Annual Report

2013 - 2014

Indian Institute of Technology
Kharagpur

September 2014

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Centralised Services, Programmes and Units

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Members of the Council of Indian Institutes of Technology

1. Dr. M. Mangapati Pallam Raju, Upto 26-05-2014
   Former Hon'ble Minister of Human Resource Development

   Smt. Smriti Zubin Irani, From 27-05-2014 - Present
   Hon'ble Minister of Human Resource Development
2. Smt. Vasanthi Stanley,
   Hon'ble Member of Parliament (RajyaSabha)
3. Shri Janardhana Swamy,
   Hon'ble Member of Parliament (LokSabha)
4. Shri Deepender Singh Hooda
   Hon'ble Member of Pariliament (LokSabha)
5. Shri Ashok Thakur, Secretary (HE), MHRD, New Delhi
6. Dr. Vijay P. Bhatkar, Chairman, Board of Governors, IIT Delhi
7. Dr. R.P. Singh, Chairman, Board of Governors, IIT Guwahati
8. Prof. M. Anandakrishnan, Chairman, Board of Governors, IIT Kanpur
9. Prof. M.M. Sharma, Chairman, Board of Governors, IIT Madras
10. Dr. Lalji Singh, Chairman, Board of Governors, IIT (BHU), Varanasi
11. Shri B.V.R. Mohan Reddy, Chairman, Board of Governors, IIT Hyderabad
12. Shri Ajai Chowdhry, Chairman, Board of Governors, IIT Patna
13. Prof. Goverdhan Mehta, Chairman, Board of Governors, IIT Jodhpur
14. Prof. Devang V. Khakhar, Director, IIT Bombay
15. Prof. R.K. Shevgaonkar, Director, IIT Delhi
16. Prof. Gautam Biswas, Director, IIT Guwahati
17. Prof. Indranil Manna, Director, IIT Kanpur
18. Prof. Bhaskar Ramamurthi, Director, IIT Madras
19. Prof. Pradipta Banerji, Director, IIT Roorkee
20. Prof. Rajeev Sangal, Director, IIT (BHU), Varanasi16
21. Prof. Sudhir K. Jain, Director, IIT Gandhinagar
22. Prof. Anil K. Bhowmick, Director, IIT Patna
23. Prof. U.B. Desai, Director, IITHyderabad
24. Prof. M.K. Surappa, Director, IIT Ropar
25. Prof. Madhusudan Chakraborty, Director, IIT Bhubaneshwar
26. Prof. C.V.R. Murty , Director, IIT Jodhpur
27. Prof. Timothy Gonsalves, Director, IIT Mandi

28. Prof. Pradeep Mathur, Director, IIT Indore

29. Prof. Partha P. Chakrabarti, Director, IIT Kharagpur

30. Prof. Ashok Misra, Former Director, IIT Bombay & India Intellectual Ventures, Bangalore

31. Prof. Ashok Jhunjhunwala, Deptt. of Elect. Engg., IIT Madras

32. Prof. R.C. Budhani, Director, Director's Secretariat, NPL, New Delhi

33. Prof. S.K. Joshi, Former Director General, CSIR

34. Dr. V.K. Saraswat, DRDO (Former SA to Raksha Mantri) – Special Invitee

35. Admiral D.S.P. Verma – Special Invitee

36. Shri K.D. Nayak, CC&DS, DRDO (on behalf of Dr. Avinash Chandra)

37. Smt. Amita Sharma, Additional Secretary (TE), MHRD, New Delhi and Secretary of the IIT Council.

38. Shri Yogendra Tripathi , JS&FA, MHRD

39. Shri Alok Mishra, Director (IITs), MHRD, New Delhi

40. Shri R.N. Mishra ADG – PIB

41. Shri S. Gopal Krishna, Under Secretary, MHRD

42. Ms. Prisca Mathew, Under Secretary, MHRD

43. Shri R.A.S. Kushwaha, Project Officer, Secretariat of Council of IITs

44. Shri V.K. Wadhwa, Project Officer, Secretariat of Council of IITs

45. Shri. Kamal R. Saha, Project Officer, Secretariat of Council of IITs

Outgoing Members

1. Prof. T. Ramasami, Chairman, Board of Governors, IIT Ropar
2. Prof. Dhananjai Pandey, Former Officiating Diretor, IIT (BHU), Varanasi
3. Prof. S.K. Som, Former Officiating Director, IIT Kharagpur
4. Prof. Gautam Barua, Former Director, IIT Guhawati
5. Prof. Prem Kumar Kalra, Former Director, IIT Jodhpur

New Members

1. Prof. V.S. Ramamurthi, Chairman, BOG, IIT Ropar
2. Prof. Rajeev Sangal, Director, IIT (BHU), Varanasi
3. Prof. Partha P. Chakrabarti, Director, IIT Kharagpur
4. Prof. Gautam Biswas, Director, IIT Guhawati
5. Prof. C.V.R. Murty, Director, IIT Jodhpur

Board of Governors, IIT Kharagpur
From 1st April, 2013 to 31st March, 2014

Sl. No	Name & Address	Position
1.	Dr. Shiv Nadar (Upto 20.03.2014) Chairman,BoG, IIT Kharagpur & Founder- HCL Technologies Ltd. A-10/11, Sector-3 Noida-201301, U.P.	Chairman
2.	Dr. Srikumar Banerjee (From 21.03.2014) DAE Homi Bhabha Chair Professor Room No. A 419, 4th Floor Central Complex Bhabha Atomic Research Centre, Trombay Mumbai - 400085	Chairman
3.	Dr. Srikumar Banerjee (Upto 20.03.2014) DAE Homi Bhabha Chair Professor Room No. A 419, 4th Floor Central Complex Bhabha Atomic Research Centre, Trombay Mumbai - 400085	Member
4.	Prof. B. B. Bhattacharya Professor of Economics A-44, Sarve Sanjhi Apts. Plot No.8, Sector-9, Dwarka New Delhi-110077	Member
5.	Shri Sandipan Chakravortty Managing Director Tata Steel Processing & Distribution Limited (TSPDL) Tata Centre (Ground Floor), 43, Chowringhee Road Kolkata – 700071	Member
6.	Prof. N. Balakrishnan Supercomputer Education and Research Centre Indian Institute of Science Bangalore - 560012	Member
7.	Shri Tamal Dasgupta (Upto 16.12.2013) A-3, Royal Greens 49/1, PGM Shah Road Golf Garden Kolkata - 700033	Member
8.	Shri Sanjiv Goenka (From 17.12.2013) Chairman, RP-Sanjiv Goenka Group CESC House 1, Chowringhee Square Kolkata - 700001	Member

9.	Prof. S. K. Som (Upto 27.07.2013 FN) Director (Officiating) IIT Kharagpur	Member
10.	Prof. Partha P. Chakrabarti (From 27.07.2013 AN) Director IIT Kharagpur	Member
11.	Prof. N. R. Mandal (Upto 31.12.2013) Dept. of Ocean Engg. & Naval Architecture IIT Kharagpur	Member
12.	Prof. Rajendra Singh (From 01.01.2014) Dept. of Agricultural & Food Engineering IIT Kharagpur	Member
13.	Prof. S. K. Satsangi (From 31.12.2013) Dept. of Ocean Engg. & Naval Architecture IIT Kharagpur	Member
14.	Prof. Swagata Das Gupta (From 01.01.2014) Dept. of Chemistry IIT Kharagpur	Member
15.	Dr. T.K. Ghosal Registrar IIT Kharagpur	Secretary

Finance Committee, IIT Kharagpur
From 1st April, 2013 to 31st March, 2014

Sl. No	Name & Address	Position
1.	Dr. Shiv Nadar (Upto 20.03.2014) Chairman,BoG, IIT Kharagpur & Founder- HCL Technologies Ltd. A-10/11, Sector-3, Noida-201301, U.P.	Chairman
2.	Dr. Srikumar Banerjee (From 21.03.2014) DAE Homi Bhabha Chair Professor Room No. A 419, 4th Floor, Central Complex, Bhabha Atomic Research Centre, Trombay Mumbai – 400085	Chairman
3.	Joint Secretary & Financial Adviser Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan, New Delhi -110115	Member
4.	Director (IITs) Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan,New Delhi -110115	Member
5.	Shri Tamal Dasgupta (Upto 16.12.2013) A-3, Royal Greens 49/1, PGM Shah Road, Golf Garden Kolkata – 700033	Member
6.	Shri Sandipan Chakravortty (From 28.04.2014) Managing Director, Tata Steel Processing & Distribution Limited (TSPDL), Tata Centre (Ground Floor), 43, Chowringhee Road, Kolkata – 700071	Member
7.	Prof. S. K. Som (Upto 27.07.2013 FN) Director (Officiating) IIT Kharagpur	Member
8.	Prof. Partha P. Chakrabarti (From 27.07.2013 AN) Director IIT Kharagpur	Member
9.	Prof. S. K. Satsangi (Upto 31.12.2013) Dept. of Ocean Engg. & Naval Architecture IIT Kharagpur	Member
10.	Prof. Rajendra Singh (From 28.04.2014) Dept. of Agricultural & Food Engineering IIT Kharagpur	Member
11.	Dr. T.K. Ghosal Registrar IIT Kharagpur	Secretary

Building and Works Committee

From 1st April, 2013 to 31st March, 2014

1	Prof. S. K. Som (Upto 27.07.2013 FN) Director (Officiating) IIT Kharagpur	Chairman
2	Prof. Partha P. Chakrabarti (From 27.07.2013 AN) Director IIT Kharagpur	Chairman
3	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
4	Superintending Engineer South Western Circle Public Works Department (PWD) Saheed Mangal Pandey Sarani Paschim Medinipur PIN - 721101	Member
5	Head Department of Civil Engineering IIT Kharagpur	Member
6	Head Department of Electrical Engineering IIT Kharagpur	Member
7	Head Dept. of Architecture & Regional Planning IIT Kharagpur	Member
8	Registrar IIT Kharagpur	Secretary

Administrative Heads

Position	Name	From	To
Director	Prof. S.K. Som	Upto	26.07.2013
	Prof. Partha P. Chakrabarti	27.7.2013(AN)	27.7.2018(FN)
Deputy Director	Prof. Souvik Bhattacharyya	04.11.2013	03.11.2016
Dean (Faculty)	Prof. Amit Basak	Upto	30.09.2013
	Prof. Pratim Kumar Chattaraj	01.10.2013	30.09.2016
Dean (UGS)	Prof. Somnath Sengupta	Upto	30.06.2013
	Prof. A. N. Samanta	01.07.2013	15.08.2013
	Prof. Rajendra Singh	16.08.2013	15.08.2016
Dean (PGS&R)	Prof. Amar Nath Samanta	01.05.2012	30.04.2015
Dean (SA)	Prof. Nisit Ranjan Mandal	01-04-2012	30.03.2015
Dean (SRIC)	Prof. P.P. Chakrabarti	Upto	30.06.2013
	Prof. Sunando Dasgupta	01.08.2013	31.07.2016
Dean (CE)	Prof. Somnath Sengupta	Upto	30.09.2013
	Prof. Om Prakash Sha	01.10.2013	30.09.2016
Dean (AA&IR)	Prof. Amit Patra	Upto	30.09.2013
	Prof. Siddhartha Mukhopadhyay	01.10.2013	30.09.2016
Dean (P&C)	Prof. B.K. Mathur	Upto	30.09.2013
	Prof. Biswajit Mahanty	01.10.2013	30.09.2016
Acting Dean, VGSOM	Prof. K.K.Guin	05.06.2012	U.F.O
Dean, RGSOIPL	Prof. Khushal Vibhute	04.03.2013	03.03.2015
Associate Dean, SRIC	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	01.09.2011	31.08.2014
Architecture & Regional Planning	Prof. Subrata Chattopadhyay	01.08.2014	31.07.2017
Chemical Engineering	Prof. Narayan Chandra Pradhan	01.01.2012	31.12.2015
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
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
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
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
Ranbir & Chitra Gupta School of Infrastructure Design & Management	Prof. U.K. Banerjee	01.09.2011	31-08-2014
School of Water Resources	Prof. Dhrubajyoti Sen	01.04.2013	31.03.2016
Computer & Informatics Centre	Prof. Prabir Kumar Biswas	10.03.2011 10.03.2014	09.03.2014 31.03.2015
Centre for Educational Technology	Dr. Bani Bhattacharya	06.07.2012 01.01.2014	31-12-2013 31.12.2014

Information Cell	Prof. B. K. Mathur	06.09.2002	U.F.O
	Prof. Soumya Kanti Ghosh	01.12.201	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 Entrepreneurship	Prof. Partha Pratim Das	01.10.2013	30.09.2016
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
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
JEE	Prof. M.K. Panigrahi	01.09.2013	JEE-2014
JAM	Prof. B. C. Meikap	12.05.2014	JAM–2015
Enterprise Resource Planning (ERP)	Prof. Debasis Bhattacharya	01.12.2013	30.11.2016
I. Central Research Facility (CRF). Chairman, Materials Division	Prof. Rahul Mitra Prof. Amit Kumar Das	01.12.2013 (Extension)	30.11.2016
II. Central Research Facility (CRF), Chairman, Life Science Division,		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. Dhrubajyoti 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 Bhattacherjee	01.10.2013	30.09.2016
Commercial Establishments & Licencing Committee (CELC)	Prof. P.B.S. Bhadoria	20.05.2010 01.01.2014	31.12.2013 31.12.2014
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. B. Mahanty	20-02-2013	19.02.2015
Industrial Training Centre, Hijli	Dean, Continuing Education	Ex-officio	
Campus Green Cover (CGC)	Prof. Adinpunya Mitra	01.10.2013	30.09.2016
Canteen Management Com.	Prof. A. K. Deb	01.02.2013	31.01.2015
Technology Film Society	Dean, Students' Affairs,	*Ex-officio*	
House Building Advance	Registrar	01.08.1996	U. F. O.
Scooter & Cycle Allowance	Registrar	26.07.1993	U. F. O.
Computer Purchase, Maintenance & Networking Committee	Prof. P.K.Biswas	01.10.2013 to 31.03.2014 01.04.2014 to 31.03.2015	
Furniture *	Deputy Director	*Ex-officio*	
Budget & Allotment of Fund	Deputy Director ,	*Ex-officio*	

Vice-chairmen/Others

Vice-Chairman, GATE	Prof. M. Ramgopal Dr. K. S. Rao	12.05.2014	GATE-2015
Vice-Chairman, JEE	Prof. Surjya Kanta Pal	01.09.2013	JEE-2014
Vice-Chairman, JEE	Prof. D. Chakravarty	01.09.2013	JEE-2014
Vice-Chairman, JAM	Prof. M. Ramgopal Dr. K. S. Rao	12.05.2014	JAM-2015
Vice-Chairmen, Career Development Centre	Prof. Debasis Deb Dr. A Rajakumar Dr. Sujoy Kumar Kar	01.01.2014	31.12.2015
Vice-Chairman, Technology Aquatic Society (TAS)	Dr. T. K. Goswami	01.10.2013	30.09.2014
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	01.10.2013	30.09.2016
Treasurer. TSG	Dr.Somesh Kumar	01.09.2011	31.08.2014

Head, NSS	Dr. P. K. Bhowmick	01.07.2002	U.F.O
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	*Ex – Officio*	
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
Head, B. C. Roy Technology Hospital	Dr. B. Mishra	04.12.2010	U.F.O
Chief Vigilance Officer	Prof. Balbir Kumar Mathur		
Managing Director, STEP	Prof. Indranil Sengupta	01.10.2013	30.09.2016
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

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 01.08.2014	31-07-2014 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
Technology Telecom Centre	Prof. Raja Datta	04.02.2011 04.02.2014	03.02.2014 03.02.2016

Time Table	Prof. Dilip Kumar Baidya	01.10.2013	30.09.2016
Audio Visual Cell	Chairman	*Ex-officio*	
Examinations	Prof. Madan Kumar Jha	01.10.2013	30.09.2016
Convocation	Prof A.N. Samanta, Dean(PGS&R)	For 2013	
	Prof A.N. Samanta, Dean(PGS&R)	For 2014	
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
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.
B.C.Roy Technology Hospital	Prof.Chhanda Chakraborti	26.06.2012	25.06.2015
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

Miscellaneous Assignment

Institute's Representative at the Indian Member Council	Prof.Om Prakash Sha, Dept. of OE&NA Dean (CE)	26.05.2014	UFO

List of Senate Members

Director - Prof. Partha P. Chakrabarti

Deputy Director - Prof. Souvik Bhattacharyya

AEROSPACE ENGINEERING
Prof. P.K. Datta
Prof. N. Singh
Prof. K. P. Sinhamahapatra
Prof. B. N. Singh
Prof. Dipak Kumar Maiti

AGRICULTURAL & FOOD ENGG.
Prof. K.P. Pandey
Prof. B.C. Mal
Prof. R. Singh
Prof. V.K. Tewari
Prof. K.N. Tiwari
Prof. R.K. Panda
Prof. R. Banerjee
Prof. S.K. Das
Prof. P.B.S. Bhadoria
Prof. B.C. Ghosh
Prof. A. K. Datta
Prof. H. N. Mishra
Prof. N. S. Raghuwanshi
Prof. S. N. Panda
Prof. T. K. Goswami
Prof. Nirupama Mallik
Prof. Madan Kumar Jha
Prof. Hifjur Raheman
Prof. S. Dutta Gupta
Prof. Adinpunya Mitra

ARCHITECTURE & REGIONAL PLANNING
Prof. R.N. Datta
Prof. B.K. Sengupta
Prof. U.K. Banerjee
Prof. Jaydip Barman
Prof. S. Chattopadhyay
Prof. Joy Sen

BIOTECHNOLOGY
Prof. S.C. Kundu
Prof. D. Das
Prof. S. Dey
Prof. A.K. Ghosh
Prof. A.K. Das
Prof. T. K. Maiti
Prof. Sudip Kumar Ghosh

CENTRE FOR EDUCATIONAL TECHNOLOGY
Prof. B. Bhattacharya

Centre for Ocean, Rivers, Atmosphere and Land Sciences
Prof. Arun Chakraborty

CHEMICAL ENGINEERING
Prof. D. Mukherjee
Prof. A.N.Samanta
Dean (PGS&R)
Prof. S. Dasgupta
Prof. N. C. Pradhan
Prof. S. De
Prof. Gargi Das
Prof. Sudarsan Neogi
Prof. Jayanta Kumar Basu
Prof. Goutam Kundu
Prof. B.C. Meikap

CHEMISTRY
Prof. D. Mal
Prof. T.K. Sarkar
Prof. J.K. Roy
Prof. P.K. Chattaraj
Prof. T. Pathak
Prof. T. S. Pal
Prof. A. Basak
Prof. D. Ray
Prof. M. Bhattacharjee
Prof. S. K. Srivastava
Prof. Nilmoni Sarkar
Prof. Swagata Dasgupta
Prof. Sarbani Taraphder
Prof. Sanjoy Bandyopadhyay
Prof. Saumen Hajra
Prof. Joykrishna Dey
Prof. P. Pramanik
Prof. Kumar Biradha
Prof. C.R. Raj

CIVIL ENGINEERING
Prof. Dhrubajyoti Sen
Prof. S.K. Bhattacharyya
Prof. K.S. Reddy
Prof. L.S. Ramachandra
Prof. S.Dey

Prof. D.K. Baidya
Prof. N. Dhang
Prof. S. K. V. Barai
Prof. V. R. Desai
Prof. S. P. Dasgupta
Prof. Ashok Kumar Gupta
Prof. M. M. Ghangrekar
Prof. Baidurya Bhattacharya
Prof. Damodar Maity
Prof. Debasis Roy
Prof. Bhargab Maitra
Prof. Anirudha Sengupta

COMPUTER SCIENCE & ENGINEERING

Prof. A. Pal
Prof. A.K. Majumdar
Prof. S. Ghose
Prof. P.P. Chakraborti
Prof. Anupam Basu
Prof. I. Sengupta
Prof. J. Mukhopadhyay
Prof. S.P. Pal
Prof. R. Mall
Prof. D. Sarkar
Prof. D. Roy Chowdhury
Prof. Pallab Dasgupta
Prof. Rajeev Kumar
Prof. Sudeshna Sarkar
Prof. Chittaranjan Mandal
Prof. Arobinda Gupta
Prof. Partha Pratim Das
Prof. Niloy Ganguly

CRYOGENIC ENGINEERING

Prof. S.S. Bandyopadhyay
Prof. T.K. Dey
Prof. V. Rao Vutukuru
Prof. K. Chowdhury

ELECTRICAL ENGINEERING

Prof. S.K. Das
Prof. A.K. Sinha
Prof. J. Pal
Prof. A. Patra
Prof. N.K. Kishore
Prof. A. Barua
Prof. Goshaidas Ray
Prof. S. Mukhopadhyay
Prof. S. Sen
Prof. P.K. Dutta
Prof. B.M. Mohan
Prof. Debapriya Das
Prof. Sabyasachi Sengupta
Prof. T. K. Bhattacharya
Prof. Chandan Chakraborty
Prof. Srinivasu Maka
Prof. Ashok Kumar Pradhan
Prof. Debaprasad Kastha
Prof. Aurobinda Routray

ELECTRONICS & ELECTRICAL COMM. ENGINEERING

Prof. A. Chakraborty
Prof. D. Dutta
Prof. Ajoy Kr. Roy
Prof. S. Banerjee
Prof. C.K. Maiti
Prof. V.R.K. Ratnam
Prof. P.K. Biswas
Prof. M. Chakraborty
Prof. Sant Sharan Pathak
Prof. Subrata Sanyal
Prof. D. Biswas
Prof. K. K. Bandyapadhya
Prof. Santanu Chattopadhyay
Prof. Ramesh Garg
Prof. Tarun Kanti Bhattacharyya
Prof. Goutam Saha
Prof. Anindya Sundar Dhar

GEOLOGY & GEOPHYSICS

Prof. S.K. Nath
Prof. B. Mishra
Prof. A.K. Gupta
Prof. D. Sengupta
Prof. A. Bhattacharya
Prof. S. Tripathy
Prof. Anindya Sarkar
Prof. Subhasish Das
Prof. M. K. Panigrahi
Prof. S. K. Bhowmik
Prof. Saibal Gupta
Prof. S. P. Sharma
Prof. Manish A Mamtani
Prof. William K. Mohanty

G S SANYAL SCHOOL OF TELECOMMONUCATION

Prof. S. Chakraborti

HUMANITIES & SOCIAL SCIENCES

Prof.(Ms.) B.Chatterjee
Prof. P. Basu
Prof. H.R. Tewari
Prof. D. Suar

Prof. A. Gera Roy
Prof. K.B.L Srivastava
Prof. S. Chopra Chatterjee
Prof. V. N. Giri
Prof. Chhanda Chakraborti
Prof. Priyadarshi Patnaik
Prof. N.C. Nayak

INDUSTRIAL & SYSTEMS ENGINEERING

Prof. P.K.J. Mohapatra
Prof. B. Mahanty
Prof. P.K. Ray
Prof. M. K. Tiwari
Prof. P. L. Narasimhan
Prof. Jhareswar Maiti

MATERIALS SCIENCE

Prof. D. Bhattacharya
Prof. C.K. Das
Prof. B. Adhikari
Prof. S. Ram
Prof. Susanta Banerjee
Prof. Pallab Banerjee
Prof. Chako Jacob

MATHEMATICS

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

MECHANICAL ENGINEERING

Prof. B. Maiti
Prof. A. Mukherjee
Prof. S.K. Som
Prof. V.V. Satyamurty
Prof. A. K. Chattopadhyay
Prof. S. Bhattacharya
Prof. R. Bhattacharyya
Prof. S. K.Dash
Prof. P. K. Das
Prof. A. R. Mohanty
Prof. S. N. Bhattacharyya
Prof. R. N. Maiti
Prof. S. Paul
Prof. M. C. Ray
Prof. A. K. Nath
Prof. S. Roy
Prof. D. K. Pratihar
Prof. S. Chakraborty
Prof. A. Dasgupta
Prof. A. Guha
Prof. S. K. Roy Chowdhury
Prof. M. Ramgopal
Prof. Ashimava Roy Choudhury
Prof. Manab Kumar Das
Prof. Surjya Kanata Pal
Prof. Arun Kumar Samantaray
Prof. Kumar Siva Cheruvu

METALLURGICAL & MATERIALS ENGINEERING

Prof. M. Chakraborty
Prof. S. K. Pabi
Prof. K.K. Ray
Prof. N.Chakraborty
Prof. I. Manna
Prof. Siddhartha Das
Prof. Sanat Kr. Roy
Prof. K. Das
Prof.Gour Gopal Roy
Prof. Rahul Mitra
Prof. P.K. Sen
Prof. Jyotsna Dutta Majumdar
Prof. Shiv Brat Singh

MINING ENGINEERING

Prof. S.S. Bhamidipati
Prof. A. Bhattacharya
Prof. K. U. M. Rao
Prof. S. K. Das
Prof. K. Pathak
Prof. J. Bhattacharyya
Prof. S. K. Mukhopadhyay
Prof. Samir Kumar Pal
Prof. Debasis Deb

OCEAN ENGINEERING & NAVAL ARCHITECTURE

Prof. S.K. Satsangi
Prof. N.R. Mandal
Prof. D. Sen
Prof. O. P. Sha
Prof. Trilochan Sahoo

PHYSICS

Prof. B.K. Mathur

Prof. S.L. Sharma

Prof. S.K. Ray

Prof. A. Taraphder

Prof. K. Kumar

Prof. Somnath Bharadwaj

Prof. Sayan Kar

Prof. Anushree Roy

Prof. Prasanta Kumar Datta

RAJENDRA MISHRA SCHOOL OF ENGG. ENTREPRENEURSHIP

RAJIV GANDHI SCHOOL OF INTELLECTUAL PROPERTY LAW

Prof. Khushal Vibhute,

RELIABILITY ENGINEERING

Prof. V.N.A. Naikan

RUBBER TECHNOLOGY

Prof. A.K. Bhowmick

Prof. G.B. Nando

Prof. D. Khastgir

Prof. T. K. Chaki

SCHOOL OF INFORMATION TECHNOLOGY

Prof. Shamik Sural

Prof. Soumya Kanti Ghosh

SCHOOL OF MEDICAL SCIENCE & TECHNOLOGY

Prof. S. K. Guha

Prof. A.K. Bardhan

STEEL TECHNOLOGY CENTRE

Prof. R. N. Ghosh

VINOD GUPTA SCHOOL OF MANAGEMENT

Prof. K. K. Guin, Dean

Prof. G. Sinha

Prof. Prabina Rajib

Central Library

Dr. B. Sutradhar, Librarian

Students' Representatives:

1.Mr. Apoorv Jain, Vice President, TSG
2.Mr. Ishan Garg, UG Representative
3.Mr. Avinash Kumar Sharma, PG Representative
4.Mr. Shubhankar Chakraborty, RS Representative

Secretary
Dr. T. K. Ghosal

DIRECTOR'S REPORT

Over the last sixty years, not only has IIT Kharagpur spearheaded setting up new standards in engineering education but has also 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 that will lead to a better and a more 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 their own 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 Sciences, 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 technology development in cutting edge areas like Nano-Science, Bio-MEMS, Materials, Circuit Design and Mathematical Methods, which produce research publications in top quality journals keeping us at 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 successfully started an International Summer and Winter Programme 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 programme 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. We have, therefore, initiated an 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.

ACADEMIC PROGRAMMES

The Institute presently offers BTech (Hons) programme in seventeen different branches of Engineering, BArch (Hons) programme in Architecture, fifteen Dual Degree programmes, seven Integrated MSc programmes, four Joint MSc-PhD programmes, and fifty- one Postgraduate degree programmes leading to Joint MTech / MCP-PhD, MBM, MHRM, LLB and MMST degrees. The curricula and syllabi of these programmes 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, students' registration, enrollment, course allocation, examination results, students' feedback and sponsored project details are now available on-line through this system.

59TH CONVOCATION

Fifth-ninth Annual Convocation of the Institute was held on July 27, 2013. Shri Sandipan Chakravortty, Managing Director of Tata Steel Processing and Distribution Limited / Dr. M. M. Pallam Raju, Hon'ble Minister of Human Resource Development Government of India, was the Chief Guest. The convocation conferred degrees to 2157 graduates that include 164 Ph.D., 29 MS, 771 M.Tech., 32 MCP, 123 MBA, 04 MMST, 17 MHRM, 27 LLB, 270 Dual Degree, 472 B.Tech. (Hons), 20 B.Arch. (Hons.) and 228 M.Sc. degrees.

- Shri Utsav Banerjee of the Department of Electronics and Electrical Communication Engineering is the recipient of **President of India Gold Medal** for the best academic performance among the outgoing B.Tech. (Hons.) and B.Arch. (Hons.) students.
- Shri Srijan Kumar of the Department of Computer Science and Engineering has won the **Dr. Bidhan Chandra Roy Memorial Gold Medal** for the best all-round performance among the B.Tech. (Hons.) and B.Arch.(Hons.) outgoing students.
- **The Prime Minister of India Gold Medal** for the best academic performance among the Dual degree and Integrated M.Sc. outgoing students goes to Shri Mayank Shrivastava of the Department of Computer Science and Engineering.
- **Dr. Jnan Chandra Ghosh Memorial Gold Medal** for the best all-round performance among the outgoing Dual Degree and Integrated M.Sc. students is awarded to Shri Abhishek Raj of the Department of Chemical Engineering.
- Shri Suvra Kanti Chakraborty of the Department of Mathematics has won the **Professor Jagadish Chandra Bose Memorial Gold Medal** for the best academic performance among the outgoing students of all 2-year M.Sc. courses in the Science Disciplines.
- Shri Santigopal Samanta of the Department of Metallurgical and Materials 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 Senate and the Board of Governors of the Institute conferred the highest honor, the degree of **Doctor of Science (Honoris Causa)**, on the following distinguished personalities:

- Shri Arun Sarin in recognition of being a doyen of the telecommunications industry making Vodafone the world's largest mobile phone company
- Shri Y. C. Deveshwar for his visionary leadership in making ITC to become a truly global company

In the convocation, the **Distinguished Alumnus Awards** were conferred on:

- Dr. Aditi Chattopadhyay, Ira A. Fulton Chair Professor of Mechanical and Aerospace Engineering and the Director of the Adaptive Intelligent Materials and Systems Research Center at Arizona State University
- Shri Aniruddha Roy, Former Executive Director of Eveready Industries Limited
- Shri Devinder Kumar Gupta, President of the All India Federation of Plastic Industry
- Professor Jay Chatterjee, Dean Emeritus and Emeritus Professor of Architecture and Planning at the University of Cincinnati
- Dr. K. G. Narayanan, Technology Adviser of Indian industry
- Shri Kamal Kumar Sarvadhikari, Former CEO of Sensi Vida Medical Technologies, Inc.

- Professor Keshab K. Parhi, Distinguished McKnight University Professor and Edgar F. Johnson Professor in the Department of Electrical and Computer Engineering at the University of Minnesota
- Dr. Parimal Kanti Bharadwaj, Senior Professor and Head of the Department of Chemistry at IIT Kanpur
- Shri Rabindra Nath Nayak, Chairman and Managing Director of Powergrid Corporation of India Ltd.
- Professor Somnath Ghosh, Michael G. Callas Professor in the Department of Civil Engineering and Professor of Mechanical Engineering at the Johns Hopkins University.

RESEARCH AND DEVELOPMENT ACTIVITIES

Aerospace Engineering: Research activities are being carried out in different fields, namely, Composite and smart structures, Structural dynamics and aeroelasticity, Design and 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 and watershed management, Ballast management of agricultural tractors, Biofiltration technology, Bio-fuels from tree-based oils, Biosynthesis of phenolic fragrance and xanthones, Climate change analysis and 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 and 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 Department focuses on areas such as 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 pathogenecity 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, 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 and biomass combustion processes in pulverized and fluidized combustors, Multi-phase processes and 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 and performance of novel bubble column scrubber/reactor for removal of SO_2 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, Adsolubilization/ 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, Decentralised 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.

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, Lttice Bolzmann Method in complex flows, Rotor dynamics and dynamics of lubricated ball bearings, Numerical simulation on two phase flow pertaining to bottom injected gas stirred ladles, Multi Layer TiN-MoS2 coating on cutting tools by unbalanced magnetron

technique, Machinability study of Inconel 718, Development of control strategies for autonomous underwater vehicles, Model based fault detection and isolation, Simulation of liquid sloshing in a tank using numerical grid generation techniques, Prediction of fluid flow and heat transfer from wavy surfaces, 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-á-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 and ISAR 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 and circulation modeling, Marine design and production, Welding technology, Coastal processes and engineering, Hydroelasticity, Storm surge prediction and Tsunamis, Suspended sediment dynamics, Marine acoustics.

Physics: 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 and 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 Programme 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 Oceans, Rivers, Atmosphere and Land Sciences: Areas of 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 specialised 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 poer 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 programme, Legal and 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 specialised 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 and micro-imaging on various healing and non-healing wounds including oral and breast precancer and cancer for their early characterization through image processing and analysis, 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 and spatial characteristics in health and 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, Neutraceuticals 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 programmes and in-house training programmes 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 steriliser, 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, CO_2 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 (Tl) based gamma ray scintillation equipment.

Mathematics: Dell desktop computers - 60 units, Online UPS 30 KVA - 1 Unit, HP Heavy duty Photocopying machine -1 unit, HP Laserjet P3015 Printer -1 unit.

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 Fluorescene 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 ocygen breathing apparatus, Spirometer, Triaxial whole body and hand arm vibration meter, Depth perception meter, Eye fatigue tester, Bicycle ergometer, Anthropolometer.

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, and 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 have been opened to boarders. Renovation of 118 capacity Girls' Hostel in the old Kendriya Vidyalaya has been completed and 76 rooms have already been handed over to HMC.
- Nalanda Classroom Complex: 58 classrooms have been handed over and 30 classrooms have been completed for use.
- J. C. Ghosh Science Block and P. C Roy Laboratory Block: Floor slabs for both the Blocks up to 7th floor have been laid.
- A. J. C. Bose Laboratory Complex: Construction of extension building is being 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 have been developed within the Campus.
- Expansion work in academic buildings: Expansion work in the departments of Industrial and Systems Engineering, Chemical Engineering, Mechanical Engineering and Computer Science & Engineering have been completed. 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 have been completed for two blocks. The first block with 28 apartments is scheduled to be completed in August, 2014 and the balance 28 flats will be handed over in December, 2014.
- Construction of Nivedita Hall of Residence: Work has been completed and students have moved in.

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 programmes. 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 programmes reach across the campus and beyond, linking together 19 departments, 16 academic centres 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 crore, 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 having a total value of Rs. 149.31 crore and 125 consultancy projects worth Rs. 12.83 crore aggregating a total of 318 projects worth 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 Centre
- Centre of Excellence in Information Assurance
- National Programme 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
- Stope design and stability, production and paste backfilling
- Improving groundwater levels and quality through enhanced water use efficiency
- Development of remote educational centres 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 faculty members, 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 programmes funded by the Government.

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

- TeamKart activity for design and implementation of 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 are also involved 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 for promotion and development of innovation and entrepreneurship in this country. Since its inception over 26 years ago, STEP has been engaged in various kind of activities to enhance the economic condition of this part of the country through innovation and enterprise creation. It has gradually transformed itself into a sustaining innovation and

entrepreneurship ecosystem as well as enterprise creation platform. It is the most active innovation and incubation activity hub 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 kinds 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. 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 moved 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 at STEP. At present, 86 companies are being incubated in 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. It also 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. 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 to 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., and 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 organised a number of programmes, such as TIFAC-SIDBI Technology Innovation Programme (SRIJAN) on 10th January, 2014; The Global Entrepreneurship Summit (GES) on 10th 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 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)
- In-service Training Programme 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 - 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 and Systems Engineering

- Executive Training Programme on Project Management (May 11-14, 2013)
- One-Day Interaction Meet on 'UKIERI-sponsored Project on Environmental Performance of Industries (August 2, 2013)
- 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 & Electronic Devices (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 Programme on Practical Ship-building (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:

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

Rajendra Mishra School of Engineering Entrepreneurship:

- Big data analytics (Two weeks , Summer 2014)

CONTINUING EDUCATION PROGRAMME

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

During 2013-2014 the Continuing Education Centre organised 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 MTech programmes for AICTE approved college teachers and industry professionals in which, during the past four years,

190 college teachers and professionals joined the departments of Electrical Engineering, Electronics and Electrical Communication, and Information and Communication Technology. The three year executive MBA programme organised by the unit had 25 and 4 students in its Kolkata and Bhubaneswar centres respectively. During this year seven QIP scholars were awarded PhD 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 started its first **International Summer and winter Term (ISwT)** in May 2014, 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. Nineteen subjects were offered during the summer term (May-July) and 10 subjects will be offered 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

Some of the outstanding achievements over the past year are as follows:

- Initiation of Schools and Centres: Four new Schools which were initiated during the past year include (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 and Winter Term: Indian Institute of Technology Kharagpur started 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 has been initiated under which Rs. 10 crore has been pledged of which Rs. 3.6 crore has 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 honoured with prestigious awards and elected as Fellows of the National Science and Engineering Academies. The students have also been rewarded with various scholarships and their contributions have been recognized for their stellar performance in various conferences, symposia etc. The details of the achievements follow:

Shanti Swarup Bhatnagar Award

Dr. Suman Chakraborty (ME) was 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

Fellowships

Dr. Kamleshm Narayan Tiwari (Ag&FE): Elected as a Fellow of the the National Academy of Sciences, India, Allahabad. He is also elected as a Fellow of the Indian Society of Agricultural Engineers, New Delhi.

Dr. Sudhindra Nath Panda (Ag&FE): Elected as a Fellow of the National Academy of Agricultural Sciences, New Delhi

Dr. Pratim Kumar Chattaraj (CY) : Elected as a Fellow of The World Academy of Sciences (TWAS), Trieste, Italy in recognition to his outstanding contributions on Chemical Sciences

Dr. Partha Pratim Chakrabarti (CSE) and Director: Awarded the J. C. Bose National Fellowship, by the Ministry of Science and Technology, Government of India, in recognition of his 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 as a Fellow of The National Academy of Sciences, India, Allahabad. Also elected as a Fellow of the Indian Geophysical Union, Hyderabad

Dr. Prasanta Kumar Das (ME): Elected as a Fellow of The National Academy of Sciences, India, Allahabad

Dr. V. N. Achutha Naikan (REC): Elected as a Fellow by The Institution of Engineers (India), Kolkata

Dr. Mahitosh Mandal (SMST): Elected as a Fellow of the West Bengal Academy of Science and Technology 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. Also 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. Also 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. Amit Basak (CY): Selected for the Chemical Research Society of India (CRSI) silver medal

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. Also selected for the INSA Young Scientist Medal 2014 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 2013by The Indian Econometric Society

Dr. Manoj Kumar Tiwari (ISE): Considered 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): 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) Former Professor: Recipient of the MEAI - Lifetime Achievement Award 2011, presented by the 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. 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 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. Also 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. Also 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 Pratihar (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.

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 20th 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, MTech student: Late Lakshmi Nandakumar Award of IIChE for Best Paper Presentation at SCHEMCON-2013

Shri Partha Laskar, Research Scholar, 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, MTech 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 Scholar, 12AT91F03: Best Poster Award at Asian Congress on Biotechnology-2013 at India Habitat Centre, New Delhi

Shri Srikanth Madala, Research Scholar, 11CL91R02: 'Gold Medal for the Best Poster Presentation at the International Tropical Meteorology Symposium (INTROMET-2014)

Shri Abhishek Dwivedi, MHRM student: Ranked 1st in the City Round and also in the State Round in the Campus2Corporate Contest, 2013

Ms. Priyanka Dasgupta, MHRM student: Ranked 2nd in the City Round and also in the State Round in the Campus2Corporate Contest, 2013

Shri S. Abhilash (UG 1st Yr.), Shri Subham Vidyant (UG 1st Yr.), Ms. Priyanka Dasgupta (MHRM Ist Yr.), Shri Chetan Pandey (MHRM 1st Yr.): Won prizes for their exemplary entries in the All India Essay Event organised by the Shri Ram Chandra Mission

Shri Gaurav Jain, BTech student, 12MT10013: Governor's Medal at Governor's House for exceptional achievements and contribution as Cadet of 3 Bengal Tech Air Squadron NCC

Shri Narendra Gogurla, Research Scholar, 12PH90J01: Nanoscale Poster Prize, awarded by Royal Society of Chemistry for paper presentation at the International Conference on Nano Science and Technology, Chandigarh

Ms. Akriti Kapoor, Ms. Preeti Kareddy and Shri C. Paresh Ravindra, Second year students of LLB: First Position in 6th B. Krishna National Intellectual Property Rights Moot Court Competition, 2014 organised by Symbiosis Law School, Pune

Shri Bikas Kumar Arya, Ex-Research Scholar, SMST, 09MM6003: Won "Robert Austrian Award" in Pneumococcal Vaccinology carrying a grant of $25,000

Shri Ranabir Dey, Research Scholar, 10ME90R24: Gandhian Young Technological Innovation Award/Appreciation 2014

Shri Shantimoy Kar, Research Scholar, 12AT91F01: Gandhian Young Technological Innovation Award/Appreciation 2014

Shri Pijus Kundu, Ex-Research Scholar: Gandhian Young Technological Innovation (GYTI) Awards - 2014 with Technological Edge(TE) Award

Ms. Raka Mukherjee, Research Scholar, 12CH91R05: Gandhian Young Technological Innovation Award/ Appreciation 2014

Shri Aliba Ao, Research Scholar, 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, MTech student, 12PH62R05: Received 2nd best SPIE Student award of US$200 at International Conference on Optics and Optoelectronics (ICOl-2014) , Dehradun

Shri Narendar G., Research Scholar, 12PH90J01: Awarded the "Excellent Paper Presentation Award" at International Conference on Optics and Optoelectronics (ICOL 2014), Dheradun

Shri Vishwatosh Mishra, Research Scholar, 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, 2nd Year LLB students Rajiv Gandhi School of Intellectual Property Law: Runner-up position in the prestigious Oxford University India Moot Court Competition (2013 – 14) organised 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 Scholar, 10CR90R02: IEEE CSC Student Fellowship award

Dr. Bikas Kumar Arya, Research Scholar, 12MM91P03: Fulbright Scholarship 2014

Ms Riya Bubna, BTech student, 13CS10041: Aditya Birla Scholarship

Shri Santanu Pradhan, Research Scholar, 10PH90R05: Bhaskara Advanced Solar Energy (BASE) Fellowship

Ms. Sneha Rani, Research Scholar, 11MI91R01: Selected for IEAGHG International Interdisciplinary CCS Summer School, University of Texas at Austin, TX, USA

Ms. S. Fatima, Research Scholar, 10RE90R02: Schlumberger Foundation Faculty for the Future Scholarship for the year 2014

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 utilised 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 Radiologyunit. 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 procedure for referring patients to higher medical care centres 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 Centre. In 2013, visits to reputed Super specialty Hospitals in Kolkata were organised 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 Centre, 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 specialised 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 clinics have been organised 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 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, organised 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 organised 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 11th Annual Alumni Meet was organised 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 that day, a debate, football competition and entertainment programme were organised 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), DSc (*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 programme. 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 organised on 10th 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 Programme: 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 programme 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 programme 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 utilised 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 honoured 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. Nineteen sixty-eight 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 Rajagarhia 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 helps 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 crore 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 *KGPian* – quarterly newsletter, Alumni Annual Report and the Annual souvenir *Yearnings of Yore* have been published during Alumni Meet. *KGP Connection*, a fortnightly e-newsletter is in regular circulation. Additionally brochures for different

campaigns, Foundation Day Celebrations, Alumni ID Cards, separate Yearbooks for UG, PG and PhD 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 programme would be modernized. Fund raising shall be undertaken to realise 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 3rd year BTech / Dual Degree and 4th year MSc 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 3rd year BTech/ Dual Degree and 4th year MSc 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 the Career Development Centre 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 facilities such as 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. Fifteen companies offered stipends in the range of Rs. 10,000/- to 20,000/- per month. In addition to the above, some students arranged internship by themselves with good stipends.

