Annual Report
2009-2010

Indian Institute of Technology
Kharagpur

CONTENTS

Subject	Page No.
Organization :	
Administration :	
Report of the Director :	
PART–I	
Departments, Centres and Schools :	
Courses Offered :	
DEPARTMENTS	
Aerospace Engineering :	
Agricultural and Food Engineering :	
Architecture and Regional Planning :	
Biotechnology :	
Chemical Engineering :	
Chemistry :	
Civil Engineering :	
Computer Science and Engineering :	
Electrical Engineering :	
Electronics and Electrical Communication Engineering :	
Geology and Geophysics :	
Humanities and Social Sciences :	
Industrial Engineering and Management :	
Mathematics :	
Mechanical Engineering :	
Metallurgical and Materials Engineering :	
Mining Engineering :	
Ocean Engineering and Naval Architecture :	
Physics and Meteorology :	
CENTRES	
Centre for Educational Technology :	
Centre for Oceans, Rivers, Atmosphere and Land Sciences :	
Cryogenic Engineering :	
Materials Science :	
Reliability Engineering :	
Rubber Technology :	
Rural Development :	
SCHOOLS	
G. S. Sanyal School of Telecommunications :	

Rajiv Gandhi School of Intellectual Property Law :
Ranbir & Chitra Gupta School of Infrastructure Design and Management :
School of Information Technology :
School of Medical Science & Technology :
School of Water Resources :
Vinod Gupta School of Management :

PART–II CENTRALISED SERVICES, PROGRAMMES AND UNITS

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

PART–III STATISTICAL INFORMATION

Statistical Information of Students :
Financial Information :

RESEARCH PUBLICATIONS

PART–I

DEPARTMENTS

Aerospace Engineering :
Agricultural and Food Engineering :
Architecture and Regional Planning :
Biotechnology :
Chemical Engineering :
Chemistry :
Civil Engineering :
Computer Science and Engineering :

Electrical Engineering :
Electronics and Electrical Communication Engineering :
Geology and Geophysics :
Humanities and Social Sciences :
Industrial Engineering and Management :
Mathematics :
Mechanical Engineering :
Metallurgical and Materials Engineering :
Mining Engineering :
Ocean Engineering and Naval Architecture :
Physics and Meteorology :

CENTRES

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

SCHOOLS

Rajiv Gandhi School of Intellectual Property Law :
School of Information Technology :
School of Medical Science & Technology :
Vinod Gupta School of Management :

PART–II CENTRALISED SERVICES, PROGRAMMES AND UNITS

Advanced Technology Development Centre :
Computer & Informatics Centre :
Central Research Facility :
Central Library :
Central Workshop and Instruments Service Section :
Centre for Theoretical Studies :
Kalpana Chawla Space Technology Cell :

LIST OF THE MEMBERS OF IIT COUNCIL
(April 2009 – March 2010)

Name of the Representing Organization

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

1.	Shri Kapil Sibal Hon'ble Minister of Human Resource Development Government of India	Chairman

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

2.	Shri B. Muthuraman Chairman, BOG, IIT Kharagpur	Member
3.	Dr. Anil Kakodkar, Chairman, BoG, IIT Bombay	Member
4.	Shri R. P. Agrawal Chairman, BOG, IIT Delhi	Member
5.	Dr. R. Chidambaram Chairman, BOG, IIT Madras	Member
6.	Prof. M. Anandakrishnan Chairman, BOG, IIT Kanpur	Member
7.	Dr. R. P. Singh Chairman, BOG, IIT Guwahati	Member
8.	Shri Ashok Bhatnagar Chairman, BOG, IIT Roorkee	Member

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

9.	Prof. Damodar Acharya Director, IIT Kharagpur	Member
10.	Prof. Surendra Prasad Director, IIT Delhi	Member
11.	Prof. Devang Khakhar Director, IIT Bombay	Member
12.	Prof. M. S. Ananth Director, IIT Madras	Member
13.	Prof. S. G. Dhande Director, IIT Kanpur	Member

14. Prof. Gautam Baura — Member
Director, IIT Guwahati

15. Prof. S. C. Saxena — Member
Director, IIT Roorkee

(D) Chairman, University Grants Commission (Ex-officio)

16. Prof. Sukhdeo Throat — Member
Chairman, University Grants Commission
New Delhi

(E) Director-General, Council of Scientific & Industrial Research (Ex-officio)

17. Prof. Samir K. Brahmachari — Member
Director General, Council of Scientific & Industrial Research
New Delhi

(F) Chairman, Council of the Indian Institute of Science, Bangalore (Ex-officio)

18. Dr. K. Kasturirangan — Member
Chairman, Indian Institute of Science
Bangalore

(G) Director, Indian Institute of Science, Bangalore (Ex-officio)

19. Prof. P. Balaram — Member
Director, Indian Institute of Science
Bangalore

(H) Three Nominees of the Central Government

20. Smt. Vibha Puri Das — Member
Secretary, Department of Higher Education
Ministry of Human Resource Development
Government of India
(To represent Ministry concerned with Technical Education)

21. Ms. Sushma Nath — Member
Secretary, Department of Expenditure
Ministry of Finance
Government of India
(To represent Ministry of Finance)

22. Dr. R. Chandrasekhar — Member
Secretary, Department of Information Technology
Ministry of Communication and Information Technology
Government of India
(To represent any other Ministry)

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

23.	Dr. S. S. Mantha Chairman, AICTE New Delhi	Member

(J) Nominees of the Visitor

24.	Prof. C. N. R. Rao Chairman, Scientific Advisory Council to the Prime Minister	Member
25.	Prof. C. S. Seshadri Director Chennai Mathematical Institute, Chennai	Member
26.	Prof. Sabyasachi Bhattacharya Ex-Director Tata Institute of Fundamental Research, Mumbai	Member
27.	Dr. Kota Harinarayan Chairman Research Council of Central Scientific Instrument Organization Bangalore	Member
28.	Shri Tarun Das Chief Mentor Confederation of Indian Industry, Gurgaon	Member

(K) Three members of Parliament (two from Lok Sabha and one from Rajya Sabha)

29.	Shri Deepender Singh Hooda Member of Parliament (Lok Sabha)	Member
30.	Shri Janardhana Swamy Member of Parliament (Lok Sabha)	Member
31.	Smt. Vasanthi Stanley Member of Parliament (Rajya Sabha)	Member

(L) Secretary to the Council

32.	Shri Ashok Thakur Additional Secretary (HE) Department of Higher Education Ministry of Human Resource Development Government of India	Secretary

BOARD OF GOVERNORS

#	Name and Address	Position
1.	Shri B. Muthuraman Chairman, BOG, IIT Kharagpur & Vice Chairman, Tata Steel Limited Bombay House 24, Homi Mody Street, Fort Mumbai – 400 001	Chairman
2.	Shri R.P. Agrawal (Upto 04.08.2009) Education Secretary, Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi – 110 115	Member
3.	Ms. Vibha Puri Das (from 05.08.2009) Secretary(HE), Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi – 110 115	Member
4.	Prof. T. P. Singh Head of the Department (Bio-Physics) All India Institute of Medical Sciences (AIIMS) Ansari Nagar New Delhi – 110 029	Member
5.	Dr. T. Ramasami Secretary, Department of Science and Technology Technology Bhawan, New Mehrauli Road New Delhi – 110 016	Member
6.	Prof. Prem Kumar Kalra Director, IIT Rajasthan III Floor, Helicopter Building IIT Kanpur Campus Kanpur – 208 016	Member
7.	Shri Roopen Roy Managing Director Deloitte & Touche Consulting India Pvt. Ltd. Bengal Intelligent Park, Building Alpha 1st Floor, Plot No. A2, M2 & N2, Block–EP & GP Sector-V, Salt lake Electronics Complex Kolkata – 700 091	Member
8.	Dr. Dhruv Prasad (upto 03.01.2010) Director, Department of Science & Technology Government of Bihar Patna – 800 015	Member

Contd…2.

#	Name and Address	Position
9.	Prof. O. N. Mohanty (upto 03.01.2010) Vice Chancellor, Biju Patnaik University of Technology Rourkela Camp Techno Campus C.E.T. Ghatikia, Kalinganagar Bhubaneswar – 751 003	Member
10.	Shri R. S. Sharma (upto 03.01.2010) Principal Secretary, Department of Science & Technology Government of Jharkhand Nepal House, Doranda Ranchi – 834 002	Member
11.	Prof. D. Acharya Director, IIT Kharagpur	Member
12.	Prof. P. P. Chakrabarti (uoto 31.12.2009) Department of Computer Science & Engineering IIT Kharagpur	Member
13.	Prof. R. N. Datta (from 01.01.2010) Department of Architecture & Regional Planning IIT Kharagpur	Member
14.	Prof. Sanat Kumar Roy (Upto 31.12.2009) Department of Metallurgical & Materials Engineering IIT Kharagpur	Member
15.	Prof. P. K. J. Mohapatra (from 01.01.2010) Department of Industrial Engineering & Management IIT Kharagpur	Member
16.	Dr. D. Gunasekaran (up to 04.12.2009) Registrar IIT Kharagpur	Secretary
17.	Dr. T. K. Ghosal (from 05.12.2009) Registrar (Officiating) IIT Kharagpaur	Secretary

FINANCE COMMITTEE

#	Name and Address	Position
1.	Shri B. Muthuraman Chairman, BOG, IIT Kharagpur & Vice Chairman, Tata Steel Limited Bombay House, 24, Homi Mody Street, Fort Mumbai – 400 001	Chairman
2.	Shri Sanat Kumar Ray Financial Adviser & Joint Secretary Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi – 110 001	Member
3.	Joint Secretary (T) Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi – 110 001	Member
4.	Shri Roopen Roy Managing Director Deloitte & Touche Consulting India Pvt. Ltd. Bengal Intelligent Park, Building Alpha, 1st Floor Plot No.A2, M2 & N2, Block–EP & GP, Sector-V, Salt lake Electronics Complex Kolkata – 700 091	Member
5.	Director Indian Institute of Technology Kharagpur Kharagpur – 721 302	Member
6.	Prof. P. P. Chakrabarti Department of Computer Science & Engineering Indian Institute of Technology Kharagpur Kharagpur – 721 302	Member
7.	Registrar Indian Institute of Technology Kharagpur Kharagpur – 721 302	Secretary

BUILDING AND WORKS COMMITTEE

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

LIST OF ADMINISTRATIVE HEADS

Director	Prof. Damodar Acharya		
Deputy Director	Prof. M. Chakraborty	Upto	19.05.2009
	Prof. A.K. Majumdar	From	27.07.2009
Registrar	Dr. D. Gunasekaran (on lien)	From	05.12.2009
	Dr. T.K. Ghosal (Officiating)	From	05.12.2009

Deans

Undergraduate Studies	Prof. S. K. Som		
Postgraduate Studies & Research	Prof. P. K. J. Mohapatra		
Faculty & Planning	Prof. R. N. Datta	Upto	31.08.2009
Faculty	Prof. Amit Basak	From	01.09.2009
Planning & Coordination	Prof. B. K. Mathur	From	09.09.2009
Sponsored Research & Industrial Consultancy	Prof. P. P. Chakrabarti		
Students' Affair	Prof. Souvik Bhattacharyya		
Continuing Education	Prof. Ajay Chakraborty		
Alumni Affairs & International Relations	Prof. Amit Patra		
Vinod Gupta School of Management	Prof. S. Srinivasan	Upto	04.06.2009
	Prof. A. Tripathy	From	05.06.2009

Head of Departments

Aerospace Engineering	Prof. Navtej Singh	Upto	13.01.2010
	Prof. Amit K. Ghosh	From	14.01.2010
Agricultural & Food Engineering	Prof. Rajendra Singh		
Architecture & Regional Planning	Prof. Arif N. Merchant	Upto	31.05.2009
	Prof. B.K. Sengupta	From	01.06.2009
Biotechnology	Prof. A. K. Ghosh	Upto	31.08.2009
	Prof. Amit K. Das	from	01.09.2009
Chemical Engineering	Prof. Amar Nath Samanta		
Chemistry	Prof. P. K. Chattaraj		

Civil Engineering	Prof. S. K. Bhattacharya	Upto	02.08.2009
	Prof. L.S. Ramachandra	From	03.08.2009
Computer Science & Engineering	Prof. Indranil Sengupta		
Electrical Engineering	Prof. A. K. Sinha		
Electronics & Electrical	Prof. Ajay Chakraborty	Upto	15.06.2009
Communication Engineering	Prof. C.K. Maiti	From	16.06.2009
Geology & Geophysics	Prof. A. K. Gupta	Upto	31.08.2009
	Prof. Biswajit Mishra	From	01.09.2009
Humanities & Social Sciences	Prof. D. Suar		
Industrial Engineering &	Prof. P. K. Ray	Upto	31.08.2009
Management	Prof. B. Mohanty	From	01.09.2009
Mathematics	Prof. A. R. Roy		
Mechanical Engineering	Prof. A. K. Chattopadhyay		
Metallurgical & Materials	Prof. N. Chakraborti	Upto	01.09.2009
Engineering	Prof. S.K. Roy	From	02.09.2009
Mining Engineering	Prof. J. Bhattacharyya		
Ocean Engineering & Naval Architecture	Prof. N. R. Mandal		
Physics & Meteorology	Prof. R. N. P. Choudhary		

