Commanding Officer of this unit by Aero Modeling Instructor Mr. Tuhin Chakraborty on every Weekend from Aug 14 to Feb 15. The workshop was focused to create awareness on aircraft basics, development of air mindedness and other basic flying skills amongst the cadets of this unit. A number of live aero-models ranging from Chuck Glider, Catapult, Control line, Glider and three dimensional models were displayed for familiarization to the cadets.
- (ix) **Thalassemia Awareness and Detection Camp.** As a part of this social cause, this unit organised an Awareness & Detection Programme on Thalassemia in association with Thalassemia Society of Midnapur Distt. Medical College and Hospital, West Midnapur on 04 Apr 15 Hijli college Kharagpur. 20 Air Wing NCC SD cadets and 30 students from Hijli college took part in this programme.
- (d) **Lecture / Guest Lecture Delivered on Various Subjects.** 11 lectures on important subjects were organised during the training year 2014-15.

### **Achievements, Awards and Honors**

- (a) **Best Cadet Award in NCC Kharagpur Group.** WBSD/13/257009 Cadet Nishant Jayaswal (Roll No. 13BT30008) of this unit won NCC GP HQ level Best Cadet Competition. He went through various competitions among many Cadets from various units under NCC Kharagpur Group. He is awarded with cash award and Certificate of Best Cadet.
- (b) **Cadets Welfare Society Scholarship.** NCC Directorate West Bengal and Sikkim awards Twenty Three scholarships from NCC Cadets Welfare Society (CWS) Scheme 2014-15 with amount of Rs Six Thousand each for eligible students of school/College or from professional courses enrolled in First year of NCC as Senior Division (Boys) or Wing (Girls) from all NCC units of the state.

It is indeed a matter of pride that under NCC Group Head Quarters Kharagpur, six cadets solely from 3 Bengal Tech Air Sqn NCC awarded the scholarship.

- (c) The cadets of the unit have planted more than 200 saplings at various locations.
- (d) Trained more than 10 cadets in aeromodel flying from IIT, Kharagpur.
- (e) The Cadets of this unit along with PI staff participated in “Pulse Polio Drive” at Ten villages of Kharagpur on 18 Jan 15.
- (f) Unit adopted a village Purbabatri near Prembazar and conducted various social service activities.

# National Service Scheme (NSS)

## Activities Undertaken during 2014-2015

- Regular activities including teaching in the adopted schools,
- Tree planting in the adopted villages
- Social awareness programs in the adopted villages
- Organizing sports meets for school students (at Chamrusai by Unit 4 and at Ayma by Unit 10)
- Five new schools have been adopted by NSS IIT Kharagpur (Madhabpur Primary School by Unit 4, Upar Kenthiya Primary School by Unit 7, Siddharth Primary School and Bharat Primary School at Ayma by Unit 10 and Hiradihi-Kesiasole Madhyamik Shiksha Kendra by Unit 11)

## Other Activities Undertaken in 2014-2015

- Medical camp in Talbagicha by unit 11: General health and eye check-up have been conducted in the medical camp. Beneficiaries are students of the primary, secondary and higher secondary sections. Total no of beneficiaries is approximately 70.
- Provide supplementary food to the primary school students at Malma village.
- Celebration of Independence Day in morning of August 15, 2014
- Swachh Bharat Abhiyan on October 10, 2014: NSS volunteers have participated in this program to keep the surrounding clean and hygienic. Volunteers of Units 2, 3, 6, 8, 13, 14 continued with the effort by cleaning the villages they adopted and by taking out awareness rallies highlighting the benefits of cleanliness and hygiene on October 4, 11, 18 and 25.
- On the occasion of National Unity Day, NSS unit 11 has organized a drawing competition and extempore among the students of Talbagicha High School in the afternoon of October 31, 2014. Unit 4 has conducted a drawing competition in Malma Hindi Bharti Primary School to commemorate the occasion.
- Facilitating the unity run in IIT Kharagpur campus to celebrate the birth anniversary of Sardar Ballavbhai Patel in the evening of October 31, 2014
- As IIT Kharagpur is planning to adopt thirteen villages in the Unnat Bharat Abhiyan launched by Union Government, NSS IIT Kharagpur has conducted a survey on November 1 and 2, 2014 in different villages where NSS IIT Kharagpur is presently operating. More than 1250 households and 7500 residents of 21 slums and villages were covered in this attempt. The survey brought out facts that the level of income at the localities surveyed are only about 19 % of the nominal per capita income of West Bengal and India at current prices and only 29 % of that of Paschim Medinipur. Only about a third of the households have access to treated drinking water supply or a properly constructed toilet; about two-thirds use firewood for cooking.
- One week Annual Camp in the Balarampur Abhayashram Naitaleem Vidyapith involving the following activities:
  - Terrain mapping and survey for construction of road in the village
  - Construction and widening of the village roads in Balarampur
  - Medical camp for general health check-up and eye testing
  - Clothes distribution among the destitute of Balarampur.
  - Rally and street play for social awareness among the villagers
- Rally on January 18, 2015 of 4 km stretch in IIT campus to celebrate National Youth Day (birth anniversary of Swami Vivekananda)
- Celebrate Republic Day on January 26, 2015.

- Road construction at Malma village by unit 3 and 400 metre stretch at Bolla village by unit 2, 7, 12 and 13 have been carried out in month of February and March, 2015.
- Medical camps in Hiradihi-Kesisole Madhyamik Shiksha Kendra on February 28, 2015. Approximately 100 villagers from Kesiasole, Hiradihi, Talbagicha underwent general health check-up, eye testing and psychiatric assessment in the event. Two other medical camps were conducted in Pariapara (by Unit 5) and Sholadahar (by Unit 11) in March and April, 2015, where more than 100 villagers received treatment. Free medicine was also provided to needy villagers, who received treatment at the camps.
- An organic farming at Pariapara village with cultivation of sweet corn and peanut are produced in this endeavour. Nine vermicompost beds have also been set up at Pariapara in this endeavour. Several villagers are interested to undertake such activities within their premises at Pariapara.
- Installation of 2 puffed rice making machine have been provided in Sholadahar village. The machines are under trial run with 20 women of two self-help groups trained to use the machines.
- Water quality monitoring at Gaighata, Ayodhyagarh and Porapara villages twice-a-month since February 2015.
- Provision of inexpensive nutritional supplements to primary school students in Malma and assessment of the impact of the intervention on cognition level of participating students since January 2015.
- Annual blood donation camp in IIT campus on March 21, 2015. Approximately 80 donors have donated blood in this occasion.
- Collection of relief materials for Nepal earthquake victims and cash donations with active participation of IIT Kharagpur student community and staff members from IIT Campus over a 1-week period and delivering them to the collection centre of Nepal Consulate General in Kolkata on June 6, 2015.
- One month training program on stitching and sewing at Porapara village women has been conducted in the month of May, 2015. Now the village women are able to stitch new dresses.



# Institute Information Cell

## Head

Prof. Soumya Kanti Ghosh

## Activities of the Cell

The Information Cell has been the hub of academic information service of the Institute. The Cell is constantly updating the web sites of the Institute and Online Notice-Board (internal website). The Cell also maintains and hosts several sites of the conferences, seminars, workshops and short-term courses held during the past year and to be held in the current academic year, in addition to regular updating information on departmental pages, academic programmes, profiles of faculties, administrative positions and halls of residences of the Institute. The Hindi version of the website has also been developed under the supervision of Information Cell.

The website for CRF Laboratory Management has been developed where all instruments are brought under a common operating system and online booking facility has been extended to the faculty members. The Cell also maintains additional information modules for in-house applications. These include on-line Faculty Self-appraisal system, Departmental Report Generation system, Guest House Booking system, Staff Directory, Message Board facility to the Academic Section, Establishment Section, Estate Office, and Doctorates' Information System. The Cell has also developed the website of ISWT, donate & vote process of Senior Class gifts 2015 under *MyImprint* programme. The cell has prepared the updated the campus guide map with latest landmarks and other important information for the visitors.

# Kalpana Chawla Space Technology Cell

## Head

PROF. DIPANWITA ROY CHOWDHURY

## Professor:

Name	Degree	Specialization
Dr. D. R. Chowdhury	Ph.D	Cryptography and Security, VLSI
Dr. B. K. Sarkar	Ph.D	RF & Microwave Engineering
Dr. S. Sanyal	Ph.D	RF & Microwave Engineering
Dr. S. Chakraborti	Ph.D	Communication
Dr. S. S. Bandyopadhyay	Ph.D	Cryogenic Engg
Dr. K. Bandyopadhyay	Ph.D	Satellite Communication
Dr. I. Manna	Ph.D	Material
Dr. I. Sengupta	Ph.D	Mobile Communication, VLSI
Dr. S. Banerjee	Ph.D	VLSI based embedded system design for signal/image processing , Biomedical Instrumentation
Dr. T. K. Chaki	Ph.D	Rubber
Dr. N V A Naikan	Ph.D	Reliability and Quality Engineering
Dr. Sunando Dasgupta	Ph.D	Microscale Transport Process and Microfluids
Dr. Ajay Chakrabarty	Ph.D	EMI/EMC
Dr. J. Mukhopadhyay	Ph.D	Image Processing, Medical Informatics, Bio- informatics
Dr. D. Maity	Ph.D	Seismic Analysis of Dam, Health Monitoring of Structures, Cost Effective Housing
Dr. A. S. Dhar	Ph.D	<b>VLSI Architecture Design</b>
Dr. G. Saha	Ph.D	Communication
Dr. T. K. Bhattacharya	Ph.D	RF MEMS
Dr. J. Datta Majumdar	Ph.D	Nano fluid based
Dr. S. Sen	Ph.D	Capacitive Sensors and MEMS, Control Allocation Fractional Order Circuits and Systems, Robust Control
Dr. P.K. Das	Ph.D	Thermal Engineering, Gas-liquid two phase flow- instrumentation and hydrodynamics, CFD for multiphase flow, Nano fluids, Thermo hydraulics of nuclear reactors, Liquid-liquid two phase flow, Experimental thermo-fluid science
Dr. J. Mukhopadhyay	Ph.D	Image processing, Medical Informatics, Bio-Informatics
Dr. P. P. Das	Ph.D	Image Processing, Software Engineering, Object-Oriented Analysis & Design, Language Translation.
Dr. Baidurya Bhattacharya	Ph.D	Computational materials science, Risk and reliability analysis of infrastructure systems
Dr. S. K. Bhowmick	Ph.D	Metamorphic Petrology, Accessory Mineral Petrology
Dr. C. Chakrabarty	Ph.D	Control System
Dr. Raja Datta	Ph.D	Optical & Wireless Network
Dr. I. Chakrabarti	Ph.D	VLSI Design for Image and Video Processing and Communication
Dr. N. K. Singha	Ph.D	Tailor-made polymers via Controlled Radical Polymerization, Block (AB & ABA) & graft copolymers, Smart self-healing and

		self-cleaning polymeric materials, Tailor-made polymer nanocomposites, Thermoplastic elastomers (TPE), Polyurethane, Tailor-made modification on elastomers.
Dr. Swati Neogi	Ph.D	Innovative composite technology, Lifetime and reliability study, Materials development, Materials development

**Associate Professor:**

Name	Degree	Specialization
Dr. S. B. Sant	Ph.D	Material
Dr. D. Chakravarty	Ph.D	Mining & Geostatics
Dr. B. Samanta	Ph.D	Mining & Geostatics
Dr. P. Mitra	Ph.D	Machine Learning, Data Mining, Information Retrieval
Dr. D. Mukhopadhyay	Ph.D	VLSI , Cryptology
Dr. A. Bhattacharya	Ph.D	RF & Microwave Engineering
Dr. M. Sinha	Ph. D	Aerospace Engineering
Dr. A. Mitra	Ph.D	Nutraceuticals & herb based medicine/Diabetology , Drug encapsulation ,Clinical Trials
Dr. Soumen Das	Ph.D	MEMS & Microsystems
Dr. Abhijit Das	Ph.D	Cryptography, Computational Number Theory Parallel and Distributed Implementations
Dr. Arun Chakrabarty	Ph.D	Ocean Dynamics and Ocean Circulation Modeling of the Bay of Bengal, Data Assimilation
Dr. P. Mitra	Ph.D	Machine Learning, Data Mining, Information Retrieval
Dr. P. Ghosh	Ph.D	Low Temperature Processes and equipment, Helium Refrigeration and liquefaction systems, Cryogenic turboexpander and expansion devices, Cryogenic storage and transfer, Thermodynamics and heat transfer of supercritical helium.
Dr. Arnab Roy	Ph.D	Aerodynamics, Computational Fluid Dynamics
Dr. Somenath Ganguly	Ph.D	Flow in thin channel and porous media, Hydrogel, Improved recovery of hydrocarbon
Dr. Sudpita Mahapatra	Ph.D	Parallel and Distributed Systems, Lossless Data Compression Hardware, Photonic Devices and Networks
Dr. Pradip Mandal	Ph.D	Analog Circuit Design CAD for CMOS Analog Sizing
Dr. Rajib Maity	Ph.D	Hydroclimatology, Water Resources Engineering, Stochastic Hydrology, Watershed Development, Soft Computing in Hydrology, Monsoon rainfall

**Assistant Professor:**

Name	Degree	Specialization
Dr. P. K. Chakraborty	Ph.D	Solid-State Science and Technology
Dr. T. K. Nandi	Ph.D	Cryogenic Engg
Dr. R. Roy	Ph.D	Numerical Computation of Wave functions
Dr. M. K. Mondal	Ph.D	Microwave circuits
Dr. Arijit De	Ph.D	EMI/EMC, RF Microwave

Dr. S. K. Varshney	Ph.D	Fiber Optics Sensors, Plasmonics, Specialty fibers photonic crystal fibers
Dr. Nilanjan Mitra	Ph.D	Physics and Mechanics of solids and fluids, Continuum Mechanics of defects in materials
Dr. Karabi Biswas	Ph.D	Sensor Design, Development of Instrumentation System, Study of Fractional Order Systems
Dr. Ratna Dutta	Ph.D	Attribute Based Cryptosystems and Broadcast Encryption, Key Pre-Distribution in WSN and Self-Healing, Elliptic Curves and Pairing based Cryptography, Oblivious Transfer and Private Set Intersection Protocols, Lattice-Based Cryptography, Signature and Commitment Schemes
Dr. S. S. Das	Ph.D	Broadband Mobile Communications, Physical & MAC Layer, 4G, OFDM, MIMO, Packet Scheduling, Link Adaptation, Femto Cells
Dr. S. K. Panda	Ph.D	Sheet metal forming, Hydroforming, Bulk forming, Formability test design and development, Theory of plasticity for metal forming, Laser and resistance spot welding of sheet metal
Dr. Sujoy Kumar Kar	Ph.D	Physical and Mechanical Metallurgy, Processing-Microstructure-Microtexture-Property Relationship, Materials and property modeling, Materials systems: Ti alloys and Ni based superalloys and steels for power plant applications
Dr. P. Sandilya	Ph.D	Gas Hydrates, Cryogenic transport Phenomena-based processes, CO2 capture and sequestration, Space cooling
Dr. Akhilesh Mohan	Ph.D	Microwave Filters, Ultra-Wideband (UWB) Antenna and Filters, Metamaterials

**Officer:**

Name	Degree	Specialization
Dr. Saswati Ghosh	Ph.D	EMI/EMC, RF Microwave Circuit & Antenna

**Thrust Areas**

- 1) Liquid Combustion, Propulsion and Cryogenics
- 2) Space Communications and EMI/EMC
- 3) Micromachine Sensors
- 4) Control , Navigation and Guidance
- 5) Embedded Systems and IP-Cores
- 6) Life Support Engineering
- 7) Smart Materials & Exotic Materials
- 8) Power Electronics
- 9) Space Education
- 10) Electronics Devices
- 11) Cryogenics

## **New Acquisitions**

- i) CST Software-Microwave studio, version-5
- ii) IE3D – version – 9 by Zeland Software Inc.
- iii) MATLAB
- iv) WIPL-D
- v) HFSS
- vi) VCO-Model no – ZOS-1025, Freq. Range – 685 -1025 MHz
- vii) LNA-
  - a) Model – ZEL – 0812 LM, Freq. Range- 800-1200 MHz
  - b) Model – ZHL – 0812 HLN, Freq. Range – 800 -1200 MHz
  - c) Model – ZHL – 2HAD, Freq. Range – 50-1000 MHz
  - d) Model – ZFL – 1000VH2, Freq. Range- 10 -1000 MHz
- viii) Filters
  - a) LOW PASS FILTER:- Model.no- BLP-550, Freq. Range – DC-520
  - b) HIGH PASS FILTER :- Model no- NHP-1000, Freq. Range-DC – 550
- ix) Mixers:-
  - a) Model. No- ZLW – 2, Freq. Range – 685-1025MHz
  - b) Model.No. – ZEM-4300, Freq. Range- 300-4300MHz

## ***Academic Performance***

Awards & Honours	2
Lectures by Visiting Experts	2
Invited Lectures by the Faculty Members	7
Sponsored Research Projects	36
Patents (filed / granted)	7
Short-Term Courses and Training Programmes organised	2
Papers Published in Journals	78
Papers Presented in Conferences	21

# **Rajbhasha Vibhag**

## **Chairman**

Prof. D. K. Gupta

## **Hindi Officer**

Dr. Rajeev Kumar Rawat

## **On Going Activities of Vibhag**

### **Translation**

All the documents, correspondence, Institute's Annual Report and Annual Accounts statement are translated by Rajbhasha Vibhag apart from the routine translation of various technical / non technical documents, administrative orders and letters from English to Hindi and vice versa. In addition to the translation of documents, the Vibhag ensures the bilingual display of different nameplates, notice boards, rubber stamps, and preparation of Degrees / Diplomas certificates awarded by the institute.

### **Hindi Training**

Rajbhasha Vibhag has initiated Hindi Training to Institute employees for Praveen and Pragya course under Hindi Teaching Scheme. The classes are arranged in Institute with the help of Sri K K Pathak, Hindi Pradhyapak, Hindi Teaching Scheme. Upto December 2014, a total 213 employees have been trained up to Pragya level. Seven Employees have undergone Hindi Traing Level -one organised by Central Translation Buerau Kolkata Centre.

### **Hindi Workshops and Seminars**

With a view to create awareness for use of Hindi as Official Language in official work as well as to accelerate the pace of its progressive use, Rajbhasha Vibhag used to organize various training programmes, Workshops and Seminars for the employees / Officers of the Institute throughout the year. In the previous year 2014-15 the following events took place:-

On 18 Nov 2014, 16 Feb 2015, 20 Jan 2015 three Hindi workshops were organized for the employees. In these Dr. Rajeev Kumar Rawat, Hindi officer, Sri Kamlakant Pathak Hindi Pradhyapak briefed the employees about the techniques for doing their day to day official work in Hindi and also hands-on training was given to them to be able to work on computer in hindi, noting and drafting.

Prof D K Gupta, Chairman and Hindi Officer Dr Rajeev Kumar Rawat attended the National meet organised by MHA on 18 Feb 2015 in National Libarary Kolkata. Dr Rajeev Kumar Rawat undergone the training organised by Central Hindi Training Institute New Delhi during 24 Mar-28 Mar 2014.

### **Celebration of HINDI DIVAS**

During the month of September, Rajbhasha Vibhag has organized "Hindi Saptah" from 07- 14th Sep 2014. Several programmes and competitions in Hindi were organised for employees and students of the Institute as well as for the students of nearby schools. Winners were motivated with certificates and hindi books as prizes. Prof Pankaj Saha was the chief guest of the occassion, and he gave a lecture on dilect relations with progress of the nation.

### **Publication**

Rajbhasha Vibhag publishes a monthly News Magazine "Jharokha" in Hindi covering all the academic, cultural, extra-curricular activities of the institute with the rules, regulations, policy matters related to Rajbhasha.

## **Resources and Achievements**

### **Softwares**

Rajbhasha Vibhag has several Hindi Softwares like i-leap, ISM Publisher, ISM Office, Leap Office etc. Vibhag also uses the tools, PARIVARTAK, MANTRA, TRANSLITERATION, PRAKHAR, developed by MGAHV Vardha, etc and others developed by Department of Official Language , MHA, Government of India, C-DAC and other agencies. Recently ISM V.6 was procured which is Unicode compatible.