Out of 1282 third/fourth year BTech / Dual Degree / MSc 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

Two hundred and sixty 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
BTech (Hons) & BArch	615	524
5-year Integrated MSc	138	113
2-year MSc	116	61
Dual Degree (BTech + MTech)	387	329
MTech / MCP	710	448
MBA	70	65
MS/PhD	20	20
Total	2056	1560

The Highest Overseas 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)
BTech & BArch	11.21
Dual Degree	11.37
5 yr. Integrated MSc	10.71
VGSOM (MBA)	11.78
2 yr. MSc	6.6
M Tech	7.9
MS/ PhD	8.3
All UG and PG Courses	9.97

Some companies like ITC Ltd., Schlumberger, Hindustan Unilever, Qualcomm, Barclay's Capital, etc have offered pre-placement offers. The total number of Pre-Placement offers received is 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 centres 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 49th Inter-IIT Sports Meet was organised at IIT Guwahati. The first phase of Sports Meet began with the Inter-IIT Aquatic Meet held from October 1st to 4th, 2013. IIT Kharagpur secured 2nd position in Swimming and 3rd in water polo. Extraordinary performance in swimming was given by Shreyash Mahajan, a final year UG student. Shreyash was declared as the individual champion. The second phase which included all other games, started from December 16th to 23rd 2013. The men's section, IIT Kharagpur secured in the third position in Badminton while in Basketball it fetched the first position, in Cricket the second position, in Football the third position; in Lawn Tennis the second position; in Squash the fourth position; in Table Tennis the third position, and in Volleyball the fourth position.

On the whole, in 49th Inter IIT Championship, IIT Kharagpur after six long years secured overall Third Position in men's section. In Women's Section, it secured the first position in Lawn Tennis; and the third in Badminton. "Mr. Inter IIT" position was secured by Nitish Balal of IIT Kharagpur.

Out-station Participation

Basketball Boys and Girls Team participated in IMG Reliance BFI Inter College Basketball League held at Kolkata and they secured the first position. IIT Kharagpur Boys Team Secured the first position and Girls Team secured the third position. The 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 organised 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 from 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 2014

The Annual Tech Fest Kshitj 2014 was organised from 31 January to 3rd February 2014. The event occurred under the patronage of UNESCO, and is currently rated as Asia's biggest techno management fest with major state-of-the-art scientific events and certifications.

The Fest consisted of many workshops such as Investigative Journalism, IFC, Technophilia, etc, while Mega-shows included Pyrolerra, BMX, Skate Driving, Roller Skating, Stunt Mania and EDM. Exhibitions included Orbit-brain controlled helicopter, Face Android, Miniature Models, NAO Robots, etc., while events included Genesis, Quizzard, Conceptualize, Theories N Core, Robotix, Strategia, Tech4fun, and many others.

The Principal Guest lecturers during the event were:

- Dougal Jerram, British geologist/earth scientist, 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 many Students centric and participatory Cells in major Research and Development initiatives sponsored by the MHRD, Government of India. During the year 2013-14, a 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 offing. 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 organising 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 organised 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 etc.

Courses of Study

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

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

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

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

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

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

Civil Engineering
- B.Tech.- Civil Engineering
- Dual Degree - Civil Engineering/ Hydraulic & Water Resources Engineering
- Dual Degree - Civil Engineering/ Transportation Engineering
- Dual Degree - Civil Engineering/ Geotechnical Engineering
- Dual Degree - Civil Engineering/ Structural Engineering

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

Computer Science and Engineering

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

Centre for Educational Technology

- M. Tech. - Media and Sound Engineering

Centre for Oceans, Rivers, Atmosphere and Land Sciences

- M. Tech. - Earth System Science and Technology

Cryogenic Engineering

- M. Tech. - Cryogenic Engineering

Electrical Engineering

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

Electronics and Electrical Communication Engineering

- B.Tech.- Electronics & Electrical Communication Engineering
- Dual Degree - Electronics & Elect. Comm. Engineering/ Fibre Optics and Lightwave Engineering
- Dual Degree - Electronics & Elect. Comm. Engineering/ Microelectronics & VLSI Design
- 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/ MBA/Engineering Entrepreneurship/Financial Engineering
- M. Tech. - Fibre Optics and Light wave Engineering (not offered in the session 2008-2009)
- M. Tech. - Microelectronics and VLSI Design
- M. Tech. - RF and Microwave Engineering

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

Geology and Geophysics
- M.Sc. - Exploration Geophysics
- M.Sc. - Applied Geology
- Joint M.Sc.- Ph.D. in Geophysics (with effect from 2009 admissions)
- Joint M.Sc.- Ph.D. in Geology (with effect from 2009 admissions)
- M. Tech. - Exploration Geosciences
- M. Tech. - Computational Seismology (Withdrawn due to less than 5 students admission)

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

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

Materials Science
- M. Tech. - Materials Science and Engineering.

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

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

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

Mining Engineering

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

Ocean Engineering and Naval Architecture

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

Physics and Meteorology

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

Rajendra Mishra School of Engineering Entrepreneurship

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

Rajiv Gandhi School of Intellectual Property Law

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

Ranbir & Chitra Gupta School of Infrastructure Design and Management

- M. Tech. - Infrastructure Design and Management

Reliability Engineering

- M. Tech. - Reliability Engineering

Rubber Technology

- M. Tech. - Rubber Technology

School of Information Technology

- M. Tech. - Information Technology
- M. Tech. – Information and Communication Technology

School of Medical Science and Technology

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

School of Water Resources

- M. Tech. - Water Management

Vinod Gupta School of Management

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

Distance Mode (Kolkata & Bhubaneswar Centre) (3 Years)

- M.Tech - Electronics and Communication Engineering
- M.Tech - Electrical Engineering
- M.Tech - Information and Communication Technology

Department of Aerospace Engineering

Head
Prof. Bhrigu 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, Bhrigu 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	*Ph.D. (T.U., Munich)*, DNS, LES, compressible turbulence, turbulence-radiation interaction, turbulent reacting flows, high performance computing
Joarder, Ratan	*Ph.D.(IISc. Bangalore)*, Supersonic Combustion, Computational Gas Dynamics, Laser Spark, Combustion Driven Shock Tunnel, Flow Diagnostics using Optical methods, Two-Phase Flow Computations
Karmakar, Srinibas	*Ph.D.(LSU, USA)*, Rocket and Gas Turbine Propulsion, Combustion, Combustion of Eneregtic Particles (Metals/Metalloids), Experimental Methods in Combustion, Nanotechnology for Energy Applications, Atomization and Sprays
Kaushik, Mrinal	*Ph.D.(IIT Kanpur)*, Theoretical studies on passive controlled jets, Theoretical studies on shock-boundary layer

	interactions, Theoretical studies on active feedback controlled jets, Experimental studies on aeroacoustics
Peyada, Naba Kumar	*Ph.D.*, System Identification/Parameter Estimation - Neural Networks, Flight Dynamics & Control and Flight Testing, Design Guidance and Control of Rockets Parafoil UAV MAV WIG-Craft etc.

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

Thrust Areas

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

Academic Performance

Awards & Honours	3
Member - Professional Bodies	15
Member - Editorial Board	7
Visits Abroad by Faculty Members	1
Doctoral and MS Degrees Awarded	3
Sponsored Research Projects	20
Consultancy Projects	2
Papers Published in Journals	26
Papers Presented in Conferences	21

Department of Agricultural & Food Engineering

Head
Prof. P B Singh Bhadoria

Professors

Banerjee, Rintu	*Ph.D.(IIT Kharagpur)*, Food Biotechnology, Bioenergy, Enzymology & its Biotechnological applications, Protein Chemistry
Bhadoria, P B Singh	*Ph.D.(IIT Kharagpur)*, Development and transfer of rural technnlogy, Soil Science &Plant nutrition
Das, Susanta Kumar	*Ph.D.(IIT Kharagpur)*, Mechanized Food Processing and Food Engineering
Datta, Ashis Kumar	*Ph.D.(Pennsylvania)*, Dairy and Food Process Engineering, Process Systems Analyses and Simulations
Dutta Gupta, Snehasish	*Ph.D.(Kalyani Univ)*, Plant Tissue Culture & Biotechnology
Ghosh, Bijoy Chandra	*Ph.D.(IIT Kharagpur)*, Soil less culture Organic farming Tea production and processing
Goswami, Tridib Kumar	*Ph.D.(IIT Kharagpur)*, Cold Storage, CA and MA storage of fruits and vegetables, Cryogenic grinding of spices, Discrete Element Analysis of grinding, CFD analysis of temperature distribution in precooler
Jha, Madan Kumar	*Ph.D.(Japan)*, Groundwater Management using RS-GIS and MCDM Techniques, Basin-wide Numerical 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	*Ph.D.(IIT Kharagpur)*, Aquacultural Engineering
Mallick, Nirupama	*Ph.D.(BHU, Varanasi)*, Microalgal Biofuel, Biodegradable Polymers (Polyhydroxyalkanoates) from Cyanobacteria, Bioremediation with Microalgae, Bioactives from Microalgae
Mishra, Hari Niwas	*Ph.D.(IIT Kharagpur)*, Algal Food Biotechnology, RTE Health Foods & Nutraceuticals, Innovative Food Processing Technologies, Horticultural & Plantation Crop Products Processing, Food Safety & Quality Control, High pressure processing of high value perishables
Mitra, Adinpunya	*Ph.D.(East Anglia UK)*, Exploring biological activities from in vitro conserved Gentianaceae medicinal plants, Regulation of shikimate/phenylpropanid and MVA/MEP pathways in hairy root cultures of Daucus carota, Understanding molecular oscillations of scent volatiles emission in moth-pollinated flowers, Enzymatic route to phenolic fragrance formation in Hemidesmus indicus roots, Evaluating metabolic perturbations in cryptogein-cotransformed root cultures of Nicotiana tabacum, Medium-term in vitro conservation and sustainable utilization of Gentianaceae fragile bioresources, Identification of flavour trait(s) in Darjeeling tea accessions by targeted metabolomics, Targeted metabolomics of scented rice cultivars

Panda, Rabindra Kumar	*Ph.D.(IARI Delhi)*, Watershed Management, Non-point Source Pollution of Soil & Water, Climate Change Effect on Agriculture, Rainwater Managment
Panda, Sudhindra Nath	*Ph.D.(PAU, Ludhiana)*, Integrated Land and Water Resources Planning and Management, Rainwater Conservation and Reuse for Climate Resilient Agriculture
Pandey, Keshaw Prasad	*Ph.D.(IIT Kharagpur)*, 1 Tractor power systems 2. Traction modelling 3. Precision agriculture
Raghuwanshi, Narendra Singh	*Ph.D.(California)*, Irrigation and Water Management, Hydrological Modelling, Watershed Management
Raheman, Hifjur	*Ph.D.(Bangkok)*, Development of farm Implements, Biofuel production and hybrid power generation, Traction and tillage performance improvement in walking tractor
Singh, Rajendra	*Ph.D.(IIT Kharagpur)*, Hydrological Modelling, Irrigation System Mangement
Tewari, Virendra Kumar	*Ph.D.(IIT Kharagpur)*, Farm Machinery & Power, Ergonomics & Safety, Precision Agriculture
Tiwari, Kamlesh Narayan	*Ph.D.(IARI Delhi)*, Micro Irrigation, Greenhouse Technology, Remote Sensing & GIS Applications in Water Resources and Watershed Management

Associate Professors

Chatterjee, Chandranath	*Ph.D (IIT Kharagpur)*, Flood Forecasting, Design Flood Estimation, Flood Inundation Modeling and Hazard Assessment, Remote Sensing and GIS Applications in Surface Water Hydrology, Hydrological Modeling
Das, Bhabani Sankar	*Ph.D.(Kansas)*, Spectral characterization of soils and water, Rice hydrology, Measurement and modeling of water and nutrient status in soil, Pedotransfer functions
Das, Madhusweta	*Ph.D.(Jadavpur Univ)*, Functional Foods, Starch based edible and biodegradable film, Isolation of bioactive component from food waste
Majumdar, Gautam Chandra	*Ph.D.(IIT Kharagpur)*, Food Process Engineering
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
Swain, Dillip Kumar	*Ph.D.(IIT Kharagpur)*, Sustainable & Precision Production Agriculture, Climate Change Adaptations & Mitigations, Crop Growth & Yield Simulation

Thomas, E V	*Ph.D.(IIT Kharagpur)*, Farm Machinery & Power, Rice Transplanter, Tea Process Machinery

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	*Ph.D.(IIT Kharagpur)*, Agricultural water and waste management, Irrigation hydraulics and modeling, Nonpoint source agricultural pollution, Cold region hydrology
Mukherjee, Chanchal Kumar	*MS (New Jersey)*, Cage for mariculture
Nalavade, Parish Prakash	*D. Eng. (A I T, Thailand)*, Tillage and Traction, Soil-Tool Interaction, Precision Agriculture
Shrivastava, Shanker Lal	*Ph.D.(IIT Kharagpur)*, Post Harvest Engineering, Dairy & Food Process Engineering, Development of low cost - farm level processing equipment
Srivastav, Prem Prakash	*Ph.D.(IIT Kharagpur)*, Food Science and Technology
Tripathy, Punyadarshini Punam	*Ph.D.(IIT Delhi)*, 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

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

Thrust Areas

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

Academic Performance

Awards & Honours	7
Member - Professional Bodies	129
Member - Editorial Board	42
Visits Abroad by Faculty Members	12
Lectures by Visiting Experts	1
Doctoral and MS Degrees Awarded	15
Sponsored Research Projects	69
Consultancy Projects	23
Technology Transferred	12
Patents (filed / granted)	29
Short-Term Courses and Training Programmes organised	10
Papers Published in Journals	114
Papers Presented in Conferences	85

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 trannsit on housing choice, peri urban dynamics, residents satisfaction in company housing, energy efficient intervention in affordable housing, housing and human performance index
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)*, Tourism Planning in Historic Areas, Urban Conservation & Heritage Management, Architectural Design and Pedagogy, Quality of Life in Residential Neighbourhoods with focus on needs of senior citizens, Traditional Architecutral and applicaiton of Shape Grammer, 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-friendlyDesigns-Landscape-Elderly Housing-Preservation
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
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)*, Building maintainability, Building performance grading, Decision making, Construction materials, Project management, Intelligent building, Safety management, Building systems and services
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)*, Architectural Design, Service Quality Evaluation, Facility Planning
Majumdar, Tapan Kumar	*MCP(IIT Kharagpur)*, Work environment in industries for industrial workers, Low cost Construction
Mazumder, Tarak Nath	*Ph.D (IIT Kharagpur)*, Urban Planning, Transportation Planning, Hazardous Waste Management
Pandit, Debapratim	*Ph.D.(Univ. of Tokyo)*, Transportation Planning, Urban Infrastructure utilities and services, Urban Environmental Planning & Management
Paul, Saikat Kumar	*MCP(IIT Kharagpur)*, Computer Application in Built Environment, GIS and Remote Sensing in Planning, Urban and Regional Planning, Architectural Design, Environmental Planning

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)

Thrust Areas

1. Green Architecture and sustainable designs and Energy efficiency.
2. Urban information system
3. Universal Design in Built Environment

Academic Performance

Awards & Honours	2
Member - Professional Bodies	55
Member - Editorial Board	16
Visits Abroad by Faculty Members	5
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	3
Sponsored Research Projects	32
Consultancy Projects	27
Books Published	4
Papers Published in Journals	25
Papers Presented in Conferences	26

Department of Biotechnology

Head
Prof. Tapas Kumar Maiti

Professors

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

Associate Professors

Ghosh, Anindya Sundar	*Ph.D.(Calcutta Univ)*, Microbial genetics, Antimicrobial chemotherapy, Bacterial biofilm, Physiology and Biochemistry of Penicillin-binding proteins (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 groundwater, Bioremediation of Petroleum refinery waste, Microbial diversity-Metagenomics and Environmental biotechnology, Molecular methods in detection of microbes in drinking water, Microbial diversity and bioremediation of Acid Mine Drainage
Sen, Ramkrishna	*Ph.D.(IIT Madras)*, Biosensor, Algal Biofuels and Bio-CCS, Biorefinery, Bioprocess Development Modeling & Optimization, Marine Biotechnology, Biochemical Engineering, Enzymes and Biofuels Technology, Bioenergy, Probiotics and Nutraceuticals, Environmental Biotechnology

Assistant Professors

Bahadur, Ranjit Prasad	*Ph.D.(Jadavpur Univ)*, Bioinformatics and Computational Structural Biology

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

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 pathogenecity 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 cypovirus 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

Thrust Areas

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

Academic Performance

Member - Professional Bodies	38
Member - Editorial Board	15
Visits Abroad by Faculty Members	10
Lectures by Visiting Experts	12
Doctoral and MS Degrees Awarded	5
Sponsored Research Projects	64
Consultancy Projects	5
Patents (filed / granted)	17
Books Published	1
Papers Published in Journals	73
Papers Presented in Conferences	53

Department of Chemical Engineering

Head
Prof. Narayan Chandra Pradhan

Professors

Basu, Jayanta Kumar	*Ph.D.(IIT Kharagpur)*, Adsorption and Separation Science, Waste Water Treatment, Reaction Engineering
Das, Gargi	*Ph.D.(IIT Kharagpur)*, Multiphase flow, Two phase instrumentation, CFD simulation
DasGupta, Sunando	*Ph.D.(RPI, USA)*, Microscale Transport Process and Microfluidics
De, Sirshendu	*Ph.D.(IIT Kanpur)*, Membrane separations, Transport Processes, Flow through microchannels
Kundu, Gautam	*Ph.D.(IIT Kharagpur)*, Multiphase Operation, Mineral Beneficiation, Rheology of Suspension, Catalysis
Meikap, Bhim Charan	*Ph.D.(IIT Kharagpur)*, Industrial Environmental Pollution Monitoring & Control, Coal Benificiation, CO2 Capturing, Fluidization
Mukherjee, Dibyendu	*Ph.D.(IIT Kharagpur)*, Multi Phase Flow, Column Flotation, Modeling & Simulation
Neogi, Sudarsan	*Ph.D.(Ohio Univ.,USA)*, Surface Modification And Engineering of Polymer Substrates For Biomedical Applications, Plasma Enhanced Chemical Vapor Deposition, Plasma Sterilization, Adhesive Development, Antimicrobial Coatings, Modeling And Simulation Of Chemical Process Plant, Environmental Pollution Control, Polymer Composites
Pradhan, Narayan Chandra	*Ph.D.(UDCT Bombay)*, Heterogeneous Catalysis, Chemical Process Development, Petrochemical Technology, Petroleum Refining, Separations Technology
Samanta, Amar Nath	*Ph.D.(IIT Kharagpur)*, Process Dynamics & Control, Nonlinear Process Control, Process Modeling & Simulation, Carbon Capture & Sequestrian

Associate Professors

Chakraborty, Sudipto	*Ph.D.(IIT Kharagpur)*, Process Modelling and Simulation, CFD & Heat Transfer, Ultra-fast cooling of steel, Coal and mineral beneficiation
Kar, Debdulal	*Ph.D.(IIT Kharagpur)*, Mineral Processing, Fluidization Engineering, Biogas Development
Mukherjee, Rabibrata	*Ph.D.(IIT Kanpur)*, Polymer Thin Film Instability, Soft Lithography, Structural Super Hydrophobicity, Colloidal Crystals, Soft Nano Fabrication, Self Organized Meso Patterning of Polymers, Sol - Gel Thin Films, Electro Hydrodynamic Instabilities
Neogi, Swati	*Ph. D.(Ohio University)*, Innovative composite technology, Lifetime and reliability study, Matrials development, Composite fabrication technology

Assistant Professors

Atta, Arnab	*Ph.D. (IIT Delhi)*, Computational Fluid Dynamics, Multiphase Flow, Complex Fluids, Process Intensification, Interfacial Science and Engineering
Chakrabarty, Saikat	*Ph.D.(Univ. of Houston)*, Chemical Reaction Engineering, Biomedical Engineering, Bioenergy
Chakraborty, Jayanta	*Ph.D.(IISc., Bangalore)*, Particle technology, Population balance modeling, Synthesis of nanoparticles, Crystallization, Manufacturing of nanomaterial based solar cells
Deshpande, Parag Arvind	*Ph.D.(IISc., Bangalore)*, Electronic structure calculations, Computational catalysis, First principles analysis of physiological reactions
G, Harikrishnan	*Ph.D.(IIT Bombay)*, polymeric foams, polymer nanocomposites, rheology, polymeric coatings
Ganguly, Somenath	*Ph.D.(Univ. of Kansas, USA)*, Flow in thin channel and porous media, Hydrogel, Improved recovery of hydrocarbon
Jana, Amiya Kumar	*Ph.D.(IIT Kharagpur)*, Renewable energy, Process intensification, Nonlinear control, Modeling and simulation, Desalination
Padmanabhan, Venkat	*Ph.D.(Columbia Univ.)*, Advanced Functional Materials, Polymer Nanocomposites, Bio-Mechanics of C. elegans, Organic Photovoltaics
Ray, Subhabrata	*M.Tech.(IIT Kharagpur)*,
Sarkar, Debasis	*Ph.D.(IISc. Bangalore)*, Optimization and control of fed-batch bioreactors, Crystallization process engineering, Multi-objective optimization: Genetic Algorithms, Multivariate image analysis, Computational systems biology
Sengupta, Sonali	*Ph.D.(UDCT Mumbai)*, Reaction Engineering, Petroleum engineering, Heterogeneous and Homogeneous Catalysis

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 peteoleum feedstock in mini-and micro-reactors for production of Hydrogen 4. Advanced separation processes involving membranes with emphasis on water purification, dye removal, effluent treatment processes etc. 5. Simulation and modeling of coal & biomass combustion processes in pulverized and fluidized combustors 6. Multi-phase processes & reactions in gas-liquid, liquid-solid, solid-liquid and liquid-liquid systems using pipelines, ejector based systems, fluidized bed, column flotation etc. 7. Development of innovative catalysts from fly ash for organic chemical synthesis (alkylation, isomerisation etc.) 8. Plasma assisted surface modification for chemical engineering applications 9. Development & performance of novel bubble column scrubber/reactor for removal of SO2 and fly ash 10. Technology of composite materials 11. Pattern Formation of Soft Materials utilizing Interfacial Instability 12. 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.

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

Academic Performance

Awards & Honours	7
Member - Professional Bodies	50
Member - Editorial Board	7
Visits Abroad by Faculty Members	5
Lectures by Visiting Experts	7
Doctoral and MS Degrees Awarded	7
Sponsored Research Projects	65
Consultancy Projects	36
Patents (filed / granted)	24
Books Published	12
Papers Published in Journals	73
Papers Presented in Conferences	26

Department of Chemistry

Head
Prof. Tanmaya Pathak

Professors

Bandyopadhyay, Sanjoy	*Ph.D.(IISc Bangalore)*, Protein folding, Theoretical and Computational Chemistry, Hydration properties of bio-molecules, Self-assembled molecular films at interfaces, Protein-ligand complexes, Phospholipid membranes, Cyclodextrin-guest interaction
Basak, Amit	*Ph.D.(Cal),D.Phil.(Oxon)*, Bioorganic/Medicinal Chemistry/Selective protein capture/Synthetic Chemistry
Bhattacharjee, Manish	*Ph.D.(NEHU)*, Catalysis, Sunthetic Inorganic Chemistry
Biradha, Kumar	*Ph.D.(Hyderabad)*, Gas sorption studies, Supramolecular Chemistry, Crystal Engineering, Polymorphism, Cooridnation Polymers, Structural Chemistry, Solid state reactions, Soft materials
Chattaraj, Pratim Kumar	*Ph.D.(IIT Bombay)*, Density functional theory, Chemical reactivity, ab initio calculations, Quantum chaos, Aromaticity in metal clusters
Dasgupta, Swagata	*Ph.D.(RPI New York)*, Protein-protein and Protein-small molecule interactions
Dey, Joykrishna	*Ph.D.(Kanpur)*, Molecular Self-assembly, Colloidal Drug Delivery Systems, Polymer-Surfactant Interactions, Organogels and Hydrogels of Low-Molecular-Weight Amphiphiles
Hajra, Saumen	*Ph.D.(Pune Univ)*, Catalytic Asymmetric Reactions, Organocatalysis, Total Synthesis of Biologically Active Compounds
Mal, Dipak Ranjan	*Ph.D.(Missouri)*, Benzannulation and Hauser annulation, Lateral lithiation Michael-initiated ring closure, Total synthesis of bioactive natural products: angucyclines anthracyclines carbazoles quinonoids, Oxidative dearomatization
Pal, Tarasankar	*Ph.D.(Burdwan Univ.), D.Sc.(Visva Bharati Uni*,
Pathak, Tanmaya	*Ph.D.(Uppsala Sweden)*, Carbohydrates. Nucleosides. Heterocycles. Carbocycles. Dinucleosides as Rnase A inhibitors
Pramanik, P	*Ph.D.(IIT Kharagpur)*, Nanoscience and Nanotechnology, Material Chemistry
Raj, C Retna	*Ph.D.(M.K Univ Madurai)*, Optical and electrochemical sensors, Electrocatalysis and fuel cell, Inorganic multifunctional nanomaterials, Energy conversion and storage devices
Ray, Debashis	*Ph.D.(Jadavpur Univ)*, High nuclearity coordination cages., Solution coordination chemistry crystallization 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 lignad arm hydrolysis., Coordination driven fluorescence enhancement.
Ray, Jayanta Kumar	*Ph.D.(Calcutta Univ)*, Synthetic Organic Chemistry
Sarkar, Nilmoni	*Ph.D.(Jadavpur Univ)*, Characterization of Ionic Liquid containing Microemulsion, Photoinduced electron transfer in RTIL and RTIL containing confined media., Photophysics and Photodynamics of biologically relevant molecules, Excited state intramolecular proton transfer in organized assemblies, Characterization of surface active ionic liquids, Fluorescene Correlation Spectroscopy, Fluorescence lifetime imaging microscopy in single molecular level
Sarkar, Tarun Kumar	*Ph.D.(Calcutta Univ)*, Synthetic Organic and Organometallic Chemistry
Srivastava, Suneel Kumar	*Ph.D.(IIT Kharagpur)*, Semiconducting/Magnetic Nanomaterials, Polymer Nanocomposites
Taraphder, Srabani	*Ph.D.(IISc Bangalore)*, Theoretical Physical Chemistry, Computer Simulation of Charge Transfer Processes, Theoretical Modelling of Functionalized Carbon Nanotubes

Associate Professors

Mahanty (Pathak), Amita	*Ph.D.(IIT Kharagpur)*, Synthesis and Characterization of Inorganic Nanomaterials and their Biological Application
Mani, Ganesan	, Anion Receptors, Organometallic Chemistry
Nag, Ahindra	*Ph.D.(Jadavpur Univ)*, Synthesis and Characterization of Natural Occurring Polyphenols
Nanda, Samik	*Ph.D.(IICT-Hyderabad)*, Application of enzymes and microorganisms in organic synthesis, Total synthesis of complex natural products, Asymmetric synthesis
Singh, N D Pradeep	*Ph.D.(Madras Univ.)*, 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

Assistant Professors

Ayyappan, Anoop	*Ph.D.(Univ. of Hyderabad)*, Computational Chemistry, Reaction Mechanisms, QM/MM studies of biological systems, Computational Photochemistry
Das, Madhab Chandra	*Ph.D.(IIT Kanpur)*, Porous Metal/Covalent Organic Frameworks (MOFs/COFs)
Dhara, Dibakar	*Ph.D.(Osmania Univ. Hyderabad)*, Synthetic Polymer Chemistry, Colloids and Nanomaterials, Physical Chemistry of Macromolecules
Halder, Mintu	*Ph.D.(IACS Kolkata)*, Experimental Physical Chemistry, Biophysics, Photophysics of Nano-materials, Spectroscopy

Maji, Modhu Sudan	*Ph.D.(Germany)*, Dual Catalysis & Asymmetric Synthesis (merging organo-catalysis with transition metal catalysis), Ru- and Pd-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
Mishra, Sabyashachi	*Ph.D.(Tech. Univ., Munich, Germany)*, Theory of Relativistic Vibronic Coupling in Molecular Physics, Relativistic Quantum Chemistry, Molecular Structure and Spectroscopy in Excited States, Reactive Processes in Biology, Network Dynamics in Bio-(chemical/physical) processes
Patra, Sanjib Kumar	*Ph.D. (IIT Kanpur)*, Inorganic Chemistry, Functional Polymer Chemistry, Organometallic Chemistry, Materials Chemistry
Rajakumar Ananthakrishnan	*Ph.D.(M.K.Univ., Madurai)*, Analytical Methods for the detection of heavy metals/ROS in AOP., Preparation of hybrid/nanomaterials for photocatalysis and surface applications, Green Methodolody for Selective Organic Transformation/photodegradation under visible light.
Samanta, Rajarshi	*Ph.D.(Osmania Univ. IICT)*, Transition metal catalysis, Asymmetric synthesis, Total synthesis of natural products, Natural product inspired compound library

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 difractometer, 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 trasformations. 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.

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

Academic Performance

Awards & Honours	11
Member - Professional Bodies	42
Member - Editorial Board	25
Visits Abroad by Faculty Members	5
Lectures by Visiting Experts	69
Doctoral and MS Degrees Awarded	23
Sponsored Research Projects	56
Consultancy Projects	1
Patents (filed / granted)	10
Papers Published in Journals	181
Papers Presented in Conferences	16

Department of Civil Engineering

Head
Prof. Subhasish Dey

Professors

Baidya, Dilip Kumar	*Ph.D.(IISc Bangalore)*, Reliability in Gotechnical Engg Pile foundations Soil Dynamics
Barai, Sudhir Kumar	*Ph.D.(IISc Bangalore)*, Soft Computing Applications, Structural Health Monitoring, Recycled Construction Materials, Fracture in Concrete
Bhattacharya, Baidurya	*Ph.D. (Johns Hopkins Univ)*, Computational materials science, Risk and reliability analysis of infrastructure systems
Bhattacharyya, Sriman Kumar	*Ph.D.(IIT Kharagpur)*,
Das Gupta, Shambhu Pada	*Ph.D.(IIT Kanpur)*, constitutive modellingSoil-Structure InteractionFpoundation Dynamics
Desai, Venkappayya R	*Ph.D.(Clemson Univ)*, 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	*Ph.D.(IIT Kharagpur)*, Turbulence, Fluvial Hydraulics, Applied Hydrodynamics
Dhang, Nirjhar	*Ph.D.(IIT Kharagpur)*, Concrete, Dynamics and Control of Railway Bridges, Biomechanics
Ghangrekar, Makarand Madhao	*Ph.D (IIT Bombay)*, Microbial Fuel Cells, UASB reactor for anaerobic wastewater treatment, Water and Wastewater Treatment, Bioenergy recovery during waste management, Wastewater reuse
Gupta, Ashok Kumar	*Ph.D.(IIT Bombay)*, Water and Wastewater Treatment, Environmental Impact Assesment, Air Quality Management, Environmental Planning
Maitra, Bhargab	*Ph.D.(IIT Bombay)*, 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, Shell analysis
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, Dhrubajyoti	*Ph.D.(IIT Delhi)*, Water resources engineering, Numerical techniques

	in civil engineering hydraulics
Associate Professors	
Dash, Sujit Kumar	*Ph.D.(IIT Madras)*, Reinforced soil structures, Shallow foundation
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/Embankment on Soft Soil, Geotechnical Earthquake Engineering, Dynamic Analysis of Rigid Pavement
Goel, Sudha	*Ph.D.(Johns Hopkins Univ)*, Environmental Impact and Risk Assessment, Water Quality and Treatment, Solid and Hazardous Waste Management, Environmental Engineering
Pal, Anjali	*Ph.D (Calcutta Univ.)*, Nanoparticle mediated wastewater treatment, Photocatalytic degradation of organic pollutants, Arsenic remediation in groundwater, Adsorption / adsolubilization for wastewater management
Reddy, M Amaranatha	*Ph.D.(IIT Kharagpur)*, Transportation Engineering
Assistant Professors	
Banerjee, Biswanath	*Ph.D.(IISc., Bangalore)*, Computational Mechanics, Inverse Problems
Bhattacharya, Paramita	*Ph.D.(IISc. Bangalore)*, Computational Geotechnical Engineering, Soil Stabilization, Seismic Analysis of Underground Structures
Biligiri, Krishna Prapoorna	*Ph.D.(Arizona St. Univ. USA)*, 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	*Ph.D.(IISc Bangalore)*, Soil Dynamics, Computational Geomechanics, Reinforced Soil Structures, Geotechnical Earthquake Engineering
Chakraborty, Sushanta	*Ph.D.(IIT Kharagpur)*, Vibration Serviceability of Building Floors using Experimental Modal Testing, Finite Element Model Updating and its application to FRP structures
Dhar, Anirban	*Ph.D.(IIT, Kanpur)*, Groundwater Contamination and Remediation, Water Resources Systems Analysis, Environmental Fluid Mechanics, Computational Hydraulics, Applied Optimization Theory, Geostatistics
Hossain, Shaikh Jahangir	*Ph.D.(IIT Kharagpur)*, computational mechanics, Finite Element Method, Nonlinear Mechanics
Maity, Rajib	*Ph.D.(IISc. Bangalore)*, Hydroclimatology, Water Resources Engineering, Stochastic Hydrology, Watershed Development, Soft

	Computing in Hydrology, Monsoon rainfall
Mitra, Nilanjan	*Ph.D.(UW, SEATTLE)*, Earthquake loading of structures, Fluid Structure Interaction, Probabilistic modeling, Physics and 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	*Ph.D.(ASU, Phoenix)*, 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	*Ph.D.(IIT Madras)*, experimental and numerical modeling of steady and unsteady flows in pipelines and open channels, experimental studies on turbulence characteristics of flows in open channels and pipelines, sediment transport in rivers- river morphology- reservoir sedimentation, pipeline engineering - water distribution networks - leaks and blockages in liquid pipelines, unsteady flows in hydropower stations
Shaws, Amit	*Ph.D.(IISc Bangalore)*, Computational Mechanics, Ballistic Response of Nano-Composite Armour, Impact Mechanics, Underwater blast
Verma, Shubha	*Ph.D.(IIT Bombay)*, Environmental Engineering, Air Pollution, Aerosol Modelling and Climate Impacts

Brief Description of on-going activities

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

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

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

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

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

Thrust Areas

1. EnE: Water and Wastewater treatment, Solid Waste Engineering, Environmental Microbiology, Environmental Impact Assessment, Air Pollution Modeling, Bio-energy
2. SE: Reliability engineering, nonlinear mechanics, structural health monitoring, fluid-structure interaction.
3. HWRE: Submerged Jets, Coherant 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.

Academic Performance

Awards & Honours	15
Member - Professional Bodies	78
Member - Editorial Board	41
Visits Abroad by Faculty Members	10
Lectures by Visiting Experts	1
Doctoral and MS Degrees Awarded	3
Sponsored Research Projects	70
Consultancy Projects	61
Technology Transferred	1
Patents (filed / granted)	2
Short-Term Courses and Training Programmes organised	2
Books Published	5
Papers Published in Journals	100
Papers Presented in Conferences	76

Department of Computer Science & Engineering

Head
Prof. Rajib Mall

Professors

Basu, Anupam	*Ph.D.(IIT Kharagpur)*,
Chakrabarti, Partha Pratim	*Ph.D.(IIT Kharagpur)*, Artificial Intelligence, CAD for VLSI & Embedded Systems, Design of Algorithms, Reliable and Fault Tolerant Systems
Das, Partha Pratim	*Ph.D.(IIT Kharagpur)*, Image Processing, Software Engineering, Language Translation, Object-Oriented Analysis & Design
Dasgupta, Pallab	*Ph.D.(IIT Kharagpur)*, Artificial Intelligence, Formal Verification of Integrated Circuits and Dynamical Systems
Ganguly, Niloy	*Ph.D.(BESU, Calcutta)*, Peer-to-peer Networks, Online Social networks, Network Theory, Wireless Internet, Delay Tolerant Networks
Ghose, Sujoy	*Ph.D.(IIT Kharagpur)*, System Intelligence, Networking, Algorithms
Gupta, Arobinda	*Ph.D.(Iowa)*, Distributed Systems, Mobile Computing
Kumar, Rajeev	*Ph.D.(Sheffield)*, Programming Language & Software Engineering, Multiobjective Optimization & Evolutionary Computing, EDA & Embedded Systems, Multimedia Systems & Video Transcoding, Education Standards & Quality
Majumder, Arun Kumar	*Ph.D.(Cal),Ph.D.(Florida)*, Database and Mutimedia Systems, Information Security, Medical Informatics and Telemedicine
Mall, Rajib	*Ph.D.(IISc Bangalore)*, program analysis and testing
Mandal, Chittaranjan	*Ph.D.(IIT Kharagpur)*, VLSI CAD, Networking, Formal Verification
Mukhopadhyay, Jayanta	*Ph.D.(IIT Kharagpur)*, Bio-Informatics, Medical Informatics, Image processing
Pal, Ajit	*Ph.D.(Calcutta Univ)*, CAD for Low Power Embedded systems Computer Networks
Pal, Sudebkumar Prasant	*Ph.D.(IISc Bangalore)*, Design and analysis of algorithms, Computational and combinatorial geometry, Graph theory and algorithms
Roychowdhury, Dipanwita	*Ph.D.(IIT Kharagpur)*, 1. Cryptography 2. Cellular Automata 3.Error Correcting Code 4. VLSI
Sarkar, Dipankar	*Ph.D.(IIT Kharagpur)*, Formal Verification of circuits and systems, Logic and Automated theorem Proving
Sarkar, Sudeshna	*Ph.D.(IIT Kharagpur)*, Machine learning, Natural Langauge Processing, Data Mining, Information Retrieval
Sengupta, Indranil	*Ph.D.(Calcutta Univ)*, VLSI design and testing, Cryptography and network security, Reversible computing

Associate Professors

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

Assistant Professors

Bhattacharya, Sourangshu	*Ph.D.(IISc. Bangalore)*, Big Data, Machine Learning, Optimization
Chakraborty, R S	*Ph.D.(CWR Univ.USA)*, Hardware Design for Security, Digital Watermarking, VLSI Design and Methodologies
Dey, Soumyajit	*Ph.D.(IIT Kharagpur)*, Formal Methods for Embedded System Design and Verification, High Performance Architecture, Assistive Technologies, For more information: http://cse.iitkgp.ac.in/~soumya/
Goyal, Pawan	*Ph.D.(University of Ulster, UK)*, Natural Language Processing, Information Retrieval and Extraction, Sanskrit Computational Linguistics
Mitra, Bivas	*Ph.D.(IIT Kharagpur)*, Technological network modeling, Complex and dynamic networks, Interdependent networks, Mobile networks
Mitra, Pralay	*Ph.D.(IISc. Bangalore)*, Computational Biology, Bioinformatics
Mukherjee, Animesh	*Ph.D.(IIT Kharagpur)*, Complex systems, language dynamics, social computation, web social media

Lecturer

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

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,

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

Academic Performance

Awards & Honours	8
Member - Professional Bodies	25
Member - Editorial Board	4
Visits Abroad by Faculty Members	7
Lectures by Visiting Experts	14
Doctoral and MS Degrees Awarded	35
Sponsored Research Projects	77
Consultancy Projects	19
Patents (filed / granted)	13
Short-Term Courses and Training Programmes organised	3
Books Published	6
Papers Published in Journals	47
Papers Presented in Conferences	60

Department of Electrical Engineering

Head
Prof. Siddhartha Sen

Professors

Barua, Alok	*Ph.D.(IIT Kharagpur)*, Fault Diagnosis of Analog and Mixed Signal Circuit In-Situ Measurement in Bio reactor
Bhattacharya, Tapas Kumar	*Ph.D.(IIT Kharagpur)*,
Chakraborty, Chandan	*Ph.D.(IIT Kharagpur)*, Electric Machines, Sensorless & Fault Tolerant Control of Industrial Drives, Power Converters, Renewable Energy Systems
Das, Debapriya	*Ph.D.(IIT Delhi)*, Microgrid Operation, Power System Operation and Control, Electric Power Distribution System.
Das, Sarit Kumar	*Ph.D.(IIT Kharagpur)*, Control Systems
Dutta, Pranab Kumar	*Ph.D.(IIT Kharagpur)*, Biomedical Image Processing, Signal processing, Optoelectronics, Pattern analysis and machine vision
Kastha, Debaprasad	*Ph.D.(Tennessee)*, Wind Electrical Systems, Switched Mode Power Supplies, Machine Drives
Kishore, N K	*Ph.D.(IISc Bangalore)*, Power and Energy Systems
Maka, Srinivasu	*Ph.D.(IIT Kharagpur)*, Biomedical System Engineering, Control Systems & Instrumentation Engineering
Mohan, Bosukonda Murali	*Ph.D.(IIT Kharagpur)*, Computational Intelligence in Control Systems, Orthogonal Functions Applications in Control Systems, Control Systems
Mukhopadhyay, Siddhartha	*Ph.D.(IIT Kharagpur)*, 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
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-DC Power Conversion, Embedded Control Systems, Fault Diagnostics and Prognostics, Analog and Mixed Signal VLSI Design and Systems on Chip
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

Associate Professor

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

Assistant Professors

Bajpai, Prabodh	*Ph.D.(IIT Kanpur)*, 1. Renewable Energy Systems, 2. Power System Restructuring
Bhattacharya, Tanmoy	*Ph.D.(IISc. Bangalore)*, Power Converters and Machine Drives, Power converter topology and control for HVDC and FACTS
Biswas, Karabi	*Ph.D.(IIT Kharagpur)*, Sensor Design, Development of Instrumentation System, Study of Fractional Order Systems
Chatterjee, Dheeman	*Ph.D.(IIT Kanpur)*, Power System Dynamics, Grid Integration of Wind Power, HVDC Transmission and FACTS controllers
Chattopadhyay, Souvik	*Ph.D (IISc. Bangalore)*, Digital Control of Power Converters, Soft-switched dc dc converters
Deb, Alok Kanti	*Ph.D.(IIT Delhi)*, Control Systems, Computational Intelligence, Fault Diagnosis
Fulwani, Deepak	*Ph.D.(IIT Bombay)*,
Kapat, Santanu	*Ph.D.(IIT Kharagpur)*, Nonlinear Analysis of Digitally Controlled DC-DC Converters, High Performance Digital Control in Power Converter Circuits
Mukherjee, Anirban	*Ph.D. (IIT Kharagpur)*, Machine learning for Healthcare applications, Medical Signal/Image Processing
Patra, Sourav	*Ph.D.(IIT Kharagpur)*, Robust control, Nonlinear control