Head of Centres

Centre for Educational	Prof. T. K. Basu	Upto	05.07.2009
Technology	Dr. Bani Bhattacharyya	From	06.07.2009
Centre for Oceans, Rivers,	Prof. A. Chandrasekar	Upto	28.06.2009
Atmosphere and Land Sciences	Prof. D. Sen	From	29.06.2009
Cryogenic Engineering	Prof. V. V. Rao		
Material Science	Prof. Basudam Adhikari		
Reliability Engineering	Prof. V. N. Achutha Naikan		
Rubber Technology	Prof. T. K. Chaki		
Rural Development	Prof. P. B. S. Bhadoria		
Computer & Informatics	Prof. Prabir Kumar Biswas		
Administrative Computer	Prof. Rajib Mall	Upto	31.08.2009
Service Support Centre	Prof. R. N. Banerjee	From	01.09.2009

Head of Schools

G. S. Sanyal School of Telecommunications	Prof. S. Chakrabarti		
School of Information Technology	Prof. I. Sengupta		
School of Medical Science & Technology	Prof. Pranab Kumar Dutta		
Vinod Gupta School of Management	Prof. S. Srinivasan	Upto	04.06.2009
	Prof. A. Tripathy	From	05.06.2009
Rajiv Gandhi School of Intellectual Property Law	Prof. S. Tripathy	Upto	11.08.2009
	Prof. V.C. Vivekanandan	From	12.08.2009
Ranbir and Chitra Gupta School of Infrastructure Design and Management	Prof. K. S. Reddy		
School of Water Resources	Prof. S. N. Panda		

Chairmen & Vice-Chairmen

UG Admissions	Prof. A. N. Samanta		
Vice-Chairman, UG Admissions	Prof. P. K. Dutta	Upto	19.08.2009
	Prof. D. K. Baidya	From	20.08.2009
PG Admissions	Prof. Biswajit Maiti		
Vice-Chairman, PG Admissions	Prof. S. K. Barai		
JAM	Prof. Somesh Kumar	Upto	15.08.2009
	Prof. Krishna Kumar	From	16.08.2009
Vice-Chairman, JAM	Prof. Krishna Kumar	Upto	15.08.2009
	Prof. A. Chandrasekar	Upto	15.08.2009
	Prof. Saibal Gupta	From	16.08.2009
Central Library	Prof. S. Sahu		
Hall Management Committee	Prof. Jayanta Pal	Upto	28.04.2009
	Prof. A. Goswami	From	29.04.2009
Chairman, CWISS	Prof. P. K. Das		
Central Research Facility	Prof. Indranil Manna	Upto	30.11.2009
CRF (Materials Division)	Prof. Rahul Mitra	From	01.12.2009
CRF (Life Science Division)	Prof. A. K. Ghosh	from	01.12.2009
IIT-Optel Fibre Optics R&D Centre	Prof. Indranil Manna	Upto	30.11.2009
Rajbhasha Vibhag	Prof. P. D. Srivastava		
Nehru Museum of Science & Technology	Prof. D. Sen		

Kalpana Chawla Space Technology Cell (KCSTC)	Prof. Somnath Sengupta		
Advanced Technology Development Centre (ATDC)	Prof. P. P. Chakrabarti		

Professors-in-Charge

Examinations	Prof. P. D. Srivastava		
Training & Placement	Prof. B. K. Mathur	Upto	09.09.2009
	Prof. S.K. Srivastava	from	10.09.2009
General Time Table	Prof. B. Mahanty	Upto	09.09.2009
	Prof. D. K. Pratihar	From	10.09.2009
Convocation-2009	Prof. P.K.J. Mohapatra		
Institute Information Cell	Prof. B. K. Mathur		
President, Technology Students Gymkhana	Prof. Manish Bhattacharjee		
Refrigeration & Air Conditioning	Prof. Sukanta Dash		
Horticulture	Prof. S. C. Kundu	Upto	07.09.2009
	Prof. C. K. Mukherjee	From	08.09.2009
Water Works	Prof. A. K. Gupta		
Civil Works (Construction and Maintenance)	Prof. S. K. Bhattacharya	Upto	02.08.2009
	Prof. N. Dhang	From	03.08.2009
Electrical Works	Prof. D. Das		
Telecommunication	Prof. R. V. Raja Kumar	Upto	15.02.2010
	Prof. S. S. Pathak	From	16.02.2010
Institute Guest Houses	Prof. B. K. Sengupta		
Intellectual Property Right & Industrial Relation	Prof. S. Tripathy		

General

Librarian	Dr. B. Sutradhar		
Public Information Officer	Dr. Tapan Kumar Ghosal	Upto	06.01.2010
	Dr. Anathbandhu Patra	From	07.01.2010
Head, B.C. Roy Technology Hospital	Dr. Nirmal Kumar Som	Upto	21.02.2010
	Dr. Seema Ray	from	22.02..2010
Superintending Engineer (Civil)	Shri T. K. Mukherjee		
Executive Engineer (Civil)	Shri Subrat Roy		
	Shri Arun Rudra		

	Shri Avik Patra		
Executive Engineer (Electrical)	Shri Sabyasachi Ghosh Shri Mahesh Kumar Shri D.K. Chakraborty		
Security Officer	Shri U. P. Singh		

Deputy Registrars

Establishment Section	Shri Atul Prakash Trivedi		
Academic Section	Shri Nalini Ranjan Maiti	Upto	30.09.2009
Finance & Accounts	Dr. Tapan Kumar Ghosal		
Estate Office	Shri B. K. Basu Roychowdhury		
Stores & Purchase	Shri Sandeep Chatterjee	From	06.04.2009

THE SENATE

Director (Chairman) Prof. Damodar Acharya

Deputy Director Prof. A. K. Majumdar

Department of Aerospace Engineering

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

Department of Agricultural & Food Engineering

Prof. K. P. Pandey
Prof. B. C. Mal (Lien Upto 10.02.2015)
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. H. Das
Prof. S. Prasad
Prof. N. Mallick
Prof. M. K. Jha
Prof. H. Raheman
Prof. S. Dutta Gupta

Department of Architecture & Regional Planning

Prof. R. N. Datta
Prof. B. K. Sengupta
Prof. U. K. Banerjee
Prof. A. N. Merchant (EOL Upto 31.05.2011)
Prof. J. Barman
Prof. S. Chattopadhyay

Department of Biotechnology

Prof. S. C. Kundu
Prof. D. Das
Prof. S. H. Dey
Prof. A. K. Ghosh
Prof. A. K. Das
Prof. T. K. Maiti

Centre for Educational Technology

Prof. A. K. Ray
Prof. B. Bhattacharya

Department of Chemical Engineering

Prof. D. Mukherjee
Prof. A. N. Samanta
Prof. S. Dasgupta
Prof. N. C. Pradhan
Prof. S. De
Prof. G. Das
Prof. R. K. Saha

Department of Chemistry

Prof. P. Pramanik
Prof. T. K. Sarkar
Prof. J. K. Roy
Prof. P. K. Chattaraj
Prof. S. Roy (Lien Upto 28.06.2011)
Prof. T. Pathak
Prof. T. Pal
Prof. A. Basak
Prof. D. Mal
Prof. D. Ray
Prof. M. Bhattacharjee
Prof. S. K. Srivastava
Prof. N. Sarkar

Department of Civil Engineering

Prof. J. N. Bandyopadhyay
Prof. D. P. Ghosh
Prof. S. P. Dasgupta
Prof. S. K. Bhattacharyya (Lien Upto 02.08.2014)
Prof. K. S. Reddy
Prof. L. S. Ramachandra
Prof. S. Dey
Prof. D. K. Baidya
Prof. N. Dhang
Prof. B. B. Pandey
Prof. S. Majumdar
Prof. D. Sen
Prof. S. K. Barai
Prof. V. R. Desai

Department of Computer Science & Engineering

Prof. A. Pal
Prof. S. Ghose
Prof. P. P. Chakraborti
Prof. A. 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

Cryogenic Engineering Centre

Prof. S. K. Sarangi (Lien Upto 02.11.2010)
Prof. S. S. Bandyopadhyay
Prof. T. K. Dey
Prof. V. Rao Vutukuru
Prof. K. Chowdhury

Department of Electrical Engineering

Prof. S. K. Das
Prof. A. K. Sinha
Prof. J. Pal
Prof. S. Banerjee (Lien Upto 30.04.2011)
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 (Lien Upto 09.06.2012)
Prof. T. K. Bhattacharya

Department of Electronics & Electrical Communication Engineering

Prof. R. Garg
Prof. A. Chakraborty
Prof. D. Dutta
Prof. A. K. Roy (Lien Upto 28.02.2013)
Prof. S. Banerjee
Prof. C. K. Maiti
Prof. V. R. K. Ratnam (Lien Upto 04.02.2015)
Prof. P. K. Biswas
Prof. S. Sengupta
Prof. M. Chakraborty
Prof. S. S. Pathak
Prof. S. Sanyal
Prof. D. Biswas
Prof. B. K. Sarkar
Prof. K. K. Bandyopadhyay

Department of 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. S. Gupta
Prof. A. K. Bhattacharya

G. S. Sanyal School of Telecommunications

Prof. S. Chakraborti

Department of 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

Department of Industrial Engineering & Management

Prof. P. K. J. Mohapatra
Prof. R. N. Banerjee
Prof. S. Sahu
Prof. B. Mahanty
Prof. P. K. Roy
Prof. J. Mukherjee
Prof. M. K. Tiwari

Materials Science Centre

Prof. D. Bhattacharya
Prof. C. K. Das
Prof. B. Adhikari
Prof. S. Ram

Department of 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

Department of Mechanical Engineering

Prof. B. Maiti
Prof. A. Mukherjee
Prof. A. Chatterjee
Prof. R. Karmakar
Prof. S. K. Som
Prof. V. V. Satyamurty
Prof. S. K. Roy Chowdhury
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

Department of Metallurgical & Materials Engineering

Prof. M. Chakraborty (Lien Upto 19.05.2014)
Prof. R. N. Ghosh
Prof. S. K. Pabi
Prof. S. K. Roy
Prof. M. M. Godkhindi
Prof. K. K. Ray
Prof. N. Chakraborty
Prof. I. Manna (Lien Upto 28.02.2015)
Prof. Siddhartha Das
Prof. K. Das
Prof. G. G. Roy
Prof. R. Mitra
Prof. P. K. Sen

Department of 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

Department of Ocean Engineering & Naval Architecture

Prof. S. C. Misra (Lien Upto 30.09.2013)
Prof. S. K. Satsangi (EOL Upto 17.07.2010)
Prof . N. R. Mandal
Prof. D. Sen
Prof. O. P. Sha

Centre for Oceans, Rivers, Atmosphere & Land Sciences

Prof. P. C. Pandey

Department of Physics & Meteorology

Prof. R. N. P. Choudhary
Prof. N. Chandra
Prof. B. K. Mathur
Prof. B. K. Samantaray
Prof. S. L. Sharma
Prof. A. Chandrasekar (Lien Upto 28.06.2011)
Prof. S. Veeturi
Prof. S. K. Ray
Prof. A. Taraphder
Prof. K. Kumar
Prof. P. K. Raina

Rajiv Gandhi School of Intellectual Property Law

Prof. I. Dube
rof. S. K. Nandy

Reliability Engineering Centre

Prof. V. N. Achutha Naikan
Prof. R. B.Mishra

Rubber Technology Centre

Prof. A. K. Bhowmick (Lien Upto 12.07.2014)
Prof. D. K. Tripathy (Lien Upto 30.09.2011)
Prof. G. B. Nando
Prof. D. Khastgir
Prof. T. K. Chaki

School of Medical Science & Technology

Prof. S. K. Guha

Vinod Gupta School of Management

Prof. G. Sinha
Prof. S. Srinivasan
Prof. K. K. Guin
Prof. T. P. Bagchi
Prof. P. S. Das
Prof. P. Mukherjee

Nominated Members

Dr. B. Sutradhar, Librarian
Prof. Arabinda Tripathy, Dean, VGSOM

Registrar (Secretary)

Dr. D. Gunasekaran (up to 04.12.2009)
Dr. T. K. Ghosal (from 05.12.2009)

Students Representative

Sri Shubham Matah (Roll No. 06CH3009)
Sri Prabhat Kumar (Roll No. 06SI2029)
Sri Dibyendu Debnath (Roll No. 08MS6004)
Sri Arindam Chakraborty (Roll No. 06BT9707)

DIRECTOR’S REPORT

PART - I

DEPARTMENTS CENTRES AND SCHOOLS

DEPARTMENTS, CENTRES AND SCHOOLS

IIT Kharagpur is a wholly residential Institute with a large campus spread over an area of approximately 600 hectares. It has a student population of approximately 7200. The sanctioned faculty strength of the Institute is 529. As per faculty : students ratio of 1 : 10, the faculty strength has to be increased to 720.

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

Departments :

Aerospace Engineering, Agricultural and Food Engineering, Architecture and Regional Planning, Biotechnology, Chemical Engineering, Chemistry, Civil Engineering, Computer Science and Engineering, Electrical Engineering, Electronics and Electrical Communication Engineering, Geology and Geophysics, Humanities and Social Sciences, Industrial Engineering and Management, Mathematics, Mechanical Engineering, Metallurgical and Materials Engineering, Mining Engineering, Ocean Engineering and Naval Architecture, Physics and Meteorology.