### **UNICODE**

The Vibhag has activated UNICODE in all the computers of departments and trained the employees to work in Hindi.

### **Rajbhasha Library**

Rajbhasha Vibhag has a full fledged Library with a collection of more than 1500 books of different writers on literature, fiction, poetry, prose, play and various subjects of translation and language.

### **Bilingual web site**

The Rajbhasha Vibhag has made its website bilingual. Useful information links are available on Vibhag Website regarding training programmes, incentives schemes, different tools etc. The Rajbhasha Vibhag has also made the Institute's website bilingual and efforts are being made to make the contents of the website also bilingual. This year the main web site of the institute was also prepared bi lingual.

### **Committees**

#### **Official Language Implementation Committee and Progress Measurement Committee**

The Institute has constituted Official Language Implementation Committee (OLIC) for the implementation of Rajbhasha Policies and to monitor the progressive use of Hindi in the Institute in day-to-day work. A meeting of the OLIC is held quarterly and is chaired by the Director. This year the meetings were held on 18.06.2013, 26.11.13 and 13.03.2014 to discuss various issues.

#### **Town Official Language Implementation Committee (TOLIC)**

In addition to this, Rajbhasha Vibhag, IIT Kharagpur plays a vital role in co-ordination for implementing the Official Language policy in the town. As the Director of the Institute is the senior most officer of Central government in Kharagpur, Rajbhasha Vibhag, Ministry of Home Affairs, Government of India has nominated him as Chairman of Town Official Language Implementation Committee (TOLIC). All the central government offices, Banks, Corporations, Autonomous bodies and enterprises are the members of TOLIC. At present there are 49 member Offices in the committee. The committee has been assigned the task of implementing the Rajbhasha policies and ensuring the orders and directives of government. The Director, Prof. Partha P Chakraborty has nominated Prof. D. K. Gupta, Chairman/Rajbhasha Vibhag as Executive Chairman and Dr. Rajeev Kumar Rawat, Hindi Officer as Member- Secretary of TOLIC to look after the routine work of committee. As per the calendar, the meetings of TOLIC Khargpur are fixed to be held in January and August. In the previous year two meetings were held on 01.09.2014 and 20.01.15. The meetings were chaired by the Chairman TOLIC and attended by Heads of the member offices with their Hindi Staff. Rajbhasha Vibhag invites the employees of TOLIC member offices to participate in the workshops, seminars and training programmes organized in IIT Kharagpur

# Science & Technology Entrepreneur's Park (STEP)

## NAME OF THE UNIT:

Science & Technology Entrepreneurs' Park / Technology Business Incubators (STEP/TBI)

## Managing Director

Prof. Satyahari Dey

## MAJOR ACTIVITIES:

### a) Infrastructure facilities created:

- i) Out of 14,800 sq.ft. of proposed additional incubation space, construction of 4,500 sq.ft. has been completed and allotted to the entrepreneurs. Remaining construction of 10,300 sq.ft, the combination of loan and innovation grant proposal to SIDBI is under speedy process. Necessary site visit and all other statutory matters have already been discussed with SIDBI officials and they have accepted the same.
- ii) We have initiated the process of construction of complete boundary wall around STEP-Gopali campus and it is at the final stage in Civil Construction & Maintenance Department of the Institute.
- iii) Finalized the process of repairing work of the existing boundary wall and raising a new boundary wall of around 100 meters behind the new incubation centre at STEP-Gopali campus.
- iv) New water pipe line has been set up for the new the incubatees at STEP-Gopali campus.
- v) Security on both the campuses of STEP have been strengthened.

b) Two Professors of our Institute have been appointed as Executive Adviser of STEP to expedite the planning and implementation of present and forthcoming programs.

c) A brain storming meeting held on August 30, 2014 at Kolkata Extension centre at Salt Lake in which plan activities in the Rajarhat Extension Campus and the 100 acres of land in STEP-Gopali campus and fund generation, management, future plans and vision have been discussed.

d) **TIETS-TIDE Screening Committee Meeting:** A Screening Committee Meeting was organized on August 20, 2014 in which 5(five) Start-ups of IIT Kharagpur have participated. Rs.20 lakh have been disbursed to 2(two) of them for product development and commercialization of their innovations – i) **M/s Annivor Medicare Pvt. Ltd. – Rs.10 lakh**, Faculty entrepreneur of IIT Kharagpur, and ii) **M/s Avalanche Automation Pvt. Ltd. – Rs.10 lakh**, Student entrepreneur of IIT Kharagpur

### e) Progress Report of TOCIC, IIT Kharagpur:

- i) Workshops conducted by TOCIC, IIT Kharagpur on 7<sup>th</sup> July, 2014 at the Department of Biotechnology, IIT Kharagpur.
- ii) PRISM Advisory Board Meeting was held at TOCIC, IIT Kharagpur on 9<sup>th</sup> January, 2015 where 5 proposals were evaluated by the Committee.
- iii) PRISM Project Review Committee Meeting was held at TOCIC IIT Kharagpur on 16<sup>th</sup> February, 2015 to review the PRISM Project.
- iv) Total Proposals received and scouted at TOCIC, IIT Kharagpur are 27, of which 12 Proposals forwarded to DSIR for funding. Till date 7 Proposals funded/approved by DSIR and 5 Proposals



has been forwarded to the next PASC Meeting for funding. Technological solutions addressed in these proposals are on Healthcare, Solar energy/ Renewable Energy/ Green Technology, Biotechnology, Mechanical, Chemical, Electrical, Robotics, Aeronautics, Hardware and ICT etc.

v) Till date Rs.31.11 lakh has been funded as grant money to the innovators through TOCIC, IIT Kharagpur.

f) **TePP Project Review Committee Meeting:** The TePP Project Review Committee Meeting was held at IIT Kharagpur on June 20, 2014 in the presence of Dr. B. N. Sarkar, Scientist 'F', DSIR, New Delhi, Govt. of India to review the funded projects of innovator.

#### **Brief descriptions of on-going entrepreneurial activities at STEP**

- Total No. of companies: 102.  
STEP IIT Kharagpur Campus: 89.  
STEP Gopali Campus: 13.
- No. of Companies incubated in 2014-15: 16.  
STEP IIT Kharagpur Campus: 14.  
STEP Gopali Campus: 2.

#### ***Companies incubated at STEP-IIT Kharagpur campus during 2014-15***

<b><i>New Acquisitions in STEP-IIT Campus:</i></b>		
<b>Sl. No</b>	<b>Name of the companies</b>	<b>Major Entrepreneurial Activity</b>
1	M/s Vejovis Healthcare Solutions Pvt. Ltd.	Working in the healthcare sector providing customized Electronic Health Record (HER) systems maintaining digital format of clinical information and its flow in hospitals and also providing consultancy.
2	Mr. Biswajit Saha	Low cost Chromatographic Column Development for Industrial Purpose
3	M/s Linnaeus Bio-Science	Low cost Chromatographic Column Development for Industrial Purpose
4	M/s Cyanberg Technology Pvt. Ltd.	E-commerce.
5	M/s Perfecist Technologies Pvt. Ltd.	Working on e-commerce project and on alumni management software.
6	M/s Skincurate Research Pvt. Ltd.	Conceived with the aspiration of developing diagnostic and therapeutic medical devices.
7	M/s Vecto Technologies Pvt. Ltd.	Software based product aiming to bridge the gap between a passenger and a driver, and have developed mobile apps (android and iOS) for customers and drivers, for instantaneous hailing of a cab, and have developed advanced algorithms for optimized driver assignment and big data analysis.
8	M/s Avalanche Automation Pvt. Ltd.	Professional 3D Prototyping services, manufacturing and/or assembling rapid prototyping machines and accessories for industries and/or any other businesses.

9	M/s Elena Geo Systems Pvt. Ltd.	Dedicated to research and development of Geospatial Technology, GNSS based Monitoring and development of Geo ERM.
10	M/s Systron Technologies Pvt. Ltd.	To develop customized embedded boards and image processing equipment for academic and commercial purposes and will also provide design and technical solutions, and conduct workshops in the relevant areas at national and international platforms.
11	M/s E Srishti Solutions Pvt. Ltd.	Developing technologies, methods for advanced manufacturing, supply chain management, mining, geospatial technologies and health care systems and to deals with the research & developmental works.
12	United Technology Laboratory	Controlled angiogenesis for reperfusion of ischaemic organs and early diagnostic approach.
13	M/s Connecting Dot Pvt. Ltd.	Online travel portal.
14	Mr. Arpan Bose	Improving the existing laser tag for military and other commercial purposes.

**Companies incubated at STEP-Gopali campus during 2014-15**

<b><i>New Acquisitions in STEP-Gopali Campus:</i></b>		
<b>Sl. No.</b>	<b>Name of the companies</b>	<b>Major entrepreneurial activity</b>
1	M/s Astami Enterprise	Manufacturing the rubber works for industrial purpose
2	M/s Polysorb Laboratory Pvt. Ltd.	Developing and manufacturing of jute-pulp and super absorbing polymer (SAP) based sanitary napkin, baby / adult diaper and surgical absorbent gauze (SAG) from Ramie Plantation. The company also developed several jute fiber reinforced cement concrete products using fly ash as filler material.
	Prof. Sudha Goel Project: Future of cities	The instrumental facilities under- 'Solid Waste Management Treatment Composting and related analysis' project is proposed to be housed in Gopali campus for using scientifically analysed compost for growing organic tea.

**Other Assistance of Entrepreneurial Activities:**

- Entrepreneurship support through MSME grant: 2 new innovators of IIT Kharagpur funded under MSME scheme during this financial year:
  - I. Rs.1.875 lakh to Mr. Vivek Pandey (Department of Mechanical Engineering, IIT Kharagpur)
  - II. Rs.1.5 lakh to Mr. Rahul Raj (Department of Mathematics, IIT Kharagpur)

**Awards and Recognition to STEP Entrepreneurs**

1. **SG ArtHeart Pvt. Ltd.:** Prof. Sujoy Kr. Guha (Institute faculty) got awarded with the 'Best Innovator's Pitch' in the BIRAC Innovators Meet 2014 for Prioritizing Innovation Research for Affordable Product Development.
2. **M/s Amnivor Medicare Pvt. Ltd.:** Dr. Santanu Dhara has been awarded by BIRAC SRISTI Gandhian Young Technological Innovation Award 2015 for their project titled; 'X-ray visible

polymers via in situ iodination - crosslinking for non-invasive real time imaging'. The innovator's R&D team also has bagged Gold Medal in DST-Lockheed Martin India-Innovation Growth Programme 2015.

3. **M/s Auro Robotics Pvt. Ltd.:** They have been selected in Y Combinator startup incubator-cum-accelerator program in California, US for their project titled; 'Development of autonomous driving system for ground vehicle'.
4. **Think Innoventions Pvt. Ltd.:** The company has received a special appreciation certificate from CDAC evaluation under DIT.

#### **SHORT-TERM COURSES:**

Five short term course in the name of Technology based Entrepreneurship Development Programme (TEDP) and two Faculty Development Programme (FDP) have been conducted under the supervision of RMSoEE department in collaboration with STEP.

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

1. Mr. Kaushik Halder, Joint Secretary, Department of Information Technology & Electronics, Govt. of West Bengal.
2. Mr. N. Ganesh, ADM, HAL, Ministry of Defence Undertaking
3. Dr. Kabir Dasgupta & his team of 6 member, Department of Mining Machinery Engg., ISM, Dhanbad
4. Mr. Prabir Kr. Das, MD, WBEIDCL and Mr. Kunal Bhattacharya, CEO, WVCL, Govt. of West Bengal

#### **SEMINARS/WORKSHOPS/CONFERENCES:**

<b>Sl. No.</b>	<b>Name of the Seminars / Workshops / Conferences / Symposia</b>	<b>Date</b>
1	TePP Project Review Committee	June 20, 2014
2	PRISM Workshop / Symposium	July 7, 2014
3	STEP Brain Storming Meeting	August 30, 2014
4	STEP GBM & AGM	November 12, 2014
5	PRISM Advisory Board Meeting	January 1, 2015
6	PRISM Project Review Committee Meeting	February 16, 2015

## **Sponsored Research & Industrial Consultancy (SRIC)**

Industrial relevance is of fundamental importance for any engineering institute. The Sponsored Research and Industrial Consultancy cell of the institute acts as the conduit for industrial interaction and faculty participation in sponsored research. The wide variety of engineering sciences at IIT Kharagpur provides a unique environment that fosters inter-disciplinary research in cutting edge technology areas, such as energy, nanotechnology, semiconductors, bioengineering, and computational sciences. The diversity of in-house expertise at IIT Kharagpur has also catalyzed the development of a healthy ecosystem for large scale industrial collaborations in multi-disciplinary areas, such as automotive control software, railways research, steel technology, petroleum and biofuels research, industrial robotics, and many more.

In order to streamline the growth of industrial research in the institute and to present the industry with better access to the in-house research capability of the institute, SRIC institutionalized six research councils in thematic areas covering the various disciplines of active research in the institute, namely:

- Electrical and Computational Sciences
- Mechanical and Structural Sciences
- Chemical and Material Sciences
- Physical and Earth Sciences
- Agriculture, Biological and Medical Sciences
- Management, Mathematics, Architecture and Social Sciences

The SRIC council members will assist SRIC in preparing the research agenda of the institute in different domains, act as the liaison with the industry in their domains of expertise, and in providing advisory support in the selection, review and assessment of institute research grants.

The year 2014-2015 has been a year in which IIT Kharagpur has set up several long term collaborative frameworks with major industrial houses in India. IIT Kharagpur assumed leadership position in setting up a PAN-IIT collaboration agreement with the Oil and Natural Gas Corporation (ONGC) for long term research collaborations, student programmes and access to ONGC Labs. IIT Kharagpur also entered into a long term agreement for collaboration, student programmes, and chair professor programmes with Hindustan Aeronautics Limited (HAL).

A very notable highlight of the activities at IIT Kharagpur in the year 2014-15 was the launching of the National Digital Library initiative. This project of enormous national importance aims to develop and archive a national digital repository of technical material, teaching aids, lectures, and many more entities. The project, launched with an initial grant of about Rs 40 crores, is one of the leading technology missions launched in 2014-15.

The year 2014-2015 germinated several new research proposals under the institute's existing technology missions of national importance. These include:

1. Food Sustainability. *This includes technology for food production, processing and distribution logistics.* This mission brings together researchers from agricultural engineering, biotechnology, operations research and industrial engineering.
2. Future of Cities. *Technology for the development and maintenance of our cities. This includes building technology, road and pavement technology, waste and hygiene management, traffic, and governance.* This mission brings together researchers from civil engineering, architecture and city planning, industrial engineering, computer science, and law school.
3. Signals and Systems for Life Sciences. *Technology for leveraging biomedical signal processing and system level understanding for analysis, prognostics, diagnostics and affordable healthcare.* This mission brings together researchers from electrical, electronics and telecommunication engineering, school of medical science and technology, biochemical engineering, computer science and information technology and practicing medical professionals.
4. Artificial Intelligence for Societal Needs. *Technology for knowledge discovery and intelligent decision making for solving problems in the sectors of energy, climate, water, disaster management and traffic.* This mission brings together researchers from Computer Science, electrical and energy engineering, environmental sciences, geology and geophysics, civil engineering, social sciences, and architecture.
5. SANDHI-Science-Heritage and Creative Economic Projects. *Technology for preservation, archival, development and scientific exploration of our heritage.* This mission brings together researchers from architecture, social sciences, geophysical sciences, computer and information sciences, electrical sciences, and management.
6. Centre for Robotics. *Technology for robotics, unmanned intelligent vehicles, intelligent exploration and surveillance, biomedical and nano-robotics.* This mission brings together researchers from mechanical engineering, mining engineering, electrical sciences, computer and information sciences, material science and architecture.
7. Centre for Microfluidics. *Technology based on micro-fluidics for mechanical, biomedical, chemical and semiconductor processes.* This Centre brings together researchers from mechanical and chemical engineering, biomedical engineering, material sciences, and, computer and electrical sciences.

The second round of Institute Challenge Grants has also been launched in 2014-15. It is anticipated that exciting new projects will start in early 2015-16.

The institute also initiated two major research facilities in the year 2014-15. These are:

- Development of a Micro/Nano manufacturing and characterization facility for robotics in nano-scale manipulation. The aim of this facility is to develop indigenous capability in micro/nano robotics.
- Centre of excellence in robotics. The aim of this center is to bring together students and researchers in the area of robotics to explore innovative robotics-based solutions.

During the year 2014-2015 the Institute received 234 research projects from the Government, private and international funding agencies/enterprises for a total value of Rs. 163.39 crores and 94 consultancy projects worth Rs. 10.58 crores.

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

- Development of national digital library (NDL) of India

- Development of a Micro/Nano manufacturing and characterization facility for robotics in nano-scale manipulation
- Virtual laboratory development (Phase II)
- Reliable and efficient system for community energy solutions
- Centre of excellence in robotics
- Reconfigurable distribution network
- DBT PAN IIT center for bioenergy
- E- business center of excellence
- Femtosecond laser facility to investigate confined media, biological assemblies, room temperature ionic liquids and nano-materials
- An integrated computational and experimental approach to structural design for ballistic impacts and blasts
- Development of gyan portal
- Microbial desalination cell for simultaneous waste water treatment, energy production and desalination
- Process development for the concomitant production of bio-emulsifier, lipid, biodiesel, glycerol and biomass as animal/fish feed using industrial waste in a renewable yeast feedstock based bio-refinery model
- Strong motion seismometry, probabilistic seismic hazard, vulnerability and risk microzonation of Darjeeling-Sikkim Himalaya
- Multifunctional hybrid nanostructures for alternative energy systems
- Development of OCR and PDF viewer
- Evaluating structural control on gold mineralization in gadag region (Karnataka)- a study based on fabric quantification and kinematic analysis
- Quantification of physical and chemical flux of discharging groundwater to sea in coastal areas of the Bay of Bengal
- Diversion of 181.013 ha of forest land for mining of manganese ore in village Malda and others.
- Development of nickel containing steel from chromite overburden
- Up-gradation of gamma radiation facility and periodic standardization for optional RISUG production
- Speech based access of agricultural commodity prices and weather information in 12 Indian languages / Dialects.
- Development of novel biodegradable metallo - curcumin nanoparticles - a new hope for endometriosis therapy
- Development of visible light photocatalysts for hydrogen production
- Spectroscopic and modeling investigations on the specific weak molecular interactions of water-soluble azo-food colorants in biochemical and biochemically relevant systems
- Study on the improvement of heat resistance and mechanical strength of Denka ER
- Advanced communication and control for the prevention of blackouts

- Real time detection of face/core debond initiation and interfacial delamination propagation morphology in sandwich composite panels using fiber-optic bragg grating sensors
- Demonstration of community participation model for economic development and nutrition health management through organic farming and education
- Natural silk protein based modification of orthopedic implant to improve osteogenesis and osseointegration
- Synthetic studies towards Volvalerenol A, a unique tricyclic triterpenoid through exploitation of pseudo  $c_2$ -symmetry
- Metal-oxide-semiconductor (MOS) based non-volatile memory devices using III-V semiconductor quantum dots as charges storage elements on Si substrates
- Evaluation of passive bus priority technique with queue lane and development of guidelines for its implementation in Indian scenario

The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell under SRIC is responsible for the licensing and the transfer of technologies developed by researchers at IIT Kharagpur to the commercial sector. Till date, more than 450 patents were filed and more than 120 were granted and a total of 19 technologies were transferred. An internal review of the IPR policy of the institute was carried out in 2014-15, and it is anticipated that in 2015-16 the institute, after accommodating stakeholders' concerns, will publish its updated IPR policy for the years to come.