Brief Description of on-going activities

From classical to modern, from milli watts to tens of kilo watts, from conventional to non-conventional, the electrical engineering department investigates these all. The range of investigation for this department is one of the broadest in this institute. The major on going activities are categorized as follows: Machine Drives and Power Electronics: * Magnetic Levitation * Superconducting magnetic energy storage * Variable frequency AC-Drives * Simulation of power electronic circuits * Resonant Converters * Design of integrated circuits for Power Management * Nonlinear phenomena in Power Electronics * Automotive Electronics * Diagnostic of drives * Drive fatigue analysis Control and Dynamic Systems: * Neuro-fuzzy controllers * Control of chaotic systems * Discrete event and hybrid systems * Fault-tolerant control of aero-space systems * Attitude control of satellites and launch vehicles * Robust stabilization using periodic controllers * Reduced order modeling * Control of Variable Air-Volume Air-Conditioning Systems * Bifurcation theory of hybrid dynamical systems * Delta domain digital control analysis and design * Neural networks

applications in control * Genetic algorithm applications in control * Decentralized control of large scale systems * Nonlinear dynamics * Fractional order system and their applications Power and Energy Systems: * Wind turbines * Power system dynamics * Real-time digital simulation of power systems * Power system protection * Intelligent relaying * State estimation of power systems * Condition and Diagnostic Monitoring of Power Apparatus * Energy audit and management * Power system planning and optimisation * Wavelet Application to Power system Transients * Neural Net Application to Partial Discharge Phenomenon * Electric Field Computations, Lightning Protection, Material Characterization * FACTs Instrumentation and Signal Processing: * Laser based profile measurement * Image based measurement systems * Motion estimation using MRI and colour Doppler imaging * Non-Linear and Statistical Signal Processing * Real Time Algorithms for Detection and Diagnostics * Condition monitoring of machines and power apparatus * Testing of analog and digital VLSI circuits * Fault detection and diagnosis of analog circuits * Control and instrumentation of bio-reactors * Fibre-optic components and sensors * Biomedical signal processing * Analysis of ECG signals * Sensors fusion * Multimedia Security * Convex Optimization and LMI applications to Signal Processing * Design and development of MEMS accelerometer * Seismic signal processing, active noise control * Fast algorithms for real time signal processing

Thrust Areas

This department has identified the following topics as the thrust areas of investigations: Efficient Power Converters & Drives, Micro-grid & Renewable Energy, Embedded Sensors & Systems, Integrated Power Management, Automotive Engineering, Cyber Physical Systems, Signal & Image Processing, Machine Learning,Advanced Control Theory & its Application, Estimation & Control of Industrial & Aerospace Systems

Academic Performance

Awards & Honours	1
Member - Professional Bodies	33
Member - Editorial Board	24
Visits Abroad by Faculty Members	14
Lectures by Visiting Experts	9
Doctoral and MS Degrees Awarded	11
Sponsored Research Projects	50
Consultancy Projects	20
Technology Transferred	3
Patents (filed / granted)	22
Short-Term Courses and Training Programmes organised	7
Books Published	3
Papers Published in Journals	41
Papers Presented in Conferences	42

Department of Electronics & Electrical Communication Engineering

Head
Prof. Swapna Banerjee

Professors

Bandyopadhyay, Kalyan Kumar	*Ph.D.(Jadavpur University)*, satellite communication
Banerjee, Swapna	*Ph.D.(IIT Kharagpur)*, VLSI based embedded system design for signal/image processing, Biomedical Instrumentation, Device modeling, Low power circuits, Mixed-signal design
Bhattacharyya, Tarun Kanti	*Ph.D.(Jadavpur Univ)*, MEMS and Microsystems, RF and Analog VLSI, Thinfilms, Nano- electronics, Nano-scale Biosystems Engineering
Biswas, Dhrubes	*Ph.D. (Illinois USA)*, 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 & AlGaN/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 AlGaN/GaNheterostructures for high power front end application.
Biswas, Prabir Kumar	*Ph.D.(IIT Kharagpur)*, Image Processing, Computer Vision, Automated Visual Inspection, Multimedia Network, Pattern Recognition, Sensor Network
Chakraborty, Ajoy	*Ph.D.(IIT Kharagpur)*, EMI/EMC, Electromagnetics, Antennas
Chakraborty, Mrityunjoy	*Ph.D.(IIT Delhi)*, Digital Signal Processing, Adaptive Signal Processing, VLSI Signal Processing, Compressive Sensing
Chattopadhyay, Santanu	*Ph.D.(IIT Kharagpur)*, Network-on-Chip Design and Test, Low Power Digital Testing, Thermal Aware Testing, Fault Diagnosis
Dhar, Anindya Sundar	*Ph.D.(IIT Kharagpur)*, VLSI Architecture Design
Dutta, Debasish	*Ph.D.(IIT Kharagpur)*, Optical Networks, Wireless Networks
Garg, Ramesh	*Ph.D.(IIT Kanpur)*, Electromagnetics
Maiti, Chinmay Kumar	*Ph.D.(IIT Kharagpur)*, Microelectronics, Silicon Heterostructures, Online Laboratories, High-k Gate dielectrics, Memristors, Protein Electronics, Technology CAD, Graphene Electronics
Pathak, Sant Sharan	*Ph.D.(IIT Delhi)*,

Rajakumar, Ratnam Varada	*Ph.D.(IIT Kharagpur)*,
Ray, Ajoy Kumar	*Ph.D.(IIT Kharagpur)*,
Saha, Goutam	*Ph.D.(IIT Kharagpur)*, Biomedical Signal Processing, Speech Processing, Audio based Surveillance, Biometric Authentication
Sanyal, Subrata	*Ph.D.(IIT Kharagpur)*,
Sen Gupta, Somnath	*Ph.D.(IIT Bombay)*, Computer Vision, Video Coding, Image and Video Processing, Multimedia Communication and Coding, VLSI for Video Coding

Associate Professors

Bhattacharya, Amitabha	*Ph.D.(IIT Kharagpur)*, RF & Microwave Communication
Chakrabarti, Indrajit	*Ph.D. (IIT Kharagpur)*, VLSI Design for Image and Video Processing and Communication
Datta, Raja	*Ph.D.(IIT Kharagpur)* , Computer Communication and Networks, Mobile Ad Hoc Networks, Optical WDM Networks, Distributed Systems, Wireless Sensor Networks, Inter Planetary Networks
Ghosh, Bratin	*Ph.D.(Univ. of Manitoba)*, Applied Electromagnetics
Mahapatra, Sudipta	*Ph.D.(IIT Kharagpur)*, 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.)*, Communication Networks, Cooperative Communication, Queuing Theory and Stochastic Processes, Optimization and network control, Performance Evaluation and optimal resource allocation problems, Learning and Self-organization and Emergent Phenomena in random environment, Social Networks, Network Coding, Cognitive Radio, Wireless communication and Geometry

Assistant Professors

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

Guha, Prasanta Kumar	, Sensor, MEMS, Interface Electronics, Integration with CMOS platform, Nano Electronics
Halder, Achintya	*Ph.D.(Georgia Tech., Atlanta)*,
Layek, Ritwik Kumar	*Ph.D., Texas A&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
Mandal, Mrinal Kanti	*Ph.D.(IIT Kharagpur)*, Microwave circuits
Mohan, Akhilesh	*Ph.D.(IIT Kanpur)*, Microwave Filters, Ultra Wideband Antenna, Metamaterials
Roy, Rajat	*Ph.D.(Univ. of Mumbai)*, Numerical computation of wave functions
Varshney, Shailendra Kumar	*Ph.D.(University of Delhi)*, Quantum optical communication, Speciality fibers-Photonic crystal fibers, Fiber optic sensors, Photonic devices for next generation communication, Plasmonics, Nanophotonics

Brief Description of on-going activities

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

digital hardware m) Architectural optimization of algorithms for signal processing and wireless communication. n) Formulation of efficient algorithms for designing CMOS operational amplifiers. o) Automated Visual Inspection of Industrial Objects, VLSI Architecture for low bit rate Video Coding, Medical Image Processing, Gesture Recognition from Video Sequences, Face recognition, Content based Retrieval of Texture Images, Fuzzy Neural Network. p) Fault tolerant design of Network on Chip systems. q) Optimal solutions are being developed for the next generation wireless Internet, including intelligent algorithms for implementing vertical handoff, traffic modelling and prediction, design and implementation of rate control algorithm for online video streaming and efficient strategies for implementing flow mobility in MIPv6 protocols.

Thrust Areas

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

Academic Performance

Awards & Honours	6
Member - Professional Bodies	43
Member - Editorial Board	10
Visits Abroad by Faculty Members	9
Lectures by Visiting Experts	7
Doctoral and MS Degrees Awarded	15
Sponsored Research Projects	81
Consultancy Projects	8
Patents (filed / granted)	16
Short-Term Courses and Training Programmes organised	10
Books Published	11
Papers Published in Journals	71
Papers Presented in Conferences	87

Department of Geology & Geophysics

Head
Prof. Debashish Sen Gupta

Professors

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

Assistant Professors

Bera, Melinda Kumar	*Ph.D.(IIT Kharagpur)*, Sedimentology, Sequence Stratigraphy, Stable Isotope Geochemistry, Paleoclimate
Kumari, Sudha	*Ph.D.*, Application of electrical and electromagnetic methods to

	environmental problems, Modeling and Inversion, Helicopter-borne electromagnetics (for imaging shallow earth structures), Joint inversion of electrical and electromagnetic methods
Maiti, Sabyasachi	*Ph.D.(IIT Kharagpur)*, Remote Sensing, Geographic Information System, Quantitative Geomorphology
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	*Ph.D.(IIT Kharagpur)*, Seismology, Geoexploration, Seismic prospecting, Near surface geophysics
Singh, Arun	*Ph.D.(NGRI)*, Seismic anisotropy: Mantle deformation Patterns, Lithospheric Structure and geodynamics, Teleseismic tomography
Singh, Chandrani	*Ph.D.(NGRI)*, Reservoir Triggered Seismicity, Attenuation characteristics of seismic waves, Seismotectonics
Upadhyay, Dewashish	*Ph.D.(Univ. of Bonn, Germany)*, Geochemistry, Igneous Petrology, Cosmochemistry

Brief Description of on-going activities

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

Thrust Areas

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

Academic Performance

Awards & Honours	2
Member - Professional Bodies	37
Member - Editorial Board	20
Visits Abroad by Faculty Members	5
Lectures by Visiting Experts	7
Doctoral and MS Degrees Awarded	10
Sponsored Research Projects	51
Consultancy Projects	14
Papers Published in Journals	41
Papers Presented in Conferences	43

Department of Humanities & Social Sciences

Head
Prof. Vijai Nath Giri

Professors

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

Associate Professors

Behera, Bhagirath	*Ph.D.(Univ. of Bonn, Germany)*, Human Transformation and Well-Being, Environmental and Natural Resource Economics, Development Economics, New Institutional Economics, Economics of Religion, Green Economics
Chakraborty, Jayshree	*Ph.D.(IIT Kanpur)*, Semantics and Pragmatics, Discourse Analysis, Sociolinguitics, Indian English, Communication
Das, Saswat Samay	*Ph.D.(Utkal Univ.)*, Postmodern/postcolonial studies Critical theory Continental Philosophy, Culture Studies
Goswami, Kishor	*Ph.D.(IIT Kharagpur)*, Development Economics (Globalization - Gender and Trade - Poverty - Food Security), Agricultural Economics, Economics of Biofuels
Husain, Zakir	*Ph.D.(Univ. of Calcutta)*, Health Economics, Education, Ageing, Gender studies

Komalesha, H. S.	*Ph.D.(IIT Kharagpur)*, Translation Studies, Indian Literatures in English, Poetry, Postcolonial Literatures, Cultural Studies
Mahakud, Jitendra	*Ph.D.(IIT, Bombay)*, Fianncial Markets, Financial Economics, Corporate Finance, Fixed Income Securities, Equity Research, Financial Econometrics
Mishra, Pulak	*Ph.D (Vidyasagar University)*, Industrial Economics, Public Economics and Policy, Economics of Rural Development
Pradhan, Rabindra Kumar	*Ph.D.(Utkal Univ.)*, Positive Organisational Behaviour, Positive Psychology, Social Psychology, Industrial & Organisational Psychology, Human Resource Development and Management, Business Values & Ethics and Morals, Organizational Behaviour
Singh, Seema	*Ph.D.(BHU)*, English Language Teaching, Managerial Communication Styles, Communication Skills, Feminist Narratology, Indian Women Writing in English, Subaltern Writing

Assistant Professors

Aditya, Anwesha	*Ph.D.(Jadavpur Univ., Kolkata)*, Development Economics, International Trade
Chattopadhyay, Siddhartha	*Ph.D.(Univ. at Albany, SUNY)*, Econometrics, Macroeconomics, Dynamic Programing
Hiremath, Gourishankar S.	*Ph.D.(Univ. of Hyderabad)*, Financial Economics - Efficiency of Financial Markets, Macro and Monetary Economics, International Economics, Credit Cooperatives, Financial and Commodity Derivatives
Sahoo, Bimal Kishore	*Ph.D.(IIT Roorkee)*, Human Development, Labour Economics, Industrial Economics, Productivity and Efficiency Analysis, Food Security and Poverty, International Trade

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

Thrust Areas

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

Academic Performance

Awards & Honours	3
Member - Professional Bodies	71
Member - Editorial Board	27
Visits Abroad by Faculty Members	9
Lectures by Visiting Experts	9
Doctoral and MS Degrees Awarded	13
Sponsored Research Projects	34
Consultancy Projects	4
Short-Term Courses and Training Programmes organised	2
Books Published	12
Papers Published in Journals	57
Papers Presented in Conferences	41

Department of Industrial and Systems Engineering

Head
Prof. Manoj Kumar Tiwari

Professors

Acharya, Damodar	*Ph.D.(IIT Kharagpur)*,
Banerjee, Rabindra Nath	*PGDM (Edinburgh UK).*,
Mahanty, Biswajit	*Ph.D.(IIT Kharagpur)*, System Dynamics, Operations Research, Information Systems, Project Management
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
Ray, Pradip Kumar	*Ph.D.(IIT Kharagpur)*, Ergonomics/Human Factors Engineering, Quality Design/Quality Management, Operations and Environmental Management, Optimization of Engineering/Service Systems
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
Sarmah, Sarada Prasad	*Ph.D.(IIT Kharagpur)*, Reverse logistics, Supply chain management, Inventory and Operaions Management

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
Thakkar, Jitesh J	*Ph.D.(IIT Delhi)*, Supply Chain Management, Lean Manufacturing, Project Management, Service Operations Management, Quality Control and Management

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.

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

Academic Performance

Awards & Honours	8
Member - Professional Bodies	22
Member - Editorial Board	24
Visits Abroad by Faculty Members	9
Lectures by Visiting Experts	7
Doctoral and MS Degrees Awarded	10
Sponsored Research Projects	26
Consultancy Projects	23
Technology Transferred	2
Short-Term Courses and Training Programmes organised	7
Books Published	6
Papers Published in Journals	46
Papers Presented in Conferences	14

Department of Mathematics

Head
Prof. Umesh Chandra Gupta

Professors

Bhattacharyya, Somnath	*Ph.D.(IISc Bangalore)*, Computational Fluid Dynamics, Micro-/nanofluidics Modeling
Biswal, Mahendra Prasad	*Ph.D.(IIT Kharagpur)*, 1. Multi Choice Programming, 2. Stochastic Programming, 3. Fuzzy Programming, 4. Game Theory and applications, 5. Uncertain Programming
Goswami, Adrijit	*Ph.D.(Jadavpur Univ)*, Operations Research and Theoretical Computer Science
Gupta, Dharmendra Kumar	*Ph.D.(IIT Kharagpur)*, Numerical Analysis and Computer Science, Constraint Satisfaction Problems
Gupta, Umesh Chandra	*Ph.D.(IIT Delhi)*, Statistics, Stochastic Modelling, Queueing Theory
Jain, Vinay Kumar	*Ph.D.(IIT Delhi)*, Zeros of polynomials and analytic functions & Extremal problems of polynomials
Kumar, Somesh	*Ph.D.(IIT Kanpur)*, Reliability Estimation, Statistical Decision Theory, 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
Murthy, P V S N	*Ph.D.*, Bio-fluid Mechanics, Convective Heat and Mass Transfer in nanofluid
Pandey, Rajnikant	*Ph.D*, Differential Equations (Ordinary), Theoretical Numerical Analysis, Singular Boundary Value Problems
Raja Sekhar, G P	*Ph.D.(Hyderabad Univ)*, Boundary integral methods for viscous flows, 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, Pawan	*Ph.D.(IIT Kanpur)*, Graph Theory
Nahak, Chandal	*Ph.D*, Applied Functional Analysis and Optimization, 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
Panigrahi, Pratima	*Ph.D.(Bangalore)*, Combinatorics, Graph Theory

Assistant Professors

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
Dutta, Ratna	*Ph.D.(ISI, Kolkata)*, 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
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)*, Linear water waves, Integral equations
Ghoshal, Koeli	*Ph.D.(Jadavpur Univ.)*, Mathematical Modelling on turbulent flow with sediment, Grain-size distribution in suspension over erodible sediment bed, Study on secondary current
Gupta, Nitin	*Ph.D.(IIT Kanpur)*, Reliability Theory, Mathematical Statistics, Applied Probability
Kumar, Jitendra	*Ph.D.(Univ. of Magdeburg, Germany)*, Numerical mathematics, Numerical solutions of integro-partial differential equations, Particle technology
Mukhopadhyay, Sourav	*Ph.D.(ISI, Kolkata)*, Digital rights management, Cryptanalysis on symmetric cipher, Key management in wireless adhoc network, Algebric attack on stream ciphers, Key Pre-Distribution (KPS) in sensor network, Time/Memory Trade-off Cryptanalysis, Cloud Computing
Sekhar, T.Raja	*Ph.D.(IIT Bombay)*, Hyperbolic System of Conservation Laws, Lie Group Analysis for Quasilinear Hyperbolic System of Partial Differential Equations

Brief Description of on-going activities

Besides extensive research in the thrust areas viz. Functional Analysis and Fluid Mechanics, significant contribution has also been made by the members of the faculty in the area of Clifford Analysis, Fuzzy Mathematics, Soft Algebra, Bio-Mechanics, Dynamics of Nonlinear systems, Inventory Management,Graph Theory, Integral Equations, Cryptography, Queueing Theory, Statistical Decision Theory, Statistical Data Analysis, Compiler Design, Combinatorics, Fractional Calculus, Optimization Theoritical Computer Science; Information and coding Theory and Cryptology. Faculty members of this department have published number of research papers in reputed international journals on those topics. Number of sponsored research projects are under taken by the faculty members.

Prof. Sourav Mukhopadhyay organizing a "A short term course on Cryptography" during 18-24 May, 2014 at Indian Institute of Technology Kharagpur. "The course is aimed for the students as well as for the professionals working either in industry or in academics who are interested to build a career in the cryptography and related areas. This summer school will bring together the experts in cryptography to give exposure to the latest developments and background of Cryptography. Adequate background material will be provided such that the participant can cope up with the diversity."

Prof U C Gupta and Prof. Geetanjali Panda are organizing an international summer course on PORTFOLIO OPTIMIZATION at Department of Mathematics, Indian Institute of Technology, Kharagpur, from 19th May 2014 to 30th May 2014 under institute funded ISWT-2014 program. The purpose of this course is to describe the process of portfolio optimization techniques employed for investment in financial markets. This course is organized in two modules: Module-A Optimization Techniques used in Financial markets, Module-Bortfolio Optimization Models for Investment. The course is planned and offered as per the norms set by IIT Kharagpur for ISWT subject. Internationally acclaimed academics, researchers and practitioners with proven knowledge, experience, and demonstrable ability in teaching, consultancy, research, and training in the field of financial mathematics and optimization techniques will deliver lectures and discuss cases in the course. Resource persons include professors from Department of Mathematics, IIT Kharagpur, Vinod Gupta School of Management, IIT Kharagpur and international faculties: Prof Duan Li, Department of Systems Engineering and Engineering Management, The Chinese University of Hong Kong and Prof. Xiangyu Cui, School of Statistics and Management, Shanghai University of Finance and Economics, China.

Thrust Areas

1. Fluid Mechanics and Functional Analysis

Academic Performance

Awards & Honours	1
Member - Professional Bodies	40
Member - Editorial Board	17
Visits Abroad by Faculty Members	4
Lectures by Visiting Experts	15
Doctoral and MS Degrees Awarded	7
Sponsored Research Projects	23
Consultancy Projects	1
Patents (filed / granted)	2
Papers Published in Journals	106
Papers Presented in Conferences	51

Department of Mechanical Engineering

Head
Prof. Prasanta Kumar Das

Professors

Bhattacharyya, Ranjan	*Ph.D.(Kentucky)*, Nonlinear Elasticity, Vibration, Dynamical Systems
Bhattacharyya, Sati Nath	*Ph.D.(IIT Kharagpur)*, Fluid Mechanics
Bhattacharyya, Souvik	*Ph.D.(Texas A & M)*, Thermal science, Natural refrigerant based transcritical heating cooling systems, Thermodynamic modelling and optimization, Natural circulation loops (NCLs), Energy Engineering and Planning
Chakraborty, Suman	*Ph.D.*, Microfluidics and Nanofluidics, Interfacial Phenomena and Phase Change, Computational Fluid Dynamics (CFD)
Chattopadhyay, Ajay Kumar	*Ph.D.(Jadavpur Univ)*, Metal-Ceramic Joining, Machining, Grinding, Surface Coating
Das Gupta, Anirvan	*Ph.D.(Kanpur)*, Wave propagation, Dynamics of discrete and continuous systems, Mechanics of membranes, Vibration induced particle transport
Das, Manab Kumar	*Ph.D.(IIT Kanpur)*, Fluid Mechanics Heat Transfer
Das, Prasanta Kumar	*Ph.D.(IIT Kharagpur)*, 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	*Ph.D.(IIT Kharagpur)*, pressure drop in gas solid flow, free surface flow
Guha, Abhijit	*Ph.D.(Cambridge)*,
Kumar, Cheruvu Siva	*Ph.D.(IIT Kharagpur)*, Robotics, Control Systems, Computer and Telecommunication Networks
Maiti, Biswajit	*Ph.D.(IIT Delhi)*,
Maiti, Rathindranath	*Ph.D.(IIT Kharagpur)*, Mechanical and Fluid Power Transmission and Gear Engineering, Mechanical and Fluid Power Transmission and Gear Engineering
Mohanty, Amiya Ranjan	*Ph.D.(Kentucky)*, Natural Materials for Noise Control, Machinery Condition Monitoring, Acoustics and Noise Control, Underwater Acoustics, More Research Details at www.iitnoise.com, Building Acoustics, Mechanical Systems and Signal Processing, Automotive Diagnostics
Mukherjee, Amalendu	*Ph.D.(IIT Kharagpur)*, System Dynamics and Controls
Nath, Ashish Kumar	*Ph.D.(Bombay University)*, Laser material interaction and processing, Underwater laser processing, Nontraditional manufacturing processes
Pal, Surjya Kanta	*Ph.D (IIT Kharagpur)*, Manufacturing Process Modelling and Simulation

Paul, Soumitra	*Ph.D.(IIT Kharagpur)*, Machining and Grinding, Cutting Tool Coating
Pratihar, Dilip Kumar	*Ph.D.(IIT Kanpur)*, Soft Computing, Robotics, Manufacturing Science
Ramgopal, Maddali	*Ph.D.(IIT Madras)*, Refrigeration & air conditioning, Carbon dioxide based natural circulation loops, Solid sorption systems
Ray, Manas Chandra	*Ph.D.(IIT Kharagpur)*, Fuzzy Fiber Reinforced Composites, Smart Structures, Composite Structures, Nanocomposites, Fluid-structure interaction, Active constrained layer damping
Roy Chowdhury, Asimava	*Ph.D.(IIT Kharagpur)*, cutter design and manufacture for CTC machine (tea leaf cutting), Rapid prototyping with curved layers - CLFDM (Curved layer fused deposition modeling), CNC machining of free form (curved) surfaces, Direct slicing (without tessellation) for Rapid prototyping, Modifiction 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
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)*,

Associate Professors

Bandyopadhyay, Partha Pratim	*Ph.D.(IIT Kharagpur)*, Thermally Sprayed coatings, Laser processing of materials
Bhattacharyya, Kingshook	*Ph.D (IIT Kharagpur)*, Dynamics
Biswas, Kajal	*Ph.D.(IIT Kharagpur)*, Welding Fracture Mechanics
Chakraborty, Goutam	*Ph.D (IIT Kanpur)*, Applied Mechanics
Gupta, Sanjay	*Ph.D.(Delft)*, Biomechanics, Finite Element Analysis, Machine Design
Moulic, Sandipan Ghosh	*Ph.D.(Arizona)*, Theoretical and computational fluid dynamics and heat transfer, Hydrodynamic and thermal instability, Spectral methods in fluid dynamics, Perturbation methods in fluid dynamics, Mixed convection
Ray, Kumar	*Ph.D.(IIT Kharagpur)*,
Saha, Partha	*Ph.D.(IIT Kharagpur)*, Laser processing of materials, Micro manufacturing, Nonconventional manufacturing, Rapid prototyping

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
Panda, Sushanta Kumar	*Ph.D.(IIT, Delhi)*, Sheet metal forming, Hydroforming, Bulk forming, Formability test design and development, Theory of plasticity for metal forming, Laser and resistance spot welding of sheet metal
Paul, Jinu	*Ph.D.(Nanyang Tech. Univ., Singapore)*, Material Processing & Characterization, Polymer Nanocomposites, Joining of Materials, More information: https://sites.google.com/site/jpauliitkgp/home
Racherla, Vikranth	*Ph.D.(Univ. of Pennsylvania)*, Failure mechanics, Composite mechanics, Metal plasticity, Numerical modeling of thermo-mechanical processes
Ramanujam, S	*Ph.D.(IIT Kharagpur)*, IC Engines
Sarangi, Mihir	*Ph.D.(IIT Kharagpur)*,
Sidpara, Ajay Muljibhai	*Ph.D.(IIT Kanpur)*, For more information: https://sites.google.com/site/sidajay80/, Development of nanofinishing processes for complex surfaces, Magnetorheolocal fluid based finishing, Micro machining, Unconventional machining processes

Brief Description of on-going activities

Expert systems in robotics, manufacturing science, medical diagnosis etc. using soft computing
Bio-micro-fluidics and microscale transport processes, Transport Phenomena in Phase Change Problems
Laser materials Processing
CFD/Lattice Bolzmann Method in Complex Flows
High Efficiency Deep Grinding: Modelling & Experimentation
High Pressure Cooling in Machining of Super Alloys
TiN hard coating by unbalanced magnetron using Physical Vapour Deposition Technique
Multi Layer TiN-MoS2 coating on cutting tools by unbalanced magnetron technique
Machinability study of Inconel 718
Development of control strategies for autonomous underwater vehicles
Softcomputing techniques used in conventional and nonconventional machining
Simulation of liquid sloshing in a tank using numerical grid generation techniques
Prediction of fluid flow and heat transfer from wavy surfaces
Design and development of carbon di-oxide based heat pump systems
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

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 composite materials, micromechanics, radially aligned carbon nanotube reinforced composites

Academic Performance

Awards & Honours	4
Member - Professional Bodies	23
Member - Editorial Board	35
Visits Abroad by Faculty Members	8
Lectures by Visiting Experts	12
Doctoral and MS Degrees Awarded	15
Sponsored Research Projects	72
Consultancy Projects	23
Technology Transferred	1
Patents (filed / granted)	11
Short-Term Courses and Training Programmes organised	1
Books Published	3
Papers Published in Journals	134
Papers Presented in Conferences	60

Department of Metallurgical & Materials Engineering

Head
Prof. Gour Gopal Roy

Professors

Chakraborti, Nirupam	*Ph.D.(Univ. of Washington, USA)*, Computational Materials Science Genetic Algorithms Extractive Metallurgy
Chakraborty, Madhusudan	*Ph.D.(IIT Kharagpur)*,
Das, Karabi	*Ph.D.(Wisconsin, USA)*, Metal Matrix Composites, Nanocomposites, Wear of Materials, Physical Metallurgy, Powder Metallurgy, Electron Microscopy
Das, Siddhartha	*Ph.D.(Illinois, USA)*, Nano Materials, Composite Materials, Physical Metallurgy, Electron Microscopy, Surface Engineering, Failure Analysis, Characterization of Materials, Lead Free Solder Materials
Dutta Majumdar, Jyotsna	*Ph.D.(IIT Kharagpur)*, Surface Engineering, Corrosion and Environmental Degradation, Laser Materials Processing, Biomaterials, Advanced Processing of Materials, shape memory alloy, Advanced Welding of Materials
Godkhindi, Mahadev Malhar	*Ph.D.(IIT Bombay)*, powder metallurgy Ceramics
Manna, Indranil	*Ph.D.(IIT Kharagpur)*,
Mitra, Rahul	*Ph.D.(Northwestern Univ., USA)*, Mechanical Behaviour of Materials, Scanning and transmission electron microscopy, Materials for high temperature applications, Composite Materials, Nanocrystalline materials, Thin Film Processing and Characterization, Oxidation behavior of materials
Pabi, Shyamal Kumar	*Ph.D.(IIT Kharagpur)*, Nanostructured materials Phase transformations Composites Modelling and simulation
Ray, Kalyan Kumar	*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, Laser Processing of Materials, Electronic and magnetic nanomaterials
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
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 (ZrO2 - Al2O3 - 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-mechnical 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
Ghosh, Sudipto	*Ph.D (IIT Kanpur)*, 1. Mathematical Modeling of Material pprocesses, 2.Solidification Processing Metal Matrix Composites, 3.Fabrication of Lithium Ion Batteries, 4.Deformation Behavior of Materials
Sant, Sudhindra B	*Ph.D.(Queen's Univ., Canada)*, Thin Film Electronic Materials and Nanostructures, Spintronic Thin Films, Defects in Thin Film Semiconductors, Wide band-Gap Semiconductors, MEMS devices, Photovoltaic Thin Films, Biomaterials and Biomimetics, Nanomaterials and Nanocrystalline Plasticity

Assistant Professors

Aich, Shampa	*Ph.D.(Univ.of Nabraska, USA)*, Rapid Solidification, Magnetic Materials, Shape Memory Alloys, Surface Modifications, Biomaterials
Bandyopadhyay, Tapas Kumar	, 1. Metal Matrix Composite 2. Material Processing 3. Intellectual Property-Transaction 4. Policy
Bhaduri, Amit	*M.Tech.(IIT Kanpur)*, STRUCTURE-PROPERTY RELATIONSHIP.
Das, Jayanta	*Ph.D.(TU Dresden, Germeny)*, Solidification and Non-equlibrium Processing, Metastable and Nanostructured Alloys, High Temperature Oxidation, Structure-Property Relationship, Phase Transformation
Kar, Sujoy Kumar	*Ph.D.(The Ohio State Univ.)*, Physical and Mechnical Metallurgy, Processing-Microstructure-Microtexture-Property Relationship, Materials and property modeling, Materials systems: Ti alloys and Ni based superalloys and steels for power plant applications
Kundu, Tarun Kumar	*Ph.D(Lulea univ of Tech,Sweden)*, Atomistic Simulations of Materials, Extractive Metallurgy, Computational Fluid Dynamics, Mineral processing
Laha, Tapas	*Ph. D.(Florida Int.Univ., Miami)*, Nanocomposites - Processing & Characterization, Interfacial Phenomena, Surface Engineering & Coating, BMG Nanocomposites, Materials Processing via Spark Plasma Sintering
Roy, Mangal	*Ph.D.(Washington State Univ.)*, Biomaterials, Ceramics, surface modification
Sen, Indrani	*Ph.D.(IIS)*,

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. In the domain of Mechanical Metallurgy, a pioneering achievement has been the design and development of fatigue testing using rotating bending machine to study short, long and non-propagating crack behaviour in several steels. Investigations related to structure-property relationship of various ceramic and metal-matrix composites, high temperature materials and advanced alloys are thrust areas of activity. Development of newer grades of dual phase and micro alloyed steels through fracture based studies, correlation between fracture and wear characteristics of materials, development of thin sheet steel components are some important fronts in this direction. In addition, research is progressing in the area of mechanical behaviour of small volume materials. The major areas in the field of Melting, Casting and Solidification Processing include: development of cast micro-alloyed steels, studies on the hot tearing of long freezing range Al alloys, austempered ductile iron through non-conventional route, grain refinement of Al alloys and the development of cast metal matrix composites. Success has been achieved in improving the mechanical properties of some hypoeutectic and eutectic Al-Si alloys by combined grain refinement and modification treatment using indigenously developed Al-B and B rich Al-Ti-B master alloys and Sr, respectively. In addition to mathematical modeling works in the areas of surface engineering, phase transformation, solidification processing, facture & fatigue, some more new areas have surfaced and these are: application of genetic algorithm for the optimization of metallurgical systems, mathematical simulation of 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 Al2O3 reinforced Ni3Al thorough reaction sintering route, reaction sintering of silicon carbide, recovery of copper from printed circuit etchant sludge and production of silicon carbide from fly ash silica. Research has been initiated in the area of semi-solid processing for casting and forming operations of Al-alloy matrix composites. In addition, significant progress has been achieved in the synthesis of Fe-TiC, Fe-ZrC and Fe-TiB2 composites from cheaper raw materials by aluminothermic reduction method. 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.

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)

Academic Performance

Awards & Honours	4
Member - Professional Bodies	56
Member - Editorial Board	14
Visits Abroad by Faculty Members	11
Lectures by Visiting Experts	3
Doctoral and MS Degrees Awarded	8
Sponsored Research Projects	54
Consultancy Projects	19
Patents (filed / granted)	4
Books Published	2
Papers Published in Journals	80
Papers Presented in Conferences	71

Department of Mining Engineering

Head
Prof. Karanam Uma Maheshwar Rao

Professors

Bhattacharya, Jayanta	*Ph.D.(IIT Kharagpur)*, Environmental Engineering and Management Social Impacts Mine Planning and Reliability Engineering
Bhattacherjee, Ashis	*Ph.D.(Penn-State)*, Occupational Health and Safety and Operations Research applications in mining
Das, Samir Kumar	*Ph.D.(ISM Dhanbad)*, Strata Control and Rock Mechanics, Mines Safety Engineering, Mine Environment
Deb, Debasis	*Ph.D.(Alabama Univ, USA)*, Rock Mechanics, Numerical modelling, Mine Design, Ground Control
Mukhopadhyay, Subir Kumar	*Ph.D.(IIT Kharagpur)*, Mine Planning and Design, Underground Metalliferous Mining, Surface Mining (Open pit/ Opencast/ Quarry/ On & Offshore Placer), Mine Safety Mining Laws and Mine Management, Mine and Mineral Economics Valuation Trade & Stockpiling, Small-scale Mining and Sustainable Development in Mining
Pal, Samir Kumar	*Ph.D.(IIT Kharagpur)*, Geomechanics - Roof fall prediction in underground coal mines, Mine Void Filling – Blind backfilling of abandoned mines using sand and other waste material, Wear of Elastomers in Mining – Abrasion of elastomers against different rock types.
Pathak, Khanindra	*Ph.D.(London Univ)*, Environmental Management in Surface Mining, Safety and Productivity of Mining Machinery, Application of Remote Sensing and GIS, Vetiver System Implementation for CSR-EMP Integration, Oil Spill Management
Rao, Karanam Uma Maheshwar	*Ph.D.(IIT Kharagpur)*, Rock Mechanics, Mine Development, Underground Metal Mining, Back filling of mine voids
Sastry, Bhamidipati Suryan	*Ph.D.(Utah)*,

Associate Professors

Chakravarty, Debashish	*Ph.D (IIT Kharagpur)*, Mine Mapping and Locational Survelliance using Digital Photogrammetry, GeoResource Exploitation using Geoinformatics and GPS & GIS, Mineral Resource Mapping using Geodesy and InSAR Technologies, Geotechnical Stability Analysis of Slopes using Numerical Modelling, Hyperspectral Imaging for Mineral Identification
Majumder, Arun Kumar	*Ph.D.(Univ. of Queensland)*, Mineral Processing, Coal Washing, Solid-Fluid Interactions, Fine Particle Processing
Samanta, Biswajit	*Ph.D.(IIT Kharagpur)*, Mine planning, Geostatistics, Mine environment and ventilation

Assistant Professors

Dey, Kaushik	*Ph.D.(ISM, Dhanbad)*, Rock excavation blasting mechanised rock cutting surface mining
Patra, Aditya Kumar	*Ph.D.(Imperial College, London)*, Air pollution measurement and modelling, Greenhouse gas emissions from mines, Human vibration in mines and allied industries, Industrial safety assessment and audit
Prusty, Basanta Kumar	*Ph.D.(Southern Ilinois)*, 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

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-á-vis land use changes near mining fields. Study of human behaviour related accidents in mines; Epidemiological investigations to identify possible risk factor of occupational injuries in mines; The statistical methods for assessing risk factors included logistical regression, loglinear modeling and structural equation modeling.

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

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

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.

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

Academic Performance

Member - Professional Bodies	51
Member - Editorial Board	10
Visits Abroad by Faculty Members	7
Lectures by Visiting Experts	3
Doctoral and MS Degrees Awarded	3
Sponsored Research Projects	36
Consultancy Projects	51
Short-Term Courses and Training Programmes organised	2
Books Published	3
Papers Published in Journals	11
Papers Presented in Conferences	24

Department of Ocean Engineering & Naval Architecture

Head
Prof. Trilochan Sahoo

Professors

Mandal, Nisith Ranjan	*Dr.Inz.(Poland)*, Wave and Tidal Energy, Computational Weld Mechanics and Welding Technology
Misra, Suresh Chandra	*Ph.D.(Newcastle UK)*,
Sahoo, Trilochan	*Ph.D.(IISc Bangalore)*, Coastal Hydrodynamics Hydroelasticity
Satsangi, Subir Kumar	*Ph.D.(IIT Kharagpur)*, Ship Structures Structural Engineering Composite Materials Naval Architecture.
Sen, Debabrata	*Ph.D.(Canada)*, Free Surface Hydrodynamics, Marine Hydrodynamics, Dynamics of Marine Vehicles, Seakeeping and Maneuvering
Sha, Om Prakash	*Ph.D.(IIT Kharagpur)*, Marine Design and Production

Associate Professors

Bhar, Ashoke	*Ph.D.(IIT Kharagpur)*, Marine Structural Engineering
Bhaskaran, Prasad K	*Ph.D (Kurukshetra)*, Wind-Wave Modeling, Marine Acoustics, Coastal Processes, Coastal Sediment Dynamics, Physical & Dynamical Oceanography, Ocean Wave Climate Projections
Warrior, Hari V	, Turbulence Modeling in Oceanography, Computational Fluid Dynamics

Assistant Professors

Bhattacharjee, Joydip	*Ph.D.(IIT Kharagpur)*, Marine Hydrodynamics, Wave-Structure Interaction, Wave Energy Converters
Datta, Nabanita	*Ph.D.(Univ. of Michigan, USA)*, Marine Dynamics, Vibrations, Hydroelasticity
Datta, Ranadev	*Ph.D.*, Numerical Ship Hydrodynamics, Hydroelasticity of Floating Structures and Ships, Computational Geometry
Vishwanath, Nagarajan	*Ph.D.(Osaka Univ. Japan)*, Ship motions, Rudder systems, Mathematical modelling

Visiting Faculty

Sunny, Mohammed Rabius	*Ph.D.(Virginia)*, Structural Engineering (Marine Structures)

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 will be introduced from next 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. The Department is in the process of upgrading the infrastructure and augmenting the existing laboratory facilities taking into account the increase in students strength.

Thrust Areas

1. 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, Hydroelasticity, Storm Surge Prediction & Tsunamis, Suspended Sediment Dynamics, Marine Acoustics.

Academic Performance

Awards & Honours	4
Member - Professional Bodies	10
Member - Editorial Board	9
Visits Abroad by Faculty Members	2
Lectures by Visiting Experts	3
Doctoral and MS Degrees Awarded	3
Sponsored Research Projects	13
Consultancy Projects	20
Short-Term Courses and Training Programmes organised	2
Papers Published in Journals	26
Papers Presented in Conferences	41

Department of Physics & Meteorology

Head
Prof. Arghya Taraphder

Professors

Bharadwaj, Somnath	*Ph.D.(IISc Bangalore)*, Astrophysics, Cosmology
Datta, Prasanta Kumar	*Ph.D.(Burdwan Univ)*, Ultrafast Lasers and Nonlinear Optics, Photonics
Kar, Sayan	*Ph.D.(IIT Kanpur)*, Gravitation and Geometry, High Energy Physics, Quantum mechanics
Kumar, Krishna	*Ph.D.(IIT Kanpur)*, Hydrodynamic flows, Pattern-forming instabilities
Mathur, Balbir Kumar	*Ph.D.(IIT Kharagpur)*, Web Based Service, Microprocessor, ERP, Thin Films
Ray, Samit Kumar	*Ph.D.(IIT Kharagpur)*, Semicondutor nanostructures, Condensed Matter Physics, Thin Films, Photovoltaics
Roy, Anushree	*Ph.D.(IISc Bangalore)*, Raman spectroscopy
Sharma, Shivcharan Lal	*Ph.D.(IIT Kanpur)*, Effects of Ionizing Radiation on Semiconductor Thin Films, Physics and Technology of Ionizing Radiation, Monte Carlo Simulations, Physics of Semiconductors and Semiconductor Devices, Fission Dynamics
Taraphder, Arghya	*Ph.D.(IISc Bangalore)*, Condensed matter physics, Condensed matter physics

Associate Professors

Das, Amal Kumar	*Ph.D.(IOP Bhubaneswar)*, Experimental Condensed Matter Physics, Magnetism including spintronics, Magnetic semiconducting nanoparticles and thin films, Mechanical and magnetic stress measurement of thin films
Dhar, Achintya	*Ph.D.(Jadavpur Univ)*, Organic Semiconductors, Semiconductor Nanostructures, Heterostructure Devices, Organic Solar Cells
Goswami, Dipak Kumar	*Ph.D.(Institute of Physics, Bhubaneswar)*, Surfaces and Interfaces Science, Nanoscale Science, Organic Semiconductors Thin Films and Nanostructrues 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 modeling of bulk and nano-materials, Astronomy and Astrophyics, Physics of Ultra-Cold atom
Nath, Tapan Kumar	*Ph.D.(IIT Kanpur)*, 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
Panigrahi, Kamal Lochan	*Ph.D.(Institute of Physics, 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
Shukla, Pragya	*Ph.D.(JNU Delhi)*, Random matrix theory and Quantum Chaos, Condensed Matter Physics, Statistical Studies of Complex Systems, Theoretical Physics
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, Dynamic nuclear polarization (DNP)
Bhaktha, Shivakiran B N	*Ph.D.(Univ of Hyderabad)*, Glass Photonics, Optofluidics, Random Laser
Chandra, Amreesh	*Ph.D.(I.T., B.H.U.)*, Multifunctional Ceramics, Energy Systems, Polymer Composites, Experimental Condensed Matter Physics, Microbial Fuel Cells, Supercapacitors
Das, Baidya Nath	*Ph.D.(IIT Kharagpur)*, condense matter physics
Gupta, Amar Nath	*Ph.D.(JNU)*, Biophysics and Soft Matter Physics
Hundi, Raghavendra Srikanth	*Ph.D.(Harish Chandra Research Institute)*, Theoretical particle physics
Manoj, Brundavanam Maruthi	*Ph.D.(Hyderabad Univ.)*, Singular Optics, Applied Optics, Ultrafast Laser Filamentation
Roy, Samudra	*Ph.D.(Jadavpur Univ.)*, Silicon Photonics, Nonlinear Photonics, Plasmonics

Scientific Officer

Chakraborty, Syamal	*Ph.D.(IIT Kharagpur)*,

Brief Description of on-going activities

The Department is carrying out research and development utilizing in-house facilities and in collaboration with sister departments. Many of the facilities have been developed in the department and procured from sponsored projects. Faculty and scholars are carrying out active research in the following areas: Astrophysical Spectroscopy, Astrophysics, Atmospheric Sciences, Atomic and Molecular Physics, Biophysics,Condensed Matter Physics, Physics of Complex Systems, Cosmology, Electronic properties of solids, ERP, Bio-Photonics, Optical Imaging, Nuclear Physics, Ferroelectricity, Fiber & Integrated Optics, Optoelectronics, Gravitation and Geometry, High Energy Physics, Hydrodynamics, Laser Physics, Nonlinear Optics, Photonics, magnetic semiconducting nanoparticles and thin films, Magnetism, Spintronics, Materials enginnering, 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

Thrust Areas

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

Academic Performance

Awards & Honours	2
Member - Professional Bodies	32
Member - Editorial Board	23
Visits Abroad by Faculty Members	17
Lectures by Visiting Experts	24
Doctoral and MS Degrees Awarded	7
Sponsored Research Projects	31
Consultancy Projects	5
Patents (filed / granted)	1
Books Published	3
Papers Published in Journals	103
Papers Presented in Conferences	76

Advanced Technology Centre

Head
Prof. Sunando DasGupta

Professor

Roy, Jatindra Nath ,

Senior Scientific Officer

Gangopadhyay, Pranabendu , Microphotonics, Microstructuring & MOEMS, Integrated Optics, Fiber Optics

ASSOCIATED FACULTY (with name, degree and specialization, categorized as Professor, Associate Professor, Assistant Professor, Lecturer, Visiting / Adjunct Faculty, Emeritus / Chair Professor and Scientific officer)
Professor :

Name	Degree	Specialization
Prof. S. DasGupta, ChE	Ph.D.	Microscale Transport Process and Microfluidics
Prof. P.P. Chakrabarti, CSE	Ph.D	Artificial Intelligence, CAD for VLSI Design of Algorithms, Formal Verification
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	Structural Engineering, Reliability
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	Ph.D	Micro fluidics
Prof. R. Banerjee, AFE	Ph.D.	Food Biotechnology, Bioenergy, Enzylology 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	Ph.D.	Microelectronics, VLSI, MEMS
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

Brief descriptions of on-going activities

Micromachining and MEMS are one of the major areas of research at Advanced Technology Development Centre. In addition to that, the fabrication of silicon and non silicon based microelectronic devices and ICs are also focused area of research at different laboratories under ATDC. Several government departments including NPSM/ADA, ISRO, DRDO, DST and BARC have funded projects to develop smart sensors and their interfacing circuits for special applications. During the last one year the MEMS devices developed in the laboratory include silicon piezoresistive, capacitive as well as tunneling accelerometer. The technology for fabrication of silicon accelerometer has been transferred to Semiconductor Complex Limited, Chandigarh. Activities have been started on development of high sensitive MEMS accelerometer based on quantum tunneling phenomena and silicon MEMS pressure sensor. Design and development of MEMS based micropropulsion devices for micro/nano satellite programme such as accelerometer

The MEMS design laboratory, a national facility created under NPSM programme is actively involved with design work on MEMS including microfluidic devices. A number of students from various departments like ATDC, E & ECE, Electrical, Mechanical, Biotechnology, Material Science Department / Centre are involved in the Design Centre to do their project / thesis works. Other academic Institutions like NIT Bhuneswar, are also involved in the Design Centre.