Centres :

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

Schools :

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

COURSES OFFERED BY DEPARTMENTS, CENTRES AND SCHOOLS

Faculty Strength – 529
as on 31.03.2010

Aerospace Engineering **13**

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

Agricultural & Food Engineering **34**

B.Tech.- Agricultural & Food Engineering
Dual Degree - Agricultural & Food Engineering / Farm Machinery & Power
Dual Degree - Agricultural & Food Engineering / Soil and Water Conservation Engineering
Dual Degree - Agricultural & Food Engineering / Dairy & Food Engineering
Dual Degree - Agricultural & Food Engineering / Water Resources Development & Management
Dual Degree - Agricultural & Food Engineering / Aqua Cultural Engineering
Dual Degree - Agricultural & Food Engineering / Agricultural Systems & Management
Dual Degree - Agricultural & Food Engineering / Post Harvest Engineering
Dual Degree - Agricultural & Food Engineering / MBA
M. Tech. - Farm Machinery & Power
M. Tech. - Soil and Water Conservation Engineering
M. Tech. - Dairy and Food Engineering
M. Tech. - Applied Botany
M. Tech. - Water Resources Development & Management
M. Tech. - Aqua Cultural Engineering
M. Tech. - Agricultural Systems & Management
M. Tech. - Post Harvest Engineering

Architecture & Regional Planning **15**

B.Arch.
MCP

Biotechnology **12**

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

Civil Engineering **32**

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
M. Tech. - Hydraulic & Water Resources Engineering
M. Tech. - Transportation Engineering
M. Tech. - Environmental Engineering & Management
M. Tech. - Geotechnical Engineering
M. Tech. - Structural Engineering

Chemical engineering **21**

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

Centre for Ocean, Rivers, Atmosphere and Land **06**

M. Tech. - Earth System Science and Technology

Cryogenic Engineering **10**

M. Tech. - Cryogenic Engineering

Computer Science & Engineering **21**

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

Chemistry **29**

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

Electronics & Electrical Communication Engineering **29**

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

M. Tech. - Fibre Optics and Lightwave Engineering
M. Tech. - Microelectronics & VLSI Design
M. Tech. - RF and Microwave Engineering
M. Tech. - Telecommunication Systems Engineering
M. Tech. - Visual Information and Embedded Systems Engineering

Electrical Engineering **28**

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

Educational Technology **03**

M. Tech. - Media and Sound Engineering

Geology and Geophysics **24**

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

Humanities and Social Sciences **20**

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

Industrial Engineering & Management **10**

B.Tech.- Industrial Engineering
Dual Degree - Industrial Engineering / Industrial Engineering & Management

Dual Degree - Industrial Engineering / MBA
M. Tech. - Industrial Engineering & Management

Rajeev Gandhi School of Intellectual Property Law **11**

LLB - Intellectual Property Rights

Information Technology **07**

M. Tech. - Information Technology

Mathematics **29**

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

Mechanical Engineering **44**

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 Engineering / MBA
Dual Degree - Manufacturing Science & Engineering / MBA
M. Tech. - Manufacturing Science & Engineering
M. Tech. - Thermal Science and Engineering
M. Tech. - Mechanical Systems Design
M. Tech. - Mechanical Systems Dynamics & Control

Mining Engineering **13**

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

Medical Science & Technology **09**

Masters in Medical Science & Technology
M. Tech. - Medical Imaging and Image Analysis

Materials Science **10**

M. Tech. - Materials Science & Engineering

Metallurgical and Materials Engineering **24**

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

Ocean Engineering and Naval Architecture **10**

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

Physics & Meteorology **30**

M.Sc. - Physics
M.Sc.(2 yr) - Physics (upto 2008 admissions)
M.Sc.- Ph.D. Dual Degree in Physics (with effect from 2009 admissions)
M. Tech. - Solid State Technology

Reliability Engineering **05**

M. Tech. - Reliability Engineering

Rubber Technology **09**

M. Tech. - Rubber Technology

Ranbir & Chitra Gupta School of Infrastructure Design and Management

M. Tech. - Infrastructure Design and Management

Water Resources

M. Tech. - Water Management

Vinod Gupta School of Management **16**

MBA

DEPARTMENT OF AEROSPACE ENGINEERING

DEPARTMENT OF AGRICULTURAL & FOOD ENGINEERING

DEPARTMENT OF ARCHITECTURE & REGIONAL PLANNING

DEPARTMENT OF BIOTECHNOLOGY

DEPARTMENT OF CHEMICAL ENGINEERING

DEPARTMENT OF CHEMISTRY

DEPARTMENT OF CIVIL ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

DEPARTMENT OF ELECTRICAL ENGINEERING

DEPARTMENT OF ELECTRONICS & ELECTRICAL COMMUNICATION ENGINEERING

DEPARTMENT OF GEOLOGY & GEOPHYSICS

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

DEPARTMENT OF INDUSTRIAL ENGINEERING & MANAGEMENT

DEPARTMENT OF MATHEMATICS

DEPARTMENT OF MECHANICAL ENGINEERING

DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING

DEPARTMENT OF MINING ENGINEERING

DEPARTMENT OF OCEAN ENGINEERING & NAVAL ARCHITECTURE

DEPARTMENT OF PHYSICS & METEOROLOGY

CENTRE FOR EDUCATIONAL TECHNOLOGY

CENTRE FOR OCEANS, RIVERS, ATMOSPHERE AND LAND SCIENCES

CRYOGENIC ENGINEERING CENTRE

MATERIALS SCIENCE CENTRE

RELIABILITY ENGINEERING CENTRE

RUBBER TECHNOLOGY CENTRE

RURAL DEVELOPMENT CENTRE

G. S. SANYAL SCHOOL OF TELECOMMUNICATIONS

RAJIV GANDHI SCHOOL OF INTELLECTUAL PROPERTY LAW

RANBIR AND CHITRA GUPTA SCHOOL OF INFRASTRUCTURE DESIGN AND MANAGEMENT

SCHOOL OF INFORMATION TECHNOLOGY

SCHOOL OF MEDICAL SCIENCE & TECHNOLOGY

SCHOOL OF WATER RESOURCES

VINOD GUPTA SCHOOL OF MANAGEMENT

PART - II

CENTRALIZED UNITS AND SERVICES & ALUMNI AFFAIRS & INTERNATIONAL RELATIONS

ALUMNI AFFAIRS & INTERNATIONAL RELATIONS

DEAN : Professor Amit Patra

Alumni Affairs & International Relations Committee :

Professor-in-Charge, Information Cell

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

Professor-in-Charge of News Letters / Publications

Prof. Joy Sen	Department of Architecture & Regional Planning – Chief Editor

Technology Alumni Association Secretariat

Prof. Goutam Bandyopadhyay Department of Aerospace Engineering	President
Dr. Dilip. K. Nanda Computer & Informatics Centre	Secretary
Prof. Kajal Biswas Department of Mechanical Engineering	Joint Secretary
Prof. Joy Sen Department of Architecture & Regional Planning	Treasurer

Officer :

Shri C. Annamalai	Assistant Registrar

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

1. The alumni affairs website **www.alumnet.iitkgp.ernet.in** has been registering alumni all over the globe online throughout the year. Donations have been received through online payment for the Malayesh Banerjee Scholarship.

2. The popular Alumni newsletter "KGPian" is being published regularly. Presently it is running in its 7th year.

3. The 59th Foundation Day of the Institute was celebrated on 18th August, 2009. The 3rd Nina Saxena Excellence in Technology Award, a first of its kind India-wide Technical Innovation Award instituted by IIT Kharagpur in 2006 was presented to Prof. Milind V. Rane, Professor, Department of Mechanical Engineering, IIT Bombay and a team of Professors and research scholars headed by Prof. Ashwini Agarwal, Professor, Department of Textile Technology, IIT Delhi by the Chief Guest Prof.

Kiran Seth, Professor, IIT Delhi and Founder, SPICMACAY. The award consists of a cash prize of Rs. 51,000/- and a gold plated plaque. Commemorating the spirit of Dr. Nina Saxena, B.Tech. (Hons.), ECE 1992, who passed away tragically in 2005, the award is an attempt to encourage and promote technical innovation with a social development focus. The award is the result of a lot of hard work on Nina's husband, Dr. Akhil Sahai's part; also our alumnus.

4. Distinguished Alumnus Award was conferred on alumni of IIT Kharagpur who have distinguished themselves in their own domain of work and made their Alma Mater proud during the 55th Annual Convocation held on 8th August 2009. Dr. Amit Goyal, Dr. Subir Chowdhury, Dr. Biswadip (Bobby) Mitra, Prof. Arun G. Phadke, Prof. Kiran Seth and Sri. Arvind Kejriwal were awarded the Distinguished Alumnus Award. Dr. Amit Goyal, Dr. Subir Chowdhury, Dr. Bishwadip (Bobby) Mitra, Prof. Arun G. Phadke and Sri. Arvind Kejriwal received the award in person whereas Prof. Kiran Seth could not attend the function.

5. The New Year brought together the alumni of the Institute again for the seventh time to IIT in the form of 7th Annual Alumni Meet 2010 held during January 8-10, 2010. The Meet was dedicated to those who graduated in the years 1960 and 1985. Many alumni came with their spouses and some with children. To commemorate the occasion a Souvenir, "Yearnings of Yore – Volume VII" was published. The programme consisted of Inauguration & Award Ceremony, a Panel Discussion, Sports events, Hall Reunion, Cultural Programme by ETMS and a musical evening. A small memento was presented to all participants belonging to the Silver Jubilee and Golden Jubilee Batches.

   This time, too, the entire function was conducted and organized by the student members of the Alumni Cell.

6. PAN IIT 2009 was held at Chicago, USA during October 9-11, 2009. Prof. Damodar Acharya, Director and Prof. Amit Patra, Dean (AA&IR) attended the event.

7. The 2nd Al Gore Sustainable Technology Venture Competition was held during November 6-7, 2009 at IIT Kharagpur. Candidates were short listed by a selection committee. The teams displayed their presentation in front of the six distinguished Juries, viz., Anjan Rai Chaudhuri, Professor, IIM Kolkata, Prithwis Mukherjee, Professor, VGSOM, IIT Kharagpur, Shoummo Acharya, Founder Managing Director & CEO of VI eTrans Pvt. Ltd., Pradeep Ranka, Executive Director, Ranka Group, Saibal Roy, and Sandeep Singhal, Managing Director, Nexus India Capital Advisors. Members of the Organizing Committee, Prof. Oopala Operajita, Chairperson, Al Gore Sustainable Venture Competition, Prof. Amit Patra, Chairman, Local Organizing Committee and Prof. Joy Sen, Convenor, Local Organizing Committee were also present there during the presentation. The Team ECPS, from IIM Bangalore and IIT Bombay won the first prize which included a cash award of Rs.1,00,000.00 (Rupees One lakh only) and a trophy. The Second prize was won by the team Xplorer, from IIT Kharagpur which included a cash award of Rs. 70,000.00 (Rupees Seventy thousand only) and a trophy. Each member of the rest of the six finalists was awarded a certificate of honour. The awards were given away on November 7, 2009 by the US Consul General in Kolkata, H. E. Beth Payne, who congratulated the winners, finalists and IIT Kharagpur.

INSTITUTE LECTURE SERIES

The following guest lectures were organized by the Office of Alumni Affairs and International Relations during the academic year 2009-2010 :

Speaker	Topic	Date
Prof. S. C. Dutta Roy Emeritus Professor and INSA Senior Scientist Electrical Engineering Department IIT Delhi	Teaching and and Research – A Lifestyle Option	April 06, 2009
Prof. Farrokh Mistree Mechanical Engineering Department Georgia Tech. University, Atlanta USA	Being the Professor is the Best Job in the World	June 23, 2009
Prof. Claude Nicollier Swiss Astronaut	Space Exploration : Why and How with Reference to my Own Experience	August 11, 2009
Prof. Gautam R. Desiraju Indian Institute of Science Bangalore	Quality and Quantity in Science Education and Research in India	August 26, 2009
Prof. K. N. Ganesh Bhatnagar Awardee Professor and Director IISER, Pune	Making Medicines out of Nucleic Acids	August 27, 2009
Dr. Chi-Foon Chan President and Chief Operating Officer Synopsys Inc., USA	A New World of Science and Engineering Partnerships	September 08, 2009
Prof. H. C. Verma Professor of Physics IIT Kanpur	The Story of Formation of Nuclei	September 11, 2009
Prof. Anjan Raichaudhuri IIM Kolkata	Marketing of Technological Innovations	November 06, 2009
Prof. S. K. Panda Department of Pathology AIIMS, New Delhi	Hepatitis E Virus Biology	December 08, 2009
Dr. Rama Jayasundar Department of NMR Imaging	Di Mystifying Ayurveda	December 11, 2009

AIIMS, New Delhi

Dr. Sudarshan Ghosh Dastidar Pioneer of In–Vitro Fertilization (IVF) Eminent Embryologist Member of American Society for Reproductive Medicine (ASRM) Member of New York Academy of Sciences (NYAS)	Evolution of IVF Technology in India	December 11, 2009
Prof. Vemuri Balakotaiah John and Rebecca Moores Chair Professor Chemical Engineering Department University of Houston, USA	Engineering Challenges in the Development of "Green Automobiles"	December 16, 2009
Prof. Asit K Biswas Distinguished Alumnus of IIT Kharagpur and President & Academician, Third World Centre for Water Management Atizapan, Mexico	Water Resources and Management	December 28, 2009
Prof. Yash Pal Singh Ex-Professor Electrical Engineering Department IIT Kharagpur	Higher Technology Education and Preserving Brand IIT	January 12, 2010
Prof. Sanjoy Banerjee Distinguished Professor of Chemical Engineering Director of the Energy Institute City University of New York, USA	Energy at the Turning Point : The Role of Technology	January 13, 2010
Prof. Jai Pal Mittal, FNA; FASc; FNASc; FTWAS	Excitement in Radiation Research	January 18, 2010
Mr. Jatin Das Eminent Creative Artist and Prolific Figurative Painter	Creativity in Academia and Public Life	February 27, 2010
Prof. Kankan Bhattacharyya, FNA, FASc, FNASc, FTWASc, Director of Indian Association for the Cultivation of Science Jadavpur, Kolkata	Rise of Modern Science in India: A National Movement	February 28, 2010
Prof. Dhruba Jyoti Biswas	A Glimpse of the Laser and its	March 17, 2010

Head, Infrared Laser Section Laser and Plasma Technology Division Bhabha Atomic Research Centre Mumbai	application in secure Communication