As in past few years, an Intellectual Property Drive was launched on March 12, 2014 at S. N. Bose Auditorium of IIT Kharagpur. A workshop cum IP clinic was arranged on April 5, 2014, at the Moot Court, Rajiv Gandhi School of Intellectual Property Law (RGSoIPL) as part of Patent Drive 2014. Four law school experts and associated persons in parallel sessions assisted in the abstract preparation. The Technology Transfer Group (TTG) of students have been trying to develop awareness among student community where they can generate and protect Intellectual Property (IP) out of their exploits in academic projects. The workshop cum IP Clinic addressed many of their queries catalyzing greater conversion rate of project output to intellectual property.

A patent drive review workshop was held on 28-01-2015 at the S. N. Bose Auditorium, IIT Kharagpur. It was attended by about 200 research students and faculty.

The IPR activity of IIT Kharagpur drew attention of a leading magazine, Career360. The Professor-in-charge, IPR & IR, Dr Goutam Saha, featured in the 'Expert Speak' column of the magazine's University Special edition in March, 2015.

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

Various student activities are encouraged and supported through SRIC. Notable activities include the following:

- **TeamKART** activity for design and implementation for single seat racing car. Formula Student (FS) is Europe's most established educational motorsport competition, run by the Institution of Mechanical Engineers. It seeks to challenge university students to conceive, design, build, cost, present and compete as a team with a small single-seat racing car in a series of static and dynamic competitions. The team took their vehicle for the Formula Design Challenge competition held in Coimbatore in January 2015. The team got 2nd place trophies in two categories - in Business Plan Presentation and in Cost and Manufacturing Report.

- **RoboSoccer** activity for design and implementation of a team of soccer playing robots. The Federation of International Robo-soccer Association (FIRA) arranges the FIRA cup. The team from IIT Kharagpur participated in this competition last year under the MiroSot category, where participants need to devise artificial intelligence strategies, and develop sharp sensing and precise real-time control for the physical soccer-playing robots.

- **TeamAGV** activity for design and implementation of autonomous ground vehicles.

- **TeamAUV** activity for design and implementation of autonomous underwater vehicle. The team has designed and operated an upgraded underwater vehicle with multiple sensors and sophisticated control computers to participate in various competitions in India and abroad. They have successfully run their vehicle in the Students Autonomous underwater Vehicle competition held by NIOT Chennai in January this year.

The M N Faruqui Innovations Center (MNFIC) was launched in 2014 with support from our alumni. The objective of this center is to provide tinkering facilities to students to motivate them to innovate through experimentation. The MNFIC will also be a nodal center to facilitate some new activities both by the institute and also with involvement of other alumni, corporates etc. For this purpose a general “Endowment for Innovation” has been created in the institute.

In addition to the above, students participation is also taking place in several areas of innovation such as the green policy initiative that aims to reduce the carbon footprint of the campus through technology advances.

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# Technology Students' Gymkhana

**President:** Prof. Somesh Kumar

**Treasurer:** Prof. Kingshook Bhattacharyya

**Vice President:** Atal Ashutosh Agrawal

## Rector's Nominees:

1. Prof Amreesh Chandra (Sports& Games)
2. Prof. Neeraj K. Goyal (Sports& Games)
3. Prof. S. K. Varshneya (Sports& Games)
4. Prof. Priyadarshi Patnayak (Social & Cultural)
5. Prof Arnab Roy (Social & Cultural)
6. Prof. Bhargab Maitra (Technology)
7. Prof. Arindam Basu (Technology)
8. Prof. Jitendra Kumar (Technology)

Technology Students' Gymkhana, an institution within the Institution works towards profound personality development of IIT students by involving them in galaxy of activities in the field of Sports, Social & Cultural and Technology. Likewise every year this year also TSG made students to indulge themselves in variety of activities not only for the utilization of their leisure time but also for fun, enjoyment, keeping themselves away from boredom, reviving their energy after academic workload and for the overall development of the students. The highlights of the year are as follows.

## INTER IIT SPORTS MEET

The 50th Inter IIT Sports Meet began with the Inter IIT Aquatic Meet held at IIT Bombay from 30<sup>th</sup> Sep 2014 to 04<sup>th</sup> Oct 2014 at IIT Bombay. IIT Kharagpur secured over all 2<sup>nd</sup> position, both in Swimming and Water polo. Wonderful performance was shown by the swimmers of IIT Kharagpur. Siraj Modiwala of Mechanical Dept. from Nehru Hall of residence showed exceptional performance by winning Gold medal in all Back stroke events, that is, 50mt., 100mt., and 200mt. He clocked 33.30sec time for 50mt. Backstroke and finished with a new **Meet record** in his name.

The Main Inter IIT Sports Meet was during 12-19 December 2014. Following was the achievements of IIT Kharagpur in the Main Meet. Rahul Kaushal made a new **Meet record** in athletics (Hammer Throw) with a distance of 40.45 meter. Athletics team secured over all 3<sup>rd</sup> position after IIT Kanpur and IIT Bombay. Other than athletics Kharagpur boys secured 3<sup>rd</sup> place in basketball, football, tennis, squash, and table tennis. The Weight Lifting team also performed well and achieved overall 4<sup>th</sup> position. The performance of the boys' Tennis team was appreciable despite the fact that they lost out to the eventual champions, IIT, Kanpur in the semi-final stage. However, the team regrouped under the leadership of Harish Wutla to defeat IIT, Guwahati and claim the bronze medal. The girls' tennis team, which was undefeated for the last three years, was in prime form yet again. The team did exceptionally well to come through the league and knockout stages undefeated and eventually retained the top spot by defeating IIT, Bombay in a one sided final, under the leadership of Mallika Saharia and won Gold. IIT Kharagpur Cricket Team shown exceptional performance and won the gold.

Following were the positions secured by different teams at Inter IIT Sports Meet.

Sports	Position at Inter IIT Sports Meet	Awards given in annual prize distribution ceremony
Athletics (Men)	3 <sup>rd</sup>	4- Inst. Blue , 1 Spl. Mention
Badminton (Women) (Men)	2 <sup>nd</sup>	1 Spl. Mention
	-	4 Inst Blue
Basketball (Men) Women)	3 <sup>rd</sup>	3 Inst Blue, 1 Honb. Mention
	4 <sup>th</sup>	2 Inst Blue, 1 Honb. Mention
Cricket (Men)	1 <sup>st</sup>	2 Inst. Blue, 1 Honb. Mention
Football (Women)	3 <sup>rd</sup>	4 Inst Blue, 1 Honb. Mention
Table Tennis (Men)	3 <sup>rd</sup>	2 Inst. Blue, 1 Spl. Mention
Tennis (Men)	3 <sup>rd</sup>	3 Inst Blue
Tennis (Women)	1 <sup>st</sup>	1 Inst Blue
Swimming (Men)	2 <sup>nd</sup>	02 Honb. Mention ,
Squash	4 <sup>th</sup>	02 Inst. Blue , 02 Spl. Mention
Water polo	2 <sup>nd</sup>	01 Spl. Mention
Weight Lifting	4 <sup>th</sup>	01 Honb. Mention
Hockey	-	01Inst.Blue, 04 Honb. Mention, 02Spl. Mention
Volleyball	-	03 Honb. Mention, 01 Spl. Mention

For Sports & Games, **Alumni Cup** was awarded jointly to Siraj Modiwala (Swimming) and Ayush Pandey (Cricket). **Bhandarkar Cup** was awarded to Rahul Kaushal and Mallika Saharia.

### INTER IIT TECH MEET

**3<sup>rd</sup> Inter IIT Tech Meet:-** 11 IITs participated in 8 events conducted for two days hosted by IIT Kharagpur. IIT Kharagpur won the General Championship .

Event	Position in the Tech Meet
Hardware Modelling	1st
Product Design	2nd
Quiz	1st
Model Village	=
Messier Marathon	2nd
Data Analysis	1st
Business case study	1 <sup>st</sup>
Open soft	1 <sup>st</sup>

## **Other achievements in the Technology Genre-**

IIT KGP students have successfully launched a new initiative '**Create In KGP**' within the premises of IIT Kharagpur to enhance the culture of research and innovation inside IIT Kharagpur. Also have arranged seed funding of few lakh rupees for various teams to develop their models and products for social welfare.

- Introduced various new events like Data Analytics in General Championship and case study, product design as an open IIT event to enhance technical know-how of the institute students.
- Published an annual online newsletter within IIT Kharagpur to disseminate information about various technical innovations, events and competitions, both inside and outside IIT Kharagpur. We also organized introductory seminar for first year students at the start of the session.
- Accommodated Business club IIT Kharagpur, under the umbrella of Gymkhana to arrange funds for them for proper functioning and introduced a puzzle solving wing, Finance wing and Data Analytics wing under the same club to enhance logical thinking and analytical skills of the student community of IIT Kharagpur.
- Introduced a new 'Strategy Cup' inside technology general championship for making the GC carrier oriented and productive for students. First step was to add data analysis inside Tech GC. Furthermore events will be added in near future to make it more fruitful.

## **NAME OF THE T.S.G. SPORTS PERSONNEL**

1. Mr. Soumen Mondal - (S.O. In-Charge T.S.G.) B.A, B.P.Ed, M.P.Ed , NIS (Patiala) Diploma in Sports Coaching in Basketball, Ph.D Perusing, Qualified , (BFI) National Referee 'A'.
2. Dr. R Prabhakaran – (Sports Officer) Ph D, DSC (NSNIS), MSM (UK), MA (Eng).
3. Ms. Priyanka – (Sports Officer) M.P. Ed, M.Phil, NIS Diploma in sports coaching (Football).
4. Mr. Sudhir Kumar- B.Sc in Physical Education, Master's in Phy. Edu. & Sports Science, M.Phil., NCC Commissioned Officer (rank Flying Officer).
5. Mr. A.K. Ghosh - B.A. B.P Ed, Sports Coaching in Football from NSNIS, Kolkata.
6. Dr. Gyan Swaroop- B.P.E, M.P.E, M.Phil, Ph.D, NIS (Patiala) Diploma in Sports Coaching in Hockey, Qualified National Referee.
7. Mr. Adrib Mitra- B.Com (H), B.P.Ed, M.P. Ed, M.Phil, Trained Life saver in water.
8. Mr. Samba Kar- B.A.Hons. in Phy. Edu., B.P.Ed, M.P. Ed
9. Mr. Pranab Sarkar-B.A (English H) B.P.Ed, M.P. Ed

## **DEVELOPMENTS IN SPORTS:-**

1. Approved Tennis Infrastructure Proposal:-The proposal for construct two synthetic tennis courts at the TSG Tennis complex is duly approved by the competent authority and is currently going through the tendering process. With the completion of laid down procedures for the allocation of tender, it is expected that this project will be finished in this academic year and the courts will be opened for use by February 2016.
2. Volleyball court playing area re-soiled.

### **FACILITIES AVAILABLE AT TECHNOLOGY STUDENTS' GYMKHANA:-**

1. Gymnasium: - A well equipped gymnasium with two floors and more than 1900 members enrolled (Students & Staff).
2. Indoor games :-
  - a. Badminton – 4 Indoor courts
  - b. Table Tennis- 04 tables
  - c. Weight Lifting – Two full size platform, 3 complete set of weights and 10 barbells.
  - d. Billiards:- 1 table
  - e. Squash:- 01 standard Court
  - f. Chess
3. Tennis Court: - 02 Synthetic (with flood lights), 2 clay and 1 hard surface court.
4. Basket ball:-02 Flood lit Basket ball courts.
5. Volleyball:-03 Courts
6. Cricket: - Two fields with two turf wickets.
7. Football :- Two fields
8. Athletics:- Standard 400mt. Track with separate Jogging Track(600mt.)
9. Hockey :- 01 Hockey field
10. Swimming:- Standard swimming pool.

**TSG ELECTIONS:-** This year TSG Elections for the various office bearer's post of TSG were conducted On-Line with revised and improved process of vote cast designed under the supervision of Prof. Kingshuk Bhattacharyya and implemented with technical guidance and support by Dr. D.K. Nanda. Election process was a success and President TSG and Election Officer Prof. M.K. Tiwari could declare the results within half-an- hour of the finish of casting of votes, saving manpower and energy.

### **MAJOR EVENTS ORGANISED:-**

1. **RUN FOR UNITY :-** Run for Unity was organized on 31<sup>st</sup> October, 2014 on the occasion of Sardar Patel's Birthday. More than 1500 students, faculty and staff participated in the run.
2. 2.2 Km **Mashal Race** was organized on 2<sup>nd</sup> November at 7:00 a.m. to mark the 50<sup>th</sup> Inter IIT Sports meet to be held at IIT Bombay this year. All the players slated to members of the Inter IIT contingent participated in the race.

### **SPORTS & GAMES:-**

1. **Tata Sports Complex :-**Technology Students' Gymkhana, IIT Kharagpur hosted Under-16 Bengal and U-16 Punjab Cricket Matches at Tata Sports Complex, organized by Cricket Association of Bengal.
2. **Kharagpur Open Tennis tournament:-** Held at the TSG Tennis courts in the last week of February 2015. The tournament was ably guided by Prof. Rajendra Singh, Dean UG studies and was conducted by all the TSG Tennis club members and students volunteers. The tournament was declared open by DIG, Mednipore Range and closed by Additional SP, Kharagpur. A total of 80 entries were received for three different events, from various places in the state and also from other states.

3. **Swimming:** - This year competition for the staff is introduced for the swimming in all four strokes.
4. **Squash:-** Squash week was organized initiated by Secretary & Inter IIT Squash Player Sanket Mondal from 23<sup>rd</sup> to 29<sup>th</sup> March 15.

#### OUTSIDE PARTICIPATION IN SPORTS

1. **CRICKET** - IIT Kharagpur Cricket team qualified Semi-Finals in AJOY GHOSH TROPHY organized by Cricket Association of Bengal. Team participated in Inter university Inter college T-20 Tournament organized by Cricket Association of Bengal.
2. **BASKETBALL** - Basketball Boys and Girls Team Participated First IMG Reliance BFI Inter College Basketball League held at Kolkata, Our Boys Team Secured second position and Girls Team Secured fourth position.
3. **Tennis Boys'** - at Kharagpur Open Tournament in singles event, two IIT KGP students played and lost the semi-finals. In doubles event, two IIT, KGP student teams participated in the semi-finals and one of those teams came as runner-up.
4. **Badminton :-** IIT Kharagpur Badminton team participated in SPARDHA Tournament 2014 held at IIT BHU and secured first position.

**INTER HALL COMPETITION IN SPORTS & GAMES :** For G.C. Points Tally for Inter Hall 2014-15 was as follows.

Event	1 <sup>s</sup> Place	2 <sup>nd</sup> Place	3 <sup>rd</sup> Place
Athletics	RP (20 points)	MS (12 points)	NH (8 points)
Basketball	LBS (10 points)	NH (6 points)	AZ (4 points)
Cricket	AZ (10 points)	LBS (6 points)	MMM (4 points)
Football	NH (10 points)	PH (6 points)	RK (4 points)
Hockey	NH (10 points)	LLR (6 points)	MS (4 points)
Tennis	AZ (10 points)	MS (6 points)	PH (4 points)
Swimming	RP (10 points)	NH (6 points)	MS (4 points)
Squash	NH (10 points)	RP (6 points)	HJB (4 points)
Table Tennis	LBS (10 points)	RK (6 points)	LLR (4 points)
Volleyball	LBS (10 points)	RK (6 points)	NH (4 points)
Weightlifting	AZ (10 points)	RK (6 points)	NH (4 points)
Chess	RK	JCB	LBS
Bridge	NH	RK	PH

## TECHNOLOGY

Event	1 <sup>st</sup> Place	2 <sup>nd</sup> Place	3 <sup>rd</sup> Place
Ad Design	RP (+75)	Nehru (+45)	HJB (+30)
Data Analysis	LLR (+50)	Azad (+30)	Patel (+20)
Product Design	Nehru (+100)	Azad (+60)	Patel (+40)
Tech Quiz	Nehru (+75)	RK (+45)	RP (+30)
Biz Quiz	Nehru (+75)	RP (+45)	RK (+30)
Open Soft	Nehru (+100)	SN/IG (+60)	RP (+40)
<b>Trophy</b>	<b>Name of the Hall</b>		<b>Points</b>
Application Cup	SN/IG Hall		135/175
Knowledge Cup	RK Hall & NEHRU Hall		150/225
Innovation Cup	Nehru Hall		205/275

At the Technology Students' Gymkhana Annual Awards function for the Technology Awards given were:  
 - Order of Merit to 08 students, Honorable Mention to 09 students and **G.S. Sanyal Cup** was awarded to Somasish Ghosh of Nehru Hall.

## SOCIAL & CULTURAL

Event	1 <sup>st</sup> Place	2 <sup>nd</sup> Place	3 <sup>rd</sup> Place
Hindi Dramatics	RK (+100 points)	Azad (+60 points)	Patel (+40 points)
Choreography	Azad (+100 points)	RP (+60 points)	SN (+40 points)
Bengali Dramatics	RP (+100 points)	RK (+60 points)	AZ (+40 points)
Debate	RP (+60 points)	Azad (+35 points)	Nehru (+25 points)
Bengali Elocution	RP (+60 points)	RK (+35 points)	Azad (+25 points)
What's the good word?	Patel (+75 points)	SN (+45 points)	RK (+30 points)
English Elocution	Nehru (+60 points)	Azad (+35 points)	RP (+25 points)
Western vocals	Azad (+60 points)	Nehru (+35 points)	SN (+25 points)
Eastern Vocals	Nehru (+60 points)	Azad (+35 points)	VSRC (+25 points)
Eastern instrumentals	RP (+60 points)	RK (+35 points)	AZ (+25 points)
Cartooning	RP (+60 points)	MS (+35 points)	NH (+25 points)
Sketching	HJB (+60 points)	Azad (+35 points)	RK (+25 points)
Postering	RP (+60 points)	SN (+35 points)	PH (+25 points)
Dramatics Cup	RK	RP	AZAD

Literary Cup	RP	NH	AZAD
Fine Arts Cup	PH	RP	AZAD
Entertainment Cup	NH	AZAD	RP

**At the Technology Students' Gymkhana Annual Awards function** for the Social and Cultural events , Awards given were :- Order of Merit to 07 students i.e. in Dramatics 02, Literary 02, Entertainment 02 and Fine Arts 01. Honorable Mention to 10 students i.e. Dramatics 04, Literary 02, Entertainment 03 and Fine Arts 0, Special Mention for Soc. & Cult were given to 06 students i.e. Dramatics 02, Literary 02, Entertainment 01 and Fine Arts 01, SHRIMATI CHHANDIRAMANI Cup was given to Sourya Mukherjee and ANKIK DHAR TROPHY was awarded to Mayank Mahawar .

#### **OVER ALL GENERAL CHAMPIONSHIP RESULT:-**

<b>Sports &amp; Games</b>	<b>Soc.&amp; Cult</b>	<b>Technology</b>
NH Hall - 69 points	RP Hall -765 points	NH (455)
RP Hall -52 points	AZ Hall- 635 points	RP (190)
LBS Hall -48 points	RK Hall- 510 points	Azad (175)

#### **GENERAL CHAMPION – NEHRU HALL OF RESIDENCE**

Along with the activities of the general championships there are many student run groups that tap the talent of the creative pool of the students of IIT KGP. These societies cover a wide area of human interest ranging from robotix, dramatics, arts, innovation, adventure, and finance. These groups of people with similar interests work together for the team and also represent IIT Kharagpur at various National and International events.

#### **SOCIETIES REGISTERED UNDER TSG ARE:-**

1. Business Club
2. Communique
3. Debating Society
4. Eastern Technology Music Society
5. Quiz Club
6. Spectra
7. Technology Adventure Society
8. Technology Dance Society
9. Technology Dramatics Society
10. Technology Filmmaking & Photography Society
11. Technology Literary Society
12. Technology Robotix Society
13. Western Technology Music Society

## **SOCIAL AND CULTURAL EVENTS:-**

- Language Class: Class Lingua – Language classes for French, German and Spanish conducted for 205 students.
- Workshops: Dramatics and Charcoal Sketching workshop for all by professionals.
- New Open IIT Events introduced.
- Drama: Komagata Maru conducted.
- Raag Class: Instrument classes for guitar and violin
- Swarsagar: Classical vocals classes.