Research and development is also undertaken in the field of Integrated Optics & Micro-Photonics. An integrated-optic design software have been developed and copyrighted. This software can design single-mode step-index and graded index waveguides along with bending losses and mode profiles. Fabrication and characterization of titanium indiffused lithium niobate waveguides, directional couplers, power splitters, switches for fiber-optic communication networks have been performed. Recently polymer based microstructures for microphotonic applications have been developed in the centre. Polymer integrated-optic waveguides have been fabricated and characterized in the centre for possible applications in passive devices.

Research is being carried out on thin film nanostructures, semiconductor, ferroelectric and magneto-resistive films for microelectronics and sensor applications under various government sponsored projects at MicroScience Laboratory of Dept. of Physics & Meteorology. A number of thrust areas have now emerged based on core competency available in the Advanced VLSI Laboratory. These include analog and RF circuits, wireless communication and Baseband processing, direct conversion receivers, power management circuits, processors and IP cores for embedded applications and design for testability. More than 60 different chips have been fabricated and tested. 15 leading companies have joined the AVLSI Consortium. More than 12 ongoing collaborative research projects funded by the Govt. of India and leading companies including National Semiconductors, Intel, Synopsys, Infineon, Texas Instruments, Si2 Microsystems, Agilent, Tessolve, Analog Devices and General Motors. The laboratory also offers regular intensive training to students of IIT Kharagpur. Buoyed by

these initial successes, the laboratory is striving to attain still higher levels of excellence. Research directions are diversifying to new areas of mixed-signal SOCs, IP cores for embedded applications and analog DFT.

The Advanced Laboratory for Plant Genetic Engineering is dedicated to develop technologies suitable to enhance the productivity potential of some of our major crop plants through biotechnological approach. The laboratory has met with some success in identifying specific genetic elements associated with fiber development in jute stem through functional genomic approach. Additionally, attempts to map the individual seven linkage groups of jute are underway. Discovery of certain plant genes and regulatory elements involved in the metabolic pathway of fatty acid synthesis and modification of their functional role in case of synthesis of seed oil of Indian mustard (*Brassica juncea*), are in active state of pursuit. Additionally, attempts have been initiated to genetically tamper the lignin biosynthetic pathway in vegetative parts of jute and sorghum plants by anti-sense approach. Major attempts have also been made in strategy development for generation of genetically modified crop plants resistant against insect pests belonging to lepidoptera, coleoptera and homoptera. Some success could be attained in case of cotton, Brassica and rice. Discovery of novel insecticidal genes from plants and bacteria and generation of transgenic crop plants expressing these insecticidal genes have been accomplished.

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, 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	1
Sponsored Research Projects	1
Papers Published in Journals	3
Papers Presented in Conferences	2

Centre for Educational Technology

Head
Prof. Bani Bhattacharya

Professor
Ray, Anup Kumar

Associate Professor

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

Assistant Professors

Bhowmick, Plaban Kumar	*Ph.D.(IIT Kharagpur)*, Natural Langauge Processing in Education, Artificial Intelligence in Education, Computer Aided Education
Das Mandal, Shyamal Kumar	*Ph.D.(Jadavpur Univ)*, Speech and Signal Processing
Mohanty, Atasi	*Ph.D.(Utkal University)*, Cognitive Psychology Human Resource Development Health & Counselling Psychology, Educational Psychology Teacher Education

New Academic Programmes

M Tech in Multimedia Information Processing

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. 11 research scholars are already working in the area of Educational Technology and Speech Processing. M.Tech programme for teachers of AICTE affiliated institutions and industry are being offered through videoconferencing mode at 3 studios in CET.

Ongoing Sponsored Projects : 1) National Program on Technology Enhanced Learning - CET, IIT Kharagpur has already developed 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) 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 4) Language Technology for E-learning Applications

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;

Academic Performance

Awards & Honours	1
Member - Professional Bodies	10
Member - Editorial Board	5
Lectures by Visiting Experts	2
Doctoral and MS Degrees Awarded	1
Sponsored Research Projects	7
Papers Published in Journals	2
Papers Presented in Conferences	10

Centre for Oceans, Rivers, Atmosphere and Land Sciences

Head
Prof. Arun Chakraborty

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
Satyanarayana, Achanta Naga Venkata	*Ph.D (BHU)*, Observations and Modeling of PBL dynamics and Thunderstorms, Meso-scale Modeling of weather events (Thunderstorms Monsoon), Upper Ocean Response Air Sea Interactions to Tropical Cyclones, Monsoon Meteorology, Air Pollution Modeling

Assistant Professors

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

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

Academic Performance

Awards & Honours	2
Member - Professional Bodies	24
Member - Editorial Board	7
Visits Abroad by Faculty Members	3
Lectures by Visiting Experts	3
Doctoral and MS Degrees Awarded	1
Sponsored Research Projects	14
Consultancy Projects	1
Papers Published in Journals	16
Papers Presented in Conferences	9

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
Sarangi, Sunil Kumar	*Ph.D.(Stony Brook)*,

Associate Professor

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

Assistant Professors

Adyam, Venimadhav	*Ph.D.(IISc. Bangalore)*, Multiferroics Spintronics Multicaloric cooling Nanomaterials and Thin film batterries
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, CO2 capture and sequestration, Space cooling

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 scienctists from R&D oranisations by conducting short term courses and workshops in specialised areas like Cryogenic Engineering, Air Seapartio, Vacuum Technology etc.

Thrust Areas

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

Academic Performance

Awards & Honours	1
Member - Professional Bodies	17
Member - Editorial Board	1
Visits Abroad by Faculty Members	3
Doctoral and MS Degrees Awarded	2
Sponsored Research Projects	14
Consultancy Projects	7
Short-Term Courses and Training Programmes organised	4
Papers Published in Journals	29
Papers Presented in Conferences	25

Materials Science Centre

Head
Prof. Susanta Banerjee

Professors

Adhikari, Basudam	*Ph.D.(Calcutta Univ)*, Membrane Electrode Based Portable e-Tongue Device for Rapid Taste Characterization of Tea, Development of jute based fully biodegradable green composites, Development of jute-cement concrete composites, Development of jute based geotextiles, Development of jute based sound proofing panels, Development of a suitable processing technique for rubber coating of jute, Development of conducting polymer based gas sensors, Polymer based drug deliverry systems, Development of volatile compound based biosensor for pest control, Development of polymer based taste sensor, Collagen and chitosan based scaffold for tissue engineering, Development of jute based baby diaper materials, Development of jute based fully biodegradable green composite, Ramie plantation and development of its downstream products
Banerjee, Susanta	*Ph.D.(IIT Kharagpur)*, Fluorinated High performance polymers, Membrane based separation, Hyperbranched polymers, Light emitting polymers, Polymer synthesis and characterization
Banerji, Pallab	*Ph.D.(Jadavpur Univ)*, Low dimensional semiconductors: Structures & Devices, Thermoelectricity, Photovoltaics, Organic semiconductors
Bhattacharya, Debasis	*Ph.D.(Calcutta Univ)*, 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	*Ph.D.(IIT Kharagpur)*, 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	*Ph.D.(Case Western, USA)*, Materials Science/ Nanomaterials and Nanotechnology/Semiconductors
Ram, Shanker	*Ph.D.(BHU, Varanasi)*, Glasses and disordered solids, Alloys and intermetallics, Nanoceramics and hybrid composites, Magnetics and magnetocaloric materials, Ferroics and applications, Porous materials and applications, Metallic foams for biological applications, Nanofluids and nanoglues, Films, Optical materials and applications, Biomaterials, Phase transformations and phase transitions, Photonics

Associate Professors

Khatua, Bhanu Bhusan	*Ph.D.(IIT Kharagpur)*, Polymer-clay and Polymer-CNT Nanocomposites, Polymer Blends and Composites, Polymer Blend-Clay nanocomposites: Morphology control, Polymeric PTCR

	composites, Polymer-Graphene Nanocomposites, polymer-carbon nanohorn nanocomposites, Polymeric Supercapacitors, Polymer Composites for EMI Shielding Applications
Majumder, Subhasish Basu	*Ph.D.(IIT Kanpur)*, Oxide gas sensors, Lithium rechargeable batteries, Natural fiber reinforced cement composites, Fly ash based ceramic products, Multiferroic thin films and composites

Assistant Professor

Pradhan, Debabrata	*Ph.D.(IIT Bombay)*, Nanostructured Materials, Physical Chemistry, Materials for Energy and Environment, Catalysis

Brief Description of on-going activities

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

Thrust Areas

1. Nanomaterials / Nanocomposites
2. Energy Materials
3. Magnetic Materials
4. Electrically Conducting Polymer Nanocomposites
5. Polymeric Supercapacitors
6. Polymer Membranes for Gas Separation and Proton Exchange
7. Sensor Materials

Academic Performance

Awards & Honours	1
Member - Professional Bodies	22
Member - Editorial Board	14
Visits Abroad by Faculty Members	8
Doctoral and MS Degrees Awarded	16
Sponsored Research Projects	40
Consultancy Projects	6
Patents (filed / granted)	23
Short-Term Courses and Training Programmes organised	3
Papers Published in Journals	98
Papers Presented in Conferences	75

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 Professor

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

Assistant Professors

Goyal, Neeraj Kumar	*Ph.D.(IIT Kharagpur)*, Software Reliability, System Reliability Analysis, Probabilistic Risk Assessment, Network Reliability, Accelerated Life Testing
Sarma, Monalisa	*Ph.D.(IIT Kharagpur)*, Software reliability, Big data analyis, Cloud computing

Brief Description of on-going activities

The Centre is developing a Virtual Lab on fault Diagnosis of Rotary Systems. This lab will be useful for virtually creating certain faults in rotaing systems and then diagnose the fault and its severity. The Research activities are now focusing more on experimental research. Accelerated life testing on various engineering components and systems are being carried out in out laboratory. 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.

Thrust Areas

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

Academic Performance

Awards & Honours	1
Member - Professional Bodies	11
Member - Editorial Board	20
Visits Abroad by Faculty Members	1
Lectures by Visiting Experts	2
Sponsored Research Projects	3
Consultancy Projects	9
Patents (filed / granted)	1
Short-Term Courses and Training Programmes organised	1
Papers Published in Journals	13
Papers Presented in Conferences	7

Rubber Technology Centre

Head
Prof. Dipak Khastgir

Professors

Bhowmick, Anil Kumar	*Ph.D.(IIT Kharagpur)*,
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
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
Khastgir, Dipak	*Ph.D.(IIT Kharagpur)*, Development of Polymer & Composites for Graded Dielctrics and High Voltage Insulation application, Polymer Composites & Nano Composites for Electrical and Electronic applications, Textile Technology for Rubber Product and Protection against Biodegradation
Nando, Golok Behari	*Ph.D.(IIT Kharagpur)*, Polymer Blends and Polymer Nano-Composites, Chemical modification and Grafting of Rubbers and additives, TPEs and TPVs from waste polymers and Rubbers, Rubber in strategic areas of applications such as in Automoitive tyres Cables and Railways

Associate Professors

Chattopadhyay, Santanu	*Ph.D.(IIT Kharagpur)*, Viscoelasticity of rubber composites and polymer based nanocomposites, Synthesis and application of block copolymers and hydogels for drug delivery, Preparation and evaluation of thermoelectric / stimuli-responsive nanocomposite materials, Self-assembled nanostructures for controlled delivery
Naskar, Kinsuk	*Ph.D.(Univ.of Twente, The Netherlands)*, Polymer blends and composites, High performance Thermoplastic elastomers (TPEs) and Thermoplastic vulcanizates (TPVs), Electron beam (EB) processing of polymers and elastomers, Green Tyre Technology, Shape memory polymer alloys
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, Thermoplastic elastomers (TPE), Polyurethane, Tailor-made modification on elastomers

Brief Description of on-going activities

The Centre works in close collaboration with other departments and centers of this Institute and other R & D organizations in India and abroad. Several research projects sponsored by different agencies are in operation.The faculty members are engaged in different research areas : (1) Polymer composites and nanocomposites (2) Chemical modification of rubbers, (3) Thermoplastic elastomers based on novel blends and alloys, (4) Recycling of rubber waste (5) Ionomers, (6) Conductive rubber composites for electrical and electronics application, (7) Electron beam modification of polymers (8) Rheology and processability of rubber compounds and polymer blends, (9) Polymer foam and microcellular rubber composite for various critical and industrial applications, (10) Development of rubber blends and composites for different industrial application like cable, oil seal, tank track pad, vibration isolators, high voltage insulators (11)Development of adhesives and coatings. (12) Development of biodegradable polymer and recycling of rubber and polymer (13) Controlled radical polymerization, (14) Development of polymers for, biomedical application,electronic application. Centre will initiate two research projects under Centre for Railway Research(CRR), IIT Kharagpur.

Thrust Areas

1) Rubber product design & development
2) Polymer blends and polymer (nano)composites
3) Synthesis of tailor-made polymers and modification polymers/rubbers
4) Green approach in polymer synthesis and technology
5) Smart polymer & nanocomposites in novel applications; electrical, electrical, self-healing & biomedical applications
6) Recycling of polymers and rubbers .

Academic Performance

Awards & Honours	3
Member - Professional Bodies	27
Member - Editorial Board	4
Visits Abroad by Faculty Members	4
Lectures by Visiting Experts	2
Doctoral and MS Degrees Awarded	2
Sponsored Research Projects	20
Consultancy Projects	10
Patents (filed / granted)	8
Books Published	1
Papers Published in Journals	43
Papers Presented in Conferences	24

Rural Development Centre

Head
Prof. P B Singh Bhadoria

Associate Professors

Bhowmick, Pradip Kumar	*Ph.D.,D.Litt.*, Tribal & Rural Development Planning
Lahiri, Debabrata	*Ph.D.(BHU, Varanasi)*, Economics of Renewable Energy Economics of Microfinance Monitoring & Evaluation Technology Transfer
Mahapatra, Subhash Chandra	*Ph.D.(IIT Kharagpur)*, Crop Production and Development Transfer & Management of Rural Technology

Brief Description of on-going activities

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

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

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

Thrust Areas

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

Academic Performance

Member - Professional Bodies	15
Member - Editorial Board	3
Lectures by Visiting Experts	1
Sponsored Research Projects	5
Technology Transferred	3
Patents (filed / granted)	2
Papers Presented in Conferences	1

G S Sanyal School of Telecommunication

Head
Prof. Saswat Chakrabarti

Professor

Chakrabarti, Saswat	*Ph.D.(IIT Kharagpur)*, Digital Communications, Wireless Communications, Bio-telemetry

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
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

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 for another 3 years.

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), MICT. Govt. of India and multiple industry partners with a total projected budget of Rs. 24 crores.

Thrust Areas

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

Academic Performance

Awards & Honours	2
Member - Professional Bodies	6
Member - Editorial Board	1
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	2
Sponsored Research Projects	11
Patents (filed / granted)	13
Books Published	2
Papers Published in Journals	8
Papers Presented in Conferences	8

Rajendra Mishra School of Engineering Entrepreneurship

Head
Prof. Partha Pratim Das

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
Chakraborty, Basab	*Ph.D.(IIT Madras)*, Nano Technology & New Material, Medical Devices & Imaging, Energy Management & Entrepreneurship
Prabha Bhola	*Ph.D.(IIT Kharagpur)*, Quality Management and Performance Measurement of Entrepreneurial Firms, Modelling SMEs Growth and its Impact for Sustainable Development, New Venture Creation
Roy, Ram Babu	*Fellow, IIM Calcutta (Ph D)*, Big Data and Business Analytics, Healthcare Operations Management, Health Service Delivery Models, Complex Networks

New Academic Programmes

RMSoEE was founded at Indian Institute of Technology (IIT) Kharagpur in the year 2010 aims to shape entrepreneurial minds of the engineering students. The School imparts strong entrepreneurial culture and develops skills in venture creation for early and late start-ups. The school offers a 5 year integrated dual degree with M. Tech in Engineering Entrepreneurship and B. Tech in an Engineering discipline.

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 and TBI funded 7 start up companies of amount Rupees 96 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 30 faculties and 51 students.

2. Global Entrepreneurship Summit: It is the largest student-level entrepreneurial summit in India. The latest GES 2014 was scheduled at IIT Kharagpur from 10th-12th January, 2014.

   - 1400 students from all over India participated.
   - Programs included:

     Start-up Camp,
     Connect the Dots,
     Elevator pitch,

Panel Discussion,
Innovation Exhibition,
Founder's Meet

3. International Summer and Winter Term on Big Data Analytics: RMSoEE is offering a course in 'Big data analytics' in the first International Summer and Winter Term(ISWT) started by Indian Institute of Technology Kharagpur in collaboration with reputed national and international faculty.

4. RS Day: Rajendra Mishra School of Engineering Entrepreneurship, IIT Kharagpur has celebrated its first Research Scholars' Day "Insight 2014" on March 23, 2014 at Kalidas Auditorium, IIT Kharagpur.

- The occasion was graced by the esteemed presence of Mr. Arindam Mukherjee, Chief Executive Officer, Alumnus Software Ltd. as the Chief Guest. Prof. Rajendra Singh, Dean(UGS), who was the officiating Dean(PGS&R), IIT Kharagpur presided over the function.
- The students presented their research through posters which evoked a lot of interest.
- The day closed with a panel discussion on University startup is an anti-cultural dream in India.

Thrust Areas

1. 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

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.

Academic Performance

Member - Professional Bodies	1
Member - Editorial Board	1
Lectures by Visiting Experts	7
Sponsored Research Projects	8
Short-Term Courses and Training Programmes organised	1
Papers Published in Journals	5
Papers Presented in Conferences	2

Rajiv Gandhi School of Intellectual Property Law

Head
Prof. Khushal Vibhute

Associate Professors

Dube, Dipa	*Ph.D.(Calcutta University)*, Crimes against Women
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, Constitutional Law: Human Rights (Social and Economic Rights) Energy Law Labour and Industrial Law, Human Rights, Energy Law, Labour and Industrial Law
Shreya, Matilal	*LL.M.(Case Western)*, Secodary Copyright Infringement
Shukla, Gaurav	*L.L.M (D.A.V.V. Indore)*, Direct & Indirect Taxation, International Taxation, Civil Laws
Subramanian	*LLM (Germany), Ph.D.(Nagpur Univ.)*, International law, International Human Rights law, International Investment law

Brief Description of on-going activities

TIFAC Eastern Region "Women Scientist Scholarship Scheme" Program
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.
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: A Study of Eastern India
Corporate Governance in Energy Sector in India

Thrust Areas

1. Intellectual Property Law
2. Corporate Laws
3. Environmental Laws
4. Criminal Law
5. Public Law
6. International Law
7. Energy Law

Academic Performance

Member - Professional Bodies	28
Member - Editorial Board	12
Visits Abroad by Faculty Members	3
Lectures by Visiting Experts	5
Doctoral and MS Degrees Awarded	14
Sponsored Research Projects	8
Consultancy Projects	5
Books Published	6
Papers Published in Journals	19
Papers Presented in Conferences	15

Ranbir and Chitra Gupta School of Infrastructure Design and Management

Head
Prof. Uttam Kumar Banerjee

New Academic Programmes

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

Brief Description of on-going activities

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

Thrust Areas

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

School of Information Technology

Head
Prof. Rajib Mall

Professors

Ghosh, Soumya Kanti	*Ph.D.*, Geospatial Database and Web Services, Network Security, Cloud Computing
Gupta, Arobinda	*Ph.D.(Iowa)*, Distributed Systems, Mobile Computing
Sural, Shamik	*Ph.D*, Information and System 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 System securuty, Big Data Securuty and Analysis, Human Computer Interaction, Computational Intelligence
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)*, Human Computer Interaction, Teaching:, Image Processing, Digital Image Processing (EE60062) (Autumn), Mathematical Foundations for Signal and Image Processing (IT60121) (Autumn), Statistical Signal Processing (EE60102) (Spring), Advanced Image Processing and Computer Vision (CS 60052) (Spring), Computer Vision, Multimedia

Brief Description of on-going activities

Computer and Communication Networks: Development of architectures, protocols and algorithms for mobile ad-hoc networks, vehicular ad-hoc networks, wireless sensor networks and wireless mesh networks, smart grid communications, cloud computing. Geographical Information System: Enterprise-wide GIS database development and its policies and protocols to make it accessible as platform independent and support for decision making are under research and development. Human Computer Interaction: Development of user interfaces for the under privileged users such as language illiterate, physically disabled etc. Application of Information Communication Technology (ICT) for the mass such as multimodal interaction, multimodal text composition mechanism, user modeling, interface adaptation, personalization, evaluation are the some areas of research. Computational modeling to brain for informatics, cognitive behavior is also another active area of research. Speech Processing: Researchers working in this area are focusing on characterization and incorporation of emotions in speech, speaker recognition system for handheld devices in varying background environments and development of Text-to-Speech (TTS) system for Indian languages. Network Security: Various areas of network security are being explored, like penetrating testing, development of new algorithms for cryptography, their efficient and attack-resistant hardware implementation etc. Systems Security: Survivable information system architecture to tolerant with potential information warfare attacks is under development. Such systems are typically characterized by the presence of a large repository of sensitive data in a distributed environment. The architecture takes into account the

presence of multiple operating systems and database platforms, their known and potential vulnerabilities as well as possibilities of simultaneous attacks from adversaries. It will be developed as a generic model which can be used to build specific information systems in a number of application domains like e-governance, finance and insurance, education, etc.

Thrust Areas

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

Academic Performance

Awards & Honours	3
Member - Professional Bodies	13
Member - Editorial Board	10
Visits Abroad by Faculty Members	5
Lectures by Visiting Experts	3
Sponsored Research Projects	19
Consultancy Projects	2
Patents (filed / granted)	1
Books Published	8
Papers Published in Journals	34
Papers Presented in Conferences	46

School of Medical Science & Technology

Head
Prof. Pranab Kumar Dutta

Associate Professors

Bhattacharya, Sangeeta Das	*MD (Johns Hopkins Univ.)*, 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	*Ph.D.*, Multimodal Medcal Imaging-Analysis Regenerative Medicine Cancer Theranostics Natural Healing Agent
Chaudhury, Koel	*Ph.D.(Delhi)*, Women's Health, Oxidative stress and Infertility, Proteomics and Metabolomics for Biomarker Discovery and Understanding Disease Pathogenesis, Development of natural antioxidant nanoparticles
Das, Soumen	*Ph.D (IIT Kharagpur)*, Microsystem Technology, MEMS BIOMEMS and Microfluidic devices, Electro-physiological characterisation of biospecies, Medical electronics
Dhara, Santanu	*Ph.D.(IIT Kharagpur)*, Biomaterials and Regenerative Medicine: Fabrication Bioactivation Cell biology 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	*Ph.D.(Jadavpur Univ.)*, Cancer Biology, Signal Transduction, Apoptosis, Cell Cycle, Angiogenesis, Drug Delivary, Multi Drug Resistance, Cancer Stem Cell
Manjunatha M	*Ph.D. (IIT Madras)*, Bioinstrumentation & Biomedical Imaging, Functional Electrical Stimulation of Nerve and Muscle, Biosignal Processing, Neural Engineering and Retinal Prosthesis, Neurorehabilitation & Bio-Robotics
Mitra, Analava	*Ph.D.(IIT Kharagpur)*, Natural Products Research, Drug encapsulation, Clinical trials, Pharmacoepidemiology

Assistant Professor

Chakraborty, Chandan	*Ph.D.(IIT Kharagpur)*, Biostatistics & Medical Informatics, Computer Vision & Pattern Recognition for Medical Imaging Informatics, Computational Pathology & Neuroinformatics, Statistical Machine Learning & Computer Aided Diagnosis (CAD)

Brief Description of on-going activities

• Development of micro-fluidic Biochips / Bio-MEMS for medical application. • Laser speckle imaging of blood-flow in microcirculation. • Development of statistical analyzer & disease pattern recognizer for Oral Pre-cancer and cancer. • Design of an intelligent diagnostic tool through the extraction of diagnostic rules for asthma. • Proteomics and reproductive health • Vaccine preventable diseases in HIV infected children • Integrated macro & micro-imaging on various healing & non-healing wounds including oral & breast precancer & cancer for their early characterization through

image processing & analysis • 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 • Neutraceuticals and Herbal medicine

Thrust Areas

1. Medical Imaging & Image Processing - Medical Instrumentation - Bio-MEMS - Medical Statistics & Pattern Recognition - Medical Expert System - Tissue Engineering - Bio-Materials - Cancer Biology - Signal Transduction - Proteomics and reproductive health -.Diabetology and Herbal Medicine - Genetics & Molecular Profiling of Pre-cancer-Cancer & Wounds - Pediatrics HIV

Academic Performance

Awards & Honours	7
Member - Professional Bodies	40
Member - Editorial Board	22
Visits Abroad by Faculty Members	6
Lectures by Visiting Experts	4
Doctoral and MS Degrees Awarded	10
Sponsored Research Projects	31
Patents (filed / granted)	17
Books Published	1
Papers Published in Journals	81
Papers Presented in Conferences	56

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

New Academic Programmes

The M. Tech. Programme in Water Engineering and Management aims at professing the students with integrated and interdisciplinary approaches of water management involving hydrological, biophysical, chemical, economic, institutional, legal, and policy-planning aspects, to solve the ever-growing set of water-related challenges in industry, agriculture, and domestic sectors. The Programme is intended for professionals and researchers from a wide range of backgrounds. It aims to develop knowledge, insight and skills required to design, implement and evaluate water management policies and strategies. Graduates will be able to promote the judicious use of water and achieve effective governance of water resources.

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 sponsered 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).

Thrust Areas

1. River basin planning and management (considering the aspects of flood, drought or contaminant)
2. Water and wastewater treatment and quality control
3. Urban, rural and industrial water supply and distribution systems
4. Remote sensing and GIS application in water resources
5. Water governance and policy issues
6. Irrigation and drainage system planning
7. Climate impact on water and environment

Academic Performance

Member - Professional Bodies	2
Member - Editorial Board	1
Lectures by Visiting Experts	1
Sponsored Research Projects	5
Consultancy Projects	1
Books Published	1
Papers Published in Journals	3
Papers Presented in Conferences	2

Vinod Gupta School of Management

Head
Prof. Kalyan Kumar Guin

Professors

Guin, Kalyan Kumar	*B.Tech.(IIT Kharagpur)*,
Mukerjee, Prithwis	*Ph.D.(Texas)*,
Rajib, Prabina	*Ph.D.(IIT Kharagpur)*, Corporate Finance, Derivatives (Financial & Commodity), Indian Capital Market
Sinha, Gautam	*Ph.D.(IIT Kharagpur)*,
Teltumbde, Anand	,

Associate Professors

Datta, Biplab	*Ph.D (IIT Delhi)*, Marketing Management, Leadership and Teamwork, Services Marketing
De, Sadhan Kumar	*Ph.D.(UK)*,
Sahney, Sangeeta	*Ph.D.(IIT Delhi)*, Quality in Education, Sales and Distribution Management, Services Marketing, Services Quality, Organizational Behavior, Marketing Management, Consumer Behavior

Assistant Professors

Arunprasad, P	*Ph.D.(IIT Madras)*,
Barai, Parama	*Fellow (XLRI, Jamshedpur)*,
Bhattacharya, Sujoy	*Ph.D.(IIIT&Mgt, Gualior)*, Data Analytics, Option Pricing, Quantitative Marketing
Madhavan, Vinodh	*D.B.A.(USA)*, Credit Default Swap Indices, Long-Term Dependence, Nonlinear Time Series Analysis
Malik, Aradhna	*Ph.D.(Univ of Denver)*, Communication Disorders, Intercultural Communication, Human Technology Interaction, Management of Public Health, Neuro Linguistic Programming (NLP), Ageing, Orality
Mishra, Chandra Sekhar	*Ph.D.(Utkal University)*, Financial Reporting and Analysis, Mergers and Acquisitions, Business Valuation, Financial Markets
Misra, Arun Kumar	*Ph.D.(IIT,Mumbai)*, Capital Market, Financial Markets, Commercial Banking, Corporate Finance, International Finance, Risk Management, Financial Economics, Competition Assessment
Mukhopadhyay, Susmita	*Ph.D.(Calcutta Univ.)*, Organizational Health and spiritual health, Human Resource Management, Business Ethics, Microfinance, Competency Mapping
Pradhan, Rudra Prakash	*Ph.D.(IIT Kharagpur)*, Econometric Modelling, Infrastructure Finance, Financial Markets, Financial Econometrics
Sarkar, Ashutosh	*Ph.D.(IIT Kharagpur)*,

Visiting Faculty

Ghosh, Kunal Kanti *M.Tech.(IIT Kharagpur)*, Supply chain management

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.

Thrust Areas

1. Big Data Analytics including Financial Analytics, Marketing Analytics and HR Analytics
2. Banking, Derivatives and Risk Management,
3. Project Management

Academic Performance

Awards & Honours	1
Member - Professional Bodies	34
Member - Editorial Board	64
Visits Abroad by Faculty Members	4
Lectures by Visiting Experts	15
Doctoral and MS Degrees Awarded	10
Sponsored Research Projects	9
Consultancy Projects	5
Short-Term Courses and Training Programmes organised	3
Books Published	4
Papers Published in Journals	21
Papers Presented in Conferences	2

Alumni Affairs & International Relations

Dean of Alumni Affairs & International Relations

Prof. Siddhartha Mukhopadhyay, Electrical Engineering

Managing Director, Institutional Development (ID) Program

Chinna Boddipalli

Institutional Development Program

Shreyoshi Ghosh
Shruti Gupta
Anupam Sarkar
Anirban Roy
Pushkar Srivastava
Arnab Das

Office of Dean of Alumni Affairs & International Relations

Shampa Goswami
Prasenjit Banerjee
Sadhan Banerjee

Technology Alumni Association, Kharagpur

Dr. Dilip Nanda, Computer Informatics Centre – Secretary and Officiating President
Prof. Kajal Biswas, Mechanical Engineering – Joint Secretary
Prof. Joy Sen, Architecture & Regional Planning – Treasurer

Alumni Affairs

Present Activities and Achievements: Alumni Connectivity, Communications and Publications, Branding, Fundraising, Events Management

Connectivity: The number of alumni connected by various means to IIT Kharagpur has been increased through active efforts during this year. The present status of connectivity is given below.

Platform	Present Count
IIT-KGP Alumni Portal	10,710 alumni registered – up from 8000
Mass Mail to Alumni	36,500 (email count) – up from 23000
LinkedIn University Page Reach	32,020 alumni connected – up from 12000
Facebook Page Reach	76336 Reach (alumni + non-alumni) – up from 1000

Communications: Communications are made through mass mailing and postings at the web portal and the social media such Facebook, LinkedIn and YouTube.

Mass Mailing: Effective Institute-Alumni communication has been maintained through mass mails to alumni, students, faculty members, retired faculty members and parents to update them regularly about the Institute news and developments. The various modes of Institute communication are as follows:

- KGP Connection, an online fortnight newsletter
- Seasonal Greetings
- Various fund-raising campaigns update

Web Portal: Web portal is updated on a fortnightly basis and also on-demand. Till the financial year which is being reported the portal was managed by Eklavya Creations. Following facilities are provided - news and events announcements, online donation, events registration, job portal, emailing facility

Social Media: Regular posts are made on Facebook and LinkedIn. Also Videos uploaded on YouTube and circulated through available channels.

Publications:

1. Annual and quarterly print publications help exchange of news and stories among alumni, students and faculty. Among these are KGPian and Yearnings of Yore.

2. The Alumni Annual Report is the initiative of ID Program which includes information about fundraising initiatives, donors and its beneficiaries, new projects in the Institute etc.

Branding:

***Public Relations*:** PR coverage was done for various events, R&D and happenings at the Institute. On an average 2 articles were published every month with one or more of 20 print media house (English, Hindi, vernacular) with total number of insertions being at 76 for the FY 2013-14. Among these the news which got maximum coverage were Convocation 2013, 1000+ Placement by Training & Placement in the first phase and R&D projects of Food in a Tube.

Ranking – Gathering Data for Metrics and Benchmarking: Data is being submitted annually for domestic and international ranking to the two top international ranking agencies such Times Higher Education, QS. Also submitted to national ranking agencies such as Outlook, India Today, Dataquest, The Week, GHRDC

***Brand Merchandising*:** Brand Merchandising is being managed by the Office round the year and made available to the alumni, faculty, students and other visitors. Merchandise is sold during the events like Convocation, Alvida and Annual Alumni Meet. Space for has been allocated at the newly renovated Technology Students Gymkhana to sell branded souvenirs of IIT-KGP. In order to make this effective the Institute has already trademarked its logo and brand name.

Yearbook and Alumni Card: Yearbook and Alumni Card are being distributed to all passing out students during Convocation. Those who could not come for the Convocation these were sent to them along with their degree certificates. More than 2000 students in 2012-13 received the Yearbook and Alumni Card.

Fund Raising

Founding Endowment Batch (Grass roots) campaign: This campaign is for alumni across all the batches to donate for their respective batches and a classroom when they reach the minimum target of INR 50lakhs. In the current financial year 2013-14, the batch of 1984 has become the Super Endowment Batch by raising more than INR 1 crore and the batch of 1970 is in the process of claiming the 2nd position. 1968 and 1975 batches too have become Founding Endowment batches by raising INR 50 lakhs each.

My Imprint: This program facilitates the final year students to give back to their Alma Mater by contributing their caution money and a part of their annual earning. Class of 2013 has raised about INR 18 lakhs through 'My Imprint Program' in support of creating KGP Endowment for students' services.

Other Campaigns: Among the other campaigns being run or introduced are Vision 2020 Annual Donors and Parents Campaigns. A new campaign which was introduced was Corporate Fundraising through their CSR programs and Microsoft India Development Center was the first donor. It funded the R&D project by Prof. Chandan Chakraborty, School of Medical Science& Technology IIT Kharagpur on Medical Imaging Informatics for Skin Wound and Malaria Screening.

***Shri Gopal Rajagarhia International Programmes* -** Shri Gopal Rajagarhia (B.Tech./ CH/ 1968)facilitated launching of the international program along with few other student programs with the seed endowment funding of INR 10 crores of which he has donated INR 3 crores. IIT Kharagpur proposes to create an Endowment Fund, with monetary contributions to be made by Shri Rajagarhia family, which would be utilized towards activities of the **"SHRI GOPAL RAJAGARHIA INTERNATIONAL PROGRAMMES AT IIT KHARAGPUR".** These programmes shall be designed to support international exchange of faculty and students.

Events Management

Foundation Day: The Office of Dean (AA&IR) along with Technology Students' Gymkhana organized this day-long event on August 18th, 2013. This year the Nina Saxena Excellence in Technology Award in the memory of alumna and scientist Dr. Nina Saxena (1992/B.Tech/ECE/SN) was given jointly to two teams viz. STREE, a wing of National Service Scheme (NSS) IIT Delhi which works in the areas of women empowerment for developing an android app called "SAFE HANDS" and the Desalination Division, Bhabha Atomic Research Centre, Trombay, Mumbai for developing Hybrid membrane technology for removal of uranium from ground water. The Foundation Day lecture was delivered by distinguished alumnus Dr. Amit Chatterjee (1984/B.Tech/ECE), General Manager for the Visual Studio Team Test Business at Microsoft, India. The lecture was followed by a lively interactive session between the Director and a group of school students from Kolkata organized by alumnus Rajiv Agarwal.

Alvida: This is the annual farewell event for outgoing students which was organized by Technology Alumni Association, Kharagpur Chapter in association with the Office of Dean (AA&IR) on 2nd April 2013. Alvida '2013 had an overwhelming participation of over 2800 students.

Institute Lecture Series (2013-2014):

- Prof. Kunal Basu, Said Business School, University of Oxford, UK on Engaging with Society: A Campus View
- Prof. D. D. Sarma, Solid State and Structural Chemistry Unit, IISC, Bangalore on Nanoscience and Technology with an emphasis onPhotoluminescence from semiconductor nanocrystals: Beyond the obvious
- Dr. Bijoy Chatterjee, Director, University Relation, Texas Instruments on 'Prospects of Students in Semiconductor Industry'
- Mr. Kumud Srinivasan, President, Intel India on 'Launch of Intel IEC, 2014&Technology'
- Prof. Sarit Kumar Das, Dean R&D, IIT Madras
- The Office also provides logistic support to the Spiritual Heritage Lecture Series organized every Wednesday during Semesters

Convocation: The Office provides various logistic support towards Convocation registration and awarding of the Distinguished Alumnus Awards.

Distinguished Alumnus Awards 2013

- AditiChattopadhyay (1980/B.Tech/AE)
- Aniruddha Ray (1966/B.Tech/EE
- Devinder Kumar Gupta (1964/B.Tech/AG)
- Jay Chatterjee (1958/B.Arch/AR)
- K.G Narayanan (1964/B.Tech/EC)
- Kamal Kumar Sarbadhikari (1964/B.Tech/ME)
- Keshab K. Parhi (1982/B.Tech/EE)
- ParimalKantiBharadwaj (1974/M.Sc/CY)
- RabindraNathNayak (1980/M.Tech/EE)
- Somnath Ghosh (1980/B.Tech/ME)

Memoranda of Understanding: The Institute signed the following MoUs during the period April 2013 – March 2014

i)	MoUbetweenMCXStockExchangeLimited,Mumbaiand VGSOM,IIT Kharagpur	Signed on 22.01.2013 Validity: 3years
ii)	MoU with Rhein-Waal University of Applied Sciences, Germany	Signed on 27.02.2013 Validity: 5years
iii)	MoU with International Advanced Research Centre for PowderMetallurgyandNew Materials (ARCI), Hyderabad	Signed on 06.03.2013 Validity: 5years
iv)	MoU between IIT Kharagpur and Leibniz-Institut Polymerforschung, Dresden, Germany	Signed on 06.03.2013 Validity:
v)	Cooperation agreement between IIT Kharagpur and The UniversityofBritish ColumbiaApplied Science	Signed on 25.03.2013 Validity: 5years
vi)	MoU with the Governors of The University of Alberta, Edmonton, Alberta, Canada	Signed on 04.04.2013 Validity: 5years
vii)	InstitutionalCollaborationAgreementwithNationalTaiwan UniversityofScienceand Technology, Taipei, Taiwan, ROC	Signed on 28.06.2013 Validity: 5years
viii)	AgreementwithMoscowStateMiningUniversity,Moscow, Russia	Signed on 27.06.2013 Validity: 5years
ix)	MoU with Confederation of Indian Industry (CII), Eastern Region, Kolkata	Signed on 19.09.2013 Validity: 3years
x)	MoU with TataMedicalCentre (TMC), Kolkata	Signed on 24.09.2013 Validity: 5years
xi)	MoU with UniversityofDublin,Ireland	Signed on 01.11.2013 Validity: 5years

International Relations

Present Activities: Exchange Program and Facilitation of Visitors (Inbound and Outbound)

Exchange Programs: As per MoU, the Institute permitted the following students to undergo academic courses/internship at IIT Kharagpur during April 2013 – March 2014

Name of the University	Name of the student (s)	Duration of visit
Polytech Lille, France	Ms. Fanny Tissot Ms. Julie Deschamps	Dept. of Agricultural & Food Engineering 01.05.2012 – 31.07.2012 Postgraduates

University of California, Berkeley	Ms. Katherine He Ms. RamyaPrathuri Ms. Akshita Dutta Mr. Jay Patel Mr. Rohan Jonnalagadda	Dept. of Chemical Engineering & Dept. of Electrical Engineering 16.06.2012 – 12.08.2012 Undergraduates
TechnischeUniversitat, Darmstadt, Germany	Ms. Judith Elin Vesper	Dept. of Mechanical Engineering 18.07.2012 – 30.04.2013 Postgraduates
Leibniz University, Hannover, Germany	Mr. Tim Federmann	Dept. of Architecture & Regional Planning August 2012 – July 2013 Postgraduates
Virginia Commonwealth University, USA	Mr. Demetrius Adams Mr. Joshua Monday Mr. David Tchao Ms. Abigail McFarland	06.01.2013 – 11.01.2013 Undergraduates

Outbound Exchange: They are 3rd year B.Tech. students from Mechanical Engg. Dept., selected by the Warwick Manufacturing Group, University of Warwick, United Kingdom under the IIT Kharagpur-University of Warwick MoU for eight weeks summer internship at Warwick in the summer of 2013.

Roll No	Name	Dept.
10IM30026	Srikar Settur	IM
10IM10010	Ashif Sikandar Iquebal	IM
10MF10007	Ayan Hazra	ME
10ME10059	Suhas Maji	ME
10MT10002	Ajaya Pratap Jena	MT
10MT10012	Dheeraj P.R.	MT

Visits: Faculty members from the Institute visit to various international universities such as Tokyo, Wollongong, Alto, Southampton. The Office provides data of alumni and relevant contacts located at the places visited by the faculty. Also visitors from reputed international universities and research organizations visit the Institute during the year many among whom are alumni. Some such universities are Leibniz, Suttgart etc.The Office provides all necessary logistic support towards such visits.