VISIT OF THE ALUMNI

Dr. Prabhakant Sinha, Co-Founder and CEO, ZS Associate, USA	Visited IIT Kharagpur during June 7-9, 2009 and discussed on setting up a Centre of Excellence in Bio Energy. Dr. Sinha visited again during January 5-7, 2010 and participated in the International Symposium on Bioenergy held at IIT Kharagpur
Prof. Kiran Seth, Professor, IIT Delhi	Visited IIT Kharagpur on August 18, 2009, the Foundation Day of the Institute. He was awarded Distinguished Alumnus Award 2009 and he was the Chief Guest of the second half programme of that day
Mr. Shail Kumar, Senior Director, External Relations, College of Letters & Science (L&S), University of California, Berkeley	Visited IIT Kharagpur on August 29, 2009 and discussed with Director and other faculty members to explore additional ways to strengthen the UCB-IIT KGP collaboration. Besides he also discussed the IIT Kharagpur's master plan and Diamond Jubilee celebration plan
Dr. Tirthankar Banerjee, Chief Executive Officer, Solar Energy Company, Australia	Visited on September 19, 2009 and discussed with Director, Deputy Director, Deans and other concerned faculty members on the feasibility of putting 1-2 Mega Watt Solar Photovoltaic Plant in the campus
Mr. Cinna Boddipalli, presently residing in Chicago, USA	Visited IIT Kharagpur during December 7–10, 2009 and prepared a development plan for sustainable fund raising in connection with Diamond Jubilee celebration in consultation with Dean (AA&IR) and other alumni scattering over the country
Dr. J. N. Saha and Dr. Ravi Gupta	Visited IIT Kharagpur during December 21–22, 2009. They met the Director, Dean (AA&IR) and Head, E&ECE Department, visited Halls and also met the Wardens alongwith alumni cell team
Prof. Asit K. Biswas, President & Academician, Third World Centre for Water Management, Atizapan, Mexico	Visited IIT Kharagpur December 28–29, 2009. Prof. Biswas was awarded D.Sc. (Honoris Causa) award. He inaugurated the School of Water Resources; held discussions on possible collaboration in terms of research and training with our new School of Water Resources, including the possibility of developing some Executive Training Programme of senior executives

	from the Indian water utilities and Central and State Government officials
Mr. B. K. Gurtu and Mrs. Shobha Gurtu	Visited IIT Kharagpur during January 4–5, 2010. They met the Director, Deputy Director, Dean (UGS), Dean (PGS&R) and Dean (SRIC)
Mr. Arjun Malhotra, CEO, Techspan Inc., New Delhi and Mr. Ajit Gupta	Visited IIT Kharagpur during January 5-6, 2010 and participated in the International Symposium on Bioenergy
Prof. Yash Pal Singh, Ex-Professor, Electrical Engineering Department, IIT Kharagpur	Visited the Institute and joined in the 7th Global Alumni Meet (January 8-10, 2010) and delivered an Institute Lecture on January 12, 2010 on Higher Technology Education and Preserving Brand IIT
Mr. Jitender K. Datta, presently residing in USA	Visited the Institute during February 17–18, 2010 and met Director, Dean (AA&IR) and other Heads of Departments

MEMORANDUM OF UNDERSTANDING SIGNED

The Institute signed Memorandum of Understanding with the following Universities / Industries during the academic year 2009-2010 for the purpose of faculty and student exchange :

#	Name of the University	Signed on
1.	Georgia Institute of Technology, Atlanta, Georgia, USA	April 15, 2009
2.	Central Institute of Fisheries Education, Mumbai	May 21, 2009
3.	School of Metallurgy and Materials, University of Birmingham, UK	May 29, 2009
4.	The Regents of the University of California	August 28, 2009
5.	MOU for setting up of ‘P. K. Sinha Centre for Bio-Energy’ at IIT Kharagpur	August 31, 2009
6.	MOU signed with Synopsys, Inc., USA for setting up the Synopsys CAD Laboratory at IIT Kharagpur	September 08, 2009
7.	Wilfrid Laurier University, Waterloo, Ontario, Canada	November 25, 2009
8.	Ghent University, Belgium	December 04, 2009

9.	India Meteorological Department, Ministry of Earth Science, New Delhi	October 2009
10.	MOU for creation of Virtual Class-Rooms at IITs over National Knowledge Network (NKN) between National Informatics Centre (NIC), New Delhi and National Informatics Centre Services Incorporated (NICSI), New Delhi with IIT Kharagpur	December 12, 2009
11.	Chonnam National University, South Korea	December 28, 2009
12.	MOU between Ministry of Railways, GOI and IIT Kharagpur for setting up of 'Centre for Railway Research' at IIT Kharagpur	February 13, 2010
13.	Singapore Technologies Engineering Limited	March 16, 2010

As per MoU, the Institute permitted the following students to undergo the academic courses/internship at IIT Kharagpur :

#	Name of the Student & University	Department & Courses / Internship attended at IIT Kharagpur	Remarks
1.	Mr. Nicolas Heine Centre for Industrial Mathematics University of Bremen Germany	**Department of Mathematics :** **All courses** in 8th Semester of Integrated M.Sc. Programme (Maths & Computing) **Period :** Spring Semester 2009-2010	100 per cent tuition fee waiver
2.	i. Ms. An Bu YONG ii. Mr. Kim USU College of Engineering Chonnam National University, Gwangju, Korea	**Department of Mining Engineering :** **Courses :** a. Elements of Rock Mechanics (MI21007) b. Economics for Mineral Industry (MI30014) c. Environmental Pollution Control (MI30006) d. Resource Evaluation & Geostatistics (MI40024) **Period :** Spring Semester 2009-2010	Waiver of tuition & service fee and free accommodation
3.	Mr. Ehlers Cedric	**Department of Architecture &**	

		Regional Planning :	
	Technische Universitat Munchen, Germany	Academic Year 2009-2010	
4.	Mr.Jan-Hernik Meier, A Masters student of Geography Leibniz University, Hannover Germany	**Department of Agricultural & Food Engineering :** **Student Internship :** Area: Irrigation Methods and Food Security **Period :** 27th January – 15th May 2009	Stipend @ Rs. 5000/- per month

DISTINGUISHED VISITORS

Details of Distinguished Visitors during the period 2009-2010

#	Name & Details of Visitors	Date of Visit	Purpose of Visit
1	i) Prof. Claude Nicollier, Swiss Astronaut ii) Mr. Mattia Celio, Scientific Counselor of Swiss Embassy	August 11, 2009	Delivered an Institute Lecture on "Space Exploration : Why and how, with reference to my own experience"
2	Prof. (Dr.) Syed Manal Shah Alquadri Ambassador of India to Uzbekistan Embassy of India, Tashkent, Uzbekistan	August 31, 2009	Met with Director & Dean (AA&IR) and discussed the matters of educational cooperation
3	i) Mr. P. Lecomte Executive Director Advanced Master in Financial Engineering ESSEC, Singapore Campus ii) Ms. Nusrat Hossain Campus France Education Advisor ESSEC, Singapore Campus iii) Mr. Laurent Reyes In Charge of University Cooperation in West Bengal	October 27, 2009	Discussed / interacted with concerned faculty members and made a comprehensive presentation to students
4	Delegation from M/s TOTAL, France	November 04–05, 2009	Signed MoU between M/s TOTAL France and IIT Kharagpur for creating a Chair

			Professorship position in Mining Engineering at IIT Kharagpur
5	Ms. Beth A. Payne US Consul General	November 07, 2009	Keynote Address in the Prize Distribution Ceremony in connection with Al Gore Sustainable Technology Venture Competition
6	Prof. Sylvain Ferrari Prof. Mathis Plapp Ecole Polytechnique, France	November 15-17, 2009	Discussed about a potential collaboration between IIT Kharagpur and Ecole Polytechnique, France, to develop student exchange programme for research internships, student exchange at Master's level, and joint supervision of PhD students for cooperation on joint research projects
7	Prof. Seetharam and Dr. Laxmi Institute of Water Policy Lee Kuan Yew School of Public Policy National University of Singapore	January 03-04, 2010	Delivered an institute lecture
8	Prof. Sanjoy Banerjee Distinguished Professor of Chemical Engineering Director, The Energy Institute The City University of New York City College, Steinman Hall 140th St & Convent Ave New York, NY 10031 (Alumnus of Chemical Engineering, IIT KGP, 1970)	January 12-13, 2010	Delivered an Institute Lecture on “Energy at the Turning Point : The Role of Technology”. Discussed educational cooperation with Dean (AA&IR) and other concerned faculty members
9	Prof. Sujit Banerji Professor of Operations Management Executive Director, Postgraduate Programs WMG, School of Engineering, University of Warwick,	March 02, 2010	Discussed the 5 interns for this summer in the 5 research areas agreed to already, as well as other relevant activities and other ideas in the MOU

	Coventry, UK		
10	1. Ms. Daisy Oropesa, Director of the Enterprise ALBERT from the University of Communications and Informatics 2. MCs Humberto Arango, Director of Enterprise DATYS 3. Ing. Marina Capo Rivalta, Advisor from the Ministry of Informatics and Communications 4. Dr. Leonel Iriarte Navarro, Vice Rector CITL, Institute of Information Technology of Cuba. 5. Mr. Luis Javier Baro Baez, First Secretary, Cuban Embassy	March 17, 2010	(Cuban Delegation) Met with Director and Dean (AA&IR), visited SIT
11	i) Dr. Rita Sharma Senior Adviser, Science & Innovation, British High Commission Delhi ii) Chris Darby Head of Science and Innovation British High Commission	March 30, 2010	Met with Director, Dean (AA&IR), visited Agricultural & Food Engineering Department and met with Head and Prof. S. N. Panda
12	Mr. Pascal Casanova Group Senior Vice President - R&D Lafarge France	March 31, 2010	Discussed with Dean (AA&IR) and other concerned faculty members to get acquainted with the research conducted by IIT Kharagpur in the field of cement and concrete and to explore a possibility of setting up a partnership to do research on concrete and material science as well as sustainable construction including the sponsoring of equipments or specific research projects.

ADVANCED TECHNOLOGY DEVELOPMENT CENTRE

CHAIRMAN : Professor Partha Pratim Chakrabarti

FACULTY ASSOCIATED

Professor :

Chakrabarti, P. P. Computer Science & Engineering	Ph.D., Artificial Intelligence, CAD for VLSI Design of Algorithms, Formal Verification
Lahiri, S. K. Advisor, Sponsored Research & Industrial Consultancy	Ph.D., Microelectronics, VLSI, MEMS, Integrated optics
Sen, S. K. Advisor, Sponsored Research & Industrial Consultancy	Ph.D., Advanced Plant Genetics.
Sengupta, S. Electronics & Electrical Communication Engineering	Ph.D., Computer Vision, Multimedia
Biswas, D. Electronics & Electrical Communication Engineering	Ph.D., III-V Semiconductor Device Technology
Patra, A. Electrical Engineering	Ph.D., VLSI Design of Power Converters, Industrial Information Technology
Basu, A. Computer Science & Engineering	Ph.D., Embedded Systems, Artificial Intelligence Application
Roy, S. K. Physics & Meteorology	Ph.D., Solid State Physics, Thin Film, Nanotechnology
Pal, S. P. Computer Science & Engineering	Ph.D., Computational Geometry, Design and Analysis of Algorithms
Bhattacharya, B. Civil Engineering	Ph.D., Structural Engineering, Reliability
Ghosh, A. Biotechnology	Ph.D., Virology and Molecular Biology
Dasgupta, Pallab Computer Science & Engineering	Ph.D., VLSI CAD & Electronic Design Automation
Chakraborty, S. Mechanical Engineering	Ph.D., Micro Fluidics

Associate Professor :

Bhattacharyya, T. K. Electronics & Electrical Communication Engineering	Ph.D., Microelectronics, VLSI, MEMS
Jacob, Chacko Material Science	Ph.D., Wide Bandgap Semiconductors/ Nanomaterials / Direct Fluorination of Materials / Oxide semiconductors
Banerjee, Pallab Material Science	Ph.D., Semiconducting Materials, Materials for Energy Conversion : Photovoltaic and Thermoelectric, III-V

	and II-VI MOCVD, Organic Semiconductor

Assistant Professor :

Dhar, A. Physics & Meteorology	Ph.D., Condensed Matter Physics, Nanotechnology
Das, S. Medical Science & Technology	Ph.D., MEMS and Microsystems including Bio-MEMS and Bio-Transducers, Microelectronic Devices, Medical Instrumentation and Medical Chip Design.
Mandal, Pradip Electronics & Electrical Communication Engineering	Ph.D., CAD for CMOS Analog VLSI, Analog Circuit Design

Officer :

Gangopadhyay, Pranabendu Senior Scientific Officer	Ph.D., Microphotonics, Integrated Optics, Fiber Optics, MOEMS, Microelectronics.