## **OUTSTATION PARTICIPATION OF SOCIETIES (SOCIAL AND CULTURAL)**

### **DRAMATICS**

#### Technology Dramatics Society : Pravah-

- Gold at Stage Play Event : Spring Fest 2015. Best Actor Award received by Shyla Gangwar.
- Gold at Stage Play Event : Carpe Diem 2015, IIM Calcutta
- 03 in-house productions

#### Technology Dramatics Society : Encore

- Runner-up at Street Play Competition : Carpe Diem 2015, IIM Calcutta
- 2 in-house productions

#### Technology Dramatics Society : Druheen

- 2 in-house productions

#### Technology Dance Society : Group Achievements:

- Shuffle - Street Dance Battle Competition, Spring Fest 2015 - Winners (Gold)
- Centrifuge - Inter-collegiate Group Dance Competition, Spring Fest 2015 - 1st Runner-Up (Silver)
- Euphoria - Group Dance Competition, Carpe Diem 2015 (IIM Calcutta) - 2nd Runner Ups (Bronze)

### **LITERARY:**

#### **Debating Society:**

- United Asian Debating Championships (2014, NTU Singapore)
- Shadow Adjudication Core Member, Grand Finalist Adjudicator
- Jindal Intervarsity 2014 (Jindal Global Law School, Sonapat)Grand Finalist team (Runner's up)
- IIT Bombay Intervarsity 2014, Teams in Quarter-finals (Maximum among all institutes), one team in the Grand Finals, Best Adjudicator Award
- NITR PD (NIT Rourkela 2014)Winners, Runner's-up (both from IIT KGP); Best Adjudicator award
- Kuala Lumpur Open Challenge (Official Pre-Worlds' Tournament) (APU, Kuala Lumpur, Malaysia, 2014)Invited Adjudicator

### **ENTERTAINMENT:**

#### Eastern Technology Music Society

- Cover of Mrigya and Spunk publicly praised respectively by the original band.

#### Western Technology Music Society

- Lake Side Dreams - Acoustic Western Group Event – Winners



## **FINE, ALLIED ARTS AND MODELLING: SPECTRA**

### Artbeat 2015 : Art festival conducted

- Public Arts: public display of various art forms in the institute foyer dedicated to events such as the Foundation Day, Teachers' Day, Diwali, etc.
- Workshops: Internal workshops on Origami, water colors, glass painting
- Photography competition: 150+ participants from our campus as well from other colleges battled it out with their stunning clicks
- Artbud: a painting competition for the school students in IIT Kharagpur.

**SPRING FEST' 2015:-** is a National Level Socio - Cultural Fest Organized by IIT Kharagpur, held during the month of January in the spring semester. It was organized from 23rd January 2015 to 26 th January 2015. A plethora of more than 60 events ranging from varied genres provides a platform to the students where they proved their mettle and caliber.

Spring Fest offered a multitude of more than 100 events spread out over nine genres. SF had something for everyone. With 55 years under its belt, the events held at Spring Fest has a rich history. From the rock band competition Wildfire that has previous participants of the caliber of Parikrama, to the Mary Bucknell Trophy, a prestigious event in the quizzing circuit since the '70s, Spring Fest has always been one of the biggest stages to showcase one's talent. In addition, Spring Fest had the big performance across all genres-from fusion to Bollywood to. Spring Fest had participants socializing and interacting with new people from all over the country, building bonfires and sitting around them, strumming their guitars and singing along late into the night. The theme of this year's fest was Reminiscence: the good old days.

### **EVENT DETAILS/HIGHLIGHTS**

- Dramatics, music and dance competitions
- fine arts contests
- quiz
- MUN(Model United Nations)
- Wildfire: Western rock band competition
- Perpz-All day dance floor
- Frolic-o-Holic
- Youth Marathon
- Star-nite

### **FILM FEST EVENTS:-**

- Lights Camera SF-( the director inside of you) Total Cash Prize: INR 15000
- AD ZAP-( for the advertisement gurus) Total Cash Prize: INR 10000
- Picture Perfect:- (photograph)brand new Hero Splendor Pro Classic
- SFM:-( producing a short film) Total Cash Prize: INR 15000.

### **LITERARY EVENTS:-**

- A Mighty Pen:- (Write a moving and thought-provoking article ) - Total Cash Prize: INR 10000
- Impromptu:- ( prepare your speech and step up to the podium)- Total cash prize: INR 6000
- Dumb C :- Total Cash Prize: INR 6000
- National Level Debate :- ( counter-argument debating) Total Cash Prize: INR 10000
- Jumble The Good :- (tests your vocabulary) Total Cash Prize: INR 6000
- JAM :- ( being a grammar nazi) - Total Cash Prize: INR 6000

- India Calling :- (case study presentation) Total Cash Prize: INR 24000
- IITKGPMMUN :- (IIT Kharagpur Model United Nations Conference)
- Poetry Slam :- (emotions through poetry)

#### **DANCE EVENTS:-**

- Shuffle :- (street dance competition) Total Cash prize: INR 30000
- Centrifuge:- (An inter-collegiate dance competition) Total Cash Prize: INR 40000
- Two for a Tango:- ( A duo dance event) Total Cash Prize: INR 15000
- Shake A Leg:- (solo dance competition) Total Cash Prize: INR 10000

#### **FINE ART EVENTS:-**

- Paint It :- (Total Cash Prize: INR 8000)
- Toon Con :- (the comic-strip making competition) Total Cash Prize: INR 6000
- Bran D :- (logo and tagline design ) Total Cash Prize: INR 10000
- Finger Painting :- (painting with fingers)
- Rangoli :- (evincing message to the world through colours)
- Panache :- (design the outfit.)
- Soapaholic – (carving the imagination on a piece of soap)
- Face Canvas:- (decorate your partner's face)

#### **QUIZ EVENTS:-**

- Mary Buknel Trophy :- ( An exciting quiz aims at finding out the best quizzers in the country) Total Cash Prize: INR 25000
- Krossfire :- (live crossword puzzle) Total Cash Prize: INR 12000
- Cineflix :- (entertainment quiz is for those whose interest for TV shows, movies and music) Total Cash Prize: INR 12000
- Bizwhiz :- (for those who know the stock market trends) Total Cash Prize: INR 12000
- Cyberbits :- (For the quizzers with a passion for all things tech) Total Cash Prize: INR 12000
- Olympiq :- (Sports based quiz ) Total Cash Prize: INR 12000

#### **MUSIC EVENTS:-**

- Wildfire :- (rock band competition) Total Cash Prize: INR 100000
- Lake Side Dreams :- (tunes and chord) Total Cash Prize: INR 18000
- Sargam :- (Sargam is the eastern cousin of "Wildfire") Total Cash Prize: INR 30000
- SF Idol:- ('SF Idol' a solo singing competition) Total Cash prize: INR 10000
- Sa Re Ga Ma :- (Antakshari event) Total Cash Prize: INR 10000
- SF Karaoke :- ( to sing the lyrics of your favorite songs) Total Cash Prize: INR 3000

#### **DRAMATICS EVENTS:-**

- Rangmanch :- ( for those who have dramatics as a passion) Total Cash Priz: INR 40000
- Nukkad :- ( the street play competition) Total Cash Prize: INR 40000
- I Me Myself :- ( solo acting competition) Total Cash Prize: INR 10000
- Curtain Call :- (situation-based dramatics competition) Total Cash Prize: INR 10000

#### **SOCIAL EVENTS**

- Blood Donation :- organize the Blood Donation Camp.
- Youth Marathon:- Run for life, run for unity, run for equality, run for humanity.
- Pratigya:- to take a pledge to improve our country and the world

### **SPECIAL ATTRACTION OF THE FEST:-**

- Vigorous performance by Farhan Akhtar at Jnan Ghosh Stadium.
- Paradigm Shift live concert on 25th January, 2015 at Jnan Ghosh Stadium
- **Centrifuge** :- Jam packed auditorium yet again.
- **Act – SpuNK**:- was live in concert on 25th January, 2015 at Jnan Ghosh Stadium.
- **Sanskriti** :- The cultural evening exposed India's Cultural Diversity .

### **ACHIEVEMENTS AT SPRING FEST 2015**

- Technology Dance Society : Individual Achievements:
- Sagar Kalbande - Shake-a-leg (Solos), Spring Fest 2015 - Special Mention (4th Place)
- Rimil Hembrom - Centrifuge (Group Dance), Spring Fest 2015 - Best Dancer (Groups)
- Technology Dance Society : Group Achievements:
- Shuffle - Street Dance Battle Competition, Spring Fest 2015 - Winners (Gold)
- Technology Dramatics Society : Pravaah-
- Gold at Stage Play Event: Spring Fest 2015. Best Actor Award received by Shyla Gangwar.

**KSHITIZ' 2015** :- (31/01/2015 to 02/02/2015) the annual techno-management fest of IIT Kharagpur provides a platform for a confluence of students, academia and the industry. The fest has been graced by the presence of such luminaries who are looked up to for their distinguished contribution in their respective fields further Kshitij provided an opportunity to interact with leaders from the corporate sector, research scientists, celebrities and faculty of IIT Kharagpur.

### **LIST OF EVENTS / PROGRAMMES CONDUCTED AT KSHITIJ 2015:**

- **GENESIS**- Woodstock, Forex, Monopoly, Relic Hunter, Math Challenge, Crytex
- **QUIZZARD**- Biz Quiz, Tech Quiz,
- **CONCEPTUALIZE**-ASME SDE, B plan, open Soft, Eureka, SOE, Scavengers
- **THEORIES IN CORE**- Overnite, Embetronix, Anadigix
- **ROBOTIX**-Anadigix, Skyfall, Minefield, StepUp, Aug-Hit, Sudocode
- **AB-INITO**-Race Pulse, Laws of Motion, Nightshift, Droid Blitz, MagLev
- **STRATEGIA**-Verdict, Le Play's Marathon, CRAn
- **TECH4FUN**-TechQuila, Snappit
- **IDP - Industrial Design Problem**

### **LIST OF WORKSHOPS**

- Intel , DAD, Takshashila Institution, Intro to Hackathon(, FPC India, DRDO, SAP Labs. CAD/C, Cinematography, Google Developer Group.

### **GUEST LECTURES BY EMINENT PERSONALITIES LIKE:-**

- Dr. Prabhakant Sinha :- Co-Chairman and Co-Founder of ZS Associates the leading Sales Management Consultancy in the world, an alumnus of IIT Kharagpur and Ph.D from University of Massachusetts.
- Ravi Kant :- Vice Chairman and Former MD of Tata Motors. (Management skills).

- Srikumar Banerjee :- Indian Nuclear Scientist, retired chairman of AECL, secretary of Department of Atomic Energy and a physical metallurgist who made contributions to study of phase transformations in zirconium and titanium based alloys.
- R. Kasturirangan – former chairman, ISRO

#### OTHER EVENTS PARTICIPATED /ORGANIZED BY THE STUDENTS

- Petrofiesta 2014 (07/11/2014 to 09/11/2014)
- Bitwise 2k15 (13/03/2015 to 15/03/2015)
- Great Step 2014 17/10/2014 to 19/10/2014
- Online Photography Competition (20/08/2014)
- IIT KGP team participated in Bitbees for the ACM ICPC World Finals 2015. This is the first time a team from Kgp has competing in this challenge. Indian Institute of Technology - Kharagpur & got Honorable Mention.

#### ILLUMINATION AND RANGOLI EVENT

IIT Kharagpur was yet again enlightened by the light of diyas, fragrant with the essence of culture and upbeat with the spirit of illumination. All the halls were drenched in the flavour of this unique way of celebrating the festival of lights, Diwali. Students here, work for this festival all month long to get illuminated on the day of Diwali. Rangoli colours, rendered masterpiece on the canvas of the common room's floor.

All the spirit, enthusiasm, and labour students put into the festival were structured to present a theme. These magnificent artworks were great medium to display a theme or send out a message.

The celebrations ended with rossogullas, tempo shouts, and a few moments of silent gazing at the illuminated art, sharing smiles with everyone, with moist eyes carrying the brimming culture in them. Illumination and Rangoli at IIT Kharagpur are deep seated in the very spirit of the student community.

The year 2014-15 was a grand success. Students of IIT Kharagpur not only participated in all the events at Inter IIT Sports Meet, they also had secured positions in almost all the events, showing a boost in the performance of IIT Kharagpur sportspersons.

# Technology Telecom Centre

## **Prof-in-Charge**

Prof. Raja Datta

## **Engineer**

Mr.Pankaj Gupta

## **Work Carried Out**

- Upgradation of MD-110 EPABX with 30 channel Audio conference bridge with server and licences for implementing E-1 based conference unit.
- Restructuring of Indoor cabling in Depts of Electrical Engg. and Mathematics
- Supply and laying of UG cable for Old ISRO office complex.
- Supply and laying of UG cable for B R Ambedkar Hall of Residence.
- Supply and laying of UG cable to RMsOE.
- Supply and laying of UG cable to newly constructed G+7 qtrs.
- Supply and laying of Indoor cable for old NCC building.
- Laying and termination of fiber optic cable with associated accessories TGH.
- Supply and laying of UG cable to old NCC building.

## **Ongoing Works:**

- The tender process is going on for the supply and laying of UG cable for newly constructed CRR building.

## **New Planning:**

- A Committee has been set up to consider the existing EPABX and its future road path.
- A satellite exchange will be installed in newly coming up JCB annex building.

## Career Development Centre

The Career Development Centre is responsible for arranging practical training for 3<sup>rd</sup> year B. Tech/Dual Degree and 4<sup>th</sup> year M.Sc. degree students and job placement of final year students graduating from the Institute. The Centre 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 CDC gives feedback to the Institute on the academic programmes.

### Summer Training Details

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

A total of 1300 companies/ organizations in India are contacted for training facilities for the current summer internships of our students in May- July 2015. Out of which 82 companies either visited the campus or conducted interviews through telephonic interviews and 20 companies allotted seats for nomination. The details of internship are as follows.

Period of Internship	Nos. of students enlisted for Internship	Nos. attending Internship in India			Internship at foreign Univ./Org.	Highest Stipend offered	
		selected by the company	Nominated by the Dept.	Self-arranged		India	Abroad
May-July 2015	1201	340	108	753	80	Rs.75,000/- p.m.	US \$ 6700

### Placement Details

**295** companies / organizations have considered our students for employment during 2014-2015. The details of number of students who had registered for placement and those actually placed through campus interviews including those who have opted either for higher studies or arranged job through off campus as on 30.04.2015 are as follows:

Course/Degree	No. of students registered	No. of students placed
B.Tech. (Hons.) & B. Arch	580	502
5-year Integrated M.Sc.	150	127
Dual Degree (B. Tech + M. Tech.)	494	425
2-year M. Sc	119	84
M.Tech./MCP	594	356
M.B.A.	55	53
MS/Ph D	53	18
<b>Total</b>	<b>2045</b>	<b>1565</b>

The Overseas Highest salary received in 2014-15 is \$250000 per annum and the second highest is \$150000 per annum.

The Highest salary received in INR is Rs. 41lakh per annum and the second highest is Rs.31lakh per annum in 2014-15.

Some companies have offered pre placement offers like ITC Ltd., Schlumberger, Hindustan Unilever, Qualcomm, Deutsche Bank, Microsoft, Facebook, Goldman Sachs, etc. Total numbers of Pre-Placement offers received are 119.

### **Student Participation**

Career Development Centre at IIT Kharagpur has taken an initiative to harness the students' management skills through a formal system during the placement season since 2005-2006. The system has progressed extremely well and from year 2010 onwards, the CDC has immensely benefitted from students participating in placement process. The organizational skill of students has helped CDC to conduct 20-25 companies' placement interviews per day and round the clock. During the placement season students and staff members play an active role from contacting the companies to the final selection at campus by providing complete logistic support.

## Water Works Section

**PROFESSOR –IN-CHARGE:** Prof. M M Ghangrekar

**Officer:** B B Rai, Executive Engineer

**On-going works / Job:**

Sl. No.	Job
01	Operation & Maintenance of Iron Removal filters for the year 2014-15.
02.	Providing & Installing the Active Carbon Filter at Dandyakaranya deep tube well.
03	New geyser pipe line for B R Ambedkar Hall
04	Augmentation of Pump situated in the Lake area
05	Providing & Installing of Active Carbon Filter at Ambedkar Hostel.
06	Installation of Iron Removal Plant near Nalanda Classroom complex
07	Installation of Iron Removal Plant near deep tube well at MMM hall of residence
08	250 mm dia delivery Water line from Balarampur pump house to U.G Reservoir along with 02 nos. tubewells at IIT Kharagpur
09	Supplying fitting & fixing of porcelain wash basin, Flushing Cistern & S S Sink at J C Bose lab complex & Vikramshila Complex lab
10	Repair & Replacement of 250mm dia DI pipeat Balarampur & replacement of valves at Anicut pump house.
11	Replacement of Filter media of sand filter bed & sludge water bed of Water Treatment Plant.
12	Miscellaneous Water works job at different hall of Residence
13	Supplying fitting & fixing of plumbing fixtures & connections(inlet &outlet) at Hijli Shaheed Bhavan( IIT old building) ground floor of IIT, Kgp.
14	Water connection including all fittings & necessary attachments in School of Bioscience at Sir J.C. Bose laboratory complex.
15	Construction of Platform for water cooler & pipeline connection
16	Construction of New deep tube well at Anicut pump house No-3
17	Providing New wash basin at dining place of 1BR quarters near Durga Mandir Gate (i.e. from 1BR -97 to 1BR-160).
18	Repairing work at re-cycling Raw water channel at treatment plant of I.I.T, Kharagpur
19	Providing & Fixing of S.S. Net over the re-cycling clean water channel at treatment plant of I.I.T, Kharagpur.
20	New pipeline connection to Annex building of Chemical Engg. Dept. & Rajendra Mishra School of Engg. Entrepreneurship of IIT Kgp.
21	Providing & fixing of various items at LBS Hall of Residence.



22	Construction a direct connection between pump line & delivery line at overhead tank no- 4 of IIT, Khargapur
23	A shed for chlorine dozing chamber, main switch & other items for Deep tube well with side fencing at B.R Ambedkar Hall.
24	Construction a new water pipe line connection with water tank & basin, sink etc. at B.R Ambedkar Hall.
25	A shed for chlorine dozing chamber, main switch & other items for Deep tube well with side fencing at MMM Hall.
26	Cleaning and washing of over head water tanks at residential campus for the year
27	New pipeline connection to annex building of Chemical Engineering Dept. & Rajendra Mishra School of Engineering Entrepreneurship of IIT Khargapur.
28	New water pipeline connection from water pump to overhead water tanks of newly constructed building at Step, Gopali Campus.

# **HEALTH CARE**

## **B.C. Roy Technology Hospital**

The Institute provides primary health care to the campus community through B C Roy Technology Hospital located strategically within the campus. Constant efforts are on to upgrade and improve the existing facilities at the B. C. Roy Hospital. Health Care remains a top priority in the activities of the Institute.

In addition to General OPD service, **special clinics are provided in General Medicine, Cardiology, Paediatrics, Chest, Skin, Psychiatry, General Surgery, Obstetrics & Gynaecology, Orthopaedics, Eye, ENT and Dental by appointing visiting consultants in the various disciplines.** Immunization clinics are operated with the help of Consultant in Public Health and Paediatrician.

**32 Indoor Beds including 2 Bedded ICU & Isolation Wards are available which are fully utilized by students & institute beneficiaries.**

Round-the-clock emergency service and a 24 hour pharmacy have been made available. Critical care ambulance support is provided in emergency situations.

Medical Insurance coverage through the Institute is available for the students.

**Installation of Computerized Radiology Unit, Fully Automatic Biochemical analyzer, Automated Cell Counter, ICU Ventilator, Telemedicine, Video Slit Lamp & Auto- Refractometer in recent years have improved the service & overall satisfaction of the beneficiaries.**

**An Operation Theatre equipped with all essential equipments has been built by renovating an existing portion of the building which will further help in providing surgical care for which we depend on external sources.**

The referral procedure for referring patients to higher centres is continuously examined and MOU are being drawn with suitable Corporate Hospitals in Kolkata viz. Ruby General Hospital, R N Tagore IICS, Medical Hospital. B M Birla Cardiac Centre, Kothari Hospital and Sanjiban Hospital . Medica Super speciality Hospital, Fortis Hospital

Promotive Health Care as Diabetic Clinics are being arranged from time to time to augment clinical services. BCRTH is regularly extending its support to NCC, NSS & other units for holding Health Camps, Blood Donation Camps.