Central Library

The Central Library, IIT Kharagpur is one of the largest technological libraries in Asia, which is fully automated and facilitates more than 10,000 users from students, research scholars, faculty and staff of the Institute. Its website address is http://www.library.iitkgp.ernet.in .

1. ACADEMIC STAFF:

Chairman

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

Librarian

Sutradhar, B	Ph. D, M.Sc., M Lib.I.Sc., C.C.A

Assistant Librarians

Shankar, U	M Lib.I.Sc., M.A
Mazumdar, K	Ph. D, M Lib.I.Sc., B.Com, CPDA
Nandi, A	M.Lib.I.Sc., M.Sc.

2. RETIREMENT:

Mr. Dulal Kumar Chanda, Senior Technician, retired on May'2013
Ms. Dipali Adak, Assistant Library Information Officer, retired on June'2013
Mr. Arun Kumar Das, Senior Technician, retired on July'2013
Mr. Ramanuj Pal, Senior Technician, retired on December'2013
Ms. Sima Rani Pal, Senior Attendant, retired on March'2014

3. PRINT AND ELECTRONIC COLLECTION ADDED DURING 2013-14

Books/ e-Books			Journals/ e-Resources		
General	Text Books	e-Books (database)	Print	Only Online	e-databases
1520	1416	00	20	1337	20

4. NEW JOURNALS/ E-DATABASES ADDED DURING 2013-14

Journals:

1 Journal of Astronautical Sciences (PR)/American Astronautical Society
2 International Journal of Energetic Materials & Chemical Propulsion (OL)/BEGELL House
3 Agronomy Journal (OL)/ American Society of Agronomy
5 Traditional Dwelling and Settlement Review (PR)/IASTE
6 International Journal of Innovation & Regional Development (OL)/Inderscience
7 Open House International (OL)/ Open House International Association
8 Journal of Bacteriology (OL)/ American Society of Microbiology
9 Journal of Biological Chemistry (OL)/ American Society of Microbiology
10 Microbiology (OL) / Society for General Microbiology
11 International Journal of Environment & Waste Management (OL) / Inderscience
12 International Journal of Environment Technology and Management (OL)/ Inderscience

13 Canadian Geotechnical Journal (OL) / NRC Research Press
14 Canadian Journal of Civil Engineering (OL) / NRC Research Press
15 Geotechnique (OL) / Thomas Telford
16 Journal of Chemical Education (OL) / American Chemical Society
17 Journal of Chemical Engineering of Japan (OL) / JCEJ
18 Journal of Aerospace Information Systems (OL) / AIAA
19 Journal of Micromechanics and Microengineering. (OL) / Institute of Physics
20 Control and Intelligent System (OL) / Acta Press
21 International Journal of Modelling, Identification & Control (OL) / Inderscience
22 RSC Gold Package (48 titles) (OL) / Royal Society of Chemistry
23 SPIE Digital Library ((10 titles) (OL) / SPIE
24 World Scientific Journals Package (10 titles) (OL) / World Scientific
25 AIR Law College (12 titles) (PR & OL) /All India Reporter Pvt. Td.
26 Indian Bar Review (PR) / Bar Council of India
27 International & Comparative Law Quarterly (OL) / Cambridge University Press
28 Corporate Law Adviser (PR) / Corporate Law Adviser
29 International Journal of Corporate Governance (OL) / Inderscience
30 Annual Survey of Indian Law (PR) / Indian Law Institute
31 Journal of the Indian Law Institute (PR) / Indian Law Institute
32 Indian Journal of Criminology and Criminalistics (PR) / Inst of Criminology and Forensic Science
33 Criminal Law Review (OL) / Sweet & Maxwell
34 Law Quarterly Review (OL) / Sweet & Maxwell
35 Annals of Mathematics (OL) / Mathematical Science Pub
36 Journal of Thermophysics and Heat Transfer (OL) / AIAA
37 Bone and Joint Journal (The) (PR) / Bone and Joint
38 Journal of Bone and Joint Surgery (The) (PR) / Bone and Joint
39 Smart Materials and Structures (OL) / IOP
40 International Journal of Mining and Mineral Engineering (OL) / Inderscience
41 Journal of Explosive Engineering (OL) / Intl. Soc. Of Explosive Eng.
42 European Journal of Mineral Processing and Environmental Protection (OL) / Minerals Engineering International
43 Asia Miner (The) (OL) / Mining Media Internaional
44 Transaction of the Society for Mining, Metallurgy and Exploration (OL) /SME
45 Lasers in Engineering (OL) / Old City Pub. House
46 International Shipbuilding Progress (OL) / IOS Press
50 Kautschuk, Gummi, Kunststoffe (OL) / Huthig GmbH
51 Polymers and Polymer Composites (OL) / Smithers Rapra
52 Paediatrics (OL) / American Academy of Paediatrics
53 Circulation (OL) / Lippincott Wiliams and Wlkins
54 Journal of the American Medical Association (OL) / American Medical Association
55 Annals of Surgery (OL) / Lippincott Wiliams and Wlkins
56 Health Affairs (OL) / Project HOPE
57. Taylor & Francis Science & Technology and Social Science Package (1201 titles)
58. Nature Journals Package (30 titles)

E-databases:

1 ACP Journal club / American College of Physicians
2 PsycARTICLES / American Psychological Association
3 BIS Standard (updated) / Bureau of Indian Standards
4 Bloomberg Data Services / Bloomberg
5 CMIE Databases (Prowess, CapEX, Industry Outlook & Economic Outlook) CMIE
6 SCC Online (Platinum Plus) / Eastern Book Company
7 Technical Insights / Frost and Sullivan

8 www.energylineindia.com / Indianpetro.com
9 Turnitin2 – – Anti Plagiarism Web Tool (for 1000 users) / iParadigms, LLC
10 ISO Standards (Complete) / ISO
11 Project Muse / John Hopkins Univ Press
12 Wiley Journals Archives (Core Collection) / John Wiley
13 Synthesis Lectures on Computer Science (Collection#1) / Morgan & Claypool Publishers
14 Springer Materials (Archives) / Springer
15 Springer Protocols (Archives) / Springer
16 Thieme Journals Archive (Synlett & Synthesis) / Thieme Pub
17 Mobility in Cities Database / UITP
18 SciFinder Academic Unlimited Access Plan / Chemical Abstracts Services
19 IEC Standards / IEC
20 Nature Publishing Journals / Nature Publishing Group, UK

5. INDEST-AICTE CONSORTIUM

As a core member of INDEST-AICTE Consortium, Central Library has been availing of access to all the full-text databases, electronic resources subscribed by the consortium. This year the facility has been come down due to inadequate budget of the consortium and some of the electronic resources have been subscribed by the member institutions as per negotiated price of the consortium.

6. BOOK FAIR

Since 1999, the Central Library of IIT Kharagpur has been organizing Technology Book Fair every year to support the information needs of IIT Kharagpur community. The fair can reasonably claim a special status in being the only one of its kind in the area of Science and Technology organized by an educational institution in this country. As a window on the frontier less world of books in diverse fields of thought, the fair gives us an opportunity to update and enlarge our vistas of knowledge.

The 9th Technology Book Fair-2014 was held during the period from 7-10 January 2014 at Vikramashila New Complex (Adjacent Kalidas Auditorium). Prof. Kunal Basu, currently at Said Business School, University of Oxford and an eminent writer as Chief Guest had inaugurated the Book Fair on 7th January 2014 at 11:30 A.M. There were 40 Book suppliers/publishing agencies participated in the 9th Technology Book Fair-2014.

A series of workshop viz a) Know your e-sources at Central Library and its access b) Turnitin anti-plagiarism web tool training session c) Get the best from SciFinder and its new features d) Web-Scale discovery services: Single window access to Library e-resources were organized by the Central Library.

7. WORKSHOPS / SEMINARS

Central Library has organized a number of workshops during the year:

i) Workshop on “Springer Materials & Springer Protocols” in Digital Library on 26 June 2013 organized by Central Library and sponsored by M/s Springer (India) Private Ltd. About 75 participants from the research scholars and students of the Institutes were attended in the workshop.

ii) Workshop on “Publishing Connect” in Annex Building of the Central Library on 25 November 2013 organized by Central Library and sponsored by M/s Elsevier (India) Private Ltd.. About 180 participants took part in the Workshop.

iii) Workshop on "Author Workshop" in Netaji Auditorium on 12 February 2014 organized by Central Library and sponsored by M/s Springer (India) Private Ltd. About 550 participants from the faculty members, research scholars and students of the Institutes were attended in the workshop.

iv) Workshop on Open Source Software for Library Management", 3-7 June 2013, organized by Central Library, IIT Kharagpur. 60 participants from all over India were participated in the woerkshop.

8. NEW LIBRARY SERVICES FOR THE USERS

24 X 7 hours library facilities for 15 days during Semester Examinations of the undergraduate students.

1. Digital Library Services

No. of Document Delivery Services	: 44 out of 70
No. of Turnitin Anti Plagiarism Services	
a) Student id	: 309
b) Instructor id	: 153
c) Report delivered	: 22
No. of JCPDS Software Services	: 153
No. of Book Accompany CD delivered	: 48
No. of Ph. D. Theses digitized	: 583

2. Circulation Section

Circulation Section is the gateway between users and document. Sop it plays a major role to any library and information system. Circulation Section performs issue, renewal and return of books using the library management software LibSys. Apart from this basic task, many other jobs like membership registration, issue of no dues certificate, inter library loan service and overdue fine collection, book reservation, various e-mail alert generations, etc. and entertaining all kinds of queries are being performed by this section. Central Library Circulation Section is kept open for 63 hours a week.

3. Institutional Digital Repository

Central Library has developed an Institutional Digital Repository (IDR) using open source software namely DSpace. The IDR collects, preserves and disseminates in digital format of the research output (Ph.D theses, Technical Reports, Faculty Publications, etc.) within IIT Kharagpur Research Community. It enables the Institute community to deposit (self archiving) their preprints, postprints and other scholarly publications using a web interface and organize these publications for easy retrieval. At present, the access of IDR is restricted within the IIT Kharagpur campus LAN only.

4. Renovation Works

Central Library Seminar Room has been renovated to a modern sophisticated sound proof Seminar Room with a seating capacity of 120 participants.

5. Facilities created for library users

24 x 7 hours reading room facility has been introduced for 15 days during Semester Examinations of the Undergraduate Students.

Central Research Facility

Chairman

Prof. Rahul Mitra, MME Materials Science Division
Prof. Ananta K. Ghosh, BT, Life Science Division (01-04-2013 to 30-11-2013)
Prof. Amit Kumar Das, BT, Life Science Division (01-12-2013 onwards)

Asscociated Faculty

Prof. A. Basak,	- In charge, CD Polarimeter
Prof. M. Bhattacharjee	- In charge, EPR
Prof. S. K. Srivastava	- In charge, ESCA
Prof. S. K. Ghosh	- In charge, FACS
Prof. S. K. Pabi	- In charge, XRD, HRXRD
Prof. J. Dutta Majumder	- In charge, FE-SEM
Prof. B. Adhikari	- In charge, FTIR
Prof. T.K. Nath	- In charge, Hall Effect
Prof. R. Banerjee	- In charge, HPLC
Prof. Rahul Mitra	- In charge, HRTEM
Prof. K.K. Ray	- In charge, UTM (Instron)
Prof. A.K. Das	- In charge, MALDI, XRD (Protein Crystallography)
Prof. S. Das Gupta	- In charge, ITC
Prof. T. Pathak	- In charge, Mass Spectrometer
Prof. S.B. Singh	- In charge, OES
Prof. J. Dutta Majumder	
Prof. K. Biswas	- In charge, Optical Microscopy
Prof. P. Roy Chowdhury	- In charge, Optical Fiber
Prof. A.K. Ghosh	- In charge, PCR, 2-D Gel. DNA Sequencer
Prof. R. Mitra	- In charge, SEM
Prof. C. Jacob	- In charge, SPM
Prof. S. Das	- In charge, TEM
Prof. K. Das	- In charge, Thermal Analysis
Prof. S.H. Dey	- In charge, LC-MS/MS
Prof. V. Adyam	- In charge, SQUID
Prof. A. Roy	- In charge, Raman Spectrometer
Prof. T. Laha	- In charge, Nanoindentation & Nanotribology

Senior Scientific Officers

Ph. D. (IIT Kharagpur), Experimental & theoretical condensed matter physics.
M.Sc., Ph. D. (IIT Kanpur), Inorganic Chemistry, Scanning Electron Microscopy and Metal Matrix Composites

Brief descriptions of on-going activities

Life Science Division

1. **2D GEL Laboratory**: Two-dimensional gel electrophoresis system: this equipment is used for analyzing protein samples (qualitative and quantitative) provided by investigators (students, scholars and faculty of the department of Biotechnology, SMST, and ALPGE).
2. **DNA Sequencer; Real time Polymeric Cyclic Reaction (PCR) analyzer, 2- Dimensional gel electrophoresis Laboratory**: This equipment is use to determine nucleotide sequence of DNA

samples provided by different investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE and AgFE).

3. **Real Time PCR machine Laboratory**: this machine is used to analyze gene expression level (quantitative) in different tissue samples provided by investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE).
4. **FACS Laboratory**: the BD FACSCalibur^{TM} system is four-color, dual-laser, bench top system capable of both cell analysis and sorting. This machine is designed specifically to support a wide range of applications like immunophenotyping, absolute counting, residual white blood cell enumeration, stem cell analysis and isolation by sorting. Recent Experiments carried out with this instrument include drug delivery, detection of apoptotic cell death by TUNEL Assay, interaction between cell and fluorescent labeled toxin molecules, and cell cycle analysis.
5. **High Pressure Liquid Chromatography Laboratory**: HPLC is an efficient technique used for the separation of macro/micro molecules such as organic compound, amino acids, nucleotides, aroma/fragrance, enzmes and proteins etc. this equipment has quaternary pumps, along with different detectors like Refractive Index (RI) and Photo diode array at variable wavelengths, manual injecting valves, ports as well as various columns for separating different molecules.
6. **MALDI_ToF Laboratory**: Matrix Assisted laser Desorption Ionization (MALDI)- Time of flight (ToF) mass spectrometry is used for mass analysis of polymers, proteins and other small molecules (>500Da),. As well as for biomarker identification of different species.
7. **Protein Crystallography: Protein X-ray Crystallography (PX) Laboratory**: Rigaku Micromax 007^{HF} X-ray generator is equipped with RaxisIV++ detector and X-steam cryo for X-ray diffraction studies of protein crystals to determine their 3D structure in atomic resolution. Three dimensional structures of proteins from pathogenic organisms like *M. tuberculosis* and *S. aureus* have been determined.
8. **Isothermal Titration Calorimetry (iTC200 Systems):** iTC200 is used for characterization of molecular interactions of small molecules, proteins, antibodies, nucleic acids, lipids and other biomolecules. Enzyme kinetics, assessment of the effect of molecular structure changes on binding mechanisms, assessment of biological activity are also possible. Direct measure of sub-millimolar to nanomolar binding constants (10^2 to 10^9 M^{-1}) and measurement of nanomolar to picomolar binding constants (10^9 to 10^{12} M^{-1}) using the competitive binding technique.

Materials Science Division

1. **Field Emission Scanning Electron Microscope Laboratory**: the field emission gun assisted scanning electorn microscopy (FE-SEM, Supra 40V, Carl Zeiss, Germany) provides an excellent scope of microstructural characterization using secondary or back scattered imaging, energy dispersive spectroscopy and electron back scattered diffraction analysis. The samples analysed include various metals and alloys, semi-conducting and insulating films, refractories, polymeric and ceramic powders, failed engineering components and hiybrid./composite materials.
2. **FTIR Laboratory**: FTIR analysis of different samples in powder, liquid and also film form in MID-IR and FAR-IR range are done at both ambient and above ambient temperatures by our institute students and faculties.
3. **Hall Effect Laboratory**: Electrical resistivity (conductivity), Magnetoresistance and Hall voltage measurements of metals, semiconductors, oxides, heterostructures, etc. Are carried out in the temperature range of 10 – 300 K by employing a closed cycle Helium refrigeration cryostat in the magnetic field range of -10 kOe -0 -+10 kOe. The magnetoresistance and Hall measurements employing a Vander Pauw four probe technique are also used for characterization of materials like magnetic oxides, spintronic materials, nanometric materials, spin sensor material, magnetic multilayers, semiconducting materials, etc.

4. **High Resolution Transmission Electron Microscope Laboratory**: The HRTEM laboratory is equipped with the JEOL JEM-2100 High Resolution Transmission Electorn Microscope, OXORD INCA EDS microanalytical system and GATAN CCD camera. This instrument is used for observation of specimens to observe the microstructures at high resolution, up to the level of arrangement of atoms, and determination of the crystal structure detects and grain sizes as well as chemical composition at selected positions. In metals, ceramics, polymers rubbers and semiconductor. The machine is routinely used for research on nano-structured materials, bulk alloys, thin films powders, and composites. In addition, it is possible to study phase transitions at low temperatures using the specimen holder operating at the liquid nitrogen temperature.
5. **Optical Emission Spectrometer Laboratory**: Optical emission spectrometer (Model No. ARL 3460) is used for very fast, reliable and accurate analysis of chemical composition. In this machine, the energy coming out from a spark formed between sample and an electrode is converted into a spectral pattern, which is used to analyze the presence of element and it's quantitative analysis (form the intensity of spectrum).
6. **Optical Fiber Laboratory**: The research in this laboratory is based on design, fabrication and analysis of microstructured optical fiber. The optical fiber perform fabrication unit mainly consists of optical lathe machine, real time monitoring system for temperature and gas flow controller, movement/speed controller of the mechanical stack-holding assembly, and the flame-brush unit. The accessory units like nitrogen plant, chiller plant are integral part of the system.
7. **Scanning Electron Microscope (SEM) Laboratory**: The SEM laboratories are equipped with 1) JEOL JSM-5800, 2) ZEISS EVO-60 Scanning Microscopes. The analytical attachments with these instruments are OXFORD ISIS-300, INCA Energy-250 EDS systems, INCA Wave-500 WDS system and HKL Channel-5 EBSD system. The projects associated with the instrument are aluminium alloys, In-situ composites, failure analysis of materials, Biomaterials, Nanostructured materials, Microallyed steel, Laser surface alloying, Cutting tool materials, Functionally graded materials, Intermetallics, Rubber and Polymer based composites, Ceramic materials etc.
8. **Scanning Probe Microscope Laboratory**: A wide variety of samples have been examined using the Scanning Probe Microscope in the last year. These include metals, polymers semiconductors, nanomaterials, etc.
9. **TEM Sample Preparation Laboratory**: This laboratory provides services for preparing samples of different types of TEM study using instruments like cryo-ultramicrotome jet polisher, and precision ion polishing system (PIPS) etc.
10. **Thermal Analysis Laboratory**: The thermal analysis laboratory I equipped with Differential Scanning Calorimeter (DSC), Thermo-gravimetric and Differential Thermal Analyzer (TE-DTA) and Thermo Mechanical Analyzer (TMA). The DSC is being extensively used to study the thermal stability of nanocomposites, glass transition temperatures of polymeric materials, and curing of polymeric materials. The recent works of significance done with the TG-DTA system include the evaluation of thermal stability of polymer nano composites, TG studies have been carried out on the calcinations of aqueous combustion synthesized metal oxide powders, analysis of reactions towards formation of new ceramic compounds, effect of mechanical milling on the reaction onset temperature of aluminium based nano composites, etc. The TMA is being used to study the sintering behavior of nano composite materials as well as to determine the thermal expansion coefficients of some newly developed materials.
11. **X-ray Diffraction Laboratory**: X-ray diffraction (XRD) facility includes three units: PW Philips 1710, Expert PRo I and Expert PRo II. While the first unit is used for routine powder diffraction studies, Expert PRo I is dedicated to texture and residual stress analysis and high temperature XRD. Expert PRo II unit is utilized for powder diffraction at normal and high resolution and low angle incidence mode. These units are extensively used to conduct phase analysis and

identification, crystallite size determination, plastic strain measurements, texture evolution, surface residual stress measurements, phase transition studies (ex situ and in situ), volume fraction determination and failure analysis of engineering components.

12. **Circular Dichroism (CD) Spectrometer Laboratory**: Circular Dichroism (CD) J-810-150-S Model, 150W air-cooled Xenon Lamp, Head-on photomultiplier tube, 163-900 nm measurement range Circular Dichroism (CD) is observed when optically active matter absorbs left and right hand circular polarized light slightly differently. It is measured with a CD spectropolarimeter. The instrument needs to be able to measure accurately in the far UV at wavelengths down to 190-170 nm. The difference in left and right handed absorbance A(l)-A(r) is very small (usually in the range of 0.0001) corresponding to an ellipticity of a few 1/100th of a degree. The CD is a function of wavelength. It has become a powerful tool to analyze the structure of biomolecules and their interaction with various ligands. Changes in the CD spectra reflect a perturbation in the structure of biomolecules brought about by changes in conditions like temperature, pH or drug binding. Protein folding/unfolding can be followed by changes in the CD spectra. Stereochemistry of products through enzymatic reactions is also an important activity of CD spectroscopy, which is related to the 3D-structure of the active site of an enzyme. Stereochemistry of products through enzymatic reactions is also an important activity of CD spectroscopy, which is related to the 3D-structure of the active site of an enzyme.
13. **Mass Spectrometer Laboratory**: Mass Spectrometer LCT is a compact, fully integrated, computer controlled, high performance, orthogonal acceleration Time-of-Flight (oa-TOF) Mass Spectrometer that can be configured for a wide range of LC-MS applications. It provides both exact molecular weight (HRMS) and structural information (LRMS) for characterization of mainly organic compounds and some organometallic compounds and metal complexes with excellent sensitivity. Both synthesis and elemental confirmation can be obtained that is essential for the support of patent applications or for the submission of data to scientific journals. The types of projects on which the equipment can be associated with are based on Synthesis Confirmation, Elemental Confirmation, Structure of Natural Products, Drug Discovery, Supramolecular Interactions/Drug-Receptor Interactions, and Environmental Monitoring. The equipment has been rendering extremely valuable service since its inception to the users within IIT, Kharagpur and external users from various academic institutes, R & D laboratories and industries.
14. **SQUID VSM Laboratory**: The Quantum Design MPMS SQUID VSM EverCool system features an integrated pulse-tube cryocooler-dewar system. This eliminates the need to use any liquid cryogens for the operation of the MPMS SQUID VSM. It offers $1x10^{-8}$ emu sensitivity with fast data acquisition. A maximum DC magnetic field up to 7T in temperature range 2-1000K is available in both DC and AC magnetization measurements. Information about hysteresis loops, relaxation times, magnetic field and temperature dependence of magnetic moment can be obtained. Magnetic properties of broad range of samples related to materials, geological and biological can be analysed.
15. System Model No:- SVSM-EC, Serial No. SMT 043
16. **Transmission Electron Microscope Laboratory**: Transmission Electron Microscope with ability to study structure and composition is being procured. The chosen electron microscope is operated at acceleration voltages up to 200 kV. The machine is equipped with high tilt specimen stage, which is essential for examination of structural defects in materials. It will be possible to study specimens using bright and dark field imaging, selected area diffraction, convergent beam electron diffraction and energy dispersive spectroscopy. The Energy Dispersive X-Ray Analyzer provided with the transmission electron microscope will be able to detect element composition, both qualitatively and quantitatively. The CCD Camera records images on high resolution

transmission electron microscope electronically. The accompanying softwares are going to be used in analyses of images. Model FEI-TECNAI G2 20S- TWIN.

17. **Raman Spectrometer Laboratory**: Raman spectroscopy is an efficient non-destructive tool, which provides enormous information on various physical properties of new state of art materials. The Triple Raman Spectrometer, T64000 from Jobin Yvon, Horiba, France, is equipped with Ar-Kr ion laser (with 10 laser lines) as an excitation source, a triple monochromator and a CCD detector (1024×256 pixels). It has a capability to reject Rayleigh line to a very high extent for all 10 laser lines. Hence, using this instrument one can record spectra from as low as 2 cm^{-1} Raman shift. Other than material characterization, it can be used for resonance Raman measurements and acoustic phonon measurements.
18. No tool-specific sample preparation is required for the measurements. The incident radiation can directly interact with the sample. The system works for all types of sample, solid (powder or crystalline), liquid and gas.
19. **Nanoindentation & Nanotribology Laboratory**:The nanoindenter with nano-tribological testing facility (*TI 950 TriboIndenter, Hysitron Inc.*, USA) in the "Nanoindentation & Nanotribology Laboratory" at Central Research Facility in IIT Kharagpur is a Nanomechanical characterization instrument with in-situ SPM (Scanning Probe Microscopy) imaging, facility, through which mechanical properties like hardness, Young's modulus, stress-strain behavior, creep indentation fatigue resistance and fracture toughness of thin films, coating, individual phases in a multiphase alloy, composites and soft biological tissues can be studied. The instrument is capable of carrying out various mechanical testing operations in nano -scale as well as in micro-scale, owing to its dual head testing capability. The various mechanical testing could be carried out at higher temperature (up to 400^{o}C) also. Integrated with low-noise three-plate capacitive transducers and electronics, the multi-layered enclosure and active vibration isolation system provide excellent environmental separation for the instrument.
20. **High Resolution Mass Spectrometry Laboratory**: Mass Spectrometer Model Xevo G2 QT of waters UK Ltd. The Xevo G2 QTof Mass Spectrometer is a highly sensitive, exact mass bench top system. The instrument is equipped with a T-wave collision cell and with a orthogonal acceleration Time-of-Flight (oa-ToF) mass analyzer with a wide mass range up to 100,000 m/z and a resolving power of 20,000 FWHM. It provides both exact molecular weight (HRMS) and structural information (LRMS) for characterization of mainly organic compounds and some organometallic compounds and metal complexes with excellent sensitivity. The range of compounds for which the instrument can be used varies widely from small organic, inorganic, compounds to oligomers, polymers and biomolecules. The instrument will provide elemental confirmation that is essential for the support of patent applications or for the submission of data to scientific journals. The system incorporates IntelliStart^{TM} technology, for automated system optimization and status monitoring, ensuring that the highest quality data is routinely available to all levels of operation.
21. **Isothermal Titration Calorimeter:** Model, iTC200 Systems (GE Healthcare, USA), Non-reactive Hastelloy® cells for chemical resistance, Peltier controller for rapid temperature equilibration, operating within a temperature range of 2ºC to 80ºC.
22. **AFM Laboratory**: A new Atomic Force Microscope (Model 5500, Agilent Technologies, USA) has been installed in CRF in October 2013, and has been thrown open to users across the Institute. Apart from the regular scanning modes, that is contact and intermittent contact modes, the state of the art instrument is equipped with closed Z loop scanner for measurement of force between two surfaces, under liquid imaging capability, temperature control stage (30 ºC to 250 ºC) with in-situ imaging capability for time resolved experiments, integrated environmentalcontrol (with 6 ports forpurging and venting), EFM (Electrical Force Microscope) and KFM (Kelvin probe microscope) in single pass inamplitude modulation (force) andfrequency modulation (force

gradient) modes, external variable magnetic field MFM with a magnetization range of +/– 850 Gauss.Since installation the instrument has been used to scan more than 600 samples till March 2014, spanning across 30 research groups in the Institute. Every day two three hour slots are given to the users, in which typically three samples are scanned. Experiments like EFM, MFM and under water imaging however takes longer time. Different samples that have been scanned successfully include polymer, metals, composites, biological molecules like proteins, quantum dots, nano patterns etc.

23. **Nuclear Magnetic Resonance (NMR) spectrometer Lab**: Recently, the institute has procured a Bruker Avance III HD 600 MHz (^{1}H frequency) Nuclear Magnetic Resonance (NMR) spectrometer, which has been installed in Central Research Facility (CRF). The spectrometer is for recording high resolution one dimensional (1D) and two dimensional (2D) spectra of chemical and biological samples in solution. It has three probes, (a) broad band probe for recording spectra of all the NMR active nuclei, including ^{19}F, (b) one three channel (^{1}H, ^{13}C and ^{15}N) inverse probe for 1D, 2D and triple resonance spectral measurements and (c) one liquid helium cooled cryoprobe for very high resolution spectral measurements. Also, it has variable temperature attachment for recording spectra at lower or higher temperatures.
24. **Dual Beam FIB-FEG Microscope Lab:** (Model: Auriga Compact Cross Beam system, Carl Zeiss, Germany) has been procured at CRF and is undergoing installation. It is equipped with both Electron and Ion Beam sources for applications including scanning electron microscopy, focused ion beam milling and lithography, along facility for TEM sample thinning and lift-out (Omniprope 200, Oxford Instruments), as well as 3D energy dispersive spectroscopy and electron backsctattered diffraction (Aztec, Oxford Instruments). The system can be used for observation using secondary and backscattered electron imaging modes, chemical analysis, orientation mapping, TEM sample preparation, as well as processing of nanostructures.

New Acquisitions

1. DUAL/ CROSS BEAM FEG/FIB, CARL ZEISS MICROSCOPY GmbH, GERMANY**.**
   STATUS: Being installed.
2. AVANCE III HD 600 MHz ONEBAY HIGH PERFORMANCE DIGITAL NMR SPECTROMETER, BRUKER BioSpin INTERNATIONAL, SWITZERLAND.
   STATUS: Being installed.
3. SCANNING PROBE MICROSCOPE SYSTEM WITH DIFFERENT MODULES FOR MORPHOLOGICAL AND STRUCTURAL CHARACTRIZATION, AGILENY TECHNOLOGIES, SINGAPORE.
   STATUS: Installation Completed.
4. PHI 710 SCANNING AUGER NANOPROBE, PHYSICAL ELECTRONICS, USA
   STATUS: Being installed.
5. FLUORESCENCE ACTIVATE CELL SORTER, Model- FACS ARIA-III, BECTON DICKINSON HOLDING, SINGAPORE.
   STATUS: Installation Completed.
6. GENETIC ANALYZER (APPLIED BIO SYSTEM-3500), LIFE TECHNOLOGIES HOLDINGS Pte. Ltd, SINGAPORE.
   STATUS: Installation Completed.
7. MALDI – TOF. STATUS: Ordered.
8. FIELD EMISSION SCANNING ELECTRON MICROSCOPE with Energy Dispersive Spectrometer and Electron Backscattered Diffraction Facility. Model Merlin, Carl Zeiss, Germany.

Central Workshop and Instruments Service Section

Chairman : Prof. A. Roy Choudhury
WS : Dr. S. Patra

The Central Workshop & Instruments Service Section (CWISS), a unique service centre at IIT, Kharagpur was established in 1965 to cater to the fabrication of custom made Instruments to sustain the Post Graduate & Research activity in the Institute for all the departments and centres.

It is one of the major service sections of the Institute having following units:

(1) Mechanical
(2) Glass Blowing
(3) Carpentry
(4) Electronics
(5) Audio Visual

Apart from executing Work Orders from various Depts./Centres/Sections of the Institute, CWISS also undertakes Workorders from outside on cost basis.

1. Mechanical Section

a. Dr. S. Patra, Assistant Workshop Superintendent

Mechanical Section in CWISS comprises Mechanical fabrication, Mechanical Instrument and Glass Blowing Section.

b. Mechanical Fabrication Section

It is equipped with various types of machines like CNC Lathe, table mounted CNC Lathe, CNC Engraving, CNC Milling, EDM, Milling, Conventional Lathe, Bench Lathe, Watch Maker's Lathe, Drilling, Shaping Machine, Bench Drill, Bench Shaper, Grinding Machines (Surface, Cylindrical, Pedestal, Belt and Hand operated), Jig Boring, Power Saw, Shearing Machine, Polishing, Press, Arc Welding, Brazing and Soldering, etc.. We have recently purchased one CNC WEDM and Laser welding machine these has enhanced our fabrication quantity and quality as well.

The Mechanical Fabrication Section caters the service to almost all the departments of the Institute for any type of Precision and complicated mechanical fabrication or repair with various types of metals with the machines available in section mostly for research and project works and regular experiment classes for B. Tech. and M. Tech. as per design.

In CNC Machines we use different types of software for drawings like Auto CAD, Rhinoceros, 3D Studio Max, Solidworks etc. for drawing works of the components to be fabricated and also use different types of CAM software for their fabrication.

During the year 2013-14 the Mechanical Section has performed jobs of about 153 workorders.

Some of the notable fabrications successfully completed by CWISS are as follows:

1) Fabrication of different types of fixtures.
2) Chassis of Robot and gears of Robocup.
3) Fabrication of Die and Extruder.
4) Fabrication of Die-Punches of different sizes.
5) Fabrication of different sizes tensile, Charpy specimens, creep specimens of different

materials.

6) Fabrication of Rack, Pinion & Gears.
7) Fabrication of Moulds with different type of metals.
8) Fabrication of dilatometer samples.
9) Fabrication of different types of grippers.
10) Fabrication of Micro- channel of various sizes.
11) Fabrication of different types of adopters.
12) Fabrication of various types of electrodes.
13) Fabrication of fixtures for experiments.
14) Fabrication of shaft encoder.
15) Fabrication of SEM samples.

2. Glass Blowing Section

This section is equipped with glass blowing lathe, glasscutter, glass grinder, glass annealing chamber, etc.. Mainly glass work of Borosilicate glass is done here with the help of oxygen & LPG for Departments, like Chemistry, Bio-Technology, Chemical, Cryogenic, Mechanical, Material Science, Metallurgical & Materials Engg., Agriculture & Food Engg., Physics & Meteorology etc. The main fabrication jobs of this section include different type of condensers, Dewars, different volume capacity F.B, R.B., Flusk with neck joints, manometer, U & S Tubes, glass bubbler, glass coil for oil bath, gas collector, etc. The fabrication of Glass ware items are done as per drawing and design of the equipments. Shortly we are going to arrange for training the interested Institute staff on Glass Blowing and fabricate different glassware items.

3. Carpentry Section

Housed in the workshop complex behind Chemical Engg. & Automobile Section, This section has Auto Planner, Joints Nature's machinery, Vertical Band Saw and Multipurpose Machine. Apart from carpentry jobs, as per requirement of the Institute it does also undertake construction of MS Frames, Hand painting, Spray painting, Polishing, Writing of name plates, display board & jobs as required by students projects.

This section also meets the major requirements of furniture of the Institute. During the year 2013-14, this section has completed 119 Workorders of various
departments of the Institute.

Details of some of the work done during 2013-14:

1) Faculty Table set	--	33 Nos.
2) Office Table	--	07 Nos.
3) Computer Table	--	12 Nos.
4) Laboratory Table	--	21 Nos.
5) Conference type meeting table	--	01 No.
6) Book Shelf	--	03 Nos.
7) Students' model of different shape	--	25 Nos.
8) Framing of metallic name plate	--	01 No.
9) Tender Box	--	01 No.
10) Repair of Furniture	--	07 Nos.
11) Name Plate/ Sign Board	--	82 Nos.
12) Modification of damaged furniture	--	01 No.
13) No parking board	--	05 Nos.
14) Trolley type tray	--	01 No.
15) Partition	--	04 Nos.
16) Key	--	01 Nos.

17) Daily chart board	--	01 No.
18) First Aid Box	--	01 No.
19) High / Low bench	--	50 Nos.
20) Stools	--	67 Nos.
21) Notice Board	--	04 Nos.

4. Electronics Section

Electronics section of CWISS has facilities for repair of different types of electronic equipments. It also helps users in their design and development activities. A LPKF PCB Prototyping machine is available in this section which helps the users of different departments in fabrication of double sided PCBs.

5. Audio Visual Section

Audio Visual Cell is primarily involved in providing audio visual support for conducting regular classes at different lecture halls (approximately 400 classes per week). It supports audiovisual facilities with Multimedia projectors, Document cameras, PCs and PA system with wireless microphones for the following class rooms: V1, V2, V3 & V4 at Vikramshila complex and F116, F127, F142, F232 & F244 at main building area. During last semester the Cell could extend support to 10 new classrooms at Nalanda classroom complex. A total 44 nos. of classrooms at Nalanda classroom complex, equipped with full AV equipments, will be available in the next Autumn semester 2014.

AV Cell used to provide support about 11,600 regular classes throughout the year in aforesaid classrooms. Besides these the Cell provides AV facilities for all seminars, symposiums, workshops, short term courses and meetings at Gargi, Moitrei, S. N. Bose Auditorium and associated programme at Netaji , Kalidas Auditorium, Senate hall, Committee room and Board room. All the T. S. G. activity programmes are also supported by the Cell. AV Cell also provides support to various student activities like Quiz, Plays, Spring festival, Kshitij, Inter Hall competitions and T&P activities.

It also helps in various other academic activities like Convocation, Senate Meeting, National & International seminars, Conferences and Workshops and also including JEE & GATE units. AVCell also given technical support for pre-placement talk during office hours & beyond office hours and sometime till midnight for special cases.

The Audio Visual Cell has a good number of sophisticated equipments like Multimedia Projectors, Document Cameras, High quality Amplifiers and Mixtures, Wireless Microphones & Conference Systems and other peripheral supporting systems. Primary maintenance of these equipments are also maintained by AVCell staff itself.

Centre for Theoretical Studies

HEAD: P.K.Chattaraj (Till 07.10.13), Sayan Kar (From 08.10.13)

FACULTY MEMBERS

	Name	Degree	Specialization
1	P. K. Chattaraj	M. Sc., Ph.D (IIT Bombay)	Chemistry (Theoretical Chemistry, Quantum Chaos)
2	A.R.Roy	Ph.D (IIT Kharagpur)	Mathematics (General Theory of Relativity, Theoretical Cosmology, Algebra and Application of Soft Set theory, Dynamics of Nonlinear Systems)
3	A. Taraphder	M. Sc., Ph.D (IISc Bangalore)	Physics (Theoretical Condensed Matter Physics)
4	S.Bharadwaj	M. Sc., Ph.D (IISc Bangalore)	Physics (Theoretical Astrophysics and Cosmology
5	Sayan Kar	M. Sc., Ph.D (IIT Kanpur)	Physics (Relativity and High Energy Physics)
6	S. Pratik Khastgir	M. Sc., Ph.D (IOP, Bhubaneswar)	Physics (Mathematical Physics and Integral Models)
7	Anirvan DasGupta	B.Tech, M.Tech., Ph.D (Kanpur)	Mechanical (Dynamics, Control and Robotics.)
8	S.P.Pal	B. Tech (Hons.), M. Tech, Ph.D (IISc Bangalore)	Computer Sc. and Eng. (Computational geometry, Design and analysis of algorithms.)
9	S. Bandyopadhyay	M. Sc., Ph.D (IISc Bangalore)	Chemistry (Computational Chemistry, Molecular Modelling)
10	Somesh Kumar	MSc.,Ph.D (IIT Kanpur)	Mathematics (Statistical Decision Theory and Inference, Quantum Computing)
11	Suman Chakraborty	Ph.D	Mechanical (Microfluidics and Nanofluidics, Interfacial Phenomena, Transport Phenomena in Materials Processing, Computational Fluid Dynamics (CFD))
12	G.P.Raja Sekhar	Ph.D.(Hyderabad Univ)	Mathematics (Boundary integral methods for viscous flows, Mass transfer in porous biological pellets)
13	Pratima Panigrahi	Ph.D.(Bangalore)	Mathematics (Combinatorics, Graph Theory)
14		Head, Mathematics	
15.		Head, Physics	

Associate of CTS:

1.	P. A. Deshpande	Ph.D.(IISc., Bangalore)	Chemical (Electronic structure calculations, Computational catalysis, First principles analysis of physiological reactions)
2.	Venkat Padmanabhan	Ph.D.(Columbia University)	Chemical (Advanced Functional Materials, Polymer Nanocomposites, Bio-Mechanics of C. elegans, Organic Photovoltaics)
3.	Chirag Kalelkar	Ph.D. (IISc., Bangalore)	Mechanical, Rheology, Fluid Dynamics

4.	Sanjoy Majumder	Ph.D.(IIA Bangalore)	Physics (Computational Many-body physics, Atomic & Molecular Physics, Theoretical modeling of bulk and nano-materials, Astronomy and Astrophyics, Physics of Ultra-Cold atom)
5.	Kamal Panigrahi	Ph.D.(Institute of Physics, Bhubaneswar)	Physics (String Theory, High Energy Physics, String Inspired Cosmology)
6.	Sabyashachi Mishra	Ph.D. (Tech. Univ. Munich, Germany)	Chemistry (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)

Staff: Name	**Degree**	**Specialization**
Ujal Halder	Post Diploma in Computer App., Diploma in Electrical Engg.	Computer (Administration, Networking, Web development, Troubleshooting etc.)
Project Staff: Name	Project, Post	Period
Soumya Bhattacharya	JRF	3 years

Brief Descriptions on-going activities

Research is carried out in CTS on the following areas:

I. Astrophysics, Cosmology and Relativity

(i) Magnetic fields of strange stars and neutron stars
(ii) Large scale structure formation in the Universe
(iii) Bulk-brane dynamics

II. Dynamics and control

(i) Nonlinear dynamics: Bifurcation Theory and Chaos
(ii) Control theory
(iii) Vibrations

III. Mathematics, Mathematical physics and Theoretical Computer Science

(i) Integrable models
(ii) Computational and combinatorial geometry
(iii) Pure and applied mathematics
(iv) Quantum computation and quantum information
(v) Graph and Hypergraph Theory

IV. Theoretical Condensed Matter Physics

(i) Computational Condensed Matter and Statistical Physics
(ii) Superconductivity

V. Theoretical Chemistry

(i) Large scale simulations of complex systems
(ii) Density functional theory, quantum chaos

Thrust Areas

1. Astrophysics, Cosmology & Relativity
2. Nonlinear Sciences
3. Mathematics, Mathematical physics and Theoretical Computer Science
4. Theoretical Condensed matter Physics
5. . Theoretical Chemistry

Courses and Graduate Programme:

- CTS is offering new advanced post-graduate courses which are relevant across departments through involvement of faculty from various departments. These courses are:

  1. Methods in molecular simulations (TS70001)
  2. Advanced dynamics (TS70002)
  3. Wave propagation in continuous media (TS70003)
  4. Advanced Mathematical techniques (TS70004)
  5. Advanced quantum theory (TS70005)
  6. Quantum mechanics and quantum computing (TS70006)

- CTS are also admitting PhD students through institute fellowships, CSIR fellowships. Currently two such students are enrolled.

CTS courses taught (2013-14):

1. Quantum mechanics and quantum computing (TS70006) (Autumn)
2. Advanced Mathematical techniques (TS70004) (Autumn)
3. Methods in molecular simulations (TS70001) (Spring)
4. Wave Propagation in continuous media (TS70003) (Spring)

COLLABORATIVE EFFORTS

The Centre for Theoretical Studies has very active collaborative research programmes in the board areas of Astrophysics and Cosmology. The research carried out under this collaboration is focused mainly on Cosmology. The collaboration with NCRA, TIFR, Pune is through a sponsored project funded by BRNS, DAE, Mumbai. This focuses on the possibility of using low-frequency radio wave observations to study a variety of astrophysical processes through the 21 cm neutral hydrogen radiation, including turbulence in the interstellar medium and the early universe.