LABORATORIES INVOLVED

i) MEMS and Microelectronics Laboratory
ii) MEMS Design Centre
iii) Microphotonics Laboratory
iv) Kalpana Chawla Space Technology Cell
v) Microscience Laboratory
vi) Advanced VLSI Laboratory
vii) Advanced Laboratory for Plant and Genetic Engineering
viii) Communication Empowerment Laboratory
ix) Optel-IIT Fiber-Optic Center

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities

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

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

The MEMS design laboratory, a national facility created under NPSM programme is actively involved with design work on MEMS including microfluidic devices. A number of students from various departments like ATDC, E & ECE, Electrical, Mechanical, Biotechnology, Material Science Department / Centre are involved in the Design Centre to do their project / thesis works. Other academic Institutions like Jadavpur University and CMERI, Durgapur, are also involved in the Design Centre. Research and development is also undertaken in the field of Integrated Optics. An integrated-optic design software have been developed and copyrighted. Fabrication and characterization of titanium indiffused lithium niobate waveguides, directional couplers, power splitters, switches for fiber-optic communication networks have been performed. Research is being carried out on thin film nanostructures, semiconductor, ferroelectric and magneto-resistive films for microelectronics and sensor applications under various government sponsored projects at MicroScience Laboratory of Dept. of Physics & Meteorology. A number of thrust areas have now emerged based on core competency available in the Advanced VLSI Laboratory. These include analog and RF circuits, wireless communication and Baseband processing, direct conversion receivers, power management circuits, processors and IP cores for embedded applications and design for testability. More than 60 different chips have been fabricated and tested. 15 leading companies have joined the AVLSI Consortium. More than 12 ongoing collaborative research projects funded by the 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. Existing expertise on formal verification and optimization methods is being applied to design verification, synthesis and CAD Tool development for the deep sub-micron processes. More than fifty Doctoral and Masters students are working on various emerging areas. The Centre for Theoretical Studies (CTS) is primarily engaged to generate and nucleate theoretical research on fundamental aspects of basic and engineering sciences.

The Advanced Laboratory for Plant Genetic Engineering is dedicated to develop technologies suitable to enhance the productivity potential of some of our major crop plants through biotechnological approach. The laboratory has met with some success in identifying specific genetic elements associated with fiber development in jute stem through functional genomic approach. Additionally, attempts to map the individual seven linkage groups of jute are underway. Discovery of certain plant genes and regulatory elements involved in the metabolic pathway of fatty acid synthesis and modification of their functional role in case of synthesis of seed oil of Indian mustard (*Brassica juncea*), are in active state of pursuit. Additionally, attempts have been initiated to genetically tamper the lignin biosynthetic pathway in vegetative parts of jute and sorghum plants by anti-sense approach. Major attempts have also been made in strategy development for generation of genetically modified crop plants resistant against insect pests belonging to lepidoptera, coleoptera and homoptera. Some success could be attained in case of cotton, Brassica and rice. Discovery of novel insecticidal genes from plants and bacteria and generation of transgenic crop plants expressing these insecticidal genes have been accomplished. Attention has also been directed towards development of efficient transformation methods for certain recalcitrant crop plants that have not yet been accessible to gene transfer methodologies. Further, development of marker free transgenic plant generation and site-specific integration of transferred DNA have figured as major targets of activities in order to enhance the efficacies of gene transfer techniques to a great height. The laboratory has also developed a microbial bioprocess

technology using the state of the art of bio-film technology for high through-put production of superior quality of jute fibers. The technique reduces production time by ~70% and results significantly low effluents and green house gases. The process thus developed is safe for human handling and offers excellent quality control ensuing at least 2-3 grades better fiber quality against methods that are in use by the jute growers. Further, attempts to explore the possibilities for generation of jute fiber based bio-composites have also been initiated. The laboratory is further working on microbial bio-film based technology for high through-put production of specific carbohydrate macerating enzymes that carries industrial significance.

Thrust Areas

Inertial MEMS, Micro Sensors and actuators for automobile, space, and defense applications, micropropulsion device for micro/nano satellite application, RF-MEMS, Bio-MEMS, Semiconductor devices, Nanotechnology, Lithium niobate integrated optics, Microstructuring of SU-8, Astrophysics, Cosmology, Nonlinear Sciences, Theoretical condensed matter physics, Wireless communication and Baseband processing, Analog and RF circuits, Plant biotechnology.

New Acquisitions

MEMS vaporising liquid microthruster, Microflow for microvalve, micropump, MEMS flow sensors, Integrated-optic switch, MEMS accelerometer for aircraft motion sensing. Tunneling accelerometer and Capacitive accelerometer, SU-8 microneedles.

ON-GOING RESEARCH PROJECTS

Sponsored Projects

#	Title of the project	Sponsor(s)	Duration
1.	Indo-US Joint Centre on Advanced and Futuristic Manufacturing	Indo-US Science & Technology Forum	Ongoing
2.	Development of Silicon Microsensors for Flow Measurement	MHRD, New Delhi	Ongoing
3.	Design, analysis and optimization of navigation grade silicon based MEMS accelerometer	ISRO-KCSTC Cell	Ongoing
4.	Upgrading facilities for MEMS design activities at national resource centre	ADA, Bangalore	Ongoing
5.	Development of MEMS based components for RF applications	ADA, Bangalore	Ongoing
6.	Development of MEMS based accelerometers for Aerospace applications	ADA, Bangalore	Ongoing
7.	MEMS based micro-propulsion devices for micro-satellite programme	ISRO, Bangalore	On-going
8.	Multi-scale modeling to study the role of atomic scale defects in CNT-based nanocomposites	DST, New Delhi	On-going

9.	Effects of non-linearity and viscoelasticity of blood and wall tissues and magnetohydrodynamic effects on the flow field in arteries in normal and pathological states (ENV)	CSIR, New Delhi	On-going
10.	Kinematics of flows in diverse contexts	DST, New Delhi	On-going
11.	Measuring the HI power spectrum with the GMRT	BRNS, DAE, Mumbai	On-going
12.	Targeted gene integration in rice and cotton	ICAR, New Delhi	On-going
13.	Establishment of independence of Linkage Groups of jute through trisomic analysis in order to construct the genetical and physical map of jute genome.	DBT, New Delhi	On-going
14.	Application of technology for tomato hybrid seed industry involving rural women for employment and income generation	DST, New Delhi	On-going
15.	Recombinant DNA for development of a male-sterility system in jute.	DBT, New Delhi	On-going
16.	Generation and cataloguing of bast fibre developmental stage specific EST library from jute	DBT, New Delhi	On-going
17.	Design and fabrication of high sensitivity micro machined silicon tunneling accelerometer with micro-g resolution	ISRO, Bangalore	On-going
18.	Development & characterization of nanostructured thin films for SiGe quantum well infrared photodetector and ferroelectric based gas/chemical sensors	DRDO, New Delhi	On-going
19.	Terahertz emission of Si/SiGe structures doped with shallow acceptors	DST, New Delhi	On-going
20.	Synthesis and characterization of nanostructured materials for functional and structural applications	DST, New Delhi	On-going
21.	Fabrication and characterization of Novel Photonic Crystal Structures and Si/Ge Quantum Dots for Photonic Applications	DST-ITPAR, Italy	On-going
22.	Design, analysis and optimization of navigation grade silicon based MEMS accelerometer	ISRO-KCSTC Cell	On-going
23.	Medical image analysis and MEMS based flow sensor development	Texas Instruments	On-going

24.	Feasibility study of MEMS based biochip platform for characterisation of biospecies	IIT Kharagpur	On-going
25.	Effects of non-linearity and viscoelasticity of blood and wall tissues and magnetohydrodynamic effects on the flow field in arteries in normal and pathological states (ENV)	CSIR, New Delhi	On-going
26.	Kinematics of flows in diverse contexts (KFD)	DST, New Delhi	On-going
27.	Measuring the HI power spectrum with the GMRT (MRT)	BRNS, DAE, Mumbai	On-going
28.	All India Coordinated Research Project on Post Harvest Technology	ICAR, New Delhi	On-going
29.	A Value Chain on Aloe Vera Processing	ICAR, New Delhi	On-going
30.	Development of Silicon Carbide Thin Films for High Temperature and High Power Devices	DRDO, New Delhi	On-going
31.	All India Coordinated Research Project on Post Harvest Technology	ICAR, New Delhi	On-going
32.	Development of a MEMS based assay for biomedical diagnostics.	ISRO-IIT Kharagpur Cell	On-going
33.	Development of SU-8 based microstructures for Integrated-Optic and Bio-applications	IIT Kharagpur	On-going
34.	Synthesis of functional groups for immobilization of functional proteins on MEMS based micro-sensor surfaces	Indo-Trento Program for Advanced Research	On-going

Consultancy Projects :

#	Title of the project	Sponsor(s)	Duration
1.	Development and realization of high Q-factor quartz double ended tuning forks using micromachining technology	ISRO-IISU	On-going
2.	Development of ADC and Receiver for wireless applications	Si2 Microsystems	On-going

3.	Design of RFIC modules	National Semiconductor Corporation, USA	On-going
4.	Design and processing of MEMS microstructure for mechanical property evolution	DMRL, Hyderabad	On-going
5.	Thin Film Characterization	Various agencies	On-going

VISITS ABROAD BY FACULTY MEMBERS

1.	Dr. T. K. Bhattacharyya	Indo–Trento programme for advanced research ITPAR programme, Italy, June 2009
2.	Dr. T. K. Bhattacharyya	GSI, Darmstadt, Germany, (to attend CBM-DASQ meeting on invitation), 7 days
3.	Dr. P. Gangopadhyay	Research on Lithium Niobate Integrated Optics and Microstructuring for MOEMS, Optoelectronics Research Centre, University of Southampton, UK, July 2008 – July 2009
4.	Dr. C. Jacob	Chungnam National University and Kookmin University, South Korea (Guest Lectures and collaboration discussions), October 28 – November 1, 2009
5.	Dr. C. Jacob	MTEC, Thailand (Guest Lectures and collaboration discussions), November 1–3, 2009
6.	Dr. C. Jacob	University of California, Irvine and Northwestern University, USA (Attend Indo-US Symposium on Fabrionics and collaborative research), June 27 – July 10, 2009

INVITED LECTURES BY FACULTY MEMBERS

1.	Prof. S. K. Ray	Semiconductor Nanostructures for Device Applications at Institute of Radio Physics & Electronics, Kolkata University
2.	Prof. S. K. Ray	Nanoelectronic and Sensing Devices at IIT Delhi
3.	Prof. S. K. Ray	Excitements in Nanoscience at Vidyasagar College, Kolkata
4.	Prof. S. K. Ray	Semiconductor Nanotechnology for Electronic Devices at UGC State Level Seminar on "Fundamentals & Frontiers in Physics", 22nd September, Garbheta
5.	Prof. S. K. Ray	Semiconductor Nanostructures for Futuristic Devices at Annual Convention of Indian National Academy of Engineering, Goa
6.	Dr. Soumen Das	BioMEMS at NEHU, Shillong, March 25–27, 2010
7.	Dr. Soumen Das	Mobile diagnostics : A MEMS perspective at Texas Instruments, Bangalore, October 26–27, 2009

8.	Dr. Soumen Das	R&D activities on MEMS at IITKGP at IIT Bombay, March 17, 2010
9.	Dr. Soumen Das	Introduction to MEMS at IIT Kharagpur, July 3–17, 2009
10.	Dr. Chacko Jacob	Micro and Nano-structured Materials at 1st Indo-German Frontiers of Engineering Symposium, Chennai, October 1–4, 2009
11.	Dr. P. Gangopadhyay	Integrated Optic Devices at a Seminar on "Journey of Fiber Optics" with Nobel Laureate, Dr. Charles Kao, IIT Kharagpur, November 15, 2009
12.	Dr. T. K. Bhattacharyya	MEMS based Inertial Sensors at CGCRI, Kolkata
13.	Dr. T. K. Bhattacharyya	MEMS based accelerometer : g to micro-g at North Eastern Hill University, Shillong

LECTURES BY VISITING EXPERTS

1.	Mr. Sourabh Datta Chowdhury, Maxim Integrated Products, California, USA	Ongoing research activities at Maxim. 2009

BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. S. K. Ray, R. Mahapatra, G. S. Kar and S. Maikap	"Dilute carbon alloy group-IV semiconductor heterostructures for advanced MOSFET devices", in Applied Physics in the 21st Century	ISBN: 978-81-308-0238-1	2009

PATENTS GRANTED

1. Terahertz frequency radiation sources and detectors based on group-IV materials and Method of manufacture (Granted, Ref: US Patent No. : US 7,386, 016 B2 dated 10th June, 2008)
2. A patent application on "The technology which leads to improved production of bast fibers using bacterial biofilm' is presently placed on the "Technologies Developed" Web-portal of IIT Kharagpur
3. Nobel Diamond Like Nanocomposite material use for biocompatibale coating application, patent application no. 896/kOL/2008

LAURELS & DISTINCTIONS

1.	Dr. P. Gangopadhyay	Royal Society Incoming Fellowship to UK

COLLABORATIVE EFFORTS

1. A joint collaboration research project on "Development of micromechanical inertial and flow sensors for environmental / biomedical application" sponsored by DST, Govt. of India in going on under an Indo-Italian research programme. (ITPAR). Collaborating Institute - ITC - irst. Trento, Italy
2. A Proposal on "Indo - US centre for advanced and futuristic manufacturing" has been submitted by IIT Kharagpur to Indo-US Science and Technology forum. Under this proposal Advanced Technology Development Centre, IIT Kharagpur will be a partner institution
3. A joint collaborative research project on “Rapid prototyping technique to write photonic structures using femtosecond laser” is submitted to EPSRC along with ORC, University of Southampton, UK

FACILITIES NEW ADDITION

1. Recently IIT Kharagpur has installed a new novel custom made MBE (Molecular Beam Epitaxy) machine, Riber France made. The versatile MBE system is Compact, flexible and affordable with features carefully designed to meet the highest specifications for the research of all III-V compound semiconductor materials. This is a "Vertical Reactor" technology, with 3-inch wafer diameter integrated system. The MBE has Arsenide and Nitride growth facilities with 6 cells. Out of the 6 cells, one is Arsenic valved cracker which allows evaporating As_2 and As_4 both the allotropes. The presence of cracker cell gives us the flexibility to maintain As_2:As_4 ratio for optimizing the Gallium Arsenide growth along with reloading of As without disturbing the chamber vacuum. Also the machine has both Ammonia (NH_3) and plasma N_2 sources for Gallium Nitride growth. Ammonia will be used for thick film growth and plasma N_2 for very fine structures. Besides, the MBE has double dopant (Si and Mg) cell for acceptor and donor impurities. The cryogenic pump is used for 10^{-11} Torr vacuum and the pump is water cooled. So, uninterrupted water supply to the pump is essential to maintain the vacuum system. The uninterrupted power supply to the system is at the same time important to power the cryo-pump, turbo-molecular pump, computer, HMI and all the cells. For that a custom designed UPS & generator system has been successfully installed
2. Recently a Network Analyser, N5242A, 10 MHz-26.5 GHz has been installed and functional