Construction of lift well is in full swing, new critical care ambulance has been procured, boundary wall around the hospital is complete.

Hospital Management Committee, comprising of representatives from all stake holders of the Institute and headed by Prof. In Charge BCRTH as the Chairperson, meets regularly to overview the functioning of the hospital, listen to the grievances and suggest to the authority regarding all round development of the hospital and its services.

# ***Statistics***



Table A-1

## ADMISSION TO UNDERGRADUATE (B.TECH./B.ARCH./M.SC./DUAL DEGREE) COURSES IN THE SESSION 2014-2015

Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL
<b>(A) B.TECH. 4-YEAR</b>																
1	Aerospace Engg	17	9	5(1)	2	<b>33</b>	17	9	5	2	<b>33</b>	17	9	5	2	<b>33+1*</b>
2	Agril. & Food Engg.	18(1)	9	5	3	<b>35</b>	18	9	5	3	<b>35</b>	14	8	5	3	<b>30</b>
3	Biotech. & Bioch. Engg.	14(1)	7	4	2	<b>27</b>	14	7	4	2	<b>27</b>	10	6	4	2	<b>22+1*</b>
4	Chemical Engg.	26	14(1)	8(1)	4	<b>52</b>	26	14	8	4	<b>52</b>	26	14	8	4	<b>52+1*</b>
5	Civil Engg.	31(1)	17	9	5(1)	<b>62</b>	31	17	9	5	<b>62</b>	31	17	8	5	<b>61</b>
6	Computer Sc. & Engg.	28	15(1)	8	4	<b>55</b>	28	15	8	4	<b>55</b>	28	15	8	3	<b>54</b>
7	Electrical Engg.	28(1)	15(1)	8	4	<b>55</b>	28	15	8	4	<b>55</b>	27	15	9	4	<b>55</b>
8	Electronics & ECE	31	17(1)	9	5(1)	<b>62</b>	31	17	9	5	<b>62</b>	29	19	9	5	<b>62+1*</b>
9	Industrial Engg.	16(1)	8	4	2	<b>30</b>	16	8	4	2	<b>30</b>	15	7	4	1	<b>27+1*</b>
10	Instrumentation Engg.	16(1)	9	5	2	<b>32</b>	16	9	5	2	<b>32</b>	16	9	5	2	<b>32</b>
11	Manuf. Sc. & Engg.	15	8	4	2	<b>29</b>	15	8	4	2	<b>29</b>	15	8	3	1	<b>27</b>
12	Mechanical Engg.	34	18(1)	10	5	<b>67</b>	34	18	10	5	<b>67</b>	34	18	10	5	<b>67</b>
13	Met. & Mat. Engg.	22(1)	12(1)	7	3	<b>44</b>	22	12	7	3	<b>44</b>	22	12	7	3	<b>44</b>
14	Mining Engg.	20	11	6	3	<b>40</b>	20	11	6	3	<b>40</b>	19	10	6	2	<b>37</b>
15	Ocean Engg. & N.A.	17(1)	9	5(1)	2	<b>33</b>	17	9	5	2	<b>33</b>	16	8	4	2	<b>30+1*</b>
	<b>Total (A)</b>	<b>333</b>	<b>178</b>	<b>97</b>	<b>48</b>	<b>656</b>	<b>333</b>	<b>178</b>	<b>97</b>	<b>48</b>	<b>656</b>	<b>319</b>	<b>175</b>	<b>95</b>	<b>44</b>	<b>633</b>

**Table A-1 (Continued)**

Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL
<b>(B) B.ARCH. 5-YEAR</b>																
1	Architecture	20(1)	11(1)	6	1	<b>38</b>	20	11	6	1	<b>38</b>	19	11	6	1	<b>37</b>
	<b>Total(B)</b>	20(1)	11(1)	6	1	<b>38</b>	20	11	6	1	<b>38</b>	19	11	6	1	<b>37</b>

Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL
<b>(C) M.Sc. INTEGRATED 5-YEAR</b>																
1	Applied Geology	18	10	5	3	<b>36</b>	18	10	5	3	<b>36</b>	10	8	3	3	<b>24+1*</b>
2	Chemistry	17(1)	9	5	3	<b>34</b>	17	9	5	3	<b>34</b>	7	4	3	1	<b>15+2*</b>
3	Economics	23(1)	12(1)	7	3	<b>45</b>	23	12	7	3	<b>45</b>	22	10	6	1	<b>39+1*</b>
4	Maths. & Computing	26(1)	13(1)	7	4	<b>50</b>	26	13	7	4	<b>50</b>	25	12	7	4	<b>48+2*</b>
6	Physics	18(1)	10	5	3	<b>36</b>	18	10	5	3	<b>36</b>	15	8	4	2	<b>29+1*</b>
7	Expl Geophysics	17	9	5	3	<b>34</b>	17	9	5	3	<b>34</b>	15	9	3	2	<b>29+2*</b>
	<b>Total (C)</b>	119	63	34	19	<b>235</b>	119	63	34	19	<b>235</b>	94	51	26	13	<b>184</b>

**Table A-1(Continued)**

Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL
<b>(D) DUAL DEGREE 5-YEAR</b>																
1	Aerospace Engg.	10	5	3(1)	1	<b>19</b>	10	5	3	1	<b>19</b>	10	5	3	1	<b>19</b>
2	AG & F.E./Water Res. Dev. & Management	18(1)	9	5(1)	3	<b>35</b>	18	9	5	3	<b>35</b>	9	7	4	1	<b>21</b>
3	Biotech. & Biochem. Engg.	13	7	4(1)	2	<b>26</b>	13	7	4	2	<b>26</b>	10	7	4	2	<b>23</b>
4	Chemical Engg.	14(1)	7	4	2	<b>27</b>	14	7	4	2	<b>27</b>	14	7	4	2	<b>27+1*</b>
27	Civil engg./Struct. Engg.	11	6(1)	3	2	<b>22</b>	11	6	3	2	<b>22</b>	11	6	3	2	<b>22+1*</b>
6	Computer Sc. & Engg.	20(1)	11	6	3	<b>40</b>	20	11	6	3	<b>40</b>	20	11	6	3	<b>40</b>
7	Elect. Engg./Instru. Engg.	11(1)	6	3	2	<b>22</b>	11	6	3	2	<b>22</b>	11	6	3	2	<b>22</b>
8	E&ECE / Auto. & Comp. vision	20(1)	11	6	3	<b>40</b>	20	11	6	3	<b>40</b>	20	11	6	3	<b>40</b>
9	Industrial Engg. /IEM	12(1)	5	4	1	<b>22</b>	12	5	4	1	<b>22</b>	12	5	4	1	<b>22</b>
10	Manuf. Sc. & Engg./IEM	8	4	2	1	<b>15</b>	8	4	2	1	<b>15</b>	8	4	2	1	<b>15</b>
11	(i) M.E./M.S.Engg. (ii) M.E./Thermal, Energy & Environ. Engg.	24(1)	13	7	4(1)	<b>48</b>	24	13	7	4	<b>48</b>	24	13	7	4	<b>48</b>
12	Met. & Mat. Engg./Met.	11	5	4	1	<b>21</b>	11	5	4	1	<b>21</b>	11	5	4	1	<b>21</b>

	Engg.															
13	Mining Engg.	11	5	3	1	<b>20</b>	11	5	3	1	<b>20</b>	9	5	3	1	<b>18</b>
14	Mining Engg. / Safety Engg. & Disaster Mgt. in Mines	9	5	3	1	<b>18</b>	9	5	3	1	<b>18</b>	6	5	3	1	<b>15</b>
15	Ocean Engg. & naval Arch.	12	5	4	2	<b>23</b>	12	5	4	2	<b>23</b>	10	5	3	2	<b>20</b>
16	QED&M	7	4(1)	2	1	<b>14</b>	7	4	2	1	<b>14</b>	6	4	2	0	<b>12</b>
	<b>Total (D)</b>	211	108	63	30	<b>412</b>	211	108	63	30	<b>412</b>	191	106	61	27	<b>385</b>
	Total (A + B + C + D)	683(20)	360(11)	200(6)	98(3)	1341(40)	683	360	200	98	1341	623	343	188	85	1239(17)

(1)-Figures in () indicates PD candidate. \* Preparatory. student



**Table A2**

**ADMISSION TO 2-YEAR M.SC. COURSES, 2014-2015**

Sl. No.	Course	OFFERED					REGISTERED					NOT REGISTERED				
		GE	OB	SC	ST	TOTAL	GE	OB	SC	ST	TOTAL	GE	OB	SC	ST	TOTAL
1	Chemistry	23	13	8	4	48	22	13	8	3	46	1			1	2
2	Geophysics					-					-					-
3	Geological Sciences	14	9	5	2	30	13	8	5	2	28	1	1			2
4	Mathematics	13	10	6	2	31	11	10	6	2	29	2				2
5	Physics	22	16	8	4	50	21	13	7	4	45	1	3	1		5
6	Statistics & Informatics															
<b>TOTAL</b>		<b>72</b>	<b>48</b>	<b>27</b>	<b>12</b>	<b>159</b>	<b>67</b>	<b>44</b>	<b>26</b>	<b>11</b>	<b>148</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>11</b>

**Table A-3**

**DISCIPLINE-WISE BREAK-UP OF STUDENTS AWARDED M.C.M. SCHOLARSHIP 2014-15**  
**Rate of Scholarship : Rs.1000/- p.m. plus Free-tuitionship**

S.N.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
<b>(A) B.Tech. 4-Year</b>							
1	Aerospace Engg.	6	9	14	3		32
2	Agri. & Food Engg.	6	2	6	3		17
3	Biotech. & Bioch. Engg.	8	0	3	2		13
4	Chemical Engg.	10	12	9	11		42
5	Civil Engg.	23	14	13	7		57
6	Computer Sc. & Engg.	16	14	12	11		53
7	Electrical Engg.	18	16	10	7		51
8	Electronics & ECE	16	21	14	10		61
9	Industrial Engg.	8	3	9	5		25
10	Instrumentation Engg.	9	8	6	8		31
11	Manuf. Sc. & Engg.	6	2	4	2		14
12	Mechanical Engg.	18	20	17	12		67
13	Met. & Mat. Engg.	9	13	7	10		39
14	Mining Engg.	10	11	6	7		34
15	Ocean Engg. & N.A.	7	4	2	4		17
<b>(B) B.Arch. 5-Year</b>							
	Architecture	10	7	10	3	3	33
<b>(C) M.Sc. Integrated 5-Year</b>							
1	Applied Geology	8	3	2	1		14
2	Economics	12	5	5	9	4	35
3	Expl. Geophysics	6	5	0	0	2	13
4	Chemistry	5	0	0	1	1	7
5	Maths. & Computing	7	6	0	3	0	16
6	Physics	4	3	0	1	0	8
7	Statistics & Informatics	0	0	0	0	0	0
	<b>TOTAL =</b>	222	178	149	120	10	679

**Contd... Table : A-3**

	B.F. =	222	178	149	120	10	679
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**(D) M.Sc. 2 Year**

Sl. No.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
1	Geological Sciences						
2	Geophysics						
3	Chemistry						
4	Mathematics						
5	Physics						
6	Statistics & Information						

**(E) Dual Degree 5-Year**

1	Aerospace Engg.	6	7	5	5	0	23
2	Ag. & F. E./ Water Res. Dev. & Manag.	7	4	6	4	0	21
3	Biotech. & Bioch. Engg.	5	3	4	2	0	14
4	Chemical Engg.	6	8	3	3	0	20
5	Civil Engg./Struct. Engg.	8	0	5	10	0	23
6	Computer Sc. & Engg./Comp. & Information Technology	9	11	7	12	0	39
7	Electrical Engg./ Instrumentation Engg.	5	10	5	6	0	26
8	E & ECE/Automation & Comp. Vision	11	11	9	4	0	35
9	Industrial Engg./IEM.	3	2	4	6	0	15
10	Manuf. Sc.& Engg.	2	0	3	1	0	6
11	Mech. Engg.	6	10	14	11	0	41
12	Met. & Mat. Engg./ Metallurgical Engg.	5	3	0	10		18
13	Mining Engineering	8	8	3	10	0	29
14	Ocean Engg. & N.A.	5	6	0	6	0	17
15	QEDM	5	3	0	3	0	11
	<b>TOTAL =</b>	91	86	68	93	0	338
	<b>GRAND TOTAL =</b>	<b>313</b>	<b>264</b>	<b>217</b>	<b>213</b>	<b>10</b>	<b>1017</b>

**Table A-4**  
**STUDENTS AWARDED ONLY FREE TUTIONSHIP 2014-15**

S.N.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
<b>(A) B.Tech. 4-Year</b>							
1	Aerospace Engg.	0	0	1	0	0	1
2	Agri. & Food Engg.	1	4	1	5	0	11
3	Biotech. & Bioch. Engg.	2	1	1	1	0	5
5	Chemical Engg.	2	2	3	1	0	8
4	Civil Engg.	1	6	6	0	0	13
6	Computer Sc. & Engg.	0	0	4	0	0	4
8	Electrical Engg	0	0	3	3	0	6
7	Electronics & ECE	0	2	2	7	0	11
9	Industrial Engg.	3	0	0	0	0	3
10	Instrumentation Engg.	0	2	3	2	0	7
11	Manuf. Sc. & Engg.	0	4	1	2	0	7
12	Mechanical Engg.	2	6	3	5	0	16
13	Met. & Mat. Engg.	2	1	3	0	0	6
14	Mining Engg.	2	4	2	0	0	8
15	Ocean Engg. & N.A.	0	4	2	2	0	8
<b>(B) B.Arch. 5-Year</b>							
1	Architecture	1	2	1	0	0	4
<b>(C) M.Sc. Integrated 5-Year</b>							
1	Applied Geology	0	4	0	0	0	4
2	Economics	0	5	5	0	0	10
3	Expl. Geophysics	2	2	1	0	0	5
4	Chemistry	0	2	0	0	0	2
5	Maths. & Computing	2	1	0	0	0	3
6	Physics	1	2	0	0	1	4
7	Statistics & Information	0	0	0	0	0	0
	<b>Total =</b>	<b>21</b>	<b>54</b>	<b>42</b>	<b>28</b>	<b>1</b>	<b>146</b>

**Condt... Table A-4**

	<b>B.F. =</b>	21	54	42	28	1	146
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**(D) M.Sc. 2 Year**

Sl. No.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
1	Chemistry						
2	Geophysics						
3	Geological Sciences						
4	Mathematics						
5	Physics						
6	Statistics & Information						

**(E) Dual Degree 5-Year**

1	Aerospace Engg.	0	0	2	2	0	4
2	Ag. & F. E./ Water Res. Dev. & Manag.	1	3	2	3	0	9
3	Biotech. & Bioch. Engg.	2	0	1	1	0	4
4	Chemical Engg.	2	1	3	1	0	7
5	Civil Engg./Struct. Engg.	1	2	0	1	0	4
6	Computer Sc. & Engg./Comp. & Information Technology	0	0	2	1	0	3
7	Electrical Engg./ Instrumentation Engg.	0	1	4	0	0	5
8	E & ECE/Automation & Comp. Vision	0	0	2	2	0	4
9	Industrial Engg./IEM.	0	2	1	3	0	6
10	Manuf. Sc.& Engg.	0	1	1	1	0	3
11	Mech.,Engg.	1	0	0	4	0	5
12	Met. & Mat. Engg./ Metallurgical Engg.	2	2	2	0	0	6
13	Mining Engineering	1	6	3	2	0	12
14	Ocean Engg. & N.A.	1	0	0	1	0	2
15	QEDM	1	2	0	0	0	3
	<b>TOTAL =</b>	<b>12</b>	<b>20</b>	<b>23</b>	<b>22</b>	<b>0</b>	<b>77</b>
	<b>GRAND TOTAL =</b>	<b>33</b>	<b>74</b>	<b>65</b>	<b>50</b>	<b>1</b>	<b>223</b>

**Table A-5**

**STUDENTS (SC & ST) AWARDED FINANCIAL ASSISTANCE 2014-2015**

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

Sl.No.	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
<b>(A) B.Tech. 4-Year</b>												
1	Aerospace Engg.	1					1					2
2	Agri. & Food Engg.								1	1	2	4
3	Biotech. & Bioch. Engg.			1						1		2
4	Chemical Engg.	1										1
5	Civil Engg.		1	1								2
6	Computer Sc. & Engg.			1								1
7	Electrical Engg.				1					1	1	3
8	Electronics & ECE				1		1			1		3
9	Energy Engg.											
10	Industrial Engg.											
11	Instrumentation Engg.											
12	Manuf. Sc. & Engg.								1		1	2
13	Mechanical Engg.									2		2
14	Met. & Mat. Engg.			1	1							2
15	Mining Engg.					1	1					2
16	Ocean Engg. & N.A.										1	1
<b>(B) B.Arch. 5-Year</b>												
	Architecture					1	1		2			4

**Table A-5 (Contd.)**

Sl.No.	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
<b>(C) M.Sc. Integrated 5-Year</b>												
1	Applied Geology					1						<b>1</b>
2	Economics	1	1						2			<b>4</b>
3	Expl. Geophysics											
4	Industrial Chemistry		1									<b>1</b>
5	Maths. & Computing											
6	Physics											
7	Statistics & Informatics											
<b>(D) M.Sc. 2-Year</b>												
1	Chemistry	2	1	4	3							<b>10</b>
2	Geophysics	1	2	3								<b>6</b>
3	Geological Sciences											
4	Mathematics	2		2	1							<b>5</b>
5	Physics	1	1	2								<b>4</b>
6	Statistics & Informatics											
<b>(E) Dual Degree 5-Year</b>												
1	Aerospace Engg.					1						<b>1</b>
2	Ag. & F. E./ Water Res. Dev. & Manag.						1	1		1		<b>3</b>
3	Biotech. & Bioch. Engg.							1				<b>1</b>
4	Chemical Engg.											