Visitors during 2013 – 2014 under CTS Visitors Programme: 10

Lectures by Visiting Experts: 12

Computer and Informatics Centre

HEAD : Prof. Prabir Kumar Biswas

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)	Enterprise & Optical transport network
Alok Baran Das	B.Tech (CU)	working, Hardware Specialist & Trouble shooter
Bimal Kanti Dutta*	M.Sc, P.G.D.C.S (Roorkee Univ.)	DBMS, OS, Algorithms, Computer Networks, Distributed DBMS & Graphics Programming.
Surid Kumar Das	B.Tech, MTech (Rajasthan Vidyapith Deemed University)	Hardware, Computer Network
A. Chattopadhyay	M.Sc, M.S (IIT Kharagpur)	Hardware, OS, Network Security & Applications
Sudipto Das	B. Tech, MTech (Rajasthan Vidyapith Deemed University)	OS, Network Applications and Security
Deepan Banerjee	B.Tech (WBUT)	Networking, Routing Switching & Wireless
Tanumoy Ghosal	B.Tech (WBUT)	Networking & Security Aspects
Subhasish Chattopadhyay	B Tech (WBUT)	Networking & Specialist in FTTH

***Retired on 31.01.2014**

FACILITIES

Networking Facilities in the Institute

The QPN facility provided in the Institute campus is running with satisfaction and with time more number of locations is being brought under its fold by CIC. This facility is currently being used as the lifeline for all Department/Centre/Schools/Sections who are using the networking rigorously for their daily work schedule. The Institute Internet bandwidth has been increased by 1 Gbps. This has been done by relocating the bandwidth available to the Institute for NKN video conferencing. In addition to the network usage being carried out for the research and academic activities of the Institute there are many other utility services of the Institute that are regularly utilizing the network. Some the utilities are:

- Computerized remote capturing of data for billing from Electric Meters in the Campus
- Centralized monitoring & recording of Video input from security surveillance cameras placed at strategic locations
- Hosting of websites of all support services for online complain & query system
- Centralized network support to Training & Placement activities for online tests, interviews & video conferencing

Networking facilities have been extended to the following location by 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
- Addition Network points of Azad & Nehru Hall of Residence
- Mother Teresa hall of residence for girl students
- Bachelors Flat 1 & 3 Converted to Girls Hostel accommodation
- CEP Guest house & Residence
- V Niwas Annex building
- 2 BR & 1 BR Faculty & Staff quarters
- New building of Computer Science & Engineering Department
- Second Floor of Bio Technology Department
- Sir J C Bose Laboratory Complex
- 2nd floor of Industrial & System Engineering
- Nalanda Class Room Complex
- PC Lab V of CIC
- Networking to the Kendriya Vidyalaya, DAV Model School, Hijli High School and St Agnes School

Laboratory Facility

- The CIC laboratories has been used in full swing for conducting Institute Computing laboratory classes, registration of students in both semesters, Training & Placement activities, 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 supported online examinations like GATE exams.

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.
- Software for Mail Messaging Solution for 20000 users is also in use faculty, staff and students of the Institute.
- VPN support is being provided to users for connecting to Institute network from any outside network
- Other software available to the user community include, Microsoft campus wide licensing, Software's like Abacus (for finite element modeling and analysis), MATLAB (for integrated technical computing), Solid Works (for engineering drawing), PASW (statistical package) and ANSYS etc.
- Additional Blades have been procured to augment the existing facilities and support the ERP activities, JEE & GATE examinations.

Continuing Education Center

1. Name of the Centre/Unit : Continuing Education Centre.

2. Full name of the Dean : Prof. Om Prakash Sha

3. 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	07	210	11 Weeks
2.	Sponsored/Self finance Short term courses	60	1600 (approx.)	1 week for each course (approx.)
3.	Workshop/ National & International Conference	18	800 (approx.)	3-4 days for each conf.
	Total =	85	2610	

3-Year M. Tech Programme organised by the Unit

Sl. No.	Name of the Subject	No. of Students	Duration
1.	Electrical Engineering	54	3 Years
2.	Electronics and Electrical Communication Engineering	82	3 Years
3.	Information & communication Technology	54	3 years

3-Year Executive MBA Programme organised by the Unit

Sl. No.	Name of the Campus	No. of Students	Duration
1.	Kolkata campus	25	3 Years
2.	Bhubaneswar campus	04	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.	Analog Electronics	221 / 7427	1 week / 2 weeks
2.	Signal & Systems	237 / 8730	1 week / 2 weeks
3.	Fluid Mechanics	229 / 8000	1 week / 2 weeks

International Summer and Winter Term (ISWT 2014)

Indian Institute of Technology Kharagpur from May 2014 is starting 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 per day.

4. 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 Organized	: 18
Total No. of participants attended	: 800 +

Particulars of M.Tech and Ph.D scholars joined/completed under QIP

A. No. of Teachers completed Ph.D degree under QIP	: 07
B. No. of Teachers completed M.Tech programme under QIP	: 08
C. No. of Teachers joined Ph.D programme under QIP	: 10
D. No. of Teachers taking advance admission to Ph.D programme under QIP	: 12
E. No. of Teachers joined M.Tech. programme	: 07

Particulars of 3-year M.Tech Programme:

A. No. of students completing the course under EC specialisation	: 23
B. No. of students completing the course under EE specialisation	: 15
C. No. of students completing the course under IT specialisation	: 13

Particulars of 3-year Executive MBA programme

A. No. of students completing the course from Kolkata campus	: 25
B. No. of students completing the course from Bhubaneswar campus	: 04

CD Cell activities

Manuscripts for text books completed	: 01

Estate Electrical and Maintenance Work Section

The Estate Electrical and Mechanical Works Section is constantly engaged in upgradation and modernisation of the power system starting from the receiving substation at 33kV to the Distribution Substations, power distribution system in the departments and sections and renovation of the internal wirings of the existing departments and sections with the latest state of the art using energy efficient luminaries and aesthetically appealing accessories.

The major achievements of the section are enumerated as follows:-

- Augmentation and Modernisation of main receiving 33kV/11kV Substation from 9.0 MVA to 20.1 MVA
- Augmentation and upgradation of the 11kV/415V distribution substations to double their capacities with new transformers, Vaccum Circuit breakers for 11kV and Air Circuit breakers for low voltage distribution.
- Augmentation of existing substation at Balarampur Pump house
- Implementation of Ring main system in the institute has been successfully completed in the 11kV and 415V network so as to ensure reliability of power supply despite fault in a particular line.
- Modernization of the distribution system in the departments, Centres and section by replacement of the low voltage distribution panels using Air Circuit breaker and Moulded Case Circuit breakers, rewiring by concealed method and using energy efficient luminaries for illumination.
- Trunk Bus alley in the first floor of the main building has been successfully implemented to ensure safety and frequent failure outbreak of fire from electric short circuit.
- Illumination augmentation of the Swimming pool, Gyan Ghosh stadium, Tennis court, Basketball and Volleyball court in accordance with intentional illumination standards using relevant illumination software.
- Installation of energy efficient LED street lights in different new roads of the campus.
- Illumination of the landscaped area in front of the Students Activity Centre.
- The section has successfully installed green, silent and environment friendly DG sets at Kolkata extension centre, Biotechnology department and CORAL.
- **Students Activity Centre**: Electrification of the new Students Activity Centre along with provisions for emergency power .The latest international standards of illumination for indoor sports lighting has been followed strictly.
- **Laboratory Complex**: The first phase of the electrification of the new laboratory complex to cater to the requirements of the first year students has been successfully completed and handed over to the respective departments.
- Electrification of the MBE-MOCVD Laboratory in the CWISS building.
- Installation of Capacitor banks at 11kV and 415V for improvement of Power factor. Steps have also been taken towards improvement of power quality by installation of FACTS devices.

- The electrification of Rajendra Mishra School of Engineering Entrepreneurship and Innovation Laboratory in the STEP complex has been successfully completed and handed over to the respective department.
- Centre for Railway Research: The electrification of the research has been successfully completed. The electrical works consisted of the following
    - A new 3x500 kVA substation dedicated to the Centre to cater to the loads of the various experimental facilities.
    - Internal electrification and workshop illumination of the centre using the latest standards.
    - Establishment of a single phase 25kV source for experimental facility.

WORKS UNDER PROGRESS

- Augmentation of existing substation at Anikut Pump house.
- Installation of Solar Power for illumination of the lake and the adjoining area.
- Electrification of the Steel Technology Centre.
- Electrification of the Mechanical workshop.
- Electrification of the Annex to the new Computer Science building.
- Electrification and upgradation of the sheds behind the hanger for CRR, PK Sinha Centre for Bio Energy, Transportation lab of the Civil Engineering department and OE & NA laboratory.
- Expansion and Electrification of the Nehru Museum.

NEW WORK TAKEN UP

- Implementation of 100 kwp Micro Grid system using Solar Power.
- Installation of Cable Management System and Bus Trunking facility for the administrative building.
- Augmentation of Substation no- 5.
- Implementation of SCADA and data acquisition from energy meters of the quarters in the campus using Wi fi network of the Institute.
- Replacement of 25 nos old electrical panels in halls and also distribution board's with new state of art modular panels and MCB distribution boards for better distribution of electricity by replacing old and burn out electrical panels and Distribution Boards.

ESTATE CIVIL HEAD OFFICE

As a part of the ongoing infrastructural development, various construction projects have been taken up by Estate Civil Head Office. Current status of those projects is as follows:

STUDENTS ACCOMMODATION :

650 rooms of B.R. Ambedlkar Hall of Residence have already been handed over. Renovation of 118 capacity Girls' Hostel in the existing Old Kendirya Vidyalaya is completed and 76 rooms have already been handed over to HMC.

NALANDA CLASSROOM COMPLEX :

58 class rooms have been handed over & Furniture etc. for 30 class rooms have been completed for use. Classes are being held from this semester in 30 class rooms.

J.C. GHOSH SCIENCE BLOCK & P.C ROY LABORATORY BLOCK :

Roof slabs for both the Blocks are complete.

A.J.C. BOSE LABORATORY COMPLEX :

Construction of extension portion is already over and all laboratories had been handed over and they are under use.

NEW WATER SUPPLY PROJECT :

8.40 km. of pipelines have been laid. Construction at river bed is going on.

DEVELOPMENT OF CHILDREN PARKS AT CAMPUS :

Six children parks at Campus have been developed. Recently one Children Park near Gas Godown has been inaugurated by the Director on 5th June, 2014.

EXPANSION WORK IN ACADEMIC BUILDINGS :

Entire Expansion work of Department of IE&M, Chemical Engineering and New buildings for Department of Mechanical Engineering and Computer Science & Engineering have been completed. Expansion work of Department of Biotechnology is completed. Expansion works of Department of A&RP, Materials Science Centre, SMST, NCC etc. are under process.

CONSTRUCTION OF A-TYPE FACULTY APARMENTS :

For 2 Blocks total RCC completed. For 1 Block (28 Flats) will be handed over shortly and balance 28 Flats will be handed over on December, 2014.

CONSTRUCTION OF B-TYPE FACULTY APARTMENTS :

Conceptual drawings approved. BOQ scrutiny is in progress.

CONSTRUCTION OF MARRIED SCHOLARS ACCOMMODATION :

Conceptual drawings approved. After scrutiny of BOQ submitted for additional amount approval, which has been approved in the 115th BWC. Construction started.

CONSTRUCITON OF FAUCLTY TRANSIT APARTMENTS :

Conceptual drawings approved. After scrutiny of BOQ submitted for additional amount approval, which has been approved in the 115th BWC. Construction started.

EXPANSION OF VIKRAM SARABHAI RESIDENTIAL ACCOMMODATION :

Conceptual drawings approved. BOQ scrutiny is in progress.

CONSTRUCTION OF SUPER SPECIALITY HOSPITAL :

The Master Plan for the Super Speciality Hospital has been accepted by the Institute. The floor layouts of the Hospital building to be considered in the first phase have also been approved by the Institute. The Architect and PMC would make another presentation on 19.06.2014 involving the overall layout of the Hospital building and other services buildings for approval of IIT Kharagpur. All plans etc. are approved. Tendering process will start very soon.

CONSTRUCTION OF RESEARCH PARK AT RAJARHAT KOLKATA:

CPWD have submitted the floor plans and the same have been approved by the Institute after several interactions. The preliminary estimate has been recently received from CPWD, Kolkata. CPWD have been advised to initiate the process of submission of drawings to NKDA.

CONSTRUCTION OF NIVEDITA HALL OF RESIDENCE :

Foundation work is going on for the new construction.

Extra Academic Activities

National Service Scheme

Introduction

Recent activities of the National Service Scheme (NSS) team of IIT Kharagpur are summarized herein. The scheme is administered according to the guidelines of the Ministry of Youth Affairs and Sports, Government of India and endeavors to add an extra dimension to the higher education by motivating youth for community service. The activities undertaken in this program has been included in the core curriculum of the undergraduate program of IIT Kharagpur. The curriculum requires three hours to be performed by each student over the entire academic session. Participating students are only entitled to their usual privileges at IIT Kharagpur if they demonstrate a satisfactory performance in the program.

At present NSS team of IIT Kharagpur includes about 1000 students every year (a five-year total of about 4000 students), mainly from the 1st and 2nd year of the undergraduate program, 16 Program Officers, a Program Coordinator and a part time accountant. The current yearly expenditure of the program stands at about Rupees four lakh ten thousand, of which Rupees three lakh seventy thousand was the grant-in-aid sanctioned by the state government. Currently, the team is organized into 15 units, each comprising of between 60 and 70 students. Names and contact particulars of the present team of Program Officers (PO) and Program Coordinator (PC) can be found in Table 1. Twenty villages and slums spread over an area extending to about 8 km from IIT Campus have been adopted by NSS units of IIT Kharagpur. Weekly and special (yearly) activities of NSS at these villages are described in the following section.

Table 1. Officers, NSS – IIT Kharagpur

Name (Function, Unit)	Telephone	Email
V Racherla (PO, 1)	3222 282900	vikranth.racherla@mech.iitkgp.ernet.in
RK Rawat (PO, 2)	3222 282864	rkrawat@hijli.iitkgp.ernet.in
D Dhara (PO, 3)	3222 282326	dibakar@chem.iitkgp.ernet.in
A Nag (PO, 4)	3222 281900	ahinnag@chem.iitkgp.ernet.in
DK Swain (PO, 5)	3222 283170	swain@agfe.iitkgp.ernet.in
MK Das (PO, 6)	3222-282924	manab@mech.iitkgp.ernet.in
MP Rajak (PO, 7)	3222 281800	mpr@hijli.iitkgp.ernet.in
M Halder (PO, 8)	3222 283314	mintu@chem.iitkgp.ernet.in
P Guha (PO, 9)	3222 283124	pguha@agfe.iitkgp.ernet.in
NDP Singh (PO, 10)	3222 282324	ndpradeep@chem.iitkgp.ernet.in
P Bhattacharya (PO, 11)	3222 282472	paramita@civil.iitkgp.ernet.in
RK Sen / BM Manoj (PO, 12)	3222 283752	rksen@hijli.iitkgp.ernet.in
A Deb (PO, 13)	3222 283412	arghya@civil.iitkgp.ernet.in
S Misra (PO, 14)	3222 282338	smisra.editor@gmail.com
V Adyam (PO, 15)	3222 282340	venimadhav@hijli.iitkgp.ernet.in
A George (PO, Admin)	3222 283236	abraham@arp.iitkgp.ernet.in
D Roy (PC, NSS)	3222 283456	debasis@civil.iitkgp.ernet.in

Activities

NSS – IIT Kharagpur work on a range of social issues including teaching, organization of medical camp and blood donation camp, and conducting environmental and social awareness campaigns. Its regular and special activities are summarized in the following subsections.

Regular Activities

Each unit identifies activities in adopted villages or slums based on their survey and open house meetings to consult local residents, government representatives (e.g., Panchayat Memebers, and Municipal Councillors), community workers and leaders (e.g., School Teachers, Rural Medical Practitioners, and Anganwadis) and government officials (e.g., SDO, BDO, and forestry officials). Main activities undertaken by the units during their weekly involvement are listed in Table 2.

Special Activities

Special activities included NSS Annual Camp, celebrations of the Independence Day and the Annual Day of NSS – IIT Kharagpur. The special activities are listed in Table 3.

NSS – IIT Kharagpur in the news

The activities undertaken by NSS – IIT Kharagpur were covered by local media. Additional and latest information on the activities of NSS – IIT Kharagpur can also be found at nssiitkgp.blogspot.com.

Table 2. Regular activities

Unit	Location (Number of volunteers / beneficiaries)	Activities (duration)
1	Sonamukhi and Jhuli: 75 / 100	Teaching at 3 primary schools (Jan-Apr), computer training for local youth (Jan-Apr), clothes collection from IIT Campus for distribution amongst slum dwellers and at Annual Camp (Apr), Prerana scholarship distribution (Jan-Apr)
2	Salboni and Ayodhagarh: 54 / 200	Teaching at Shishu Shiksha Kendra of state government at Ayodhyagarh (Jan-Apr), and collection of clothes, books and household items from IIT Campus and their distribution at Salboni and Ayodhyagarh (Jan-Apr), distribution of books and stationery items to school students (Feb-Mar), open house with local residents and local government representatives (Mar)
3	Salua Board and Rakhalgeria Primary Schools: 64 / 175	Teaching (curricular and extra-curricular) village students of grades up to VI (Jan-Apr)
4	Porapara and Chamrusai: 70 / 200	Teaching and taking computer classes Premananda Ashram School, Chamrusai (Jan-Apr), maintenance of a club building used for tutoring local children (door / window painting, whitewashing of building walls and repair of a shed) at Porapara (Feb-Apr), survey of social and economic conditions of Porapara residents (Mar-Apr), institution of a scholarship in memory of Abhik Mahto, a class VI student from Porapara under Unit 4 tutorship, who passed away recently (Apr), open house with local residents and local government representatives (Apr)
5	Pariapara: 75 / 250	Teaching at a primary school (Jan-Apr), Setting up a library at the primary school (Feb), organizing a cricket match between NSS volunteers and Pariapara residents (Jan) and a sports meet (Mar), filing online for SC/ST certificates for ~30 Pariapara residents (Mar-Apr)
6	Gholghoria: 74 / 350	Teaching at Gholghoria primary school (Jan-Apr), maintenance of school building (door / window painting, whitewashing of building walls) at Gholghoria primary school (Feb-Apr), tending of saplings (Jan-Apr), water quality testing (Jan-Apr), medical camp in which about 180 villagers from Gholghoria, Ayodhyagarh, Salboni and Gopali were treated by seven doctors and one optometrist and were provided with prescribed medicine free of cost (Jan), organization of a sports meet (Mar)
7	Gangadharpur and Debigeria: 64 / 350	Teaching at a state government Shishu Shikksha Niketan (Jan-Apr), maintenance of school building and premises (door / window painting and erection of a bamboo fence) at primary school (Mar-Apr), organization of a football tournament and a sports meet (Jan), distribution of exercise books and stationery at Kenthia Primary School (Jan), Prerana scholarship distribution (Jan-Apr)
8	Balarampur (71 / 300)	Teaching students of grades IX to XII (Jan-Apr), organizing test for awarding Prerana scholarships (Apr), data collection for SC/ST certificate filing for about 50 villagers (Jan-Apr), administering "Vivekdisha," a distance learning program for high school students webcast from RKMVU, Belur, Howrah (Jan-Apr), clothes collection from IIT Campus and distribution at Balarampur (Jan-Feb), Help two destitute village residents with hutments repair (Apr)
9	6 IIT residence halls (12 / 35);	Teaching underprivileged children employed within IIT Campus and slum households around IIT Kharagpur

	Mata Mandir, Durga Mandir and Shiv Mandir, Telugu Basti Tuli Para (18 / 95); Hindi Bharti Prim. School, Jhuli (4 / 200); Netaji Club, North Ghagra (4 / 15); Puri Gate Basti (5 / 12); Sanjay Prasad's residence, Puri Gate (5 / 20); Dhobi Ghat (4 / 50)	
10	Ayma (44 / 600) and Kasturba Primary School (26 / 100)	Teaching at Chhattisgarh High School, Ayma and Kasturba Primary School, Balarampur (Jan-Apr), personality development training for students at Chhattisgarh High School (Jan-Apr), school facilities upkeep (Jan-Apr), collecting and donating books for school library at Chhattisgarh High School (Jan-Apr), help organizing sports meet at Chhattisgarh High School (Jan)
11	Talbagicha (69 / 120)	Teaching 50 to 60 students of standards VIII to X at Talbagicha High School twice a week (30 volunteers Jan-Apr), clothes and medicine from IIT campus collection and cataloging collected items (39 NSS volunteers Jan-Apr), administering "Vivekdisha" (Jan-Apr), Kanyashree Prakalpa baseline survey (Feb-Apr), maintenance of school building (whitewashing of two class rooms) (Apr), organization of thalassemia awareness camp (Feb) and a camp blood testing for thalassemia detection (80 beneficiaries) (Mar)
12	Rangametia (70 / 120)	Teaching primary school students (Jan-Apr), Kanyashree Prakalpa baseline survey (Feb-Apr), open house with local residents and local government representatives leading to the identification of adult education and water quality assessment as two potential future activities (Mar)
13	Kashijora (60 / 150)	Teaching at Kashijora Primary School (Jan-Apr), cleaning and upkeep of school premises (Jan-Apr), distribution of first aid kit 60 village residents (Jan), collecting books from IIT campus residents and setting up a library at Kashijora Primary School with donated books (Jan-Mar)
14	Ghagra (64 / 200)	Teaching primary school children (Jan-Apr), temple rehabilitation (Jan-Apr), organizing test for awarding Prerana scholarships (Apr), organizing a medical camp that served about 50 Ghagra residents and distribution of medicine free of cost to the patients (Mar)
15	Sholadahar (65 / 200)	Teaching at a primary school (Jan-Apr), tutoring Sholadahar high school students (Jan-Apr), vocational training (Jan-Apr), medical camp (50 beneficiaries) (Mar), organizing cultural events and street plays to spread awareness on the benefits of SC/ST certificates and Kanyashree Prakalpa (Feb, Apr)

Table 3. Special activities

Event / date(s) / Location	Activities (duration)
National Youth Day / January 12, 2014 / IIT Kharagpur	A rally was organized by NSS – IIT Kharagpur to mark the occasion continuing with the NSS tradition. Campus residents participated in the rally alongside NSS volunteers. They followed a 5-km course with colorful posters.
Republic Day / January 26, 2014 / IIT Kharagpur	NSS volunteers participated in the celebration of Republic Day in the IIT Kharagpur Campus as in other years. Continuing with IIT Kharagpur tradition, NSS volunteers facilitated the celebration by organizing local school children and providing refreshments to them on January 26 as well as during the children's rehearsal on two occasions before the actual celebration. As in other years, an issue of NSS – IIT Kharagpur newsletter, "Anuraag," was published on this day for distribution amongst guests. Unit 10 helped organize the annual sports meet at Chhattishgarh High School, Ayma on this day.
Blood donation camp / April 5, 2014 / BC Roy Technology Hospital, IIT Kharagpur	The Annual Blood Donation Camp was organized by NSS, IIT Kharagpur on April 12 in IIT campus with the joint help of BC Roy Technology Hospital, IIT Kharagpur and Kharagpur Voluntary Blood Donors' Association. The blood bank collected total 120 units.
Annual Day, NSS – IIT Kharagpur / April 12, 2014 / IIT Kharagpur	The day was marked by distribution of best volunteer certificates to 35 work groups of 15 units of NSS – IIT Kharagpur by Professor PP Chakrabarti, Director, IIT Kharagpur and Professor Rajendra Singh, Dean (UGS), IIT Kharagpur. 1st year volunteers of Units 3 (gold medalists), 15 (silver medalists) and 4 (bronze medalists), also received their medals from Professors Chakrabarti and Singh for their performance of in the last NSS Annual Camp at Ayma, Kharagpur. Chandrasekhar Memorial Scholarship (instituted by Professor Jacob Chacko and his students in memory of one of Professor Chacko's students) to six Class XI students was given away by Professor Jacob Chacko of IIT Kharagpur. The celebration was concluded by a cultural program by school children from villages / slums, where NSS – IIT Kharagpur operate.

Institute Information Cell

Prof.-in-Charge: **Prof. B.K. Mathur**

The Institute Information Cell has been the hub of academic information service of the Institute all round the year. In the past year, the Cell has renovated the web sites of the Institute and Online Notice-Board. The Cell also created and hosted sites of about forty conferences, seminars, workshops and short-term courses held during the past year and to be held in the next academic year. In addition to regular updating information on departmental pages, academic programmes, profiles of all faculty, halls of residences and administrative positions in the Institute

The Cell also developed additional information modules for in-house application and they can be used in any other academic organization as well. These are: on-line Faculty Self Appraisal Package, departmental Report Package, Online Voting System, Guest House Booking Package, Extension of on-line Message Board facility to the Academic Section, Training and Placement Section and Doctorates Information System. In a major development of Guest House Management, all guest houses are brought under a common operating system and online booking facility has been extended to faculty. The Cell has made available the basic information about all Institute Staff on the LAN. The Cell has also developed software for various service sections for online filling of complaints.

Kalpana Chawla Space Technology Cell

HEAD: PROF. DIPANWITA ROY CHOWDHURY

ASSOCIATED FACULTY

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. Sengutpa	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	VLSI Architecture Design
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.

Associate Professor:

Name	Degree	Specialization
Dr. C. Chakrabarty	Ph.D	Control System
Dr. S. B. Sant	Ph.D	Material
Dr. Raja Datta	Ph.D	Optical & Wireless Network
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. I. Chakrabarti	Ph.D	VLSI Design for Image and Video Processing and Communication
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. 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. 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

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. Rajib Maity	Ph.D	Hydroclimatology, Water Resources Engineering, Stochastic Hydrology, Watershed Development, Soft Computing in Hydrology, Monsoon rainfall
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 Mechnical Metallurgy, Processing-Microstructure-Microtexture-Property Relationship, Materials and property modeling, Materials systems: Ti alloys and Ni based superalloys and steels for power plant applications

Emeritus Professor:

Name	Degree	Specialization
Dr. K. G. Naryanan	Ph.D	Microwave Engineering

Officer:

Name	Degree	Specialization
Dr. Saswati Ghosh	Ph.D	EMI/EMC, RF Microwave Circuit & Antenna

Brief description of on-going activities:

Space Technology Cell, IIT Kharagpur was renamed as Kalpana Chawla Space Technology Cell and was formally inaugurated by Chairman ISRO on 17th November 2004 this Cell has been functioning under the supervision of chairman of Space Technology Cell since June 1998. The Cell is being funded by ISRO, DRDO, CMPDIL Ranchi, etc. During the period under report the following highlights of sponsored research activities in this inside KCSTC and in different of departments of IIT Kharagpur:

1. Dual Mode Ring Resonator Bandpass Filter with wide stopband
2. Design of Wide-band, Sharp-rejection Bandpass Filters with Parallel – coupled Lines
3. Compact Bandpass Filters with Wide Controllable Fractional Bandwidth
4. Analysis of linear tapered waveguide by two approaches
5. Compact Sharp cutoff wide stopband low-pass filter using defected ground structure and spurline
6. Size Reduction and Harmonic Suppression of Microstrip Branch – Line Coupler Using Defected Ground Structure
7. On An Algorithm for Boundary Estimation of Commonly Occuring Heart Value Diseases in Time Domain
8. Log Gabor Wavelet and Maximum a Posteriori Estimation in Speaker Identification
9. A Robust Heart Sound Segmentation Algorithm for Commonly Occurring Heart Value Diseases
10. An object based coding scheme for frontal surface of defective fluted ingots
11. A Hierarchical Framework for Generic Sports Video Classification

12. Texture Classification Using a Novel, Soft-Set Theory Based Classification Algorithm
13. Performance of high rate data in wideband CDMA with correlated interferers
14. An Energy – Efficient Packet Filtering Architecture for Wireless Sensor Nodes
15. Effects of correlated interferers on packet data in presence of voice in cellular CDMA
16. Resource allocation for data in presence of voice in cellular CDMA with correlated interferers
17. Estimation of Antenna Factor of Wire Antenna as EMI Sensor Fusion
18. An Evolutionary Algorithm based approach to Automated Design of Analog and RF circuits using Adaptive Normalized Cost Functions
19. Image – based classification of Defects in Frontal Surface of Fluted Ingot
20. Impedance Calculation of Broadwall Longitudinal Slot on Rectangular Waveguide
21. Harmonic Supperssion and Miniaturization of Microstrip Branch Line Couplers
22. Method of Moment Analysis of Arbitrary Length Longitudinal Slot on Broadwall of Rectangular Waveguides
23. Analysis of Longitudinal Slot Antennas in the Broadwall of Standard and Non-standard Rectangular Waveguides
24. Planar Compact, Wideband Bandpass Filters with Wide Upper Stopband
25. Estimation of EMI from Waveguide Joints and Analysis of Thick Rectangular windows and Open-end of a Rectangular Waveguide as EMI Sensors
26. Compact Bandpass Filter for Ultra –Wide Band Communication
27. U-Shaped microstrip structure to decrease DGS resonance frequency
28. Analysis of Wire Antennas as an Element in Reflect Array Antennas
29. Theoretical Investigation of Phase Control Using Variable Length Dipole and Loaded Dipole in Reflectarray Antenna
30. Monopole Antenna Loaded with Dielectric Resonator as EMI Sensor
31. Designing Matched Filter for Imaging of Buried Objects, Water Layer and Voids within the Earth Surface & b amp; Underground Coal Mines using Electromagnetic Wave
32. Detection of Water Layer within the Earth Surface & Underground Coal Mines using Electromagnetic Wave
33. Imaging of Water Layer and buried object using Electromagnetic wave
34. Compact Wideband Bandpass Filters with Extended Upper Stopband
35. Harmonic Suppression and Size Reduction of Planar Branch Line Couplers
36. Method of Moment Analysis and Impedance Calculation of Broadwall Longitudinal Slot on Rectangular Waveguides
37. Compact Highpass Filter using Complementary Split Ring Resonator
38. Switched Beam Array Antenna for Sectorized Optimum Power Distribution into Discrete Localities of Rural Area
39. Augmentation of Anti-Jam GPS system on Moving Platform using Adaptive Array Antenna: a Low Side Lobe- Constant Radiated Power Algorithm and DOA Estimation Algorithm measuring the Deviation of Look Angle
40. Multiple Beamforming using Switched Beam Array Antenna
41. Application of Multiple Cavity Modeling Technique for Accurate Analysis of Waveguide Fed Thick Rectangular Window
42. Comparison of IE3D and CST-Microwave Studio Simulator for Planar Microwave Filter design
43. Study on the Effect of Different Shapes of Defective Ground Structures Using Finite-Difference Time-Domain Technique
44. The role of GTD in the analysis and design of Antennas on shipboard platforms
45. A Wide-band Lumped Element Compact CAD Model of Si-Based Planar Spiral Inductor for RFIC
46. Design of a 1 V Low Power 900 MHz QVCO, 19th IEEE/ACM International Conference on VLSI Design

47. High Level Synthesis of Linear Analog Systems, International Conference on Emerging Applications of IT (EAIT 2006)
48. AGC of a Hydrothermal System with Thyristor Controlled Phase Shifter in the Tie-Line
49. Texture Classification Using a Novel, Soft-Set Theory Based Classification Algorithm
50. TEM Characterization of Polyester – Urethane – Clay (3 Weight%) nanocomposite
51. Improvement of performance of planner antenna using composite dielectric. EBG, RIS, SIAD structure are used for the improvement (Graind and Bandwidth enhancement, Miniaturization)
52. Efficient permittivity and permeability, slow wave structure and its application in electromagnetic wave propagation in media
53. Numerical Analysis of periodic structure.

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

SPONSORED RESEARCH (*Sponsored by ISRO-IIT Kharagpur Cell): 37*

INVITED LECTURES BY FACULTY MEMBERS: 6

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 2013, 194 employees have been trained up to Pragya level.

Hindi Workshops and Seminars

With a view to create awareness for use of Hindi as Official Language in official work as well as to accelerate the pace of its progressive use, Rajbhasha Vibhag used to organize various training programmes, Workshops and Seminars for the employees / Officers of the Institute throughout the year. In the previous year 2013-14 the following events took place:-

On 16th May, 08th August, & 6th November, 2013 and 20th March, 2014, three Hindi workshops were organized for the employees. In these Dr. Rajeev Kumar Rawat, Hindi officer briefed the employees about the techniques for doing their day to day official work in Hindi and also hands-on training was given to them to be able to work on computer in hindi, noting and drafting.

Celebration of HINDI DIVAS

During the month of September, Rajbhasha Vibhag has organized "Hindi Saptah" from 10- 14th Sep 2013. 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.

Publication

Rajbhasha Vibhag publishes a monthly News Magazine "Jharokha" in Hindi covering all the academic, cultural, extra-curricular activities of the institute with the rules , regulations, policy matters related to Rajbhasha.

Resources and Achievements
Softwares

Rajbhasha Vibhag has several Hindi Softwares like i-leap, ISM Publisher, ISM Office, Leap Office etc. Vibhag also uses the tools, PARIVARTAK, MANTRA, TRANSLITERATION, etc developed by Department of Official Language , MHA, Government of India, C-DAC and other agencies. Recently ISM V.6 was procured which is Unicode compatible.

UNICODE
The Vibhag has activated UNICODE in all the computers of departments and trained the employees to work in Hindi.

Rajbhasha Library
Rajbhasha Vibhag has a full fledged Library with a collection of more than 1200 books of different writers on literature, fiction, poetry, prose, play and various subjects of translation and language.

Bilingual web site
The Rajbhasha Vibhag has made its website bilingual. Useful information links are available on Vibhag Website regarding training programmes, incentives schemes, different tools etc. The Rajbhasha Vibhag has also made the Institute's website bilingual and efforts are being made to make the contents of the website also bilingual.

Committees

Official Language Implementation Committee and Progress Measurement Committee

The Institute has constituted 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 20.08.2013 and 20.03.14. The meetings were chaired by the Chairman TOLIC and attended by Heads of the member offices with their Hindi Staff. Rajbhasha Vibhag invites the employees of TOLIC member offices to participate in the workshops, seminars and training programmes organized in IIT Kharagpur

Science & Technology Entrepreneurs' Park (STEP)

NAME OF THE UNIT

Science & Technology Entrepreneurs' Park / Technology Business Incubators (STEP/TBI)

FULL NAME OF THE CONCERNED OFFICER

Prof. Indranil Sen Gupta
Professor, Department of Computer Science & Engineering, &
Prof-in-Charge of Incubation and Entrepreneurship Programme, SRIC &
Managing Director, Science and Technology Entrepreneurs' Park,
Indian Institute of Technology Kharagpur, India

MAJOR ACTIVITIES:

1) High end TBI lab with VLSI based equipments has been established to facilitate the entrepreneurs under TBI/STEP incubation.

2) Infrastructure facilities created:

   - Construction of incubation facilities 13,500 sq.ft. is under process. Out of that, 4500 sq.ft. is completed and already under use at STEP, Gopali.
   - A set of twenty cubicles for the usage of Entrepreneurs have been established in the old building of STEP, IIT Kharagpur.
   - The companies can access these cubicles and avail the facilities for their design and testing.
   - Prof. Ajoy Kumar Ray, Vice Chancellor and Dr. M. K. Sanyal, professor & Head, Department HRM, Indian Institute of Engineering Science & Technology visited STEP on 28th March, 2014 for the possible collaboration on E-Cell activities and entrepreneurial programme.
   - Prof. Paul Lillrank (Aalto University, Finland) visited STEP, IIT Kharagpur in the month of January, 2014 and delivered lectures on "Quality Management for Entrepreneurial ventures" and visited Seva-Bharati School of Living, Kapgari, Jhargram, West Midnapur district of West Bengal, towards awareness camp on health delivery model. Dr. Ranjan Sen, Alumnai of IIT Kharagpur and Chaiman of Seva-Bharati School of Living visited STEP for the possible collaboration in the field of agricultural innovation & entrepreneurial activities to change the socio-economic scenario of extreme rural area of Jhargram.

3) TIFAC-SIDBI Technology Innovation Programme (SRIJAN): On the 10th day of January, 2014 the programme was held at STEP, IIT Kharagpur. Around 100 (hundred) innovators attended the meeting where 17 innovators have showcased their product. The scheme provides support to entrepreneurs (either start up or existing) to scale-up / commercialize new products / process based on technology innovations. Dr. P. R. Basak, Head-TIFAC/SIDBI Technology Innovation Programme, New Delhi, Mr. S. Ramakrishnan, General Manager, SIDBI, Kolkata, Prof. Indranil Sen Gupta, Managing Director, STEP, Prof. Partha Pratim Das, Head, Rajendra Mishra School of Engineering Entrepreneurship along with 5 (five) other professors of RMSoEE attended the meeting. Honorable Director of IIT Kharagpur also visited during the meeting.

4) PRISM Awareness Meet: On the 26th day of March, 2014, Dr. Ramanuj Banerjee, Scientist 'D', DSIR, New Delhi, Govt. of India, visited STEP, IIT Kharagpur to discuss the details of PRISM

project. Prof. Indranil Sen Gupta, Prof. Partha Pratim Das, Prof. Basab Chakraborty, Prof. Satyahari Dey and Mr. Sumit Biswas, Assistant Registrar, SRIC were present at the meeting.

5) **Entrepreneurs Meet:** On March 29, 2014 an entrepreneur's meet was organized at STEP, IIT Kharagpur. Prof. Indranil Sen Gupta, as new Managing Director of STEP inaugurated the programme and addressed the entrepreneurs. He has interacted with the incubatees about the guidelines and policies of various funding programmes available through different Govt. Projects . Prof. Indranil Sen Gupta (MD, STEP), shared his experience and appreciated the step taken by the young entrepreneurs and innovators for their development. Mr. S. C. Santra (GM, STEP) explained the activities of the centre and support mechanisms for the grassroots entrepreneurs and innovators.

6) **PRISM Awareness Camp:** On the 29th day of March 2014, a PRISM Awareness Camp was held at STEP, IIT Kharagpur. Around 50 (fifty) innovators attended the meeting including professors of various department of IIT Kharagpur. Prof. Indranil Sen Gupta, PI of the project, discussed in details about the project and attended to all the queries made by the Innovators. Prof. Indranil Sen Gupta asked innovators to submit PRISM Proposals in a large numbers as Tepp Outreach & Cluster Innovation Centre (TOCIC), IIT Kharagpur will be happy to help the innovators in all respect.

7) **Faculty Development Programme (FDP):** We have successfully conducted entrepreneurship (academic and practice) based one faculty development programme (FDP) in 2013-14. Seventeen faculty members participated in the programme. The participants were taught how to start E-Cell in their respective institution, how to create courseware on entrepreneurship, and how to promote entrepreneurial activity in their corresponding areas.

8) **Technology based Entrepreneurship Development Programme (TEDP):** We have successfully conducted entrepreneurship (energy, environment, education & health) based two entrepreneurship development programme (TEDP) in 2013-14. Fifty one students from Science background participated in the programme. The participants were taught how to start their own business based on their own innovation.

9) **The Global Entrepreneurship Summit (GES):** The annual flagship event of E-Cell IIT Kharagpur unfurled in a grand style on 10 January 2014 as more than 2000 students from all over the country watched in awe. The GES summit 2014 witnessed workshops, interactive sessions and lectures from eminent personalities like Mr. Avinash Vashistha, Chairman and Geography Managing Director, Accenture India; Mr. Anil Joshi, Ex- President, Mumbai Angels; Mr. Varun Agarwal (Alma Mater), Mr. Arunachalam Muruganantham (Jayaashree Industries), Mr. Bhaskar Majumdar (Heath Ventures, IIT Kgp Alumnus), Mr. Farrhad Acidwalla (Rockstah Media), Ms.Ira Trivedi(Novelist, Entrepreneur),Ms. Devita Saraf (Vu Technologies), Mr. MN Srinivasu (Bill Desk) and Mr. Sam Pitroda (Advisor to PM, Chairman, National Innovation Council). Mr. Avinash Vashistha and Mr. Anil Joshi were the keynote speakers for the inauguration ceremony. The three day conference served as a platform for discussion of opportunities and programs for promoting entrepreneurship at IIT Kharagpur and in India on the whole and chalk out common strategies. The GES witnessed several programs and conclaves as well which were widely appreciated by the participants. Mr. Rajat Sharma Chairman and Editor-in-Chief, India TV) and Mr. Sharad Gupta(CEO, 10kya.com) were the keynote speaker at the closing ceremony.

10) TIETS-TIDE–Screening Committee Meeting: A screening Committee meeting, consisting of Prof. Indranil Sen Gupta, Prof. Partha Pratim Das, Prof. Satyahari Dey, Prof. Bhaskar Bhowmick and Mr. Subhash Chandra Santra, General Manager, STEP, was organized on February 7, 2014. 4(four) Start-ups of IIT Kharagpur and 1 (one) Start-up of IIT Madras have participated in the committee. Rs.17

lakh have been disbursed to two of them for product development and commercialization of their innovations.

11) TDB–Screening Committee Meeting: A screening Committee meeting, consisting of Prof. Indranil Sen Gupta, Prof. Partha Pratim Das, Prof. Satyahari Dey, Prof. Bhaskar Bhowmick and Mr. Subhash Chandra Santra, General Manager, STEP, was organized on February 7, 2014. 2(two) companies, formed by IIT Kharagpur students, have participated in the committee. Rs.22 lakh have been disbursed to both of them for product development and commercialization of their innovations.

Thrust Areas of Research

TBI Research: Following fields of development are well supported and bolstered by TBI (Test/Measurement, Design and Characterization lab)

- Embedded System Design & Development (High and Low End FPGA/DSP development board) for major below application.
- Wireless Communication
- Image Processing
- Medical: Biometric passports, Active & Passive semiconductor devices design & Modeling, Low Noise receiver & Power amplifier
- Design & Development for medical instrumentation

Management Research:

- Business Architecture/Business Networks for SME
- Information & Communication Technology (ICT) applications in Healthcare
- Technology Interventions of Growth Ventures
- The Education-Enterprise association for entrepreneurship through ideation, incubation and entrepreneurial integration
- Product Development Strategy for Startup Firm
- Business Intelligence for Entrepreneurial venture
- Quality of Service for SME

Brief descriptions of on-going entrepreneurial activities at STEP

Total No. of companies: 84
STEP IIT Kharagpur Campus: 71
STEP Gopali Campus: 13

Other Assistance of Entrepreneurial Activities:

- Entrepreneurship support through MSME grant.
- MSME IIT Kharagpur centre has funded 9 innovators and approved another 2 innovator.

LECTURE BY VISITING EXPERT: 01

SEMINARS/WORKSHOPS/CONFERENCES: 07

Sponsored Research & Industrial Consultancy (SRIC)

The academic excellence of an educational institution stands on its research capability, where learning and innovation complement each other. IIT Kharagpur has been committed towards 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 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. 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:

- 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.

- 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.

- 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.

- 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.

- 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.

- 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.

- 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 launched the 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 crores and 125 consultancy projects worth Rs. 12.83 crores aggregating a total of 318 projects for Rs. 162.14 crores.

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

- Centre for Railway Research
- K. Sinha Centre for Bioenergy
- 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
- Stope 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-bsed bulk metallic glasss 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 were filed and more than 120 were granted and a total of 19 technologies were 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 Kharagpurteam 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.