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA ORGANIZED

#	Name of the Seminars / Workshops / Conferences / Symposia	Duration
1.	Third National Conference on “MEMS, smart structures and materials, ISSS MEMS 2009”, at CGCRI, Kolkata	3 days
2.	Workshop on “MEMS accelerometer”, at IIT Kharagpur	1 day
3.	Workshop on “MEMS CAD”, at IIT Kharagpur	2 days

COMPUTER & INFORMATICS CENTRE

HEAD : Professor Prabir Kumar Biswas

Officer :

Nanda, Dilip Kumar	M.Sc., DIIT, Ph.D. (IIT Kharagpur), IT Infrastructure Management and Operations, Application Software & Numerical Techniques
Partha Goswami	B.Tech. (CU), M.Tech. (IIT Kharagpur), Enterprise & Optical Transport Network
Pramod Kumar Singh (On lien)	B.Tech., M.Tech., Ph.D. (IIT Kharagpur), Algorithm and Data Network
Devshri Roy	B.Tech., M.Tech., Ph.D. (IIT Kharagpur), Artificial Intelligence, DBMS
Bimal Kanti Dutta	M.Sc., PGDCS (Roorkee University), DBMS, OS, Algorithms, Computer Networks, Distributed DBMS & Graphics Programming.
Surid Kumar Das	B.Tech., M.Tech. (Rajasthan Vidyapith, Deemed University), Hardware, Computer Network
A. Chattopadhyay	M.Sc., MS (IIT Kharagpur), Hardware, OS, Network Security & Applications
Sudipto Das	B.Tech., M.Tech. (Rajasthan Vidyapith, Deemed University), OS, Network Applications and Security

FACILITIES

(i) Networking Facilities

The Institute has a wired Gigabit Ethernet campus wide network with optical fiber backbone spread over Academic and Hall areas. It is one of the biggest network setup in the region that caters to approx 10,000 users. In addition to the two high bandwidth STM1 connections existing in the Institute for the user community which is being utilized properly, access is also available to the 1 Gbps redundant bandwidth connectivity provided by the National Knowledge Network.

Following new network connections/components have been added to the Institute backbone network:

(i) Network connectivity in the newly constructed Rajiv Gandhi School of Intellectual Property Law (RGSOIPL)

(ii) Extension of the network to the 2nd Floor of Ashutosh Mukherjee Hall of Residence (AM)

(iii) Extension of the network to the 2nd floor of Mother Teresa Hall of Residence (MT)

(iv) Extending dedicated gigabit connectivity from CIC to the ERP Development Lab in the Industrial Engineering & Management Department for the hosting of the ERP Servers.

(v) Installation of a Proxy Server Load-balancing Switch at CIC to distribute client requests among the proxy servers for efficient use. It will allow all the proxy servers to be represented by a single virtual IP address to internal clients also provide a failover across the group of proxy servers.

(vi) Upgrade and strengthen the Central Library network backbone infrastructure for speed and reliability enhancement.

(vii) Network expansion in the new Annex III building of Mining Engineering Department

(viii) Extending and strengthening the network connectivity's of the extension centers at Bhubaneswar and Kolkata for running the post graduate program thru video conferencing.

(ix) Integrating the National Knowledge Network with the Institute network

(ii) Network Facilities Being Created

Network design and implementation due to extension of Hall of Residences in phases

Phase – I, the network extension is being carried out in the Radha Krishnan Hall of Residence (RK), Rajendra Prasad Hall of Residence (RP), Patel Hall of Residence (PH), Azad Hall of Residence (AH), Nehru Hall of Residence (NH), Gokhale Hall of Residence (GH) and Zakir Hussain Hall of Residence (ZH) to provide for an additional 1403 new connections

Phase – II, the network extension is to be done for 857 students in the Azad Hall of Residence (AH),

Adhoc wireless connectivity has been provided in the halls as well as the hospital for the students

(iii) Laboratory Facility

One of the three student's laboratories would be equipped with state of art thin clients and the other two would be using PC's in order to cater to high end Engineering graphics laboratory classes. The centre would also have a thin client based student's terminal room which would be available to them round the clock. The laboratories as in the earlier years are being utilized to the fullest by engaging them to support the Institute Training & Placement activities, various short term courses as well as IT related festivals organized by different Departments / Centers / Schools. In addition to this the laboratories are also being utilized for the techno fest Kshitij and online registration of UG and PG students every semester.

(iv) Software Facility

Institute has procured 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 has also been procured for the faculty, staff and students of the Institute.

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), SPSS (statistical package) etc.

CONTINUING EDUCATION CENTRE

DEAN : Professor Ajay Chakrabarty

FACILITIES

(i) Transit Hostel Accommodation for 40 Beds Capacity
(ii) Three Studios at Kolkata, Bhubaneswar and Kharagpur Seating Capacity (40+4+60)

(a) Equipments

(i) Lap Top (Three numbers)
(ii) High luminosity overhead projectors.
(iii) LCD Panel for multimedia projection.
(iv) 3M Multimedia Projector.
(v) Shure cordless microphone and transmitter/receiver set.
(vi) Ahuja tape recorder and public address system.

(b) Software

(i) Distance Education Database (from International Centre for Distant Learning)
(ii) KOMPASS Industrial Directory of India giving details of over 60,000 companies
(iii) Macromedia Authorware (4.0.6 licences)
(iv) Adobe Photoshop - graphics package
(v) Microsoft Front Page Express - for Web page development
(vi) Microsoft Office 2000 Professional
(vii) Microsoft Windows 2000 Professional
(viii) Microsoft Windows 2000 Server with terminal server facility
(ix) Norton Antivirus 5.0 for Windows 95/98/NT, Norton System Works 2000 for Windows 95/98
(x) ALGOR FEM package for stress fluid flow and electrostatic field analysis

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

(i)	No. of Teachers completed Ph.D. degree	:	15
(ii)	No. of Teachers completed M.Tech. programme	:	14
(iii)	No. of Teachers joined Ph.D. programme	:	12
(iv)	No. of Teachers taking advance admission to Ph.D. programme	:	13
(v)	No. of Teachers joined M.Tech. programme	:	15

CD CELL ACTIVITIES

(i)	Manuscripts for text books completed	:	01
(ii)	No. of Text books approved	:	01
(iii)	No. of CAI packages approved	:	00

SEMINARS / WORKSHOPS / CONFERENCES ORGANIZED BY THE UNIT

(i) Total No. of Workshops / Conferences Organized : 14
(ii) Total No. of participants attended : 364+

(a) Short Term Courses Organized

#	Short term courses organized under	No. of Courses	No. of participants	Remarks
1.	QIP (AICTE) Short Term Courses	10	393	11 Weeks
2.	MHRD/AICTE Special Summer Short Term Courses	14	481	21 Weeks
3.	MHRD/AICTE Special Winter Short Term Courses	17	588	23 Weeks
4.	Sponsored/Self finance Short term courses	52	1560	
	Total ::	93	3022	

(b) M. Tech. Programme organised

#	Name of the Subject	No. of Students	Remarks
1.	Electrical Engineering	17	3 Years
2.	Electronics and Electrical Communication Engineering	22	3 Years

CENTRAL RESEARCH FACILITY

CHAIRMAN :	**Professor Indranil Manna**	**(upto November 30, 2009)**
	Professor Rahul Mitra (Materials Science Division)	**(from December 01, 2009)**
	Professor Ananta Kumar Ghosh (Life Science Division)	**(from December 01, 2009)**

FACULTY ASSOCIATED

Prof. A. Basak,	In charge, CD Polarimeter
Prof. M. Bhattacharjee	In charge, EPR
Prof. S. K. Srivastava	In charge, ESCA
Prof. S. K. Ghosh	In charge, FACS
Prof. I. Manna	In charge, FESEM, XRD, HRXRD (upto 30.11.09)
Prof. S. K. Pabi	In charge, XRD, HRXRD w.e.f. 1.12.09)
Prof. J. Dutta Majumder	In charge, FE-SEM (w.e.f. 1.12.09)
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. T. Pathak	In charge, Mass Spectrometer
Prof. S.B. Singh **Prof. J. Dutta Majumder**	In charge, OES
Prof. K. Biswas	In charge, Optical Microscopy (w.e.f. 1.12.09)
Prof. B. K. Dhindaw	In charge, Optical Microscopy (upto 30.11.09)
Prof. P. Roy Chowdhury	In charge, Optical Fibre
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

Senior Scientific Officer :

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

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

Life Science Division :

i) **2D GEL Laboratory : Two-dimensional gel electrophoresis system :** This equipment is used for analyzing protein samples (qualitative and quantitaive) provided by investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE).

ii) **DNA Sequencer; Real time Polymeric Cyclic Reaction (PCR) analyzer, 2-Dimensional gel electrophoresis Laboratory :** This equipment is used to determine nucleotide sequence of DNA samples provided by different investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE and AgFE).

iii) **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)

iv) **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, DNA 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.

v) **High Pressure Liquid Chromatography Laboratory :** HPLC is an efficient technique used for the separation of macro/micro molecules such as organic compounds, amino acids, nucleotides, aroma/fragrance, enzymes and proteins etc. 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.

vi) **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.

vii) **Protein Crystallography : Protein X-ray Crystallography (PX) Laboratory :** Rigaku Micromax 007^{HF} X-ray generator is equipped with RaxisIV++ detector and X-stream cryo for X-ray diffraction studies of protein crystals to determine their 3D structure in atomic resolution. Three dimensional structures of proteins from pathogenic organisms like *M. tuberculosis* and *S. aureus* have been determined.

Materials Science Division :

viii) **Field Emission Scanning Electron Microscope Laboratory :** The field emission gun assisted scanning electron microscopy (FE-SEM, Supra 40V, Carl Zeiss, Germany) provides an excellent scope of microstructural characterization using secondary or back-scattered imaging, energy dispersive spectroscopy and electron back scattered diffraction analysis. The samples analysed include various metals and alloys, semi-conducting and insulating films, refractories, polymeric and ceremic powders, failed engineering components and hiybrid / composite materials.

ix) **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.

x) **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 magneto-resistance 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.

xi) **High Resolution Transmission Electron Microscope Laboratory :** The HRTEM laboratory is equipped with the JEOL JEM-2100 High Resolution Transmission Electron Microscope, OXFORD 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.

xii) **Optical Emmission 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 (from the intensity of spectrum).

xiii) **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.

xiv) **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, Microalloyed steel, Laser surface alloying, Cutting tool materials, Functionally graded materials, Intermetallics, Rubber and polymer based composites, Ceramic materials etc.

xv) **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.

xvi) **TEM Sample Preparation Laboratory :** This laboratory provides services for preparing samples of different types for TEM study using instruments like cryo-ultramicrotome jet polisher, and precision ion polishing system (PIPS) etc.

xvii) **Thermal Analysis Laboratory :** The thermal analysis laboratory I equipped with Differential Scanning Calorimeter (DSC), Thermo-gravimetric and Differential Thermal Analyzer (TG-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 calcination of aqueous combustion synthesized metal oxide powders, analysis of reactions towards formation of new ceramic compounds, effect of mechanical milling on the reaction onset temperature of aluminum based nano composites, etc.. The TMA is being used to study the sintering behaviour of nano composite materials as well as to determine the thermal expansion coefficients of some newly developed materials.

xviii) **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 utilised 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.

Thrust Areas :

New Acquisitions :

1. Thermal Analysis Laboratory:

Nanotrac Particle Analyzer : An instrument to determine the particle size and zeta potential of fine powders.
Make : Microtrac Inc., 148, Keystone Drive, Montgomeryville, PA 18936, USA**.**

2. **Hall Effect :** Low temperature measurement facility for electrical resistivity, magneto-resistance, Hall voltage etc. down to 10 K and the magnetic field up to 1 Tesla have been added recently in the laboratory.

LECTURES BY VISITING EXPERT

i) A Seminar talk delivered by Dr. Keith Graham Dicks, Oxford Instruments, UK on "Electron Backscattered Diffraction (EBSD) Technique and Applications in Scanning Electron Microscope" on 23.02.2010.

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA ORGANIZED

#	Name of the Seminars / Workshops / Conferences / Symposia	Duration
i)	Workshop on "Characterization of Biomaterials"	September 12, 2009
ii)	Workshop on 'Characterization of Engineering Materials"	September 13, 2009
iii)	Workshop on "Electron Backscattered Diffraction (EBSD) Technique and Applications in Scanning Electron Microscope"	February 23-24, 2010

CENTRAL LIBRARY

CHAIRMAN : Professor Sadananda Sahu

Librarian

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

Deputy Librarian :

Ratnasamy, M.	M.L.I.S., P.G.D.C.A. M.Lib.Sc., M.Com.

Assistant Librarian :

Shankar, Uma	M.Lib.I.Sc., M.A.
Mazumdar, Kamal	Ph.D., M.Lib.I.Sc., B.Com, CPDA
Pathak, Sandeep K.	Ph.D, M.Sc., M.Lib.I.Sc., M.A., B.Sc., D.C.A.
Nandi, Atin	M.Lib.I.Sc., M.Sc.

APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Retirement :

Mr. J. N. Pusty	Deputy Librarian
Mr. P. K. Mohapatra	Assistant Librarian
Mr. D. K. Das	Attendant

The Central Library is one of the biggest technical libraries in Asia and its web site address is http://www.library.iitkgp.ernet.in

PRINT DOCUMENTS ADDED DURING THE YEAR 2009-2010

The Central Library acquired 2121 general books and 1852 text books. It also added 4663 bound volumes of periodicals, 329 Theses, besides reprints and annual reports of other universities.

NEW E-RESOURCES ADDED DURING THE YEAR 2009-2010

i) 600 e- journals from different publishers
ii) 450 print journals from different publishers
iii) 4000 CRC E-books collection copy right years 2004-2010

INTRODUCTION OF NEW LIBRARY SERVICES

i) Online Document Delivery Service of journal's articles
ii) Weekly current arrival list of PhD theses submitted by the students of the Institute

CIRCULATION

The books circulation activities are fully automated and serve the users consisting of the faculty, research scholars, students and staff. The books circulation service is kept open for 50 hours a week. On the average, the monthly circulation transactions are about 10000. About 65 copies of documents were obtained through Inter-Library Loan.

DIGITAL LIBRARY

The Digital Library provides access to the following e-resources :

i) Full-text databases :

Access to 10000 full-text journals from the following databases.

Elsevier Science Direct, Springer Link, Proquest, ABI/INFORM, Applied Science & Technology Plus online, IEL (IEEE & IEE electronic library), ACM Digital Library, ASME, ASCE, EBSCO Databases, Emerald, Nature Journal, ASTM Standard, Capitaline, ACS Journals, JSTOR, Project Muse, 27 Nature group journals, 27 Annual Review Journals.

ii) Bibliographic Databases :

SciFinder Scholar, ISI Web of Science, MathSciNet, J-Gate Custom Content for Consortia and SCOPUS.

iii) E-books :

Central Library has purchased (onetime) with perpetual access of 4000 CRC Press e-books of major science and technology subjects.

The digital library also provides access to Video-Courses which contain the lectures delivered by out faculty members. Twice a week the Digital Library organizes User Education Programme so as to train the users to use our digital resources effectively.

iv) INDEST-AICTE Consortium Databases :

The Central Library IIT, Kharagpur is a member of the INDEST Consortium. INDEST membership facilitates the users to access the full text of about 10000 online journals and 5 bibliographic databases.

INSTITUTIONAL DIGITAL REPOSITORY

Central Library, IIT Kharagpur has setup an Institutional Repository using open source software 'D-Space'. At present the Institutional Repository has 2000 articles; several question papers, books and institute PhD theses.

RENOVATION WORK

Hall no. 3, 4 and 5 at Central Library of IIT Kharagpur have been renovated (civil and electrical work).

NEW EQUIPMENT AND FURNITURE

The following equipment and furniture have been acquired for the users :

i) Two 5 KVA UPS
ii) 10 Computers
iii) One water Cooler
iv) 300 reading chairs

PHYSICAL STOCK VERIFICATION OF LIBRARY BOOKS

Central Library had carried out physical stock verification of Library books during the year 2009-2010. This is the first time stock verification has been carried out since inception.

ORGANIZING INDEST-AICTE WORKSHOP AND 7TH ANNUAL MEET

The "INDEST-AICTE Workshop and Seventh Annual Meet" was held at IIT Kharagpur during January 13-15, 2010 for the benefit of all categories of its member institutions. The theme of the Workshop for this year was "Use and Management of E-Resources". Prof. D. Acharya, Director of IIT Kharagpur inaugurated the workshop. 200 participants from 18 states including Librarians from IITs, IIMs, IISERs, NITs, National Library and other government engineering and private engineering college attended the 7^{th} annual meet and workshop. Twelve publishers and publishing agencies participated the product exhibition and product presentation during the workshop. There were invited lectures by expert and a panel discussion on "Issue and Challenges in Management of e-resources".

IIT Kharagpur received the best user award for the following e-resources subscribed by the INDEST-AICTE Consortium :

i) Product : IEEE,
ii) Product : Springer- E-books
iii) Product : ACM Digital Library
IV) Product : Science Direct.

Dr. B. Sutradhar was the coordinator of the Workshop

INVITED LECTURES

i)	Dr. B. Sutradhar	Delivered an invited lecture on Community Development in College Libraries in the seminar on Role of College Libraries in Community Development Organized by Central Library Department, Mahishadal Girl's College during February 05-06, 2010
ii)	Dr. B. Sutradhar	Delivered an invited lecture on Management of Electronic Resources at 8th Refresher Course on ICT Application in Academic Library Management, organized by the Department of Library and Information Science, University of Calcutta during February 19 – March 12, 2010

PARTICIPATION IN CONFERENCE / WORKSHOPS

i)	Dr. B. Sutradhar	Participated in 3rd International conference on Digital Libraries (ICDL 2010) held at TERI, New Delhi. ICDL 2010 organized by TERI during February 23-26, 2010 at New Delhi

CENTRAL WORKSHOP & INSTRUMENTS SERVICE SECTION

CHAIRMAN : Professor Prasanta Kumar Das

Officer :

Patra, S.	**Assistant Workshop Superintendent**
Sanyal, A. K.	**Engineer**

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 :

i) Mechanical
ii) Glass Blowing
iii) Carpentry
iv) Electronics
v) Audio Visual

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

MECHANICAL SECTION

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

i) Mechanical Fabrication Section :

It is equipped with various types of machines like 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, and Pantograph Machine, Power Saw, Shearing Machine, Polishing, Press, Arc Welding, Brazing and Soldering, etc.. This year we are purchasing one table mounted CNC Lathe machine, this will enhance 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 as per design.

During the year 2009-2010 the Mechanical Section has performed jobs of about 120 work orders, comprising of –

a) Fabrication of different types of Wave Guides
b) Fabrication of Die-Punches of different sizes
c) Fabrication of different sizes tensile, Charpy specimens of different materials
d) Fabrication of sample holder for wear test
e) Fabrication of different types of flanges, Studs etc.
f) Fabrication of Rack, Pinion & Gears
g) Fabrication of Sample for, XRD, X-ray, SEM, test
h) Fabrication of different attachment for leaser operation
i) Fabrication of Micro-channel
j) Fabrication of Mould with different materials
k) Fabrication of different types of adopters
l) Fabrication of servo hinges
m) Flat Pannel Bio-reactor
n) Heat sink
o) Fabrication of fixtures for experiments.

ii) Mechanical Instruments Section :

Different types of precision mechanical instruments are repaired in this section. Some typical examples include different types of stopwatches, gauges, valve regulators, balances, vacuum pumps, gear pumps, husk cutter, water flow meter, gas flow meter, dial indicator, dial gauge, micrometer, gas regulator, pressure gauge, autoclave, viscometer, various types of equipments & machines used in our Hospital, etc. Fabrication of sample holders of SEM & XRD, fabrication of very precision items etc.

GLASS BLOWING SECTION

This section is equipped with glass blowing lathe, glasscutter, glass grinder, glass annealing chamber, etc. Mainly glass work of Borosilicate glass is done here with the help oxygen and LPG for Departments, like Chemistry, Biotechnology, Chemical, Cryogenic, Mechanical, Material Science, Metallurgical Engineering, Agriculture & Food Engineering, Aquaculture, Physics & Meteorology, etc. The main fabrication jobs of this Section include different type of condensers, Dewars, different volume capacity F.B, R.B., Flusk with neck joints, manometer, U&S Tubes, glass bubbler, glass coil for oil bath, gas collector, etc. The fabrication of glassware items are done as per drawing and design of the equipments. This year this Section has finished about 65 Work Orders.

CARPENTRY SECTION

Housed in the workshop complex behind Chemical Engineering and Automobile Section, this section has Auto Planner, Joints Nature’s machinery, Vertical Band Saw and Multipurpose Machine. Apart from carpentry jobs, as per requirement of the Institute it does also undertake construction of MS Frames, Hand painting, Spray painting, Polishing of leather painting,

writing of name Plates, display board & upholstery jobs as students projects. This year this section has manufactured 40 Nos. special reading tables for our library.

This Section also meets the major requirements of furniture of the Institute. During the year 2009-2010, this Section has completed 105 Work Orders of various Departments of the Institute.

Details of some of the Work done during period :

i)	Faculty Table	---	17 Nos.
ii)	Office Table	---	09 Nos.
iii)	Computer Table	---	04 Nos.
iv)	Laboratory Table	---	23 Nos.
v)	Working Table	---	13 Nos.
vi)	Book Shelf	---	03 Nos.
vii)	Student's model of different shape	---	92 Nos.
viii)	Display Board	---	20 Nos.
ix)	Counter	---	01 No.
x)	Box as per design	---	08 Nos.
xi)	Show Rack	---	05 Nos.
xii)	Wooden blocks	---	36 Nos.
xiii)	Name Plate	---	67 Nos.
xiv)	Partition wall	---	03 Nos.
xv)	Wooden Frame	---	11 Nos.
xvi)	Big Arena for Kshitij	---	02 Nos.
xvii)	Table with safety cover	---	04 Nos.
xviii)	Bench	---	02 Nos.
xix)	Stool	---	25 Nos.
xx)	Keyboard	---	01 No.

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 installed in this section helps users of different departments in fabrication of double sided PCBs.

List of some of the equipments repaired by the section are :

i)	GBC Lamination Machine	Academic (UG)
ii)	Inverter (Microtek 800)	Mining Engineering
iii)	Spectro Photometer	Agricultural & Food Engineering
iv)	Electronic Roker	Biotechnology [2 Nos.]
v)	Ultrasonic machine	B. C. Roy Technology Hospital [2 Nos.]
vi)	Sonicator	Chemistry [5 Nos.]
vii)	Electronic steady pipette	Biotechnology
viii)	COD Digester (Reactor)	Civil Engineering
ix)	Stabilizer	Biotechnology [3 Nos.]
x)	Steripette (Tarson)	Biotechnology

xi)	Engine indicating system	Agricultural & Food Engineering
xii)	Electronic Balance	Metallurgical & Materials Engineering, Materials Science, Agricultural & Food Engineering
xiii)	Lathe machine Elect. controlled	Mining Engineering
xiv)	Shaker Motor	Biotechnology
xv)	The Dry bath	Biotechnology
xvi)	U. P. S.	Accounts
xvii)	Projector	Chemistry
xviii)	Astro Furnace	Metallurgical & Materials Engineering
xix)	Control unit of U.H.V. Ion gauge	Advanced Technology Development Centre
xx)	Magnet Power Supply	Central Research Facility
xxi)	Waterbath of data vapour	Chemistry [2 Nos.]
xxii)	Creep testing machine	Metallurgical & Materials Engineering
xxiii)	Temperature Controller	Civil Engineering
xxiv)	E.C.G. Charger	B. C. Roy Technology Hospital
xxv)	Thermostat	Chemistry
xxvi)	Magnetic Stirrer	Biotechnology [3 Nos.]
xxvii)	Aplab power supply	Metallurgical & Materials Engineering, Biotechnology
xxviii)	Display unit of ponto flow meter	Civil Engineering
xxix)	Vertex mixture	Biotechnology

AUDIO VISUAL SECTION

Audio Visual Cell is primarily involved in providing audio visual support for conducting regular classes at different lecture halls (approximately 150 classes per week). It supports audiovisual facilities with MM 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. AV Cell used to provide support about 5000 regular classes throughout the year in aforesaid classrooms. Besides these the Cell provides AV facilities in all seminars, symposiums, workshops, short term courses and meetings at Gargi Moitrei, S N Bose Auditorium and associated programme at Netaji and Kalidas Auditorium. Senate hall, Committee Room and Board Room. All the TSG activity programme are 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 and International Seminars, Conferences and Workshops and also to JEE and GATE units.

The Audio Visual Cell has a number of sophisticated equipments like Multimedia Projectors, Document Cameras, High quality Amplifiers and Mixtures, Wireless Microphones & Conference Systems.

A new 5200 lumen DLP multimedia projector has been procured and installed ceiling mounted at Kalidas auditorium at Vikramshila complex.

5 new multimedia projectors, 8 nos. of cordless collar mics and 6 nos of hand held cordless microphones and 4 PCs have been appended to the inventory of the Cell.

CENTRE FOR THEORETICAL STUDIES

HEAD : Professor Pratim Kumar Chattaraj

FACULTY ASSOCIATED

Pal, Sudebkumar Prasant	B.Tech. (Hons.), M.Tech., Ph.D. (IISc Bangalore) (Computer Science and Engineering) Computational geometry, Design and analysis of algorithms
Banerjee, Soumitro	B.E., M.Tech., Ph.D. (IIT Delhi) (Electrical Engineering) Nonlinear Dynamics, Chaos / Bifurcation Theory
Ghatak, S. K.	Ph.D. (Calcutta University) (Physics & Meteorology) Condensed Matter Physics
Taraphder, A.	M.Sc., Ph.D. (IISc Bangalore) (Physics & Meteorology) Theoretical Condensed Matter Physics
Bharadwaj, Somnath	M.Sc., Ph.D. (IISc Bangalore) (Physics & Meteorology) Theoretical Astrophysics and Cosmology
Kar, Sayan	M.Sc., Ph.D. (IIT Kanpur) (Physics & Meteorology) Relativity and High Energy Physics
Khastgir, S. Pratik	M.Sc., Ph.D. (IOP, Bhubaneswar) (Physics & Meteorology) Mathematical Physics and Integral Models
DasGupta, Anirvan	B.Tech., M.Tech., Ph.D. (Kanpur) (Mechanical Engineering) Dynamics, Control and Robotics
Chattaraj, P. K.	M.Sc., Ph.D. (IIT Bombay) (Chemistry) Theoretical Chemistry, Quantum Chaos
Bandyopadhyay, Sanjoy	M.Sc., Ph.D. (IISc Bangalore) (Chemistry) Computational Chemistry, Molecular Modelling
Kumar, Somesh	M.Sc., Ph.D. (IIT Kanpur) (Mathematics) Statistical Decision Theory and Inference, Quantum Computing
Roy, A. R.	M.Sc., Ph.D. (IIT Kharagpur) (Mathematics) Relativistic Cosmology, Fuzzy Mathematics, Operations Research
Choudhary, R. N. P.	Ph.D. (Edinburgh University) (Physics & Meteorology) Condensed Matter Physics (Expt.)