5	Civil Engg./Struct. Engg.									1		1
6	Computer Sc. & Engg./ Comp. & Information Technology											
7	Electrical Engg./ Instrumentation Engg.		1									1
8	E & ECE/Automation & Comp. Vision											
9	Industrial Engg./IEM.										1	1
10	Manuf. Sc.& Engg./ IEM	1								1		2
11	M.E./M.S. Engg.											
12	M.E./Thermal, Energy & Environ. Engg..					1					1	2
13	Met. & Mat. Engg./ Metallurgical Engg.											
14	Mining Engineering											
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines		1			1			1			3
16	Ocean Engg. & N.A.	1									1	2
17	QEDM	1										1
<b>Total:</b>		<b>12</b>	<b>9</b>	<b>15</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>9</b>	<b>8</b>	<b>80</b>



**Table -6****MEDALS AND PRIZES : 2014 – 2015 : UNDER - GRADUATE****1. INSTITUTE GOLD MEDALS:**

Sl. No.	Name of Medal/Prize	Name of the winner	Instt.Roll No.	CGPA
1.	PRESIDENT OF INDIA GOLD MEDAL	Sikhar Patranabis	11CS10044	9.87
2.	DR. BIDHAN CHANDRA ROY MEMORIAL GOLD MEDAL	Rishav Jain	11EC10067	9.52
3.	PRIME MINISTER OF INDIA GOLD MEDAL	Abhisek Datta	10PH20002	9.84
4.	DR. JNAN CHANDRA GHOSH MEMORIAL GOLD MEDAL	Som Bose	10EC32011	8.64
5.	PROF. J. C. BOSE MEMORIAL GOLD MEDAL	Urmimala Dey	13PH40046	9.83

**2. ENDOWMENT GOLD MEDALS:**

Sl. No.	Name of Medal/Prize	Name of the winner	Instt. Roll No.	CGPA
1.	ANUKUL CHANDRA SARKAR MEMORIAL GOLD MEDAL	Thati Sony	11CE10051	8.78
2.	PROF. R. G. CHATTERJEE MEMORIAL GOLD MEDAL	Abhisek Datta	10PH20002	9.84

**3. SILVER MEDALS:****A. 4-YEAR B. TECH.(HONS.) COURSES:**

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Aerospace Engineering	Raj Deshmukh	11AE10022	8.49
2.	Agricultural & Food Engineering	Challoju Hemanth Aditya	11AG10014	8.41
3.	Biotechnology & Biochemical Engineering	Aneesh Agarwal	11BT10004	8.83
4.	Chemical Engineering	K Aadithya	11CH10054	9.50
5.	Civil Engineering	Thati Sony	11CE10051	8.78
6.	Computer Science & Engineering	Sikhar Patranabis	11CS10044	9.87
7.	Electrical Engineering	Sreyam Sinha	11EE10044	9.59

8.	Instrumentation Engineering	Proloy Das	11IE10034	9.49
9.	Electronics & Electrical Comm. Engineering	Sanchari Sen	11EC10069	9.67
10.	Industrial & Systems Engineering	Sayanti Pal	11IM10031	9.08
11.	Mechanical Engineering	Sumit Joshi	11ME10057	9.06
12.	Metallurgical & Materials Engineering	Pritish Kumar Jena	11MT10025	9.13
13.	Mining Engineering	Vishal Agrawal	11MI10038	8.70
14.	Ocean Engineering & Naval Architecture	Rahul Jindal	11NA10028	9.06

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

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Architecture	Tangudu Sweeya P.	10AR10044	9.26

### **C. 5-YEAR DUAL DEGREE COURSES:**

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Aerospace Engineering (AED)	Ravish Verma	10AE30015	8.96
2.	Agricultural & Food Engineering (AGD)	Mallika Prasad	10AG32005	9.09
3.	Biotechnology & Biochemical Engineering (BTD)	Tejeshwar Singh Gill	10BT30024	8.96
4.	Chemical Engineering(CHD)	Kanjakha Pal	10CH30035	9.52
5.	Civil Engineering(CED)	Saikat Dan	10CE31011	9.26
6.	Computer Science & Engineering (CSD)	Degwekar Anand Dhananjai	10CS30016	9.60
7.	Electrical Engineering (EED)	Satya Narayan Shukla	10EE35025	9.25
8.	Industrial & Systems Engineering (IMD)	Bharat Malhotra	10IM30010	8.51
9.	Mechanical Engineering (MED)	Prasann Jain	10ME31023	9.23
10.	Manufacturing Sc.& Engg (MFD)	Akshay Prakash Kangale	10MF3IM19	8.73
11.	Metallurgical & Materials Engineering(MTD)	Rishabh Singh	10MT30016	9.14
12.	Mining Engineering (MID)	Medikonda Bhargava Reddy	10MI32008	9.10

**D. M. SC. (5-YEAR) COURSES:**

Sl. No.	COURSES	Name of the winner	Instt Roll No.	CGPA
1.	Chemistry	Manisit Das	10CY20015	8.82
2.	Exploration Geophysics	Adesh Pandey	10EX20004	8.68
3.	Economics	Amrut Tripathy	10HS20006	9.36
5	Mathematics & Computing	Shevgaonkar Poorva Prashant	10MA20038	8.73
5	Physics	Abhisek Datta	10PH20002	9.84

**E. M. SC. (2-YEAR) COURSES**

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Chemistry	Paramita Pal	13CY40032	9.73
2.	Geology	Asmita Maitra	13GG40003	9.52
3.	Mathematics	Chayanika Rout	13MA40007	9.36
4.	Physics	Urmimala Dey	13PH40046	9.83

**4. ENDOWMENT PRIZES - (UNDER GRADUATE)**

Sl. No.	Name of Prize	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Sarat Memorial Prize	Sanchari Sen	11EC10069	9.67	500.00
2.	Suhasini Devi Memorial Prize	Mallika Saharia	11CH10055	9.03	500.00
3.	P. K Bhattacharya Memorial Prize	Jointly : Adesh Pandey Kaushik Mitra	10EX20004 10GG20014	8.68 8.33	250.00 250.00
4.	Sachinandan Basak Memorial Prize	Prabhat Agarwal	13CS10060	9.88	500.00
5.	Amlan Sen Memorial Prize	Sumit Joshi	11ME10057	9.06	1,000.00
6.	Swapan Kumar Saha Memorial Prize	Sanchari Sen	11EC10069	9.67	1,000.00
7.	Medury Bhanumurthy Memorial Prize	Rishav Jain	11EC10067	9.52	350.00
8.	H.N. Bose Memorial Prize	Abhisek Datta	10PH20002	9.84	3,000.00

9.	Sharmila Bose Memorial Prize	Shevgaonkar Poorva Prashant	10MA20038	8.73	3,000.00
10.	Bigyan Sinha Memorial Prize	Sanchari Sen	11EC10069	9.67	1,000.00
11.	Usha Martin Award	Pritish Kumar Jena	11MT10025	9.13	1,000.00
12.	Systems Society Award	Pragya Sharma	11EE10059	9.34	2500.00
13.	Prof.K.L.Chopra Award	Jointly : Pronay Roy Adesh Pandey	13CY40033 10EX20004	9.09 8.68	500.00 500.00
14.	Charubala Devi Memorial Prize	Biswajit Paria	12CS30009	9.72	1000.00
15.	Gouri Basak Design Award	Kuppa Gowri Sankar	11AR10014	8.61	1,000.00
16.	Prof. Prabodh Chandra Sanyal Award	Mohit Khetpal	10MA20030	8.43	1,000.00
17.	B. L. Nagpal Memorial Prize	Arya Prakash Padhi	12CE10008	9.20	2,000.00
18.	Umesh Kumar Bhatia Sports Prize	Ambati Satya Prakash	11IE10003	7.23	1000.00
19.	Pradeep Kumar Chakraborty Award	Arghya Patra	12MT30024	9.37	1,000.00
20.	G. B. Mitra Award	Abhisek Datta	10PH20002	9.84	1,000.00
21.	Bhartiya Cutler Hammer Prize	Sohail Ahasan	12EE10046	9.52	3,000.00
22.	R. M. Lalwani Prize	Biswajit Paria	12CS30009	9.72	1000.00
23.	H.P.Bhadury Memorial Prize	Rishav Roy	12ME10048	9.63	1,500.00
24.	John Von Neuman Award	Biswajit Paria	12CS30009	9.72	2,500.00
25.	Prof. S. K. Nandi Memorial Prize	Pujari Srinivasa Rao	12CH10036	9.44	500.00
26.	International Symposium (Microwave & Communica 1981 Prize	Vardaan Pahuja	12EC10067	9.64	3,000.00
27.	Class Of 1970 Alumni (US) Association Prize	Saurav Maji	13EC10056	9.93	2,500.00
28.	Technology Alumni Association (Delhi Chapter) Award	Kushagra Aggarwal	14CS30013	9.87	1,500.00
29.	IIT Kharagpur Alumni (California Chapter) Award	Saurav Maji	13EC10056	9.93	3,000.00
30.	Ram Gopal Kabre Memorial Prize	K.Vignesh	13AR10018	8.99	1,000.00

31.	Prof. S. P. Sengupta Memorial Prize	Ravi Jain	11CH10059	9.15	2,500.00
32.	Smt. Ava Sanyal Memorial Prize	Arghya Patra	12MT30024	9.37	2,500.00
33.	Prof. B.N. Avasthi Memorial Award For Sports	Siraj Modiwala Aishwarya	13ME10054 13CS10004	7.92 7.58	2,500.00 2,500.00
34.	Prof. Sunil Kanti Sen Memorial Award	Aditya Paul	14MF10001	8.76	4,000.00
35.	Prof. Sudhir Ranjan Sengupta Memorial Prize	Rajeev Choudhary	11CE31013	9.14	2,000.00
36.	Best B.Tech. Project Thesis Award By Mr. Mitrajit Mukhopadhyay	1 <sup>st</sup> -K.Aadithya 2 <sup>nd</sup> -Shubham Baranwal 3 <sup>rd</sup> -Partha Dutta	11CH10054 11CH10043 11CH10032	9.50 8.62 9.01	25,000.00 15,000.00 10,000.00
37.	A. A. Hakim Memorial Endowment Prize	Mallika Prasad	10AG32005	9.09	2,500.00
38.	Keshab K Parhi Endowment Prize	Aakash Anuj	10CS30043	9.40	15,000.00
39.	Nilanjan Ganguly Memorial Award For E&E.C.E. Deptt	Sanghamitra Dutta	11EC10050	9.48	10,000.00
40.	Nilanjan Ganguly Memorial Award For Physics Deptt	Abhisek Datta	10PH20002	9.84	10,000.00
41.	Kedar Nath Singh Memorial Prize	Abhisek Datta	10PH20002	9.84	6,400.00
42.	Dwaraka Nath Singh Memorial Prize	Prasann Jain	10ME31023	9.23	6,400.00
43.	Jugal Kishore Singh Memorial Prize	Sumit Joshi	11ME10057	9.06	6,400.00
44.	Rajender Kumar Khanna Memorial Award	Sreyam Sinha	11EE10044	9.59	10,000.00
45.	Ramneek Sodhi Memorial Award	Arijit Mitra	11MT3EP17	9.36	10,000.00
46.	Sushil Kumar Chowdhury Memorial Award	Raj Deshmukh	11AE10022	8.49	7,000.00
47.	Ashim Ranjan Guha Memorial Award	Challoju Hemanth Aditya	11AG10014	8.41	7,000.00
48.	TKT Srikrishnan Endowment Prize	Ashish Daga	11ME32006	9.46	20,000.00
49.	Prof. J.P.Ghose Memorial Award	Shakkir T	12NA30019	9.08	10,000.00
50.	Sikharini Nag Memorial Award	Debajyoti Chakraborty Kaustav Ghosh	10ME32016 11ME10027	8.69 8.36	20,000.00 20,000.00
51.	Sikharini Nag Memorial Award for Girl Student	Megha Jhunjunwala	12CS10061	9.72	20,000.00
52.	Prof. D.V.S.Murthy Merit Award	Proloy Das	11IE10034	9.49	10,000.00

## 5. J. C. GHOSH MEMORIAL PRIZE

	Aerospace Engineering	Bajrang Lal Sharma	12AE30003	9.38	2,000.00
1.	Biotechnology & Biochemical Engineering	Kritarth Jha	12BT10015	8.67	2,000.00
2.	Chemical Engineering	Pujari Srinivasa Rao	12CH10036	9.44	2,000.00
3.	Civil Engineering	Arya Prakash Padhi	12CE10008	9.20	2,000.00
4.	Computer Science & Engineering	Biswajit Paria	12CS30009	9.72	2,000.00
5.	Electrical Engineering	Sohail Ahasan	12EE10046	9.52	2,000.00
6.	Instrumentation Engineering	Bodepu Lakshmi Lavanya	12IE10008	9.05	2,000.00
7.	Electronics & Elect. Commu. Engineering	Vardaan Pahuja	12EC10067	9.64	2,000.00
8.	Mechanical Engineering	Rishav Roy	12ME10048	9.63	2,000.00
9.	Manufacturing Science & Engineering	Apurv Shukla	12MF10003	9.14	2,000.00
10.	Metallurgical & Materials Engineering	Arghya Patra	12MT30024	9.37	2,000.00
11.	Mining Engineering	Kumar Shwetank	12MI31011	8.79	2,000.00
12.	Ocean Engineering & Naval Architecture	Shakkir T	12NA30019	9.08	2,000.00
13.	Architecture & Regional Planning	Kuppu Sundara Karthikeyan	12AR10026	8.63	2,000.00
14.	Chemistry	Sayak Subhra Panda	11CY20026	9.20	2,000.00
15.	Applied Geology	Achyut Mishra	11GG20004	8.87	2,000.00
16.	Exploration Geophysics	Pushkar Mondal	11EX20025	9.21	2,000.00
17.	Mathematics & Computing	B Hari Sri Sai Charan Reddy	11MA20015	8.98	2,000.00
18.	Physics	Koushik Chatterjee	11PH20013	9.02	2,000.00
19.	Economics (HS)	Chandra Mouli Halder	11HS20008	9.10	2,000.00

## 6. BEST PROJECT AWARD:

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

Sl. No.	Department	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Aerospace Engineering	Rishita Das	11AE30024	9.41	1,000.00
2.	Agricultural & Food Engineering	Bhavya B	11AG32018	7.33	1,000.00
3	Biotechnology & Biochemical Engineering	Madhur Parashar	11BT30027	9.06	1,000.00
4	Chemical Engineering	K.Aadithya	11CH10054	9.50	1,000.00
5	Civil Engineering	Mane Soham Manohar	11CE31011	8.45	1,000.00
6	Computer Science & Engineering	Sikhar Patranabis	11CS10044	9.87	1,000.00
7	Electrical Engineering	Akshay Singh	11EE33003	9.45	1,000.00
8	Instrumentation Engineering	Proloy Das	11IE10034	9.49	1,000.00
9	Industrial And Systems Engineering	Kondapaneni Karthik	11IM10010	8.12	1,000.00
10	Electronics & Elect. Comm. Engineering	Sanghamitra Dutta	11EC10050	9.48	1,000.00
11	Manufacturing Science & Engineering	Arpit Kumar Agrawal	11MF3IM03	8.38	1,000.00
11	Mechanical Engineering	Ashish Daga	11ME32006	9.46	1,000.00
12	Metallurgical & Materials Engineering	Arijit Mitra	11MT3EP17	9.36	1,000.00
13	Ocean Engineering & Naval Architecture	G.Akshay Deepak	11NA30007	8.57	1,000.00

### B. 5-YEAR B. ARCH. (HONS.) COURSE:

Sl. No.	Name of Deptt.	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Architecture & Regional Planning	T. Sweeya Panduranganadharao	10AR10044	9.26	1,000.00

**C. 5-YEAR DUAL DEGREE COURSES:**

Sl. No.	Name of Deptt.	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Aerospace Engineering (AED)	Tanul	10AE30019	8.65	1,000.00
2.	Agricultural & Food Engineering (AGD)	Mallika Prasad	10AG32005	9.09	1,000.00
3.	Biotechnology & Biochemical Engineering (BTD)	Tejeshwar Singh Gill	10BT30024	8.96	1,000.00
4.	Chemical Engineering (CHD)	Kumbhum Abhilash Reddy	10CH30032	8.37	1,000.00
5.	Civil Engineering (CED)	Ashutosh Kedia	10CE33003	9.09	1,000.00
6.	Computer Science & Engineering (CSD)	Aakash Anuj	10CS30043	9.40	1,000.00
7.	Electrical Engineering (EED)	Satya Narayan Shukla	10EE35025	9.25	1,000.00
8.	Electronics & Elect. Commu. Engineering (ECD)	Aditya Agarwal	10EC32002	8.71	1,000.00
9.	Industrial & Systems Engineering (IMD)	Rahul Koshal	10IM30022	7.63	1,000.00
10.	Mechanical Engineering (MED)	Sai Sidhardh	10ME33002	8.98	1,000.00
11.	Manufacturing Science & Engineering (MFD)	Akshay Prakash Kangale	10MF3IM19	8.73	1,000.00
12.	Metallurgical & Materials Engineering (MTD)	Khanna Sumeet Rajesh	10MT30030	8.56	1,000.00
13.	Mining Engineering (MID)	Sourav	10MI31016	8.97	1,000.00
14.	Ocean Engineering & Naval Architecture (NAD)	Ankit	10NA30005	8.50	1,000.00



**D. 5-YEAR M. SC. COURSES:**

Sl. No.	Name of Deptt.	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Chemistry	Sahil Chhabra	10CY20025	8.66	1,000.00
2.	Exploration Geophysics	Adesh Pandey	10EX20004	8.68	1,000.00
3.	Applied Geology	Kaushik Mitra	10GG20014	8.33	1,000.00
4.	Economics	Neelotpal Sahu	10HS20026	8.64	1,000.00
5.	Mathematics & Computing	Mohit Khetpal	10MA20030	8.43	1,000.00
6.	Physics	Dipankar Roy	10PH20011	8.25	1,000.00

**E. 2-YEAR M. SC. COURSES:**

Sl. No.	Name of Deptt.	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Chemistry	Nandini Kundu	13CY40027	9.49	1,000.00
2.	Geology	Bidisha Som	13GG40006	8.64	1,000.00
3.	Mathematics	Arjun Paul	13MA40006	8.53	1,000.00
4.	Physics	Anuj Pratim Lara	13PH40007	7.50	1,000.00



ACADEMIC (UG) SECTION  
INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

No. IIT/Acad(UG)/Prizes & Medals/61/2015

Date : 27<sup>th</sup> July 2015

**ADDENDUM**

**Ref : IIT/Acad(UG)/Prizes & Medals/61/2015 dated 22<sup>nd</sup> July 2015**

In continuation to earlier Office Order under reference cited above, one student's name of Manufacturing Science & Engineering in Page No. 7 under the heading "Best Project Award" will be added as follows :

**6. BEST PROJECT AWARD :**

**A. 4-YEAR B.TECH(HONS) COURSES :**

Sl.No.	Department	Name of the Winner	Instt. Roll No	CGPA	Amount Rs.
10.A	Manufacturing Science & Engineering	Arpit Kumar Agrawal	11MF3IM03	8.38	1,000.00

All other entries remain unchanged.