Technology Students Gymkhana

PRESIDENT:	Prof. Joy Sen
TREASURER:	Prof. Somesh Kumar
VICE PRESIDENT:	Sri Punj Rajan

Rectors' Nominee:

1. Prof. Kingshook Bhattacharya (Sports)
2. Prof. N. K. Goyel (Sports)
3. Prof. Bhargab Maitra (Technical)
4. Prof. Arindam Basu (Technical)
5. Prof. Priyadarshi Patnaik (Soc & Cult)
6. Prof. G. Harikrishnan (Soc & Cult)

NAMES OF THE PHYSICAL TRAINING INSTRUCTORS

1. Mondal S: *B.A, B.P.Ed, M.P.Ed , Diploma in Sports Coaching in Basketball from NSNIS Patiala, Ph.D Perusing, Qualified , (BFI) National Referee 'A'*

2. Kumar S: *B.Sc in Physical Education, Master in Physical Education & Sports Science*

3. Ghosh A .K: *B.A. B.P Ed, Sports Coaching in Football from NSNIS, Kolkata*

4. Gyan Swaroop: *B.P.E, M.P.E, M.Phil, Ph.D, Diploma in Sports Coaching in Hockey from NSNIS Patiala, Qualified National Referee*

5. Adrib Mitra: *B.Com (H), B.P.Ed, M.P. Ed, M. Phil*

6. Samba Kar: *B.P.Ed, M.P. Ed*

7. Pranab Sarkar: *B.A (English H) B.P.Ed, M.P. Ed*

DEVELOPMENTS

The development of all-round students' activities centering TSG, IIT Kharagpur is based on the full utilization of its existing facilities; and evident in its activities in the year 2013- 14:

Existing Facilities

- 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

Activities

The activities of the students of IIT Kharagpur can be summarized as follows with the allied highlights.

Inter IIT Sports Meet

IIT Guwahati was host of 49th Inter IIT Sports Meet. The first phase of Sports Meet began with the Inter IIT Aquatic Meet held on **October 1st to 4th, 2013.** IIT Kharagpur Secured 2nd in Swimming and 3rd in water polo. Extra ordinary performance in swimming was forwarded by Sherays Mahajan, a final year UG student. Shreyas was declared as individual champion.

The second phase which includes all other games, started from December **16th to 23rd 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.

Over all 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: Basketball Boys and Girls Team had participated and **they stood First in IMG Reliance BFI Inter College Basketball League** held at Kolkata. **IIT Kharagpur Boys Team Secured First Position** and Girls Team Secured Third Position**.** Boys 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.**

The Basketball Team of IIT Kharagpur also participated in the Senior State Basketball (Boys & Girls) Championship which was held at West Bengal Basketball Association, Kolkata. Subsequently, IIT Kharagpur Basketball team got an affiliation from West Bengal Basketball Association.

Cricket: The Cricket Team of IIT Kharagpur participated in the Inter University Cricket Tournament T-20 which organized by IIT Kharagpur.

Football: The football team of IIT Kharagpur participated in Kharagpur football league.

Lawn Tennis: Lawn Tennis (Boys') Team participated in Midnapore open & Kharagpur open Tennis tournament and both the Tournament the team secured first position.

Inter Hall Competition in Sports & Games

During the Autumn Semester Inter hall competition was initiated with the 6.6 Km Run. In the Spring Semester, the Second Phase of inter Hall Competition was held in Athletics, Badminton ,Basketball

,Cricket, Football ,Hockey ,Volleyball ,Table Tennis, Lawn Tennis, Squash, Weightlifting and overall, Nehru Hall won General Championship with 75 Points, followed by R.P Hall arriving at Second position with 46 Points and finally, with the Third position going to MS Hall of Residence with 41 Points. The Inter Hall Competitions among the Girl's hostels ware conducted in Athletics, Basketball, Badminton, Table Tennis, Lawn Tennis, Swimming and Volleyball.

Inter Hall Competition in Social Culture Events

General Championship social & cultural 2013-14 awarded to Azad hall of residence

Spring Fest 2014

Spring Fest is the annual social cultural fest of IIT Kharagpur. It is conducted in the Spring Semester, during the month of January.

Highlights

- Edition: This was the 55th edition of Spring Fest edition of Spring Fest, held on 23rd-26th January 2014
- Theme: The Great Indian Carnival - 'Dil Se Desi"
- Performances: Agnee, Swarathma, Underground Authority, Salim-Sulaiman, Pentagram.
- 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.
- Footfall: 2400+ was the total footfall, the largest till date.
- Associations: Shiamak Davar Dance Academy, Anupam Kher's Actor Prepares, Naujawan-e-hind, ZIMA, IFMA, International Institute of Photography.

Outstation participation and achievements by societies in Spring Fest

- **Monkey cap:** Finalists at channel V India fest, National competition ... Top 7 out of 2000 bands ...Played on the red Bull tour bus, an international initiative by red bull to showcase the top bands of the country ...Performed in the world music fusion fiesta, calcutta alongside motherjane, sivamani, trilok gurtu ... International turnover .
- **Quizzing achievements:** Sweden India nobel memorial quiz- won kolkata regionals and nationals team : Ajay Viswanathan; Somashish Ghosh; Saswat Panigrahi
- **NDTV croma tech grandmasters:** Won 1st round: team: Yogarshi Vyas and Anirudh Deb
- **Tata Crucible: cleared zonal round - team :** Yogarshi Vyas and Saswat Panigrahi
- **Nihilanth : Rank 4India quiz Gold Team :** Kanisk Samot; Yogarshi Vyas; Arijit Patra
- **Sports Quiz: SilverTeam:** Yogarshi Vyas; Ajay Viswanatha; and Mhilesh Gurujala
- **Mela Quiz : Silver Team:** Yogarshi Vyas; Ajay Viswanathan; Somashish Ghosh
- **HTDS:** 1st in rangmanch sf 2014 , 2nd in rangmanch SF 2013; IIM cal 2014- 2nd in play, 1st in nukkad; IIM cal 2013- 2nd in nukkad
- **ETDS:** IIM Banglore 2nd in stage play; IIT guwahati- 2nd in stage play
- **BTDS & TTDS:** no outstation
- **Technology dance society:** IIT guwahati 1st 2014
- **Technology Music Society**- ALL the monkey cap achievements no outstation other than that

- **Technology Literary Society:** Priyal Maheshwari won cash prize in thomso IIT R; -started Hindi e pulse the only Hindi literary newsletter; creative writing workshop by Sushmita Bhattacharya (writer from London)
- **Debsoc**
  - Teams or individuals from IIT Kharagpur achieved the following positions: 3 teams broke at KSOL '12 (KIT School of Law)

  - Two teams broke at VITDT"13, (VIT Debating Tournament) with one team reaching the finals.
  - Best adjudication at IITB' PD '13. (IIB parliamentary debate)
  - A team reached the semifinals at Mukherjee Memorial '14
  - Two teams broke at IITD PD '13
  - A team broke at INDC '14 (Indian National Debate Championship)
  - A team broke at NUJS '14 (National University of Juridical Sciences)
  - A team won NIT Rourkela PD '13

Inter Hall Competition in Technology Events

General Championship Technology 2013-14 was awarded to Azad hall of residence

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
- As Asia's biggest techno management fest
- With Footfall increased from 2400 00 (50% increase)
- With major state-of-the-art Scientific Events and certifications

Key events were:

- 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- ASME
- Speak Out for Engineering- Institution of mechanical Engineers
- IDP – GE
- Illuminate- E.B.A.I. , Drishti

Principal Guest lecturers were:

- Dougal Jerram, British geologist/earth scientist, television & 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

Key Workshops were: NVIDIA - Game Streaming ,TECHNOPHILIA Accelero-Botix ,PFI - State of City Finances, Simulating FSAE Vehicle with Adams/Car 2013, HONDA - Automotive Engineering, KLA Tencor - Semiconductor Fabrication, Investigative Journalism, MOZILLA - The Mozboot Camp, IFC - Rupee Depreciation ,TERI - Green Technologies.

Exhibitions: PUZZLEBOX ORBIT, MINIATURE MODELS, FACE ANDROID, TOUCHWALL, TALKING ROBOT, NAO ROBOT, PAPER TAB, SWARM ROBOTICS, FACE VIDEO MAPPING

Megashows:

BMX Extreme Stunts, the Acrobatics Show for Basketball and EDM Night

Intrinsic Highlights:

- Application Cup LLR Hall Secured First Place.
- Innovation Cup RP Hall & Azad Hall (Joint) Secured First Place
- Knowledge Cup Azad Hall Secured First Place.

Some major highlights of Kshitij 2013-14 were:

- Largest techno-management symposium in Asia.
- More than 50,000 participants from all over world.
- First time IIT Kharagpur conducted Computer Programmer policy and IIT Delhi secured first position, Second position secured EEE, Hyderabad, IIT, KGP secured forth position.

Some of the flagship events of Kshitij were as follows:

- Quizzes
- Laws of Motion
- Nightshift
- Racepulse
- Overline
- BPlan

Technology General Championship won by Nehru Hall of Residence, 2nd LLR hall of Residence and 3rd AZ Hall of Residence.

Gymkhana Awards:

During the annual Prize Distribution Ceremony and farewell function, 21 Players received the Institute blues, 11 Order of Merit, 8 Honorable Mention and 7 Special Mention have been awarded to the students for their outstanding achievements in Sports & Games, Social & Cultural and Technology activities.

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.

The outgoing Students Governing body 2013-14 had rendered a significant contributive role under the leadership of past President Prof. Manish Bhattacharya and past Vice President Sri Apoorv Jain. A continued and perhaps, a greater role is expected from the new incoming flow under the governance of new Vice President elect Sri Punj Rajaan and his accompanying league of bright students. Let us wish all of them a great year of 2014-15 ahead!

Technology Telecom Centre

Prof-in-Charge: Prof. Raja Datta
Engineer: Mr.Pankaj Gupta

Work Carried Out

- A new facility to forward the calls coming to the office internal phones to the respective officer's cell phones has been added.
- All the rooms of Visveswaraya Guest House (CEC) has been given telephone facility.
- The internal back bone cable of the Dept. of Chemical Engg has been restructured and replaced with new cables.
- The internal backbone cable of the Dept. of Geology and Geophysics has also been restructured and replaced with new cables.
- 500 new telephone instruments have been purchased for replacing old telephones as well as to provide the new connections.
- The internal backbone telephone cabling in the newly added floor of Dept. of Biotechnology is completed.

Ongoing Works:

- Restructuring and replacing of old internal telephone cables in the Dept. of Electrical Engg. and Dept. of Mathematics has been taken up.
- An Audio Bridging system for internal conference facility upto 30 participants will be installed in the existing exchange soon.
- Laying of cabling work is going on in the pilot project in the Dept. of Agriculture and Food Engineering.

New Planning:

- Telephone facility to all the class rooms of Nalanda Complex has been planned.
- Laying of telephone cabling in the newly built floor of the Dept. of Industrial and Systems Engg.
- A new Satellite Exchange has been planned in the upcoming building of JCB Complex Annex building so that telephone connections can be provided to the entire JC Bose laboratory Complex as well as in the upcoming Diamond Jubilee Tower.

CAREER DEVELOPMENT CENTRE

The Career Development Centre is responsible for arranging practical training for 3rd year B. Tech/Dual Degree and 4th year M.Sc. degree students and job placement of final year students graduating from the Institute. The 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 3rd year B. Tech/Dual Degree and 4th year M.Sc. degree is a compulsory part of the curriculum at IIT Kharagpur, carrying 2 credits. All efforts are made to place the concerned students in the best of organizations in India and abroad for summer training through Training and Placement section and various departmental supports. An emergent trend is that more and more students are seeking summer training abroad.

A total of 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 s**tudents 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

247 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 30.04.2014 are as follows:

Course/Degree	No. of students registered	No. of students placed
B.Tech. (Hons.) & B. Arch	615	506
5-year Integrated M.Sc.	138	111
2-year M. Sc	116	58
Dual Degree (B. Tech + M. Tech.)	387	325
M.Tech./MCP	710	423
M.B.A.	70	65

MS/Ph D	18	18
Total	2054	1506

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. 36.9lakh per annum and the second highest is Rs.28.5lakh per annum in 2013-14.

Average Salary for 2013-14is as follows.

Courses	**Average Salary (CTC) Rs. Lakhs per annum)**
B. Tech.& B. Arch	10.98
Dual Degree	11.69
5yr. Integrated M.Sc.	10.75
2yr. M.Sc.	7.05
M. Tech.	8.60
MS/ Ph.D	6.93
Average Salary for all UG & PG Courses	9.81
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.

WATER WORKS SECTION

PROFESSOR –IN-CHARGE: Prof. M M Ghangrekar

Officer: B B Rai, Executive Engineer

On-going works / Job:

Annual repair and maintenance in connection with plumbing and water supply at Academic Campus for the year 2014 -15.
Annual repair and maintenance in connection with plumbing and water supply at Old Residential Campus for the year 2014 -15.
Annual repair and maintenance in connection with plumbing and water supply at New Residential Campus for the year 2014 -15.
Annual repair and maintenance in connection with plumbing and water supply at VS, BC ROY, MS, MT, Gokhale , AM, SN&IG,RK, RP, BF -1&3, RLB Halls for the year 2014 -15.
Annual repair and maintenance in connection with plumbing and water supply at MMM, Patel, Azad, Nehru, HJB, JCB, LLR, ZH Halls for the year 2014 -15.
Annual maintenance of main water pipelines from Anicut & Balarampur Pumphouse for the year 2014 -15.
Operation & Maintenance of Balarampur Pump house for the year 2014 -15
Laying of 150 mm & 100mm dia. DI main water pipeline from UGPH to JC Ghosh & PC Roy Lab
Surging of few existing deep tube wells inside campus & Anicut Pump House
Construction of a Mini Deep tube well with main distribution water line at Tata Sports Complex
Construction of a Mini Deep tube well at Ambedkar Hostel including its inlet line
Construction of one Deep tube well near Anicut Pump House No.- 1
Installation of New Iron Removal Plant & repair of existing plant at Deep tube wells near Gas Godown & VSRC
Water line connection & Sinks at all rooms of the newly constructed building of Metallurgical and Materials Engg. Dept.

Statistics

Table A-1

ADMISSION TO UNDERGRADUATE (B.TECH./B.ARCH./M.SC./DUAL DEGREE) COURSES IN THE SESSION 2013-2014

Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	OB	SC	ST	**TOTAL**	GN	OB	SC	ST	**TOTAL**	GN	OB	SC	ST	**TOTAL**
(A) B.TECH. 4-YEAR																
1	Aerospace Engg	16	9	5(1)	2	**32**	16	9	4	2	**31**	16	9	4	2	**31**
2	Agril. & Food Engg.	17(1)	9	5	3	**34**	16	9	5	3	33	16	9	**5**	3	33
3	Biotech. & Bioch. Engg.	14(1)	7	4	2	**27**	13	7	4	2	**26**	12	7	4	2	**25**
4	Chemical Engg.	26	14(1)	8(1)	4	**52**	26	13	8	4	**51**	26	13	8	4	**51**
5	Civil Engg.	31(1)	17	9	5(1)	**62**	31	17	9	5	**62**	31	17	9	5	**62+1***
6	Computer Sc. & Engg.	28	15(1)	8	4	**55**	28	15	8	4	**55**	28	15	8	4	**55**
7	Electrical Engg.	28(1)	15(1)	8	4	**55**	28	15	8	4	**55**	28	15	8	4	**55**
8	Electronics & ECE	31	17(1)	9	5(1)	**62**	31	17	9	4	**61**	31	17	9	4	**61**
9	Industrial Engg.	15(1)	8	4	2	**29**	14	8	4	2	**28**	14	8	4	2	**28**
10	Instrumentation Engg.	16(1)	9	5	2	**32**	16	9	5	2	**32**	16	9	5	2	**32+1***
11	Manuf. Sc. & Engg.	15	8	4	2	**29**	15	8	4	2	**29**	15	8	4	2	**29+1***
12	Mechanical Engg.	34	18(1)	10	5	**67**	34	18	10	5	**67**	34	18	10	5	**67**
13	Met. & Mat. Engg.	22(1)	12(1)	7	3	**44**	21	11	7	3	**42**	21	11	7	3	**42+1***
14	Mining Engg.	20	11	6	3	**40**	20	11	6	3	**40**	20	11	6	3	**40**
15	Ocean Engg. & N.A.	17(1)	9	5(1)	2	**33**	16	9	5	2	**32**	16	9	5	2	**32+1***
	Total (A)	330	178	97	48	**653**	325	176	97	47	**644**	324	176	96	47	**643**

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.ARCH. 5-YEAR																
1	Architecture	25(1)	13(1)	8	4	**50**	25	10	8	1	**44**	25	10	7	1	**43**
	Total (B)	25(1)	13(1)	8	4	**50**	25	10	8	**1**	**44**	25	10	7	**1**	**43**

Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	OB	SC	ST	**TOTAL**	GN	OB	SC	ST	**TOTAL**	GN	OB	SC	ST	**TOTAL**
(C) M.Sc. INTEGRATED 5-YEAR																
1	Applied Geology	18	10	5	3	**36**	18	10	5	0	**33**	13	10	2	0	**25**
2	Chemistry	17(1)	9	5	3	**34**	17	9	5	1	**32**	11	4	4	1	**20**
3	Economics	22(1)	12(1)	7	3	**44**	22	12	7	0	**41**	21	12	7	0	**40**
4	Maths. & Computing	24(1)	13(1)	7	4	**48**	23	13	7	4	**47**	23	13	7	3	**46**
6	Physics	18(1)	10	5	3	**36**	18	10	5	0	**33**	18	10	5	0	**33**
7	Expl Geophysics	17	9	5	3	**34**	17	9	5	0	**31**	17	8	2	0	**27**
	Total (C)	116	63	34	19	**232**	115	63	34	5	**217**	103	57	27	4	**191**

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**
(D) DUAL DEGREE 5-YEAR																
1	Aerospace Engg.	10	5	3(1)	1	**19**	10	5	3	1	**19**	10	5	3	1	**19**
2	AG & F.E./Water Res. Dev. & Management	17(1)	9	5(1)	3	**34**	17	9	5	3	**34**	16	8	5	3	**32**
3	Biotech. & Biochem. Engg.	13	7	4(1)	2	**26**	13	7	4	2	**26**	12	7	4	2	**25+1***
4	Chemical Engg.	14(1)	7	4	2	**27**	13	7	4	2	**26**	13	7	4	2	**26**
27	Civil engg./Struct. Engg.	11	6(1)	3	2	**22**	11	5	3	2	**21**	11	5	3	2	**21**
6	Computer Sc. & Engg.	20(1)	11	6	3	**40**	20	11	6	3	**40**	20	11	6	3	**40**
7	Elect. Engg./Instru. Engg.	11(1)	6	3	2	**22**	11	6	3	2	**22**	11	6	3	2	**22+1***
8	E&ECE / Auto. & Comp. vision	20(1)	11	6	3	**40**	20	11	6	3	**40**	20	11	6	3	**40**
9	Industrial Engg. /IEM	12(1)	5	4	1	**22**	11	5	4	1	**21**	11	5	4	1	**21**
10	Manuf. Sc. & Engg./IEM	7	4	2	1	**14**	7	4	2	1	**14**	7	4	2	1	**14**
11	(i) M.E./M.S.Engg. (ii) M.E./Thermal, Energy & Environ. Engg.	24(1)	13	7	4(1)	**48**	24	13	7	4	**48**	24	13	7	4	**48+1***
12	Met. & Mat. Engg./Met. Engg.	10	5	3	1	**19**	10	5	3	1	**19**	10	5	3	1	**19**
13	Mining Engg.	10	5	3	1	**19**	10	5	3	1	**19**	10	5	3	1	**19**
14	Mining Engg. / Safety Engg. & Disaster Mgt. in Mines	9	5	3	1	**18**	9	5	3	1	**18**	9	5	3	1	**18**
15	Ocean Engg. & naval Arch.	11	5	4	2	**22**	11	5	4	2	**22**	11	5	4	2	**22+1***
16	QED&M	7	4(1)	2	1	**14**	7	4	2	1	**14**	6	4	2	1	**13**
	Total (D)	206	108	62	30	**406**	204	107	62	30	**403**	201	106	62	30	**399**
	Total (A + B + C + D)	677(20)	362(11)	201(6)	101(3)	**1341(40)**	669	356	200	83	**1308**	653	349	192	82	**1276+(9)***

(1)-Figures in () indicates PD candidate. * Prepatory student

Table A2

ADMISSION TO 2-YEAR M.SC. COURSES, 2013-2014

Sl. No.	Course	OFFERED					REGISTERED					NOT REGISTERED				
		GE	OB	SC	ST	TOTAL	GE	OB	SC	ST	TOTAL	GE	OB	SC	ST	TOTAL
1	Chemistry	21	13	8	4	46	21	11	7	4	43		2	**1**		3
2	Geophysics					-					-					-
3	Geological Sciences	13	10	5	2	30	13	10	5	2	30					-
4	Mathematics	16	8	5	1	30	15	8	3	1	27	1		**2**		3
5	Physics	17	16	9	4	46	14	16	9	4	43	3				3
6	Statistics & Informatics															
	TOTAL	**67**	**47**	**27**	**11**	**152**	**63**	**45**	**24**	**11**	**143**	**4**	**4**	**3**	**-**	**09**

Table A-3

DISCIPLINE-WISE BREAK-UP OF STUDENTS AWARDED M.C.M. SCHOLARSHIP 2013-2014

Rate of Scholarship : Rs.1000/- p.m. plus Free-tuitionship

S.N.	Course	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	Total
(A) B.Tech. 4-Year							
1	Aerospace Engg.	14	14	03	03-	-	**34**
2	Agri. & Food Engg.	06	05	04	07	-	**22**
3	Biotech. & Bioch. Engg.	02	03	03	04	-	**12**
4	Civil Engg.	20	12	13	19	-	**64**
5	Chemical Engg.	06	07	11	10	-	**34**
6	Computer Sc. & Engg.	12	18	12	14	-	**56**
7	Electronics & ECE	21	19	17	18	-	**75**
8	Electrical Engg	16	15	10	16	-	**57**
9	Industrial Engg.	08	08	06	06	-	**28**
10	Instrumentation Engg.	09	08	09	05	-	**31**
11	Mechanical Engg.	21	20	17	15	-	**73**
12	Manuf. Sc. & Engg	05	04	02	05	-	**16**
13	Mining Engg.	17	06	09	08	-	**40**
14	Met. & Mat. Engg.	13	05	13	06	-	**37**
15	Ocean Engg. & N.A.	10	06	04	06	-	**26**
(B) B.Arch. 5-Year							
	Architecture	06	08	04	07	05	**30**
(C) M.Sc. Integrated 5-Year							
1	Chemistry	01	-	-	01	-	**02**
2	Expl. Geophysics	07	-	01	02	-	**10**
3	Applied Geology	06	02	01	-	-	**09**
4	Economics	07	04	10	03	-	**24**
5	Maths. & Computing	03	-	04	-	-	**07**
6	Physics	02	-	03	-	-	**05**
						Total	**692**

Contd…

Contd… Table A-3

S.N.	Course	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	B/F : 692
(D) M.Sc. 2-Year							
1	Chemistry						
2	Geophysics						
3	Geological Sciences						
4	Mathematics						
5	Physics						
(E) Dual Degree 5-Year							
1	Aerospace Engg.	06	06	05	06		**23**
2	Ag. & F. E../ Water Res. Dev. & Manag.	07	04	04	03		**18**
3	Biotech. & Bioch. Engg.	05	06	01	07		**19**
4	Chemical Engg.	05	04	03	08		**20**
5	Civil Engg./Struct. Engg.	02	06	04	04		**16**
6	Computer Sc. & Engg./Comp. & Information Technology	13	11	08	13		**45**
7	Electrical Engg./Instrumentation Engg.	08	06	04	07		**25**
8	E & ECE/Automation & Comp. Vision	11	11	05	12		**39**
9	Industrial Engg./IEM.	05	06	03	04		**18**
10	Mech,.Engg.	14	19	07	10		**50**
11	Manuf. Sc.& Engg.	02	05	02	02		**11**
12	Met. & Mat. Engg./ Metallurgical Engg.	02	-	07	05		**14**
13	Mining Engineering	10	05	10	09		**34**
15	Ocean Engg. & N.A.	01	02	03	04		**10**
16	Q E D M	05	01	03	-		**09**
	TOTAL:	**308**	**256**	**225**	**249**	**05**	**1043**

Table A-4

STUDENTS AWARDED ONLY FREE TUITIONSHIP 2013-14

(Applicable to Genl. & OBC students only)

S.N.	Course	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	**Total**
(A) B.Tech. 4-Year							
1	Aerospace Engg.	01	01	04	-	-	**06**
2	Agri. & Food Engg.	03	01	06	-	-	**10**
3	Biotech. & Bioch. Engg.	02	03	01	01	-	**07**
4	Chemical Engg.	03	03	02	-	-	**08**
5	Civil Engg.	07	05	01	-	-	**13**
6	Computer Sc. & Engg.	05	01	03	01	-	**10**
7	Electrical Engg.	02	03	02	02	-	**09**
8	Electronics & ECE	01	05	04	02	-	**12**
9	Industrial Engg.	01	01	06	02	-	**10**
10	Instrumentation Engg.	02	04	01	03	-	**10**
11	Manuf. Sc. & Engg.	02	02	03	-	-	**07**
12	Mechanical Engg.	04	01	04	05	-	**14**
13	Met. & Mat. Engg.	05	04	01	-	-	**10**
14	Mining Engg.	05	05	-	-	-	**10**
15	Ocean Engg. & N.A.	01	03	04	02	-	**10**
16	Q E D M	-	-	-	-	-	-
(B) B.Arch. 5-Year							
	Architecture	04	04	-	-	-	**08**
(C) M.Sc. Integrated 5-Year							
1	Applied Geology	03	-	-	-	-	**03**
2	Economics	07	06	01	-	-	**14**
3	Expl. Geophysics	03	01	-	-	-	**04**
4	Chemistry	01	-	-	-	-	**01**
5	Maths. & Computing	01	-	-	-	-	**01**
6	Physics	03	01	-	-	-	**04**
Total:							**181**

Contd…..

Contd… Table A-4

S.N.	Course	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	B/F: 181
(D) M.Sc. 2-Year							
1	Chemistry						
2	Geophysics						
3	Geological Sciences						
4	Mathematics						
5	Physics						
6	Statistics & Informatics						
(E) Dual Degree 5-Year							
1	Aerospace Engg.	02	01	-	01	-	04
2	Ag. & F. E../ Water Res. Dev. & Manag.	03	03	01	02	-	09
3	Biotech. & Bioch. Engg.	01	-	01	-	-	02
4	Chemical Engg.	03	03	03	05	-	14
5	Civil Engg./Struct. Engg.	02	03	01	-	-	06
6	Computer Sc. & Engg./Comp. & Information Technology	01	-	03	-	-	04
7	Electrical Engg./Instrumentation Engg.	04	05	02	02	-	13
8	E & ECE/Automation & Comp. Vision	01	02	01	01	-	05
9	Industrial Engg./IEM.	-	01	-	01	-	02
10	QUDM	01	-	-	-	-	01
11	Manuf. Sc.& Engg.	01	-	-	-	-	01
12.	M.E./M.S. Engg.	03	01	05	04	-	13
13	M.E./Thermal, Energy & Environ. Engg.						
14	Met. & Mat. Engg./ Metallurgical Engg.	03	02	-	01	-	06
15	Mining Engineering	10	02	-	-	-	12
16	Mining Engg./Safety Engg. & Disaster Mgt in Mines						
17	Ocean Engg. & N.A.	05	01	03	-	-	09
	Total:	106	78	63	35	-	282

Table A-5

STUDENTS (SC & ST) AWARDED FINANCIAL ASSISTANCE 2013-2014

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

Sl.No.	Course	1st yr.		2nd yr.		3rd yr.		4th yr.		5th yr.		**Total**
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
(A) B.Tech. 4-Year												
1	Aerospace Engg.											
2	Agri. & Food Engg.			1	1		1		1			**4**
3	Biotech. & Bioch. Engg.											
4	Chemical Engg.											
5	Civil Engg.	1							1			**2**
6	Computer Sc. & Engg.											
7	Electrical Engg.											
8	Electronics & ECE		1					1				**2**
9	Energy Engg.											
10	Industrial Engg.								1			**1**
11	Instrumentation Engg.											
12	Manuf. Sc. & Engg.						1					**1**
13	Mechanical Engg.							2	1			**3**
14	Met. & Mat. Engg.					1			1			**2**
15	Mining Engg.	1			1				1			**3**
16	Ocean Engg. & N.A.											
(B) B.Arch. 5-Year												
	Architecture			1	1		2					**4**

	Prepatory	1	3									**4**

Table A-5 (Contd.)

Sl.No.	Course	1st yr.		2nd yr.		3rd yr.		4th yr.		5th yr.		**Total**
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
(C) M.Sc. Integrated 5-Year												
1	Applied Geology											
2	Economics						2					**2**
3	Expl. Geophysics			1								**1**
4	Industrial Chemistry		1									**1**
5	Maths. & Computing											
6	Physics											
7	Statistics & Informatics							1				**1**
(D) M.Sc. 2-Year												
1	Chemistry	4	3	1								**8**
2	Geophysics											
3	Geological Sciences	3										**3**
4	Mathematics	3										**3**
5	Physics	2			1							**3**
6	Statistics & Informatics											
(E) Dual Degree 5-Year												
1	Aerospace Engg.											
2	Ag. & F. E../ Water Res. Dev. & Manag.		1		1			2				**4**
3	Biotech. & Bioch. Engg.											
4	Chemical Engg.							1				**1**
5	Civil Engg./Struct. Engg.											
6	Computer Sc. & Engg./ Comp. & Information Technology											
7	Electrical Engg./ Instrumentation Engg.											
8	E & ECE/Automation & Comp. Vision											

Table -6

MEDALS AND PRIZES : 2013 – 2014 : 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	Lakshya Jain	10ME10024	9.63
2.	DR. BIDHAN CHANDRA ROY MEMORIAL GOLD MEDAL	Lakshya Jain	10ME10024	9.63
3.	PRIME MINISTER OF INDIA GOLD MEDAL	Ahanjit Bhattacharya	09CY2001	9.64
4.	DR. JNAN CHANDRA GHOSH MEMORIAL GOLD MEDAL	Chander Chandak	09EC3517	9.16
5.	PROF. J. C. BOSE MEMORIAL GOLD MEDAL	Saparya Chattaraj	12CY40032	9.56

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	Samir Kumar Jena	10CE10047	9.04
2.	PROF. R. G. CHATTERJEE MEMORIAL GOLD MEDAL	Sarthak Subhankar	09PH2028	8.95

3. SILVER MEDALS :

A. 4-YEAR B. TECH.(HONS.) COURSES :

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Aerospace Engineering	Bhatt Mrugank Pranav	10AE10006	9.04
2.	Agricultural & Food Engineering	Desam Gnana Prasuna Reddy	10AG10008	8.81
3.	Biotechnology & Biochemical Engineering	Vinay Patel	10BT10028	9.09
4.	Civil Engineering	Samir Kumar Jena	10CE10047	9.04
5.	Computer Science & Engineering	Yelam Anil Kumar	10CS10056	9.58
6.	Electrical Engineering	K. Nagaraju	10EE10059	9.16
7	Instrumentation Engineering	Saquib Ahmad	10IE10034	8.70
8	Electronics & Electrical Comm. Engineering	Paturi Rohit	10EC10039	9.28
9	Industrial & Systems Engineering	Dhawal Thakkar	10IM10014	9.31
10	Mechanical Engineering	Lakshya Jain	10ME10024	9.63
11	Manufacturing Science & Engineering	Ayan Hazra	10MF10007	9.02
12	Metallurgical & Materials Engineering	Kunwar Akash Singh	10MT10023	9.34
13	Mining Engineering	Ankit Gupta	10MI10006	8.68

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

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Architecture	Nishant Vats	09AR1014	8.89

B. 5-YEAR DUAL DEGREE COURSES :

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Aerospace Engineering (AE1)	Atanu Halder	09AE3017	8.91
2.	Agricultural & Food Engineering (AG1)	Arpit Rohatgi	09AG3207	9.37
3.	Biotechnology & Biochemical Engineering (BT1)	Vegesna Neeraja CCCC	09BT3005	9.09
4	Chemical Engineering(CH1)	Kaushik Sivaramakrishnan	09CH3026	9.09
5	Civil Engineering(CED)	Kamalendu Ghosh	09CE3112	8.97
6	Computer Science & Engineering (CS2)	Ananth Balashankar	09CS3035	9.60
7	Electrical Engineering (EED)	Sanjukta Nandi	09EE3512	9.23
8	Electronics & Electrical & Comm. Engineering (ECD)	Soumya Basu	09EC3401	9.58
9	Industrial & Systems Engineering (IM1)	Ashutosh Nayak	09IM3014	9.05
10	Mechanical Engineering (MED)	Prateek Sehgal	09ME3209	9.53
11	Manufacturing Sc.& Engg (MFI)	Soudagar Abdul Khaja Irfan Babu	09MF3008	8.72
12	Mining Engineering (MI1)	R. Ashwin Kumar	09MI3040	9.27
13	Ocean Engineering & Naval Architecture(NA1)	Joseph D Thekinen	09NA3022	9.19

D. M. SC. (5-YEAR) COURSES :

Sl. No.	COURSES	Name of the winner	Instt Roll No.	CGPA
1.	Chemistry	Ahanjit Bhattacharya	09CY2001	9.64
2.	Exploration Geophysics	Tripti Kumari	09EX2018	8.74
3.	Applied Geology	Parinay Jain	09GG2010	8.98
4.	Economics	Abhishek Jadon	09HS2010	9.22
5	Mathematics & Computing	Meghanath M Y	09MA2028	8.66
6	Physics	Sarthak Subhankar	09PH2028	8.95

E. M. SC. (2-YEAR) COURSES

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Chemistry	Saparya Chattaraj	12CY40032	9.56
2.	Geology	Soumadip Das	12GG40027	9.51
3.	Mathematics	Meraj Alam	12MA40012	9.43
4.	Physics	Siddhartha Gupta	12PH40039	9.54

3. **ENDOWMENT PRIZES - (UNDER GRADUATE)**

Sl. No.	Name of Prize	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Sarat Memorial Prize	Anamika Chowdhury	10CH10003	9.19	500.00
2.	Suhasini Devi Memorial Prize	Anamika Chowdhury	10CH10003	9.19	500.00
3	P. K Bhattacharya Memorial Prize	Jointly : Tripti Kumari Parinay Jain	 09EX2018 09GG2010	 8.74 8.98	 250.00 250.00

4	Sachinandan Basak Memorial Prize	Rajorshi Paul	12ME10074	9.31	500.00
5	Amlan Sen Memorial Prize	Lakshya Jain	10ME10024	9.63	1,000.00
6	Swapan Kumar Saha Memorial Prize	Paturi Rohit	10EC10039	9.28	1,000.00
7	Medury Bhanumurthy Memorial Prize	Anamika Chowdhury	10CH10003	9,19	350.00
8	H. N. Bose Memorial Prize	Sarthak Subhankar	09PH2028	8.95	3,000.00
9	Sharmila Bose Memorial Prize	Tripti Kumari	09EX2018	8.74	3,000.00
10.	Bigyan Sinha Memorial Prize	Yelam Anil Kumar	10CS10056	9.58	1,000.00
11.	Usha Martin Award	Neelu Sheoran	10MT10028	8.56	1,000.00
12.	Systems Society Award	Mayank Sharma	10EE10058	8.98	2,500.00
13.	Prof.K.L.Chopra Award	Surendra Karwa	09CY2020	8.37	1,000.00
14.	Charubala Devi Memorial Prize	Sikhar Patranabis	11CS10044	9.83	1000.00
15.	Gouri Basak Design Award	Souradeep Paul	10AR10043	8.18	1,000.00
16.	Prof. Prabodh Chandra Sanyal Award	Tushar Gupta	09MA2018	8.45	1,000.00
17.	B. L. Nagpal Memorial Prize	Rajeev Choudhary	11CE31013	9.16	2,000.00
18.	Umesh Kumar Bhatia Sports Priz	Rahul Koshal	10IM30022	7.39	1000.00
19.	Pradeep Kumar Chakraborty Award	Arijit Mitra	11MT3EP17	9.24	1,000.00
20.	G. B. Mitra Award	Ahanjit Bhattacharya	09CY2001	9.64	1,000.00
21.	Bhartiya Cutler Hammer Prize	Harit Bansal	11EE32001	9.70	3,000.00
22.	Mansara Prize	Tangudu Sweeya Panduranganadharao	10AR10044	9.22	1,000.00
23.	R. M. Lalwani Prize	Abhisek Datta	10PH20002	9.84	1,000.00
24.	H. P. Bhadury Memorial Prize	Ashish Daga	11ME32006	9.43	1,500.00
25.	John Von Neuman Award	Sikhar Patranabis	11CS10044	9.83	2,500..00
26.	Prof. S. K. Nandi Memorial Prize	K.Aadithya	11CH10054	9.36	500.00
27.	International Symposium (Microwave & Comm.) 1981 Prize	Tanvi Ranjan	11EC30034	9.63	3,000.00
28.	Class Of 1970 Alumni (US) Association Prize	Vardaan Pahuja	12EC10067	9.75	2,500.00
29.	Technology Alumni Association(Delhi Chapter) Award	Sidhartha Satapathy	13CH10047	9.96	1,500.00
30.	IIT Kharagpur	Vardaan Pahuja	12EC10067	9.75	3,000.00

	Alumni (California Chapter) Award				
31.	Ram Gopal Kabre Memorial Prize	Kuppu Sundara Karthikeyan	12AR10026	8.85	1,000.00
33.	K. Rama Rao Endowment Prize	Challoju Hemanth Aditya	11AG10014	8.54	2,500.00
34.	Smt. Ava Sanyal Memorial Prize	Arijit Mitra	11MT3EP17	9.24	2,500.00
35.	Prof. B.N. Avasthi Memorial Award For Sports	Monish Kumar	12CH30018	7.70	2,500.00
36.	Prof. Sunil Kanti Sen Memorial Award	Naitik Jain	13MF10020	8.76	4,000.00
37.	Prof. Sudhir Ranjan Sengupta Memorial Prize	Saikat Dan	10CE31011	9.22	2,000.00
38.	Best B.Tech. Project Thesis Award By Mr. Mitrajit Mukhopadhyay	1st –Kanjakhja Pal 2nd–Saurabh Goel 3rd–Nilanjon Naskar	10CH30035 10CH10061 10CH30015	9.39 7.78 8.90	25,000.00 15,000.00 10,000.00
39.	A. A. Hakim Memorial Endowment Prize	Arpit Rohatgi	09AG3207	9.37	2,500.00
40.	Keshab K Parhi Endowment Prize	Ananth Balashankar	09CS3035	9.60	15,000.00
41.	Nilanjan Ganguly Memorial Award For E&E.C.E. Deptt	Siddhartha Satpathi	10EC34001	9.26	10,000.00
42.	Nilanjan Ganguly Memorial Award For Physics Deptt	Sarthak Subhankar	09PH2028	8.95	10,000.00
43.	Kedar Nath Singh Memorial Prize	Sarthak Subhankar	09PH2028	8.95	6,400.00
44.	Dwaraka Nath Singh Memorial Prize	Prateek Sehgal	09ME3209	9.53	6,400.00
45.	Jugal Kishore Singh Memorial Prize	Lakshya Jain	10ME10024	9.63	6,400.00
46	Rajender Kumar Khanna Memorial Award	K. Nagaraju	10EE10059	9.16	10,000.00
47	Ramneek Sodhi Memorial Award	Kunwar Akash Singh	10MT10023	9.34	10,000.00
48	Sushil Kumar Chowdhury Memorial Award	Bhatt Mrugank Pranav	10AE10006	9.04	7,000.00
49	Ashim Ranjan Guha Memorial Award	Desam Gnana Prasuna Reddy	10AG10008	8.81	7,000.00
50	TKT Srikrishnan Endowment Prize	G,Neeraj Krishna	10ME33008	9.02	20,000.00
51.	Prof. J.P.Ghose Memorial Award	Joseph D Thekinen	09NA3022	9.19	10,000.00
52	Sikharini Nag Memorial Award	Lakshya Jain Shaik Vaseem Akram	10ME10024 09ME3213	9.63 9.17	20,000.00 20,000.00

53	Sikharini Nag Memorial Award for Girl Student	Tanvi Ranjan	11EC30034	9.63	20,000.00

5 **J. C. GHOSH MEMORIAL PRIZE**

1.	Aerospace Engineering	Rishita Das	11AE30024	9.27	2,000.00
2.	Agricultural & Food Engineering	Nayan Mallick	11AG32008	8.80	2,000.00
3	Biotechnology & Biochemical Engg	Kaustav Bera	11BT30010	9.33	2,000.00
4	Chemical Engineering	K.Aadithya	11CH10054	9.36	2,000.00
5	Civil Engineering	Rajeev Choudhary	11CE31013	9.16	2,000.00
6	Computer Science & Engineering	Sikhar Patranabis	11CS10044	9.83	2,000.00
7	Electrical Engineering	Harit Bansal	11EE32001	9.70	2,000.00
8	Instrumentation Engineering	Proloy Das	11IE10034	9.42	2,000.00
9	Electronics & Elect. Commu. Engineering	Tanvi Ranjan	11EC30034	9.63	2,000.00
10	Industrial and Systems Engineering	Sayanti Pal	11IM10031	8.99	2,000.00
11	Mechanical Engineering	Ashish Daga	11ME32006	9.43	2,000.00
12	Metallurgical & Materials Engineering	Arijit Mitra	11MT3EP17	9.24	2,000.00
13	Mining Engineering	Vishal Agrawal	11MI10038	8.81	2,000.00
14	Ocean Engineering & Naval Architecture	Rahul Jindal	11NA10028	9.15	2,000.00
15	Chemistry	Manisit Das	10CY20015	8.67	2,000.00
16	Exploration Geophysics	Adesh Pandey	10EX20004	8.64	2,000.00
17	Physics	Abhisek Datta	10PH20002	9.84	2,000.00
18	Economics (HS)	Amrut Tripathy	10HS20006	9.32	2,000.00

5. <u>BEST PROJECT AWARD</u> :

A 4-YEAR B. TECH.(HONS.) COURSES :

Sl. No.	Department	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Aerospace Engineering	Ravish Verma	10AE30015	8.81	1,000.00
2.	Agricultural & Food Engineering	Nadella Tejaswi	10AG10021	7.74	1,000.00
3	Biotechnology & Biochemical Engg	Vinay Patel	10BT10028	9.09	1,000.00
4	Chemical Engineering	Anamika Chowdhury	10CH10003	9.19	1,000.00
5	Civil Engineering	Pushpal Mazumder	10CE31001	8.57	1,000.00
6	Computer Science & Engineering	Shabahat Shakeel	10CS10040	9.07	1,000.00
7	Electrical Engineering	Nitin Kumar	10EE10029	8.54	1,000.00

		Singh			
8	Instrumentation Engineering	Sourya Dey	10IE10024	8.62	1,000.00
9	Industrial and Systems Engineering	Prashant Shekhar	10IM10022	8.09	1,000.00
10	Electronics & Elect. Comm. Engineering	Susnata Mondal	10EC32015	9.61	1,000.00
11	Mechanical Engineering	G.Neeraj Krishna	10ME33008	9.02	1,000.00
12	Manufacturing Science & Engineering	Khalid Abdullah Quidwai	10MF10031	8.49	1,000.00
13	Metallurgical & Materials Engineering	Abhinav Gupta	10MT30002	8.77	1,000.00
14	Mining Engineering	Bonthalakoti Teja	10MI10011	7.59	1,000.00
15	Mining Engineering (MI1)	T.Nagendra Leela Nirup	10MI31019	8.10	1,000.00
16	Mining Engineering (MI2)	Praneel Jain	10MI32014	8.67	1,000.00
17	Ocean Engg & Naval Architecture	Ankit	10NA30005	8.20	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	Nishant Vats	09AR1014	8.89	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 (AE1)	U.Umesh	09AE3001	8.77	1,000.00
2	Agricultural & Food Engineering (AG1)	Arpit Rohatgi	09AG3207	9.37	1,000.00
3	Biotechnology & Biochemical Engg (BT1)	Ravella Dheeraj	09BT3011	7.49	1,000.00
4	Chemical Engineering (CH1)	Puppala Prathyusha	09CH3008	8.94	1,000.00
5	Civil Engineering (CED)	Kamalendu Ghosh	09CE3112	8.97	1,000.00
6	Computer Science & Engineering (CS2)	Ananth Balashankar	09CS3035	9.60	1,000.00
7	Electrical Engineering (EED)	Tamanna Singh	09EE3502	9.04	1,000.00
8	Electronics & Elect. Commu. Engineering(ECD)	Soumya Basu	09EC3401	9.58	1,000.00
9	Industrial & Systems Engineering (IM1)	Mohd Arshad Naeem	09IM3015	8.77	1,000.00
10	Mechanical Engineering (ME1)	Sahil Gupta	09ME3120	8.78	1,000.00
11	Mechanical Engineering (ME2)	Nikhil Desai	09ME3211	8.81	1,000.00

12	Mechanical Engineering (ME3)	Shah Arth Navneetkumar	09ME3304	8.77	1,000.00
13	Manufacturing Science & Engineering (MF1)	Soudagar Abdul Khaja Irfan Babu	09MF3008	8.72	1,000.00
14	Metallurgical & Materials Engineering (MT1)	Aditya Nema	09MT3006	8.44	1,000.00
15	Mining Engineering (MI1)	R.Ashwin Kumar	09MI3040	9.27	1,000.00
16	Ocean Engg & Naval Architecture (NA1)	Joseph D Thekinen	09NA3022	9.19	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	Ahanjit Bhattacharya	09CY2001	9.64	1,000.00
2	Exploration Geophysics	Tripti Kumari	09EX2018	8.74	1,000.00
3	Applied Geology	Parinay Jain	09GG2010	8.98	1,000.00
4	Economics	Ankit Bhatia	09HS2016	8.85	1,000.00
5	Mathematics & Computing	Vishal Raj	09MA2026	7.68	1,000.00
6	Physics	Sourabh Kumar	09PH2022	8.61	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	Saparya Chattaraj	12CY40032	9.56	1,000.00
2	Geology	Wriju Chowdhury	12GG40031	8.56	1,000.00
3	Mathematics	Gurmeet Kaur	12MA40006	9.09	1,000.00
4	Physics	Siddhartha Gupta	12PH40039	9.54	1,000.00

Table : A-7

UG STUDENTS AWARDED SCHOLARSHIP BY EXTERNAL AGENCIEIS

During the 2013-14

(Government or Private)

Sl. No.	Awarding Organization	No. of Recipients
1.	National Council of Educational Research & Training, Sri Aurobinda Marg, New Delhi 16	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.)	520
3.	Rajarshee Shahu Maharah Merit Scholarship, Director of Social Welfare, Mahararashtra State, Pune.	08
4.	CSR- Balmer Lawrie Scholarship under CSR Initiative of Balmer Lawrie & Co. Ltd. Kolkata For SC/ST /PC students.	14
5.	SAIL Scholarship being awarded by Steel Authority of India Ltd. through Vishakhapatnam Steel Plant 06 Nos. + 01 through Rourkela Steel Plant	07
6.	Aditya Birla Scholarship, Aaditya Birla Group, Aditya Birla Management Corporation, Mumbai (1 No. Fresh + 3 Nos. Renewal)	04
7.	Jagadish Chandra Bose National Talent Search, Calcutta (JBNSTS) (16 Nos. Fresh - 1st Year + 21 Nos. Renewal from 2nd year onwards)	37
	OPJEM Scholarship being awarded by Zindal Trust , New Delhi	03
	Indian Oil Corporation Ltd., Delhi	03
8.	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	10
9.	Scholarship under Scheme (Trust Fund) for Differently Abled Students being awarded by National Handicapped Finance & Development Corporation, Faridabad.	03
10.	KVPY Scholarship, IISc, Bangalore	30
11.	FAEA Scholarship to BPL Cat. SC/ST students being awarded by Foundation for Academic Excellence & Access, New Delhi.	21
12.	Post Matric Scholarship to SC/ST students , awarded through different District Welfare Officers in A.P. State Govt. of Anhdra Pradesh	01
13.	Directorate of Technical Education, Chattisgarh	01
14.	INLAKS Scholarship being awarded by INLAKS Fioundations, New Delhi	02
15.	ST Scholarship awarded by Sinapore Technologies Eng.. Ltd., to students of Computer Science Engg. and O.E. & Naval. Arch.	09
16.	Joint. M.Sc. Ph. D Scholarship being awarded by this Institute to the students admitted to this Programme(2- Year M..Sc.) Fresh 1st Year: 94 Nos. + Renewal 2nd Year: 80 Nos.	174
17.	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.)	01
	Total :	864

Table A-8

STUDENTS FROM FOREIGN COUNTRIES ON ROLL OF UNDERGRADUATE COURSES, CLASS WISE, 2013 – 2014

Sl.No.	Course	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	Total
(A) B.Tech. 4-Year							
1	Aerospace Engg.	_	-	-	-	-	-
2	Agri. & Food Engg.	-	-	-	-	-	-
3	Biotech. & Bioch. Engg.	-	-	-	-	-	-
4	Chemical Engg.	-	-	-	-	-	-
5	Civil Engg.	-	-	-	-	-	-
6	Computer Sc. & Engg.	-	-	-	-	-	-
7	Electrical Engg.	-	-	-	-	-	-
8	Electronics & ECE	-	-	-	-	-	-
9	Energy Engg.	-	-	-	-	-	-
10	Industrial Engg.	-	-	-	-	-	-
11	Instrumentation Engg.	-	-	-	-	-	-
12	Manuf. Sc. & Engg.		-	-	-	-	-
13	Mechanical Engg.	--	-	-	-	-	-
14	Met. & Mat. Engg.	-	-	-	-	-	-
15	Mining Engg.	-	-	-	-	-	-
16	Ocean Engg. & N.A.	-	-	-	-	-	-
(B) B.Arch. 5-Year							
	Architecture	-	-	-	-	-	-
(C) M.Sc. Integrated 5-Year							
1	Applied Geology	-	-	-	-	-	-
2	Economics	-	-	-	-	-	-
3	Expl. Geophysics	-	-	-	-	-	-
4	Industrial Chemistry	-	-	-	-	-	-
5	Maths. & Computing	-	-	-	-	-	-

Table A-8 (Contd.)