Assistant Registrar (UGS)

To

The Deputy Registrar (F& A)

IIT, Kharagpur

Copy to : 1. Dean (UGS)

2. Head, Mech. Engg. Deptt. – with the request to kindly bring it to the notice of

Arpit Kumar Agrawal, 11MF3IM03

## Table : A-7

### UG STUDENTS AWARDED SCHOLARSHIP BY EXTERNAL AGENCIEIS During the Year 2014-15 (Government or Private)

Sl. No.	Awarding Organization	No. of Recipients
1	National Council of Educational Research & Training, Sri Aurobinda Marg, New Delhi-16	
2	INSPIRE Scholarship awarded by Department of Science & Technology, Govt. of India, New Delhi to the students of 5-Yr. Int. M.Sc.Course(Science stream only) ( Fresh(1st Year): 78 + Renewal : 442 (from 2nd Yr, to 5th Yr.)	517
3	Rajarshee Shahu Maharah Merit Scholarship, Director of Social Welfare, Maharashtra State, Pune.	6
4	CSR- Balmer Lawrie Scholarship under CSR Initiative of Balmer Lawrie & Co. Ltd. Kolkata For SC/ST /PC students.	10
5	SAIL Scholarship being awarded by Steel Authority of India Ltd. through Vishakhapatnam Steel Plant 06 Nos. + 01 through Rourkela Steel Plant	7
6	Pandit Jawharlal Nehru Science & Technology Scholarship Scheme of	8
7	Aditya Birla Scholarship, Aaditya Birla Group, Aditya Birla Management Corporation, Mumbai ( 1 No. Fresh + 3 Nos. Renewal)	4
8	Jagadish Chandra Bose National Talent Search, Calcutta (JBNSTS) (16 Nos. Fresh - 1st Year + 21 Nos. Renewal from 2nd year onwards)	21
9	OPJEM Scholarship being awarded by Zindal Trust , New Delhi	4
10	Indian Oil Corporation Ltd., Delhi	3
11	BOEING Scholarship to the students of Aero Space Engg. Department from the ongoing Research Project "Boeing University Relations"(BUR) sponsored by Boeing Company, U.S.A	
12	Scholarship under Scheme (Trust Fund) for Differently Abled Students being awarded by National Handicapped Finance & Development Corporation, Faridabad.	1
13	KVPY Scholarship, IISc, Bangalore	26
14	FAEA Scholarship to BPL Cat. SC/ST students being awarded by Foundation for Academic Excellence & Access, New Delhi.	17
15	Post Matric Scholarship to SC/ST students , awarded through different District Welfare Officers in A.P. State Govt. of Anhdra Pradesh	
16	Directorate of Technical Education, Chattisgarh	
17	INLAKS Scholarship being awarded by INLAKS Foundations, New Delhi	1
18	ST Scholarship awarded by Sinapore Technologies Eng.. Ltd., to students of Computer Science Engg. and O.E. & Naval. Arch.	9

19	Joint. M.Sc. Ph. D Scholarship being awarded by this Institute to the students admitted to this Programme( 2- Year M..Sc.) Fresh 1 <sup>st</sup> Year: 94 Nos. + Renewal 2 <sup>nd</sup> Year: 80 Nos.	178
20	PG Indira Gandhi Scholarship for Single Girl Child being awarded by UGC, New Delhi to the students of Joint. M.Sc. Ph. D programme ( 2-Year M.Sc.)	3
21	Post-Matric Scholarship, Assam	1
	<b>Total =</b>	<b>816</b>

**Table A-8****STUDENTS FROM FOREIGN COUNTRIES ON ROLL OF UNDERGRADUATE COURSES,  
CLASS WISE, 2014 – 2015**

Sl.No.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
<b>(A) B.Tech. 4-Year</b>							
1	Aerospace Engg.	-	-	-	-	-	-
2	Agri. & Food Engg.	-	-	-	-	-	-
3	Biotech. & Bioch. Engg.	-	-	-	-	-	-
4	Chemical Engg.	-	-	-	-	-	-
5	Civil Engg.	-	-	-	-	-	-
6	Computer Sc. & Engg.	1	-	-	1	-	2
7	Electrical Engg.	-	-	-	-	-	-
8	Electronics & ECE	-	-	-	-	-	-
9	Energy Engg.	-	-	-	-	-	-
10	Industrial Engg.	-	-	-	-	-	-
11	Instrumentation Engg.	-	-	-	-	-	-
12	Manuf. Sc. & Engg.	-	1	-	-	-	1
13	Mechanical Engg.	-	-	-	-	-	-
14	Met. & Mat. Engg.	-	-	-	-	-	-
15	Mining Engg.	-	-	-	-	-	-
16	Ocean Engg. & N.A.	-	-	-	-	-	-
<b>(B) B.Arch. 5-Year</b>							
	Architecture	-	-	-	-	-	-
<b>(C) M.Sc. Integrated 5-Year</b>							
1	Applied Geology	-	-	-	-	-	-
2	Economics	-	-	-	1	-	1

3	Expl. Geophysics	-	-	-	-	-	-
4	Industrial Chemistry	-	-	-	-	-	-
5	Maths. & Computing	-	-	-	-	-	-
6	Physics	-	-	-	-	-	-
7	Statistics & Informatics	-	-	-	-	-	-
<b>(D) M.Sc. 2-Year</b>							
1	Chemistry	-	-	-	-	-	-
2	Geophysics	-	-	-	-	-	-
3	Geological Sciences	-	-	-	-	-	-
4	Mathematics	-	-	-	-	-	-
5	Physics	-	-	-	-	-	-
6	Statistics & Informatics	-	-	-	-	-	-
<b>(E) Dual Degree 5-Year</b>							
1	Aerospace Engg.	-	-	-	-	-	-
2	Ag. & F. E../ Water Res. Dev. & Manag.	-	1	-	-	-	1
3	Biotech. & Bioch. Engg.	1	-	-	-	-	1
4	Chemical Engg.	-	-	-	-	-	-
5	Civil Engg./Struct. Engg.	-	-	-	-	-	-
6	Computer Sc. & Engg.	-	-	-	-	2	2
7	Electrical Engg./Instrumentation	-	-	-	--	-	-
8	E & ECE/Automation & Comp. Vision	-	--	-	-	-	-
9	Industrial Engg./IEM	-	--	-	-	-	-
10	Manuf. Sc.& Engg./IEM	-	-	-	-	-	-
11	M.E./M.S. Engg.	--	-	-	-	-	-

12	M.E./Thermal, Energy & Environ. Engg.	-	-	-	-	-	-
13	Met. & Mat. Engg./ Metallurgical Engg.	-	--	-	-	-	-
14	Mining Engineering	-	-	-	-	-	-
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines	-	-	--	-	-	-
16	Ocean Engg. & N.A.	-	-	-	-	-	-
<b>Total:</b>		2	2	-	2	2	8

**Table A - 9**  
**STATEMENT OF RESULTS (UNDERGRADUATE) 2014-2015**

S.No.	Course	1st yr.		2nd yr.		3rd yr.		4th yr.		5th yr.		
		P	I	P	I	P	I	P	I	P	I	
<b>Total</b>												
<b>(A) B.Tech</b>												
1	AEROSPACE ENGINEERING	27	5	24	6	12	3	14	10	0	0	101
2	AGRICULTURAL AND FOOD ENGINEERING	17	9	17	12	21	6	23	5	0	0	110
3	BIOTECHNOLOGY	15	6	12	9	6	5	14	2	0	0	69
4	CHEMICAL ENGINEERING	47	4	41	7	42	9	52	4	0	0	206
5	CIVIL ENGINEERING	51	4	40	20	26	18	36	6	0	0	201
6	COMPUTER SCIENCE & ENGINEERING	56	7	51	10	59	9	54	6	0	0	252
7	ELECTRICAL ENGINEERING	58	4	45	16	48	11	49	15	0	0	246
8	ELECTRONICS & ELECTRICAL COMMUNICATION ENGG.	58	10	59	11	56	4	55	14	0	0	267
9	INDUSTRIAL AND SYSTEMS ENGINEERING	23	4	19	5	24	5	20	0	0	0	100
10	INSTRUMENTATION ENGINEERING	27	5	25	10	27	4	33	4	0	0	135
11	MANUFACTURING ENGINEERING	23	2	19	7	18	4	21	5	0	0	99
12	MECHANICAL ENGINEERING	65	9	62	12	52	16	55	10	0	0	281
13	METALLURGICAL & MATERIALS ENGINEERING	34	3	31	7	29	4	29	4	0	0	141
14	MINING ENGINEERING	26	7	27	9	22	13	23	6	0	0	133
15	OCEAN ENGG AND NAVAL ARCHITECTURE	19	4	19	9	20	6	25	3	0	0	105
<b>Total(A)</b>		<b>546</b>	<b>83</b>	<b>491</b>	<b>150</b>	<b>462</b>	<b>117</b>	<b>503</b>	<b>94</b>	<b>0</b>	<b>0</b>	<b>2446</b>
<b>(B) B.Arch</b>												
1	ARCHITECTURE AND REGIONAL PLANNING	34	2	30	11	36	10	26	17	42	4	212
<b>Total(B)</b>		<b>34</b>	<b>2</b>	<b>30</b>	<b>11</b>	<b>36</b>	<b>10</b>	<b>26</b>	<b>17</b>	<b>42</b>	<b>4</b>	<b>212</b>
<b>(C) M.Sc(2yr)</b>												
1	CHEMISTRY	45	0	44	0	0	0	0	0	0	0	89
2	GEOLOGY & GEOPHYSICS	28	0	30	0	0	0	0	0	0	0	58
3	MATHEMATICS	29	0	27	0	0	0	0	0	0	0	56
4	PHYSICS	38	2	41	1	0	0	0	0	0	0	82
<b>Total(C)</b>		<b>140</b>	<b>2</b>	<b>142</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>285</b>
<b>(D) M.Sc(5yr)</b>												
1	CHEMISTRY	12	3	11	7	22	2	21	0	16	0	94
2	EXPLORATION GEOPHYSICS	26	3	24	2	27	3	28	5	23	0	141
3	GEOLOGY & GEOPHYSICS	17	5	16	7	23	9	25	5	21	3	131
4	HUMANITIES & SOCIAL SCIENCES	33	5	31	7	38	10	30	5	30	0	189
5	MATHEMATICS	50	6	48	5	44	10	44	8	45	3	263
6	PHYSICS	22	7	15	9	21	13	19	6	21	1	134
7	STATISTICS AND INFORMATICS	0	0	0	0	0	0	0	0	0	1	1
<b>Total(D)</b>		<b>160</b>	<b>29</b>	<b>145</b>	<b>37</b>	<b>175</b>	<b>47</b>	<b>167</b>	<b>29</b>	<b>156</b>	<b>8</b>	<b>953</b>
<b>(E) Dual Degree</b>												
1	AEROSPACE ENGINEERING	16	3	15	4	24	10	28	1	25	3	129
2	AGRICULTURAL AND FOOD ENGINEERING	23	1	18	10	22	11	27	14	26	3	155
3	BIOTECHNOLOGY	20	2	14	7	30	7	24	2	25	1	132
4	CHEMICAL ENGINEERING	25	6	24	7	26	5	31	5	37	3	169
5	CIVIL ENGINEERING	20	2	14	6	27	5	27	8	24	6	139
6	COMPUTER SCIENCE & ENGINEERING	42	4	39	7	41	7	40	7	43	4	234
7	ELECTRICAL ENGINEERING	20	4	20	4	21	7	28	3	34	4	145

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**Table A-10****STUDENTS ON ROLL (Department wise)– UNDERGRADUATE (B.TECH/B.ARCH./M.SC./DUAL DEGREE) COURSES  
AT THE BEGINNING OF THE SESSION 2014 – 2015**

Sl. No.	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		F	M	F	M	F	M	F	M	F	M	
<b>(A) B.Tech. 4-Year</b>												
1	Aerospace Engg.	1	34	3	26	-	30	-	27			<b>121</b>
2	Agri. & Food Engg.	3	29	5	24	4	28	8	23			<b>124</b>
3	Biotech. & Bioch. Engg.	8	16	4	17	4	20	3	15			<b>87</b>
4	Chemical Engg.	4	49	4	44	9	46	9	48			<b>213</b>
5	Civil Engg.	1	60	8	53	4	52	3	39			<b>220</b>
6	Computer Sc. & Engg.	3	52	4	58	6	63	3	60			<b>249</b>
7	Electrical Engg.	10	77	12	86	9	88	9	94			<b>385</b>
8	Electronics & ECE	7	57	5	65	9	57	10	65			<b>275</b>
9	Industrial Engg.	4	26	1	24	1	27	3	18			<b>104</b>
10	Mechanical Engg.	3	92	3	97	4	97	5	94			<b>395</b>
11	Met. & Mat Engg.	5	40	4	34	10	31	3	34			<b>161</b>
12	Mining Engg.	-	37	1	37	-	40	-	30			<b>145</b>
13	Ocean Engg. & N.A.	1	30	1	27	4	27	-	31			<b>121</b>
<b>TOTAL (A):</b>		<b>50</b>	<b>599</b>	<b>55</b>	<b>592</b>	<b>64</b>	<b>606</b>	<b>56</b>	<b>578</b>			<b>2600</b>
<b>(B) B.Arch. 5-Year</b>												
	Architecture	6	33	14	28	9	38	7	36	11	36	<b>218</b>
<b>TOTAL (B):</b>		<b>6</b>	<b>33</b>	<b>14</b>	<b>28</b>	<b>9</b>	<b>38</b>	<b>7</b>	<b>36</b>	<b>11</b>	<b>36</b>	<b>218</b>
<b>(C) M.Sc. Integrated 5-Year</b>												
1	Chemistry	4	14	5	13	8	16	6	15	-	16	<b>97</b>

2	Geology	6	50	2	49	5	57	3	61	6	42	<b>281</b>
3	Humanities & Social Sc	2	38	11	27	3	45	9	26	9	21	<b>191</b>
4	Maths.	2	49	2	51	9	45	10	45	3	47	<b>263</b>
5	Physics	6	24	1	25	-	37	3	22	2	21	<b>141</b>
<b>TOTAL (C):</b>		<b>20</b>	<b>175</b>	<b>21</b>	<b>165</b>	<b>25</b>	<b>200</b>	<b>31</b>	<b>169</b>	<b>20</b>	<b>147</b>	<b>973</b>
<b>(D) M.Sc. 2-Year</b>												
1	Chemistry	11	35	9	36							<b>91</b>
2	GG	12	16	9	21							<b>58</b>
3	Mathematics	11	19	7	22							<b>59</b>
4	Physics	13	31	10	33							<b>87</b>
<b>TOTAL (D):</b>		<b>47</b>	<b>101</b>	<b>35</b>	<b>112</b>							<b>295</b>
<b>(E) Dual Degree 5-Year</b>												
1	Aerospace Engg.	1	18	-	19	2	18	5	24	-	28	<b>115</b>
2	Ag. & F. E..	4	18	5	24	2	30	6	33	7	23	<b>152</b>
3	Biotech. & Bioch. Engg.	6	18	5	18	9	15	10	15	5	21	<b>122</b>
4	Chemical Engg.	1	27	4	27	1	27	2	34	3	38	<b>164</b>
5	Civil Engg./Struct. Engg.19	4	18	1	19	4	17	1	34	5	26	<b>129</b>
6	Computer Sc. & Engg./ Comp. & Information Technology	2	39	2	43	2	49	3	43	3	46	<b>232</b>
7	Electrical Engg./ Instru. Engg.	2	20	2	22	3	24	1	30	4	34	<b>142</b>
8	E & ECE	8	32	6	40	9	38	7	34	10	51	<b>235</b>
9	Industrial and System Engg./IEM	5	30	1	35	5	31	3	34	1	31	<b>176</b>
10	Mechanical Engg.	1	64	1	64	4	65	2	79	1	94	<b>375</b>

11	Met. & Mat. Engg./ Metallurgical Engg.	3	18	2	17	2	19	1	24	2	25	<b>113</b>
12	Mining Engg.	-	35	-	35	1	34	-	42	-	38	<b>185</b>
13	Ocean Engg. & N.A.	2	19	3	18	-	20	2	28	-	26	<b>118</b>
<b>Total (E):</b>		<b>39</b>	<b>356</b>	<b>32</b>	<b>381</b>	<b>44</b>	<b>387</b>	<b>43</b>	<b>454</b>	<b>41</b>	<b>481</b>	<b>2258</b>
<b>TOTAL (A+B+C+D+E)</b>		<b>162</b>	<b>1264</b>	<b>157</b>	<b>1278</b>	<b>142</b>	<b>1231</b>	<b>137</b>	<b>1237</b>	<b>72</b>	<b>664</b>	<b>6344</b>

Source : ERP

**TABLE B-1 ADMISSION TO POSTGRADUATE COURSES IN 2014-2015**

Dept./ Centre/ School	Specialisation	Code	Sanc- tioned	Admitted	Regular	SP	QIP	DEF	GE	OBC	SC	ST	PD	MALE	FEMALE
AE	AEROSPACE ENGINEERING	AE	24	25	21	4	0	0	15	6	3	1	0	22	3
AG	FARM MACHINERY AND POWER	AG1	19	19	19	0	0	0	7	8	3	1	1	19	0
AG	LAND AND WATER RESOURCES ENGINEERING	AG2	18	17	17	0	0	0	8	5	3	1	1	12	5
AG	FOOD PROCESS ENGINEERING	AG3	30	28	28	0	0	0	13	10	4	1	1	18	10
AG	AGRICULTURAL BIOTECHNOLOGY	AG4	20	12	12	0	0	0	5	6	1	0	0	6	6
AG	AQUACULTURAL ENGINEERING	AG5	18	8	8	0	0	0	4	2	2	0	0	7	1
AG	AGRICULTURAL SYSTEMS AND MANAGEMENT	AG6	19	13	13	0	0	0	8	2	2	1	0	9	4
AR	CITY PLANNING	AR	42	40	38	0	1	1	20	11	7	2	0	25	15
AT	EMBEDDED CONTROLS AND SOFTWARE	AT	12	2	2	0	0	0	1	0	0	1	0	2	0
BT	BIOTECHNOLOGY AND BIOCHEMICAL ENGINEERING	BT	24	15	15	0	0	0	9	2	3	1	1	9	6
CE	HYDRAULIC AND WATER RESOURCES ENGINEERING	CE1	20	7	7	0	0	0	3	1	2	1	1	7	0
CE	TRANSPORTATION ENGINEERING	CE2	20	20	19	0	0	1	10	6	2	2	1	16	4
CE	ENVIRONMENTAL ENGINEERING & MANAGEMENT	CE3	18	12	10	2	0	0	6	4	2	0	0	11	1
CE	GEOTECHNICAL ENGINEERING	CE4	18	8	8	0	0	0	3	3	1	1	0	6	2
CE	STRUCTURAL ENGINEERING	CE5	20	20	18	1	0	1	11	4	3	2	1	19	1
CH	CHEMICAL ENGINEERING	CH	75	56	55	0	0	1	33	16	6	1	2	49	7
CL	EARTH SYSTEM SCIENCE AND TECHNOLOGY	CL	31	14	14	0	0	0	9	2	3	0	1	10	4
CR	CRYOGENIC ENGINEERING	CR	21	8	7	1	0	0	4	2	2	0	1	8	0
CS	COMPUTER SCIENCE AND ENGINEERING	CS	37	42	35	2	0	5	25	10	6	1	0	33	9
EC	MICROELECTRONICS & VLSI DESIGN	EC2	29	31	28	0	0	2	17	7	3	3	1	29	2
EC	RF AND MICROWAVE ENGINEERING	EC3	28	17	15	0	1	1	8	7	1	1	0	15	2
EC	TELECOMMUNICATION SYSTEMS ENGINEERING	EC4	28	33	29	0	0	4	18	9	4	2	1	29	4
EC	VISUAL INFORMATION AND EMBEDDED SYSTEMS ENGG.	EC5	28	26	25	1	0	0	12	8	4	2	1	23	3
EE	MACHINE DRIVES AND POWER ELECTRONICS	EE1	18	15	13	1	0	0	7	5	2	0	1	13	2
EE	CONTROL SYSTEM ENGINEERING	EE2	18	14	12	1	0	1	5	5	3	1	0	13	1
EE	POWER AND ENERGY SYSTEMS	EE3	18	10	9	0	1	0	5	2	3	0	0	10	0
EE	INSTRUMENTATION AND SIGNAL PROCESSING	EE4	18	13	10	0	0	3	6	4	3	0	1	12	1
ET	MULTIMEDIA INFORMATION PROCESSING	ET	15	2	2	0	0	0	0	1	1	0	0	2	0
GG	EXPLORATION GEOSCIENCES	GG	24	11	11	0	0	0	3	4	2	2	0	11	0
ID	INFRASTRUCTURE DESIGN AND MANAGEMENT	ID	31	11	11	0	0	0	6	3	1	1	1	9	2
IM	INDUSTRIAL ENGINEERING AND MANAGEMENT	IM	25	11	7	2	0	2	9	1	1	0	1	9	2
IT	INFORMATION TECHNOLOGY	IT	30	22	18	0	0	4	10	7	5	0	0	20	2
MA	COMPUTER SCIENCE AND DATA PROCESSING	MA	34	12	12	0	0	0	6	4	1	1	0	11	1
ME	MANUFACTURING SCIENCE AND ENGINEERING	ME1	26	23	21	1	0	1	11	6	3	3	1	22	1

ME	THERMAL SCIENCE AND ENGINEERING	ME2	33	30	26	1	1	2	17	8	4	1	1	30	0
ME	MECHANICAL SYSTEMS DESIGN	ME3	44	46	37	2	2	5	22	16	5	3	0	45	1
MI	MINING ENGINEERING	MI	22	14	14	0	0	0	5	5	3	1	0	14	0
MS	MATERIALS SCIENCE AND ENGINEERING	MS	29	14	12	0	0	2	9	1	3	1	0	11	3
MT	METALLURGICAL AND MATERIALS ENGINEERING	MT	54	34	34	0	0	0	13	12	6	3	1	30	4
NA	OCEAN ENGINEERING AND NAVAL ARCHITECTURE	NA	20	20	9	8	0	3	13	5	2	0	0	19	1
PH	SOLID STATE TECHNOLOGY	PH	25	12	12	0	0	0	4	4	4	0	0	11	1
RE	RELIABILITY ENGINEERING	RE	20	14	8	0	0	6	7	1	4	2	0	13	1
RT	RUBBER TECHNOLOGY	RT	24	17	16	1	0	0	11	4	2	0	0	17	0
MM	MEDICAL IMAGING AND INFORMATICS	SM	15	11	11	0	0	0	7	2	2	0	0	6	5
WM	WATER ENGINEERING AND MANAGEMENT	WM	12	1	1	0	0	0	0	1	0	0	0	1	0
VGSOM	BUSINESS MANAGEMENT(MBA)	MBA	160	104	0	0	0	0	57	35	12	0	1	88	16
VGSOM	EXECUTIVE MBA	EMBA	100	46	0	0	0	0	42	2	2	0	0	43	3
IP	INTELLECTUAL PROPERTY LAW(LLB)	LLB	80	40	0	0	0	0	33	5	2	0	0	29	11
MM	MEDICAL SCIENCE AND TECHNOLOGY(MMST)	MMST	15	11	0	0	0	0	9	0	1	1	0	11	0
HS	HUMAN RESOURCES MANAGEMENT(MHRM)	MHRM	30	15	0	0	0	0	8	4	2	1	0	8	7
	<b>TOTAL</b>		<b>1539</b>	<b>1,046</b>	<b>749</b>	<b>28</b>	<b>6</b>	<b>45</b>	<b>574</b>	<b>278</b>	<b>146</b>	<b>46</b>	<b>22</b>	<b>892</b>	<b>154</b>

**TABLE B-2 : POSTGRADUATE STUDENTS ON ROLL 2014-2015**

Dept./ Centre/ School	Specialisation	Code	1st Year		2nd Year		3rd Year		Total	
			Male	Female	Male	Female	Male	Female	Male	Female
AE	AEROSPACE ENGINEERING	AE	22	3	8	0	0	0	30	3
AG	FARM MACHINERY AND POWER	AG1	19	0	13	2	0	0	32	2
AG	LAND AND WATER RESOURCES ENGINEERING	AG2	12	5	10	4	0	0	22	9
AG	FOOD PROCESS ENGINEERING	AG3	19	10	17	12	0	0	36	22
AG	AGRICULTURAL BIOTECHNOLOGY	AG4	6	6	12	8	0	0	18	14
AG	AQUACULTURAL ENGINEERING	AG5	7	1	7	1	0	0	14	2
AG	AGRICULTURAL SYSTEMS AND MANAGEMENT	AG6	8	4	5	5	0	0	13	9
AT	EMBEDDED CONTROLS AND SOFTWARE	AT	0	0	5	1	0	0	5	1
BT	BIOTECHNOLOGY AND BIOCHEMICAL ENGINEERING	BT	9	6	13	10	0	0	22	16
CE	HYDRAULIC AND WATER RESOURCES ENGINEERING	CE1	7	0	7	0	0	0	14	0
CE	TRANSPORTATION ENGINEERING	CE2	16	4	10	2	0	0	26	6
CE	ENVIRONMENTAL ENGINEERING & MANAGEMENT	CE3	11	1	2	2	0	0	13	3
CE	GEOTECHNICAL ENGINEERING	CE4	5	2	10	1	0	0	15	3
CE	STRUCTURAL ENGINEERING	CE5	19	1	9	3	0	0	28	4
CH	CHEMICAL ENGINEERING	CH	48	7	45	10	0	0	93	17
CL	EARTH SYSTEM SCIENCE AND TECHNOLOGY	CL	10	4	9	1	0	0	19	5
CR	CRYOGENIC ENGINEERING	CR	8	0	5	0	0	0	13	0
CS	COMPUTER SCIENCE AND ENGINEERING	CS	33	9	30	4	0	0	63	13
EC	MICROELECTRONICS & VLSI DESIGN	EC2	28	2	21	1	0	0	49	3
EC	RF AND MICROWAVE ENGINEERING	EC3	15	2	11	3	0	0	26	5
EC	TELECOMMUNICATION SYSTEMS ENGINEERING	EC4	29	4	21	0	0	0	50	4
EC	VISUAL INFORMATION AND EMBEDDED SYSTEMS ENGG.	EC5	23	3	16	6	0	0	39	9
EE	MACHINE DRIVES AND POWER ELECTRONICS	EE1	11	2	11	0	0	0	22	2
EE	CONTROL SYSTEM ENGINEERING	EE2	12	1	7	0	0	0	19	1
EE	POWER AND ENERGY SYSTEMS	EE3	10	0	6	0	0	0	16	0
EE	INSTRUMENTATION AND SIGNAL PROCESSING	EE4	12	1	10	1	0	0	22	2
GG	EXPLORATION GEOSCIENCES	GG	11	0	0	0	0	0	11	0
ID	INFRASTRUCTURE DESIGN AND MANAGEMENT	ID	9	2	21	1	0	0	30	3
IM	INDUSTRIAL ENGINEERING AND MANAGEMENT	IM	9	2	4	1	0	0	13	3
IT	INFORMATION TECHNOLOGY	IT	20	2	6	3	0	0	26	5

MA	COMPUTER SCIENCE AND DATA PROCESSING	MA	11	1	20	0	0	0	31	1
ME	MANUFACTURING SCIENCE AND ENGINEERING	ME1	21	1	14	1	0	0	35	2
ME	THERMAL SCIENCE AND ENGINEERING	ME2	29	0	28	1	0	0	57	1
ME	MECHANICAL SYSTEMS DESIGN	ME3	45	1	33	1	0	0	78	2
MI	MINING ENGINEERING	MI	14	0	12	0	0	0	26	0
MM	MEDICAL IMAGING AND INFORMATICS	SM	6	5	0	0	0	0	6	5
MS	MATERIALS SCIENCE AND ENGINEERING	MS	11	3	4	4	0	0	15	7
MT	METALLURGICAL AND MATERIALS ENGINEERING	MT	30	4	25	6	0	0	55	10
NA	OCEAN ENGINEERING AND NAVAL ARCHITECTURE	NA	19	1	11	0	0	0	30	1
PH	SOLID STATE TECHNOLOGY	PH	10	1	0	0	0	0	10	1
RE	RELIABILITY ENGINEERING(RE )	RE	13	1	6	0	0	0	19	1
RT	RUBBER TECHNOLOGY	RT	17	0	13	2	0	0	30	2
AR	CITY PLANNING (MCP)	AR	25	15	17	15	0	0	42	30
VGOSM	BUSINESS MANAGEMENT (MBA)	MBA	89	16	51	7	0	0	140	23
VGOSM	EXECUTIVE MBA (Kolkata Campus)	EMBA	28	1	29	2	13	1	70	4
VGOSM	EXECUTIVE MBA (Bhubaneswar Campus)	EMBA	15	2	8	1	11	5	34	8
EC	ELECTRONICS AND COMMUNICATION ENGINEERING(3 YEARS)	EC8	0	1	0	0	22	8	22	9
EE	ELECTRICAL ENGINEERING(3 YEARS)	EE8	0	0	0	0	13	6	13	6
IT	INFORMATION AND COMMUNICATION TECHNOLOGY(3 YEARS)	IT8	0	0	0	0	24	4	24	4
IP	INTELLECTUAL PROPERTY LAW (LLB)	LLB	29	11	16	12	32	15	77	38
MM	MEDICAL SCIENCE AND TECHNOLOGY(MMST )	MMST	11	0	2	0	8	2	21	2
HS	HUMAN RESOURCES MANAGEMENT (MHRM)	MHRM	8	7	11	8	0	0	19	15
	<b>TOTAL</b>		<b>879</b>	<b>155</b>	<b>651</b>	<b>142</b>	<b>123</b>	<b>41</b>	<b>1653</b>	<b>338</b>

**TABLE B-3 STATEMENT OF RESULTS OF POSTGRADUATE EXAMINATION**

<b>Dept./ Centre/ School</b>	<b>Specialisation</b>	<b>Code</b>	<b>Registered</b>	<b>Successful</b>	<b>Incomplete</b>
AE	AEROSPACE ENGINEERING	AE	24	24	0
AG	FARM MACHINERY AND POWER	AG1	14	14	0
AG	LAND AND WATER RESOURCES ENGINEERING	AG2	14	14	0
AG	FOOD PROCESS ENGINEERING	AG3	25	24	1
AG	AGRICULTURAL BIOTECHNOLOGY	AG4	16	15	1
AG	AQUACULTURAL ENGINEERING	AG5	8	7	1
AG	AGRICULTURAL SYSTEMS AND MANAGEMENT	AG6	7	7	0
AR	CITY PLANNING	AR	33	32	1
AT	EMBEDDED CONTROLS AND SOFTWARE	AT	7	7	0
BT	BIOTECHNOLOGY AND BIOCHEMICAL ENGINEERING	BT	15	15	0
CE	HYDRAULIC AND WATER RESOURCES ENGINEERING	CE1	7	7	0
CE	TRANSPORTATION ENGINEERING	CE2	17	17	0
CE	ENVIRONMENTAL ENGINEERING & MANAGEMENT	CE3	5	5	0
CE	GEOTECHNICAL ENGINEERING	CE4	14	14	0
CE	STRUCTURAL ENGINEERING	CE5	17	17	0
CH	CHEMICAL ENGINEERING	CH	49	46	3
CL	EARTH SYSTEM SCIENCE AND TECHNOLOGY	CL	10	10	0
CR	CRYOGENIC ENGINEERING	CR	9	9	0
CS	COMPUTER SCIENCE AND ENGINEERING	CS	37	37	0
EC	MICROELECTRONICS & V L S I DESIGN	EC2	30	29	1
EC	RF AND MICROWAVE ENGINEERING	EC3	15	13	2
EC	TELECOMMUNICATION SYSTEMS ENGINEERING	EC4	30	28	2
EC	VISUAL INFORMATION AND EMBEDDED SYSTEMS ENGG.	EC5	22	22	0
EE	MACHINE DRIVES AND POWER ELECTRONICS	EE1	6	5	1
EE	CONTROL SYSTEM ENGINEERING	EE2	12	12	0
EE	POWER AND ENERGY SYSTEMS	EE3	16	15	1
EE	INSTRUMENTATION AND SIGNAL PROCESSING	EE4	13	11	2
ET	MEDIA AND SOUND ENGINEERING	ET	5	5	0
GG	EXPLORATION GEOSCIENCES	GG	11	11	0
ID	INFRASTRUCTURE DESIGN AND MANAGEMENT	ID	12	12	0



IM	INDUSTRIAL ENGINEERING AND MANAGEMENT	IM	11	10	1
IT	INFORMATION TECHNOLOGY	IT	17	17	0
MA	COMPUTER SCIENCE AND DATA PROCESSING	MA	20	20	0
ME	MANUFACTURING SCIENCE AND ENGINEERING	ME1	18	17	1
ME	THERMAL SCIENCE AND ENGINEERING	ME2	18	14	4
ME	MECHANICAL SYSTEMS DESIGN	ME3	32	31	1
MI	MINING ENGINEERING	MI	3	3	0
MM	MEDICAL IMAGING AND INFORMATICS	MM	5	5	0
MS	MATERIALS SCIENCE AND ENGINEERING	MS	22	22	0
MT	METALLURGICAL AND MATERIALS ENGINEERING	MT	36	36	0
NA	OCEAN ENGINEERING AND NAVAL ARCHITECTURE	NA	18	18	0
PH	SOLID STATE TECHNOLOGY	PH	12	12	0
RE	RELIABILITY ENGINEERING	RE	10	10	0
RT	RUBBER TECHNOLOGY	RT	10	10	0
WM	WATER MANAGEMENT	WM	9	9	0
VGSOM	BUSINESS MANAGEMENT(MBA)	MBA	70	70	0
VGSOM	EXECUTIVE MBA	EMBA	33	29	4
EC	ELECTRONICS AND COMMUNICATION ENGINEERING(3 YEARS)	EC8	26	13	13
EE	ELECTRICAL ENGINEERING(3 YEARS)	EE8	15	6	9
IT	INFORMATION AND COMMUNICATION TECHNOLOGY(3 YEARS)	IT8	27	10	17
HS	HUMAN RESOURCES MANAGEMENT(MHRM)	MHRM	18	18	0
IP	INTELLECTUAL PROPERTY LAW(LLB)	LLB	42	41	1
MM	MEDICAL SCIENCE AND TECHNOLOGY(MMST)	MMST	11	10	1
<b>TOTAL</b>			<b>983</b>	<b>915</b>	<b>68</b>





TABLE C-2 NUMBER OF MS STUDENTS ENROLLED DURING 2014-2015

(01.07.2014 TO 30.06.2015)

DEPT./ CENTRE/ SCHOOL	GE		OB		SC		Total
	Female	Male	Female	Male	Female	Male	
AG	1	1	0	0	0	0	2
AT	2	3	0	1	0	0	6
CL	1		0	0	0	0	1
CR	0	1	0	0	0	0	1
CS	3	4	0	0	0	1	8
EC	3	4	1	1	0	0	9
EE	1	1	0	0	0	0	2
ET	0	2	0	0	0	0	2
GS	0	1	0	0	0	0	1
HS	6	3	1	2	0	0	12
IM	0	2	0	1	0	0	3
IT	0	2	0	0	0	0	2
ME	0	1	0	0	0	0	1
MM	0	3	1	0	1	0	5
<b>Total</b>	<b>17</b>	<b>28</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>55</b>

TABLE C-2A NUMBER OF POST DOCTORAL FELLOWS AS ON 02.06.2015

DEPT	TOTAL	GE	SC	ST	OBC	MALE	FEMALE
BT	1	1	0	0	0	1	0
CS	1	1	0	0	0	1	0
CY	5	4	0	0	1	3	2
NA	2	1	0	0	1	2	0
PH	1	1	0	0	0	1	0
<b>TOTAL</b>	10	8	0	0	2	8	2

**TABLE C-3 UGC SCHOLARS ENROLLED DURING 2014-2015 (01.07.2014 TO 30.06.2015)**

DEPT/ CENTRE/ SCHOOL	GE		OB		SC		ST		Grand Total
	F	M	F	M	F	M	F	M	
<b>AG</b>	0	1	0	0	0	1	0	0	2
<b>AR</b>	0	1	0	0	0	0	0	0	1
<b>BM</b>	0	4	1	1	1	0	0	0	7
<b>BS</b>	1	0	0	0	0	0	0	0	1
<b>BT</b>	3	4	0	0	0	0	0	0	7
<b>CL</b>	0	1	0	0	0	0	0	0	1
<b>CR</b>	0	1	0	0	0	0	0	0	1
<b>CY</b>	6	26	1	6	0	4	0	0	43
<b>GG</b>	2	2	2	1	1	1	0	1	10
<b>HS</b>	4	1	0	2	1	2	0	0	10
<b>IP</b>	0	0	0	1	0	0	0	0	1
<b>MA</b>	0	4	1	0	0	1	0	0	6
<b>MI</b>	0	1	0	0	0	0	0	0	1
<b>MM</b>	1	0	0	0	2	0	0	0	3
<b>MS</b>	1	8	0	0	0	1	0	0	10
<b>PH</b>	1	5	0	4	0	0	0	0	10
<b>RD</b>	0	0	1	0	0	0	0	0	1
<b>RT</b>	0	2	0	1	0	0	0	0	3
<b>Total</b>	19	61	6	16	5	10	0	1	118

**TABLE C-4 RESEARCH SCHOLARS ON ROLL AS ON 31-05-2015**

DEPT./ CENTR E/ SCHO OL	CSIR/DBT/UGC				Employ ee		Institute				Project				QIP				Self Finance			SPON				Tot al																	
	GE		OB		SC		S T	G E	O B	GE		OB		SC		S T	GE		OB		SC	S T	GE		ST		GE		OB		S C	S T											
	F	M	F	M	F	M				M	F	M	F	M	F		M	F	M	F			M	F	M		F	M	F	M			F	M	F	M	F	M	F	M	F	M	F
AE	0	0	0	0	0	0	0	0	0	3	12	2	4	1	3	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	1	0	35	
AG	8	4		4	0	5	0	0	0	31	26	1	11	1	4	0	1	2	16	1	7	1	1		2	0	0	0	0	0	0	0	0	0	0	1	1	7		4	1	0	150
AR	0	2		0	0	0	0	0	0	15	7	2	3	4	2	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	2	0	0	0	0	0	41	
AT	3	3		1	0	1	0	0	0	13	40	2	12	1	4	0	0	8	13	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	113	
BM	0	7	1	3	2	0	0	0	0	5	15	0	3	0	3	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	6	9	1	0	0	0	59		
BS	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4		
BT	9	16	2	1	2	4	0	0	0	17	7	0	1	0	0	0	0	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70		
CE	0	1	0	0	0	0	0	0	0	16	35	3	10	2	5	1	1	2	3	0	0	0	3	0	1		3	0	0	0	3	1	0	0	0	0	8	0	0	0	0	98	
CH	0	1	0	0	0	0	0	0	0	18	37	5	6	2	8	0	0	0	3	1	0	0	1		0	1	1	0	0	0	0	0	0	0	0	3	0	0	0	0	87		
CL	1	3	0	0	0	2	0	0	0	5	7	0	2	1	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		1	0	0	28		
CR	0	0	0	0	0	0	0	0	0	4	8	1	0	0	1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14		
CS	0	5	0	0	0	0	0	1	0	10	21	1	3	0	2	0	0	2	8	0	0	0	0	0	0	0	2	0	1		0	0	0	0	0	1	2	0	0	0	59		
CY	2	0	61	1	9	1	8	0	0	14	16	2	13	5	4	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	158			
EC	0	4	0	0	0	0	0	0	0	17	62		7		3	0	1	0	5	0	1	0	0	0	0	2	5	0	0	0	2	0	0	2	0	0	6	0	0	0	0	117	
EE	0	0	0	0	0	0	0	0	0	14	48	1	11	1	3	0	1	1	5	0	1	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	3	0	0	0	0	93	
EF	0	0	0	0	0	0	0	0	0	3	2	1	2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	9		
ES	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6		
ET	0	0	0	0	0	0	0	0	0	5	4	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11		
GG	7	11	2	3	2	2	1	0	0	8	25	5	3	2	8	0	0	1	3		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84		
GS	0	0	0	0	0	0	0	0	0	2	14	0	3	0	1	0	0	0	3	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	1		1	1	0	30		
HS	4	6		1	1	3	0	0	0	18	12	1	4	0	1	1	0	0	2	1	1	0	0	0	0	0	0	0	0	0	2	0	0	8	6	0	0	1	0	73			
ID	0	0	0	0	0	0	0	0	0		5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6		
IM	0	0	0	1	0	0	0	0	0	3	16	0	5	0	0	0	0	0	2	0	1	0	0	0	0	1		0	0	0	0	0	0	0	0	8	0	0	1	0	38		





**RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31<sup>ST</sup> MARCH, 2015**

Sl.No	RECEIPTS	Current Year	Previous Year	Sl.No	PAYMENTS	Current Year	Previous Year
		(2014-2015)	(2013-2014)			(2014-2015)	(2013-2014)
I.	Opening Balance ( Bank Balances)						
	a) In Current Accounts	183974695	176074466	I.	<u>EXPENSES:</u>		
	b) In Savings Accounts	290668089	266284102		a) Establishment Expenses	2409388459	2038162772
II.	Grants Received				b) Administrative Expenses.	711341536.1	779518264
	Non-Recurring (Plan)	2200000000	2805000000	II.	Expenditure on Fixed Assets & Capital Work-in-Progress (Plan)	2780713413	3772186798
	Recurring (Non-Plan)	2602700000	2482923000				
	Multi Speciality Hospital (Plan)	0	0	III.	<u>Investments and deposits</u> <u>made :</u>		
	Diamond Jubilee Special Grant (Plan)	0	0		Out of Own Funds & Others	6465939190	8627223699
	Science park (NITT Plan)	58300000		IV.	Other Payments	737290211.5	923919724
III.	Income from Investment						
	c) Own Funds	101280092.3	158522649				
IV.	Interest Received						
	a) On Bank Deposits	12444454.5	14053057				
	b) Recoverable Advances	10692419	9659366				
V.	Academic & General Receipts	473673988.5	477963035				
VI.	Amount Borrowed/Loan refund received	89000000	12000000	V.	Closing Balance		
					a) In Current Accounts	122872550.2	183974695
VII.	Other Receipts(Refund/Reimbursement)	7497318049.7	10213174366		b) In Savings Accounts	292506428.1	290668089
	<b>TOTAL :</b>	<b>13520051788</b>	<b>16615654041</b>		<b>TOTAL :</b>	<b>13520051788</b>	<b>16615654041</b>