Sl.No.	Course	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	Total
6	Physics	-	-	-	-	-	-
7	Statistics & Informatics	-	-	-	-	-	-
(D) M.Sc. 2-Year							
1	Chemistry	-	-	-	-	-	-
2	Geophysics	-	-	-	-	-	-
3	Geological Sciences	-	-	-	-	-	-
4	Mathematics	-	-	-	-	-	-
5	Physics	-		-	-	-	-
6	Statistics & Informatics	-	-	-	-	-	-
(E) Dual Degree 5-Year							
1	Aerospace Engg.	-	-	-	-	-	-
2	Ag. & F. E../ Water Res. Dev. & Manag.	-	-	-	-	-	-
3	Biotech. & Bioch. Engg.	-	-	-	-	-	-
4	Chemical Engg.	-	-	-	-	-	-
5	Civil Engg./Struct. Engg.	-	-	-	-	-	-
6	Computer Sc. & Engg.	-	-	-	-	-	-
7	Electrical Engg./Instrumentation	-	-	-	--	-	-
8	E & ECE/Automation & Comp. Vision	-	--	-	-	-	-
9	Industrial Engg./IEM	-	--	-	-	-	-
10	Manuf. Sc.& Engg./IEM	-	-	-	-	-	-
11	M.E./M.S. Engg.	--	-	-	-	-	-
12	M.E./Thermal, Energy & Environ. Engg.	-	-	-	-	-	-
13	Met. & Mat. Engg./ Metallurgical Engg.	-	--	-	-	-	-
14	Mining Engineering	-	-	-	-	-	-
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines	-	-	--	-	-	-
16	Ocean Engg. & N.A.	-	-	-	-	-	-
	Total:						

Table A - 9

STATEMENT OF RESULTS (UNDERGRADUATE) 2013-2014

S.No.	Course	1st yr.		2nd yr.		3rd yr.		4th yr.		5th yr.		
	Total	**P**	**I**	**P**	**I**	**P**	**I**	**P**	**I**	**P**	**I**	
(A) B.Tech												
1	AEROSPACE ENGINEERING	27	1	26	5	11	7	21	5	0	0	**103**
2	AGRICULTURAL AND FOOD ENGINEERING	22	7	23	9	21	6	22	3	0	0	**113**
3	BIOTECHNOLOGY	14	7	17	8	16	1	15	0	0	0	**78**
4	CHEMICAL ENGINEERING	43	6	44	10	43	6	48	5	0	0	**205**
5	CIVIL ENGINEERING	50	7	46	14	32	6	50	5	0	0	**210**
6	COMPUTER SCIENCE & ENGINEERING	58	4	58	11	51	5	53	6	0	0	**246**
7	ELECTRICAL ENGINEERING	60	3	51	11	51	7	57	4	0	0	**244**
8	ELECTRONICS & ELECTRICAL COMMUNICATION ENGG.	67	3	62	4	61	7	57	6	0	0	**267**
9	INDUSTRIAL AND SYSTEMS ENGINEERING	23	2	22	6	17	5	28	0	0	0	**103**
10	INSTRUMENTATION ENGINEERING	32	4	26	6	35	1	35	2	0	0	**141**
11	MANUFACTURING ENGINEERING	24	2	18	7	18	5	25	2	0	0	**101**
12	MECHANICAL ENGINEERING	72	2	62	13	54	11	55	7	0	0	**276**
13	METALLURGICAL & MATERIALS ENGINEERING	35	4	36	5	27	5	30	2	0	0	**144**
14	MINING ENGINEERING	33	4	24	15	24	6	29	1	0	0	**136**
15	OCEAN ENGG AND NAVAL ARCHITECTURE	23	5	25	6	18	10	21	2	0	0	**110**
	Total(A)	**583**	**61**	**540**	**130**	**479**	**88**	**546**	**50**	**0**	**0**	**2477**
(B) B.Arch												
1	ARCHITECTURE AND REGIONAL PLANNING	36	5	37	8	24	19	24	19	32	4	**208**
	Total(B)	**36**	**5**	**37**	**8**	**24**	**19**	**24**	**19**	**32**	**4**	**208**
(C) M.Sc(2yr)												
1	CHEMISTRY	44	0	39	0	0	0	0	0	0	0	**83**
2	GEOLOGY & GEOPHYSICS	30	0	27	0	0	0	0	0	0	0	**57**
3	MATHEMATICS	26	1	29	0	0	0	0	0	0	0	**56**
4	PHYSICS	39	3	46	1	0	0	0	0	0	0	**89**
	Total(C)	**139**	**4**	**141**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**285**

(D) M.Sc(5yr)												
1	CHEMISTRY	15	3	19	5	18	3	14	1	15	1	**94**
2	EXPLORATION GEOPHYSICS	24	2	26	4	27	6	17	5	26	1	**138**
3	GEOLOGY & GEOPHYSICS	20	2	17	16	28	3	21	2	25	1	**135**
4	HUMANITIES & SOCIAL SCIENCES	36	1	38	10	30	6	27	3	22	0	**173**
5	MATHEMATICS	50	4	48	5	42	11	32	15	32	2	**241**
6	PHYSICS	23	3	26	9	18	8	20	1	20	1	**129**
7	STATISTICS AND INFORMATICS	0	0	0	0	0	1	0	1	2	0	**4**
	Total(D)	**168**	**15**	**174**	**49**	**163**	**38**	**131**	**28**	**142**	**6**	**914**
(E) Dual Degree												
1	AEROSPACE ENGINEERING	15	3	14	6	23	6	25	2	19	0	**113**
2	AGRICULTURAL AND FOOD ENGINEERING	25	3	25	7	33	7	25	4	25	0	**154**
3	BIOTECHNOLOGY	18	5	20	4	23	2	25	1	25	0	**123**
4	CHEMICAL ENGINEERING	29	1	24	5	33	3	34	3	26	4	**162**
5	CIVIL ENGINEERING	17	3	19	2	31	3	25	6	20	0	**126**
6	COMPUTER SCIENCE & ENGINEERING	43	1	39	12	39	7	42	4	40	3	**230**
7	ELECTRICAL ENGINEERING	24	0	21	4	29	3	28	5	23	4	**141**
8	ELECTRONICS & ELECTRICAL COMMUNICATION ENGG.	42	2	38	10	36	6	48	10	40	4	**236**
9	INDUSTRIAL AND SYSTEMS ENGINEERING	19	4	21	4	23	4	28	3	26	1	**133**
10	INSTRUMENTATION ENGINEERING	0	0	1	0	0	0	0	0	1	0	**2**
11	MANUFACTURING ENGINEERING	11	2	11	4	12	2	14	4	21	0	**81**
12	MECHANICAL ENGINEERING	50	3	49	5	56	10	56	13	46	8	**296**
13	METALLURGICAL & MATERIALS ENGINEERING	18	1	15	6	23	2	26	1	17	0	**109**
14	MINING ENGINEERING	29	6	25	10	39	4	36	1	30	0	**180**
15	OCEAN ENGG AND NAVAL ARCHITECTURE	20	2	13	5	18	12	19	4	20	2	**115**
16	QUALITY ENGINEERING DESIGN AND MANUFACTURING - INDUSTRIAL ELECTRONICS VERTICAL	6	0	6	0	4	2	0	0	0	0	**18**
17	QUALITY ENGINEERING DESIGN AND MANUFACTURING - MECHANICAL ENGINEERING VERTICAL	7	0	3	3	5	1	0	0	0	0	**19**
	Total(E)	**373**	**36**	**344**	**87**	**427**	**74**	**431**	**61**	**379**	**26**	**2238**
	Total(A+B+C+D+E)	**1299**	**121**	**1236**	**275**	**1093**	**219**	**1132**	**158**	**553**	**36**	**6122**

Table A-10

STUDENTS ON ROLL (Department wise)– UNDERGRADUATE (B.TECH/B.ARCH./M.SC./DUAL DEGREE) COURSES AT THE BEGINNING OF THE SESSION 2013 – 2014

Sl. No.	Course	1st yr.		2nd yr.		3rd yr.		4th yr.		5th yr.		**Total**
		M	F	M	F	M	F	M	F	M	F	
(A) B.Tech. 4-Year												
1	Aerospace Engg.	26	3	31	0	18	0	27	0	-	-	**105**
2	Agri. & Food Engg.	25	6	28	4	20	7	19	6	-	-	**115**
3	Biotech. & Bioch. Engg.	17	4	21	4	14	3	12	5	-	-	**80**
4	Chemical Engg.	44	5	46	9	40	9	45	9	-	-	**207**
5	Civil Engg.	50	8	56	4	35	3	50	5	-	-	**211**
6	Computer Sc. & Engg.	58	4	63	6	54	3	56	5	-	-	**249**
7	Electrical Engg.	87	12	85	9	87	9	92	8	-	-	**389**
8	Electronics & ECE	67	5	57	9	59	10	53	10	-	-	**270**
9	Industrial Engg.	23	2	28	1	18	3	26	2	-	-	**103**
11	Mechanical Engg.	96	3	97	4	83	5	83	7	-	-	**378**
12	Met. & Mat Engg.	36	4	31	10	29	3	30	4	-	-	**147**
13	Mining Engg.	38	2	39	0	30	0	30	0	-	-	**139**
14	Ocean Engg. & N.A.	27	1	27	4	28	0	23	1	-	-	**111**
	TOTAL (A):	**594**	**59**	**609**	**64**	**515**	**55**	**546**	**62**			**2504**
(B) B.Arch. 5-Year												
	Architecture	31	14	39	8	36	6	31	12	28	8	**213**
	TOTAL (B):	**31**	**14**	**39**	**8**	**36**	**6**	**31**	**12**	**28**	**8**	**213**
(C) M.Sc. Integrated 5-Year												
1	Chemistry	13	5	16	8	15	6	15	0	9	7	**94**
2	Geology	47	2	60	5	60	3	39	6	47	6	**275**
3	Humanities & Social Sc	26	10	44	4	27	9	21	9	17	5	**172**

Sl. No.	Course	1st yr.		2nd yr.		3rd yr.		4th yr.		5th yr.		**Total**
		M	F	M	F	M	F	M	F	M	F	
4	Maths.	52	2	46	9	43	10	47	2	34	2	**247**
5	Physics	25	1	35	0	26	3	19	2	18	3	**132**
	TOTAL (C):	**163**	**20**	**201**	**26**	**171**	**31**	**141**	**19**	**125**	**23**	**920**
(D) M.Sc. 2-Year												
1	Chemistry	34	10	32	8	-	-	-	-	-	-	**84**
2	GG	22	9	21	5	-	-	-	-	-	-	**57**
3	Mathematics	21	8	22	7	-	-	-	-	-	-	**58**
4	Physics	32	12	45	3	-	-	-	-	-	-	**92**
	TOTAL (D):	109	39	120	23	-	-	**-**	**-**	**-**	**-**	**291**
(E) Dual Degree 5-Year												
1	Aerospace Engg.	19	0	19	2	24	5	27	0	19	1	**116**
2	Ag. & F. E..	25	6	30	2	34	6	22	7	21	5	**158**
3	Biotech. & Bioch. Engg.	19	5	15	10	15	10	21	5	21	4	**125**
4	Chemical Engg.	27	3	27	2	34	2	35	2	26	4	**162**
5	Civil Engg./Struct. Engg.19	19	1	17	4	33	2	26	4	17	3	**126**
6	Computer Sc. & Engg./ Comp. & Information Technology	43	2	50	2	43	3	43	3	43	1	**233**
7	Electrical Engg./ Instru. Engg.	22	2	23	3	31	1	29	4	26	3	**144**
8	E & ECE	38	6	39	9	35	7	48	10	38	7	**237**
9	Industrial and System Engg./IEM	36	1	32	5	36	3	30	1	47	1	**192**
10	Mechanical Engg.	66	1	65	4	79	2	86	1	51	3	**358**
11	Met. & Mat. Engg./ Metallurgical Engg.	17	2	19	2	24	1	25	2	15	2	**109**
12	Mining Engg.	38	0	34	1	43	0	37	0	30	0	**183**
13	Ocean Engg. & N.A.	20	3	19	0	29	2	23	0	21	1	**118**
	Total (E):	**389**	**32**	**389**	**46**	**460**	**44**	**452**	**39**	**375**	**35**	**2261**
	TOTAL (A+B+C+D+E)	**1286**	**164**	**1358**	**167**	**1182**	**136**	**1170**	**132**	**528**	**66**	**6189**

TABLE – B-1 ADMISSION TO POSTGRADUATE COURSES IN 2013-2014

Deptt./ Centre	Specialisation	Sanct-ioned	Admit.	Reg-ular	SP	QIP	DF	GN	SC	ST	PD	OBC	M	F
AE	Aerospace Engineering	24	09	09	00	00	00	04	02	00	00	03	09	00
AG	Farm Machinery & Power (AG1)	19	16	16	00	00	00	09	02	01	00	04	14	02
	Land & Water Resources Engineering (AG2)	18	15	15	00	00	00	07	03	01	00	04	11	04
	Food Process Engineering (AG3)	30	29	27	02	00	00	15	05	00	00	09	17	12
	Agricultural Biotechnology (AG4)	20	19	19	00	00	00	11	03	01	00	04	12	07
	Aquacultural Engineering (AG5)	18	08	08	00	00	00	02	03	00	00	03	06	02
	Agricultural Systems & Management (AG6)	19	10	10	00	00	00	06	00	01	00	03	05	05
AT	Embedded Controls and Software	12	08	08	00	00	00	02	02	00	00	04	06	02
BT	Biotechnology and Biochemical Engineering	24	23	23	00	00	00	13	03	00	00	07	13	10
CH	Chemical Engineering	75	54	54	00	00	00	27	08	03	00	16	43	11
CE	Hydraulic & Water Resources Engineering (CE1)	20	06	06	00	00	00	02	02	00	00	02	06	00
	Transportation Engineering (CE2)	20	15	14	01	00	00	09	03	01	00	02	13	02
	Environmental Engineering and Management (CE3)	18	05	05	00	00	00	01	02	00	00	02	03	02
	Geotechnical Engineering (CE4)	18	11	10	01	00	00	07	02	00	00	02	10	01
	Structural Engineering (CE5)	20	15	14	01	00	00	08	02	01	00	04	12	03
CS	Computer Science & Engineering	37	37	31	00	02	04	20	06	02	00	09	32	05
CR	Cryogenic Engineering	21	05	05	00	00	00	02	01	00	00	02	05	00
CL	Earth System Science and Technology	31	12	12	00	00	00	09	00	00	00	03	11	01
EE	Machine Drives and Power Electronics (EE1)	18	15	14	01	00	00	06	02	00	00	07	14	01
	Control System Engineering (EE2)	18	09	08	00	00	01	05	03	00	00	01	09	00
	Power and Energy System (EE3)	18	10	08	00	01	01	03	03	00	00	04	09	01
	Instrumentation Signal Processing (EE4)	18	12	10	01	00	01	04	05	00	00	03	11	01
	Microelectronics and VLSI Design	29	25	23	00	01	01	13	02	02	00	08	24	01

EC	(EC2)													
	RF and Microwave Engineering (EC3)	28	13	13	00	00	00	03	02	00	00	08	11	02
	Telecommunication Systems Engineering (EC4)	28	19	16	01	01	01	12	03	00	00	04	19	00
	Visual Information and Embedded Systems Engineering (EC5)	28	25	23	00	00	02	14	05	02	00	04	19	06
ET	Media and Sound Engineering	15	00	00	00	00	00	00	00	00	00	00	00	00
GG	Exploration Geosciences (GG1)	24	00	00	00	00	00	00	00	00	00	00	00	00
IM	Industrial Engineering and Management	25	05	04	01	00	00	03	00	01	00	01	04	01
IT	Information Technology	30	09	06	00	01	02	06	00	03	00	00	06	03
MM	Medical Imaging and Informatics	15	00	00	00	00	00	00	00	00	00	00	00	00
MS	Materials Science and Engineering	29	09	08	00	00	01	04	00	01	00	04	05	04
MA	Computer Science and Data Processing	34	22	22	00	00	00	12	04	00	00	06	22	00
ME	Manufacturing Science and Engineering (ME1)	26	15	15	00	00	00	08	03	02	00	02	14	01
	Thermal Science and Engineering (ME2)	33	28	27	00	00	01	14	02	02	00	10	27	01
	Mechanical System Design (ME3)	44	36	33	00	00	03	20	05	02	00	09	35	01
MT-1	Metallurgical & Materials Engineering	54	36	35	00	00	01	18	07	02	00	09	30	06
MI	Mining Engineering	22	13	13	00	00	00	07	02	01	00	03	13	00
NA	Ocean Engineering and Naval Architecture	20	12	09	00	00	03	06	01	00	00	05	12	00
PH	Solid State Technology	25	00	00	00	00	00	00	00	00	00	00	00	00
ID	Infrastructure Design and Management	31	24	24	00	00	00	13	02	02	00	07	23	01
RE	Reliability Engineering	20	07	02	00	01	04	05	00	01	00	01	07	00
RT	Rubber Technology	24	16	16	00	00	00	06	03	00	00	07	14	02
WM	Water Management	12	00	00	00	00	00	00	00	00	00	00	00	00
AR	City Planning **(MCP)**	42	31	30	00	01	00	17	04	00	00	10	16	15
MM	Medical Science and Technology	15	08	08	00	00	00	04	01	00	00	03	07	01
IP	Intellectual Property Law	80	28	28	00	00	00	22	01	00	00	05	16	12
BM	Business Administration	160	59	58	00	00	01	38	05	00	00	16	52	07
HS	Human Resources	30	19	19	00	00	00	10	04	00	01	04	11	08

	Management													
MT-2	Steel Technology	20	00											
EMBA	Executive MBA(Kolkata Campus)	50	33	00	00	33	00	26	05	00	00	02	31	02
EMBA	Executive MBA (Bhubaneswar Campus)	50	09	00	00	09	00	08	00	00	00	01	08	01
EC-8	Electronics and Communication Engineering (3 years M. Tech) Kol-30, Bhub-30, KGP-30, Raipur-20, Portblair-20	130	00	00	00	00	00	00	00	00	00	00	00	00
EE-8	Electrical Engineering (3 years M. Tech) Kol-30, Bhub-30, KGP-30, Raipur-20, Portblair-20	130	00	00	00	00	00	00	00	00	00	00	00	00
IT-8	Information and Communication Technology (3years M. Tech) Kol-30, Bhub-30, KGP-30, Raipur-20, Portblair-20	130	00	00	00	00	00	00	00	00	00	00	00	00
Total		**1949**	**844**	**758**	**09**	**50**	**27**	**461**	**123**	**32**	**01**	**227**	**697**	**147**

TABLE B-2 - POSTGRADUATE STUDENTS ON ROLL 2013-2014										
Dept./ Centre	**Specialisation**	**Code**	**1st year**		**2nd year**		**3rd year**		**Total**	
			M	**F**	**M**	**F**	**M**	**F**	**M**	**F**
AE	Aerospace Engineering	AE	09	00	20	06	-	-	15	06
AG	Farm Machinery And Power	AG1	14	02	15	01	-	-	29	03
AG	Land and Water Resources Engineering	AG2	11	04	08	06	-	-	19	10
AG	Food Process Engineering	AG3	17	12	24	06	-	-	41	18
AG	Agricultural Biotechnology	AG4	12	07	04	14	-	-	16	21
AG	Aquacultural Engineering	AG5	06	02	04	04	-	-	10	06
AG	Agricultural Systems and Management	AG6	05	05	04	03	-	-	09	08
AT	Embedded Controls and Software		06	02	08	00	-	-	14	02
BT	Biotechnology and Biochemical Engineering	BT	13	10	07	09	-	-	20	19
CE	Hydraulic and Water Resources Engineering	CE1	06	00	04	04	-	-	10	04
CE	Transportation Engineering	CE2	13	02	13	04	-	-	26	06
CE	Environmental Engineering & Management	CE3	03	02	02	03	-	-	05	05
CE	Geotechnical Engineering	CE4	10	01	12	02	-	-	22	03
CE	Structural Engineering	CE5	12	03	14	05	-	-	26	08
CH	Chemical Engineering	CH	43	11	42	18	-	-	85	29
CL	Earth System Science and Technology	CL	11	01	08	04	-	-	19	05
CR	Cryogenic Engineering	CR	05	00	09	02	-	-	14	02
CS	Computer Science and Engineering	CS	32	05	30	08	-	-	62	13
EC	Microelectronics & V L S I Design	EC2	24	01	24	06	-	-	48	07
EC	RF and Microwave Engineering	EC3	11	02	13	05	-	-	24	07
EC	Telecommunication Systems Engineering	EC4	19	00	26	05	-	-	45	05
EC	Visual Information and Embedded Systems Engg.	EC5	19	06	15	07	-	-	34	13
EE	Machine Drives and Power Electronics	EE1	14	01	14	01	-	-	28	02
EE	Control System Engineering	EE2	09	00	15	01	-	-	24	01
EE	Power and Energy Systems	EE3	09	01	13	04	-	-	22	05

TABLE B-2 - POSTGRADUATE STUDENTS ON ROLL 2013-2014										
Dept./ Centre	**Specialisation**	**Code**	**1st year**		**2nd year**		**3rd year**		**Total**	
			M	**F**	**M**	**F**	**M**	**F**	**M**	**F**
EE	Instrumentation Signal Processing	EE4	11	01	15	02	-	-	26	03
ET	Media and Sound Engineering	ET	00	00	06	01	-	-	06	01
GG	Exploration Geosciences	GG1	00	00	08	06	-	-	08	06
ID	Infrastructure Design and Management	ID	23	01	11	01	-	-	34	02
IM	Industrial Engineering and Management	IM	04	01	16	00	-	-	20	01
IT	Information Technology	IT	06	03	14	04	-	-	20	07
MA	Computer Science and Data Processing	MA	22	00	17	04	-	-	39	04
ME	Manufacturing Science and Engineering	ME1	14	01	19	01	-	-	33	02
ME	Thermal Science and Engineering	ME2	27	01	28	00	-	-	55	01
ME	Mechanical Systems Design	ME3	35	01	37	02	-	-	72	03
MI	Mining Engineering	MI	13	00	13	00	-	-	26	00
MM	Medical Imaging and Informatics	MM1	00	00	05	01	-	-	05	01
MS	Materials Science and Engineering	MS	05	04	16	08	-	-	21	12
MT	Metallurgical and Materials Engineering	MT1	30	06	31	08	-		61	14
NA	Ocean Engineering and Naval Architecture	NA	12	00	18	01	-	-	30	01
PH	Solid State Technology	PH2	00	00	09	03	-	-	09	03
RE	Reliability Engineering	RE	07	00	09	01	-	-	16	01
RT	Rubber Technology	RT	14	02	11	01	-	-	25	03
WM	Water Management	WM	00	00	08	04	-	-	08	04
AR	City Planning	MCP	16	15	12	22	-	-	28	37
MM	Medical Science And Technology	MM	07	01	12	02	-	-	19	03
BM	Business Administration	BM	52	07	52	19	-	-	104	26
HS	Human Resources Management	HS	11	08	11	05	-	-	22	13
MT	Steel Technology	MT2	00	00	00	00	-	-	00	00
BM	Executive MBA (3 Yrs.) (Kolkata Campus)	EMBA	31	02	13	02	20	02	64	06
BM	Executive MBA (3 Yrs.) (Bhubaneswar Campus)	EMBA	08	01	14	04	05	00	27	05
EC	Electronics & Communication Engineering (3 Yrs.)	EC8	00	00	10	05	14	03	24	08
EE	Electrical Engineering (3	EE8	00	00	07	04	04	02	11	06

TABLE B-2 - POSTGRADUATE STUDENTS ON ROLL 2013-2014										
Dept./ Centre	**Specialisation**	**Code**	**1st year**		**2nd year**		**3rd year**		**Total**	
			M	**F**	**M**	**F**	**M**	**F**	**M**	**F**
	Yrs.)									
IT	Information & Communication Technology (3 Yrs.)	IT8	00	00	09	02	14	04	23	06
IP	Intellectual Property Law (3 Yrs.)	IP	16	12	32	14	25	20	73	46
	Total		**811**	**255**	**926**	**204**	**82**	**31**	**1819**	**492**

TABLE- B -3 - STATEMENT OF RESULTS OF POSTGRADUATE EXAMINATION

(M.TECH/MCP//MBA/MHRM) 2011-2012 BATCH AND MMST/LLB/M.TECH.-3 YRS/EMBA 2010-2011 BATCH OF STUDENTS

Deptt./ Centre	Specialisation	Code	Registered	Successful	Incomplete
AE	Aerospace Engineering	AE	21	16	5
AG	Farm Machinery and Power	AG1	15	14	1
AG	Land and Water Resources Engineering	AG2	16	12	4
AG	Food Processing Engineering	AG3	25	25	4
AG	Applied Botany	AG4	17	14	3
AG	Aquacultural Engineering	AG5	07	05	2
AG	Agricultural Systems and Management	AG6	17	16	1
AT	Embedded Controls and Software	AT	07	07	0
BT	Biotechnology and Biochemical Engineering	BT	22	20	2
CH	Chemical Engineering	CH	63	44	19
CE	Hydraulic and Water Resources Engineering	CE1	13	12	1
CE	Transportation Engineering	CE2	17	15	2
CE	Environmental Engineering and Management	CE3	11	10	1
CE	Geotechnical Engineering	CE4	10	10	0
CE	Structural Engineering	CE5	21	18	3
CS	Computer Science and Engineering	CS	39	37	2
CR	Cryogenic Engineering	CR	07	07	0
CL	Earth System Science and Technology	CL	11	05	6
EE	Machine Drives and Power Electronics	EE1	15	13	2
EE	Control System Engineering	EE2	14	14	0
EE	Power and Energy System	EE3	18	13	5
EE	Instrumentation	EE4	13	08	5
EC	Microelectronics & V LS I Design	EC2	28	27	1
EC	RF and Microwave Engineering	EC3	23	19	4
EC	Telecommunication Systems Engineering	EC4	32	32	0
EC	Visual Information and Embedded Systems Engg.	EC5	21	21	0
ET	Media and Sound Engineering	ET	05	05	0
GG	Exploration Geosciences	GG1	07	07	0
IM	Industrial Engineering and Management	IM	17	16	1
IT	Information Technology	IT	29	27	2
MS	Materials Science and Engineering	MS	20	11	9
MA	Computer Science and Data Processing	MA	22	19	3
ME	Manufacturing Science and Engineering	ME1	16	14	2
ME	Thermal Science and Engineering	ME2	32	24	8
ME	Mechanical Systems Design	ME3	39	34	5
MT	Metallurgical and Materials Engineering	MT	24	21	3
MI	Mining Engineering	MI	05	02	3
NA	Ocean Engineering and Naval Architecture	NA	11	10	1
PH	Solid State Technology	PH2	18	16	2
ID	Infrastructure Design and Management	ID	23	19	4
RE	Reliability Engineering	RE	15	15	0
RT	Rubber Technology	RT	17	16	1
WM	Water Management	WM	08	08	0
AR	City Planning	MCP	34	32	2
BM	Business Administration	MBA	108	101	7
MM	Medical Science and Technology	MMST	13	04	9
HS	Human Resources Management	MHRM	19	17	2
IP	Intellectual Property Law	IP	45	27	18
EC	Electronics and Communication Engineering	EC 8	40	38	2
EE	Electrical Engineering	EE 8	30	22	8
IT	Information and Communication Technology	IT 8	20	13	7
BM	Executive MBA Programme	EMBA	30	22	8
	Total		**1150**	**974**	**180**

TABLE C-1

NUMBER OF RESEARCH SCHOLAS ENROLLED FOR THE PH.D. DEGREE DURING: 2013-2014
(01-07-2013 TO 30-06-2014)

Deptt./ Centre/ School	Institute	Joint	Sponsored Scholar	Project/CSIR/ /UGC/QIP/ DBT/ICMR	Teaching/ Non-teaching	Total	General	SC	ST	OBC	MINOR	Male	Female
AE	06	02	01	00	00	09	06	00	00	03	00	05	04
AG	11	03	02	07	00	23	14	02	00	06	01	13	10
AR	05	00	00	00	00	05	04	00	00	01	00	03	02
AT	10	00	00	01	00	11	05	00	00	05	01	10	01
BT	03	01	00	09	00	13	10	02	00	01	00	04	09
CY	08	09	00	12	00	29	17	06	00	06	00	21	08
CH	21	06	00	02	00	29	20	02	00	05	02	21	08
CE	13	02	01	04	00	20	13	03	01	02	01	13	07
CS	11	01	01	05	00	18	16	01	00	01	00	13	05
CR	05	00	00	00	00	05	05	00	00	00	00	03	02
ET	04	00	00	00	00	04	03	00	00	01	00	02	02
CL	03	03	00	01	00	07	04	01	00	02	00	05	02
EE	16	01	01	01	00	19	12	03	00	04	00	14	05
EC	18	01	02	02	00	23	20	01	00	02	00	20	03
GG	13	01	00	07	00	21	15	03	00	03	00	16	05
GS	07	00	00	00	00	07	06	01	00	00	00	06	01
HS	08	00	04	05	00	17	16	00	00	01	00	05	12
IM	07	00	02	03	00	12	10	01	00	01	00	11	01
ID	01	01	00	00	00	02	02	00	00	00	00	02	00
IP	07	00	00	00	00	07	05	00	00	02	00	04	03
MS	03	02	00	09	00	14	13	00	00	01	00	08	06
MA	06	13	00	06	00	25	13	06	00	06	00	15	10
ME	22	03	00	02	00	27	20	02	00	05	00	26	01
MT	10	00	04	03	00	17	10	04	01	02	00	12	05
MI	03	00	00	05	00	08	06	00	00	02	00	07	01
NA	04	00	00	01	00	05	04	00	00	01	00	03	02
PH	09	04	00	05	00	18	11	02	00	04	01	14	04
RE	03	00	00	02	00	05	04	00	00	01	00	05	00
RT	07	00	01	03	00	11	07	01	01	02	00	07	04
RJ	05	00	00	01	00	06	05	01	00	00	00	03	03
MM	03	00	01	11	00	15	13	01	01	00	00	09	06
IT	02	00	00	03	00	05	04	00	00	01	00	03	02
BM	05	00	04	06	00	15	12	00	00	02	01	11	04
WM	06	00	00	03	00	09	06	01	00	01	01	04	05
TS	01	00	00	01	00	02	02	00	00	00	00	02	00
TOTAL	**266**	**53**	**24**	**120**	**00**	**463**	**333**	**44**	**04**	**74**	**08**	**320**	**143**

TABLE: C-2

NUMBER OF MS STUDENTS ENROLLED DURING: 2013-2014 (01-07-2013 TO 30-06-2014)

Deptt./Centre/ School	Total	General	SC	ST	OBC	Minor	Male	Female
CE	02	02	00	00	00	00	02	00
CS	05	05	00	00	00	00	04	01
CL	01	01	00	00	00	00	00	01
EC	05	04	00	00	01	00	02	03
EE	01	01	00	00	00	00	01	00
GS	01	00	00	00	01	00	01	00
GG	01	01	00	00	00	00	00	01
IT	03	03	00	00	00	00	02	01
MT	01	01	00	00	00	00	01	00
ME	02	02	00	00	00	00	02	00
RJ	01	01	00	00	00	00	01	00
NA	01	01	00	00	00	00	01	00
MI	01	01	00	00	00	00	01	00
WM	02	01	00	00	01	00	02	00
TOTAL	**27**	**24**	**00**	**00**	**03**	00	**20**	**07**

TABLE: C-2a

NUMBER OF POST DOCTORAL FELLOWS AS ON 02-06-2014

Dept/Centre/ School	Total Number	General	SC	ST	OBC	MINOR	Male	Female
CS	01	01(**FN**)	00	00	00	00	01	00
CY	03	03	00	00	00	00	02	01
NA	01	00	00	00	01	00	01	00
TOTAL	**05**	**04**	**00**	**00**	**01**	**00**	**04**	**01**

(FN) from Ethiopia

TABLE: C-3
UGC SCHOLARS ENROLLED DURING: 2013-2014 (01-07-2013 TO 30-06-2014)

Dept/Centre/ School	Total Number	General	SC	ST	OBC	MINOR	Male	Female
AG	01	00	00	00	01	00	01	00
BT	01	00	01	00	00	00	01	00
CY	08	06	01	00	01	00	07	01
CL	01	01	00	00	00	00	01	00
GG	02	01	01	00	00	00	01	01
HS	04	03	00	00	01	00	03	01
IM	01	00	00	00	01	00	01	00
MS	02	02	00	00	00	00	02	00
MA	01	01	00	00	00	00	01	00
PH	03	02	00	00	00	01	03	00
BM	06	04	00	00	01	01	05	01
TOTAL	**30**	**20**	**03**	**00**	**05**	**02**	**26**	**04**

TABLE: C-4

RESEARCH SCHOLAS ON ROLL AS ON 31-05-2014

Deptt./ Centre/ School	Institute	Joint	Sponsored Scholar	Project/CSIR/ /UGC/QIP/ DBT/ICMR	Teaching/ Non-teaching	Self-Fin.	Total	General	SC	ST	OBC	MINOR	Male	Female
AE	22	02	08	004	00	00	036	024	04	00	08	00	027	09
AG	47	07	12	072	01	00	139	101	07	04	25	02	086	53
AR	24	01	02	007	00	00	034	023	04	00	02	05	015	19
AT	39	00	04	044	00	00	087	066	05	01	13	02	065	22
BT	16	02	00	057	00	00	075	061	08	00	06	00	042	33
CY	21	17	00	161	00	00	199	151	17	00	22	09	146	53
CH	50	07	03	013	01	00	074	051	08	00	12	03	056	18
CE	54	04	08	024	00	00	090	064	12	03	10	01	070	20
CS	29	01	05	022	01	00	058	051	03	00	04	00	044	14
CR	13	00	00	001	00	00	014	012	01	00	01	00	010	04
ET	12	00	00	001	00	00	013	011	01	00	01	00	007	06
CL	07	03	03	012	00	00	025	017	03	00	04	01	020	05
EE	58	04	02	006	00	00	070	052	04	01	11	02	058	12

EC	83	01	10	017	01	00	112	093	06	01	10	02	098	14
GG	29	04	01	031	00	01	066	043	11	01	09	02	047	19
GS	18	00	06	005	00	00	029	023	05	00	01	00	024	05
HS	35	00	15	017	00	04	071	059	06	00	05	01	033	38
IM	22	00	10	006	01	00	039	031	02	01	04	01	036	03
ID	04	01	00	000	00	00	005	005	00	00	00	00	004	01
IP	08	00	00	003	02	00	013	010	00	00	03	00	008	05
MS	17	03	02	037	01	00	060	042	05	00	09	04	047	13
MA	29	30	00	017	00	01	077	048	12	00	14	03	056	21
ME	79	05	08	021	00	01	114	089	12	00	12	01	109	05
MT	32	00	21	013	00	00	066	045	11	02	07	01	053	13
MI	19	00	02	011	00	00	032	024	04	00	04	00	025	07
NA	10	00	01	004	00	00	015	010	02	00	02	01	012	03
PH	38	16	01	028	00	01	084	063	06	00	12	03	065	19
RE	08	00	02	005	00	00	015	011	01	00	01	02	012	03
RT	17	00	08	019	00	00	044	033	04	01	06	00	037	07
RJ	09	00	00	006	00	00	015	013	01	00	00	01	009	06
MM	19	00	12	033	00	01	065	053	06	02	04	00	040	25
IT	07	01	01	028	00	00	037	032	01	00	02	02	029	08
BM	18	00	15	013	00	01	047	037	02	00	06	02	034	13
WM	16	00	00	003	00	00	019	013	02	00	02	02	012	07
TS	03	00	00	002	00	00	005	003	00	00	01	01	005	00
TOTAL	**912**	**109**	**162**	**743**	**08**	**10**	**1944**	**1464**	**176**	**17**	**233**	**54**	**1441**	**503**

INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR
RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31ST MARCH'2014

(Amount-Rs) (Amount-Rs)

Sl.No	RECEIPTS	Schedule	Current Year (2013-2014)	Previous Year (2012-2013)	Sl.No	PAYMENTS	Schedule	Current Year (2013-2014)	Previous Year (2012-2013)
I.	**Opening Balance (Bank Balances)**								
	a) In Current Accounts	A	176074466	194759252	I.	**EXPENSES:**			
	b) In Savings Accounts	A	266284102	711995687		a) Establishment Expenses	H	2038162772	1921979609
II.	**Grants Received**					b) Administrative Expenses.	I	779518264	501447142
	Non-Recurring (Plan)	B	2805000000	1590000000					
	Recurring (Non-Plan)	B	2482923000	1736012000	II.	**Expenditure on Fixed Assets &**	J	3772186798	2520760636
	Multi Speciality Hospital (Plan)	B	0	750000000		**Capital Work-in-Progress (Plan)**			
	Diamond Jubilee Special Grant (Plan)	B	0	700000000					
					III.	**Investments and deposits made :**			
III.	**Income from Investment**					Out of Own Funds & Others	K	8627223699	10152024009
	c) Own Funds	C	158522649	176533032					
IV.	**Interesed Received**				IV.	**Other Payments**	L	923919724	1510477157
	a) On Bank Deposits	D	14053057	7134522	V.	**Closing Balance**			
	b) Recoverable Advances	D	9659366	10455387					
						a) In Current Accounts	M	183974695	176074466
V.	**Academic & General Receipts**	E	477963035	438856220		b) In Savings Accounts	M	290668089	266284102
VI.	**Amount Borrowed/Loan refund received**	F	12000000	12600000					
VII.	**Other Receipts(Refund/Reimbursement)**	G	10213174366	10720701021					
	TOTAL :		**16615654041**	**17049047121**		**TOTAL :**		**16615654041**	**17049047121**