Staff :

Halder, Ujal	Post Diploma in Computer Application, Diploma in Electrical Engineering (Computer Science and Engineering) Administration, Networking, Web development, Trouble shooting etc.)

Project Staff :

Guha Sarkar, Tapamoy	JRF, MRT, 3 years
Panda, Subhasis	CSIR, JRF, 2 years
Nayak, R. R.	DST Fast Track Project, 3 years
Parihari, D.	DST Fast Track Project, 3 years
Ghosh, Tatan	CSIR, JRF, Till March 2010

RESEARCH AND DEVELOMPENT

Brief Descriptions on-going activities :

Research is carried out in CTS on the following areas :

1. Astrophysics, Cosmology and Relativity
   - i) Magnetic fields of strange stars and neutron stars
   - ii) Large scale structure formation in the Universe
   - iii) Bulk-brane dynamics

2. Dynamics and Control
   - i) Nonlinear dynamics : Bifurcation Theory and Chaos
   - ii) Control theory
   - iii) Vibrations

3. Mathematics, Mathematical Physics and Theoretical Computer Science
   - i) Integrable models
   - ii) Computational and combinatorial geometry
   - iii) Pure and applied mathematics
   - iv) Quantum computation and quantum information
   - v) Graph and Hypergraph Theory

4. Theoretical Condensed Matter Physics
   - i) Computational Condensed Matter and Statistical Physics
   - ii) Superconductivity

5. Theoretical Chemistry
   - i) Large scale simulations of complex systems
   - ii) Density functional theory, quantum chaos

Thrust Areas :

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

ACTIVITIES

Courses and Graduate Programme :

1. CTS is offering new advanced post-graduate courses which are relevant across Departments through involvement of faculty from various Departments. These courses are :
   - i) Methods in Molecular Simulations (TS70001)

ii) Advanced Dynamics (TS70002)
iii) Wave Propagation in Continuous Media (TS70003)
iv) Advanced Mathematical Techniques (TS70004)
v) Advanced Quantum Theory (TS70005)
vi) Quantum Mechanics and Quantum Computing (TS70006)

2. CTS is also admitting Ph.D. students through sponsored projects and fellowships (CSIR) under Advanced Technology Development Center. Currently three such students are enrolled.

CTS courses taught (2009-2010) :

i) Advanced Mathematical Techniques (TS70004) (Autumn)
ii) Quantum Mechanics and Quantum Computing (TS70006) (Autumn)
iii) Advanced Dynamics (TS70002) (Spring)
iv) Methods in Molecular Simulations (TS70001) (Spring)
v) Wave Propagation in Continuous Media (TS70003) (Spring)

ON-GOING RESEARCH PROJECTS

Sponsored Projects :

#	Title of the Project	Sponsor(s)	Duration
1.	Kinematics of flows in diverse contexts	DST, New Delhi	2006 – 2009
2.	Measuring the HI power spectrum with the GMRT	BRNS, DAE, Mumbai	2007 – 2010
3.	Gauge-Gravity Duality and D-brane Dynamics	DST, New Delhi	2009 – 2012

FACILITIES

i) A Computer Lab with 11 Pentiums, 2 Quad core server and a Linux Cluster from CDC, HP color Laserjet duplex network printer, HP Laserjet duplex network printer, HP Colour Deskjet Printers, Scanner, Multimedia Projector

ii) Software (Mathematica, Matlab, Maple, Scilab, IDL etc.)

iii) CTS library

AIMS & OBJECTIVES

i) To generate and nucleate theoretical research
ii) To organize seminars on diverse topics
iii) To organize Conferences/Workshops
iv) To provide research facilities to students/faculties from within and outside IIT Kharagpur

v) To offer postgraduate level elective courses

The Centre for Theoretical Studies (CTS) at the Indian Institute of Technology, Kharagpur (IIT Kharagpur) has been in existence since 1998 and is located in the first floor of the Sahid Bhavan (Old Institute Building) at the Eastern end of the IIT campus. Its primary goal is to generate and nucleate theoretical research on fundamental aspects of basic and engineering sciences. The role of the CTS in the academic framework of IIT Kharagpur is to bring together people of similar interests under a common umbrella. The CTS, apart from acting as a facility for research in theoretical studies in science and engineering, also trains graduate students and provide opportunities to post doctoral workers and researchers from outside IIT Kharagpur. Additionally, the CTS has an active visitors programme of both short and long term visitors. The CTS also organizes seminars, workshops on a regular basis on diverse topics. An important component of CTS workshops and seminars is to motivate young students (both undergraduates from IIT Kharagpur and graduate students from within and outside IIT Kharagpur) to actively pursue theoretical research in front-line areas of science and engineering. Finally, besides promoting research on specialised topics within a given sub field, the CTS hopes to cultivate inter-disciplinary theoretical research as a major goal, tapping the diversity available in the academic population of an Institute like IIT Kharagpur.

VISITORS PROGRAMME

Objective

To provide facilities to faculty members, postdoctoral fellows and students from academic and research institutions in India and abroad to conduct research on theoretical problems in science and engineering in collaboration with faculty members of IIT Kharagpur.

COLLABORATIVE EFFORTS

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

VISITORS DURING 2009–2010

#	Name of the Visitor	Institute / University	Associated Faculty
1.	Dr. Sanjay K Pandey	Reader, LBS Clooege, Gonda	Prof. S. Bharadwaj Department of Physics
2.	Dr. Motahar Reza	Assistant Professor, NIST, Berhampur	Prof. S. Chakraborty Mechanical Engineering
3.	Dr. Arindam Chakraborty	Assistant Teacher, JPHS, Kolkata	Prof. P. K. Chattaraj Department of Chemistry

4.	Dr. Shanta Kumari Sunanda	Lecturer, BIT Mesra, Ranchi	Prof. C. Nahak Dept. of Mathematics
5.	Dr. Dilip Kr. Maity	Lecturer, BITS, Pilani	Prof. S. Bhattacharyya Dept. of Mathematics
6.	Dr. Maifuz Ali	Assistant Professor, NIST, Berhampur	Prof. S. Sanyal Dept. of E&ECE
7.	Dr. Biswajit Pandey	Lecturer, Dept. of Physics, Visva-Bharati University	Prof. S. Bharadwaj Department of Physics
8.	Dr. Sujit kumar Bose	Prof. [Retd.], SNBNCBS, Kolkata	Prof. S. Dey Civil Engineering
9.	Dr. Sk. Saiyad Ali	Lecturer, Dept. of Physics, Jadavpur University	Prof. S. Bharadwaj Department of Physics
10.	Dr. Hemant Kr. Srivastava	Project Associate, IICT, Hyderabad	Prof. P. K. Chattaraj Department of Chemistry
11.	Dr. Ram N. Mohapatra	Prof., Dept. of Mathematics, Univ. of Central Florida, USA	Prof. P. Panigrahi Dept. of Mathematics
12.	Dr. Hemwati Nandan	Post Doc, JMI University, New Delhi	Prof. S. Kar Department of Physics

LECTURE BY VISITING EXPERT

1.	Prof. Patrick Bultinck Head, Quantum Chemistry Group, Ghent University	Title : Are there atoms in a molecule? Date : February 19, 2009
2.	Dr. Sudhansu S. Mandal IACS, Kolkata	Title : Neutral Collective Excitations in Fractional Quantum Hall Effect Date : October 19, 2009
3.	Prof. Subir Kumar Ghosh, FNASc Professor, TIFR, Mumbai	Title : Online Algorithms for Searching and Exploration in the Plane Date : December 29, 2009
4.	Prof. N. Sukumar Rensselaer Polytechnic Institute, USA	Title : The Elephant and the Flea - Cheminformatics with Electron Density-Derived Descriptors Date : September 15, 2009
5.	Prof. S.K.Ghosh Professor, BARC, Mumbai	Title : Density Functional Theory at Different Length Scales: A Versatile Tool for Materials Modelling Date : December 31, 2009
6.	Prof. V. Subramaniam Chemical Laboratory, CLRI	Title : Engineering and redesigning of metalloproteins and metalloenzymes: A computational chemistry perspectives Date : December 31, 2009
7.	Prof. P.W.Ayers Department of Chemistry & Chemical Bio Science, McMaster University, Canada	Title : Implications of “Nearsightedness” for Chemical Concepts Date : December 31, 2009
8.	Prof. P.Sen	Title : Electronic shell models in atomic clusters

	Harish-Chandra Research Institute (HRI), Allahabad	: Applicability and consequences Date : December 31, 2009
9.	Prof. S.K.Pati Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore	Title : Transport, magnetic and optical Properties of Graphene Nanoribbons Date : December 31, 2009
10.	Prof. P.Bandyopadhyay School of Information Technology, JNU, New Delhi	Title : Understanding the enzyme important in antibiotic resistance: Computer simulation of b-lactamase enzyme Date : December 31, 2009
11.	Prof. Sourav Pal, FNA, FASc, FNASc National Chemical Laboratory, Pune	Title : Non-iterative approximation to Coupled perturbed Kohn-Sham method (NIA-CPKS): Development of new approach and its application to study electric response properties Date : December 31, 2009
12.	Prof. R. N. Mohapatra Professor, University of Central Florida, USA	Title : Frames on a Hilbert C* Module Date : February 05, 2010
13.	Prof. Naresh Dadhich Professor Emeritus, IUCAA, Pune	Title : Uniform density static fluid sphere in higher dimensions and its universality Date : March 26, 2010
14.	Prof. V. Balakrishnan Professor Emeritus, Department of Physics, IIT Madras	Title : Recurrences in classical and quantum dynamics Date : February 03, 2010

LAURELS & DISTINCTIONS

1.	Prof. P. K. Chattaraj	J. C. Bose National Fellowship, 2010
2.	Prof. P. K. Chattaraj	Elected Member, National Council for the Infosys Prize, 2010
3.	Prof. P. K. Chattaraj	Elected Fellow of the National Academy of Sciences, India and West Bengal Academy of Science & Technology

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

1.	One-day Symposium on Theoretical Sciences, 31st December 2009	December 31, 2009

INFORMATION CELL

PROFESSOR-IN-CHARGE : Professor Balbir Kumar Mathur

INSTITUTE CIVIL WORKS

CHAIRMAN : Professor Nirjhar Dhang

Officer :

Mukherjee, T. K.	Superintending Engineer (Civil)
Roy, Subrat	Executive Engineer (Civil)

The development programme of the Institute Campus involving infrastructure and new facilities have been taken up in view of the increase in student strength population, faculty strength and staff strength. The programme includes construction of new hostel buildings, extensions of existing students` hall of residence, classroom complex, residential flats for faculty and staff members etc.

(i) Students Accommodation

The construction for extension of Patel Hall, Nehru Hall, Azad Hall have already been completed, New blocks for Radha Krishnan Hall & Rajendra Prasad Hall are also been completed . On the other hand ongoing works such as, New blocks for Azad Hall, New blocks for Rajendra Prasad Hall, New blocks for Sarojini Naidu Hall / Indira Gandhi Hall / Mother Teresa Hall are in progress. Apart from the above works, 02 (Two) nos. of 2000 capacity Boys' Hostel have also been started.

(ii) Nalanda Classroom Complex

Block `B` for the above Complex is presently going on. The project is expected to be handed over by July 2011.

(iii) J. C. Ghosh Science Block and P. C. Roy Laboratory Block

Arrangements have been made for the construction of J. C. Ghosh Science Block and P. C. Roy Laboratory Block for Chemistry Department and Rubber Technology Centre. CPWD has been entrusted to execute the job.

(iv) Residential Apartments for Faculty and Staff

The construction works for 63 nos. of A–Type Flats and 81 nos. of B–Type Flats are going on. It is expected that 63 nos. of A–Type flats will be completed by June 2010 and 81 nos. of B–Type Flats will be completed by January 2011. Construction for 64 nos. of 2–BR Type and 80 nos. of 1–BR Type of flats for staff housing are going on.

(v) Project Staff Accommodation

The extension programme for Vikram Sarabhai Residential Complex is going on. It is expected that 117 nos. of quarters will be ready for occupancy by March 2011.

(vi) Guest House

We have already completed the 124 room guest house and is presently under use.

The Master Plan for the campus has already been approved. Several infrastructure development programmes have been undertaken in view of the increasing students' population in the campus. A few of them are students' amenity centre, Laboratory Complex, Roads and Drains, etc.

INSTITUTE ELECTRICAL WORKS

PROFESSOR-IN-CHARGE : Professor Debapriya Das

Officer :

Ghosh, Sabyasachi	Executive Engineer (Electrical)
Kumar, Mahesh	Executive Engineer (Electrical)
Chakrabarty, Dipak Kumar	Executive Engineer (Electrical)

Brief description of major activities and on going projects

The principal endeavour of this section during last one year was to ensure and provide un-interrupted power supply with minimum break down time in places for Academic activities and other areas. In order to achieve the same following measures were adopted.

i) Installation of Fire Alarm System in Central Library

ii) Augmentation and replacement of the remaining distribution networks with MCCB controlled panels and adequate size of power cables

iii) Renovation of old class rooms, laboratories and offices

iv) Replacement of conventional luminaries with energy saving luminaries in most of the academic areas mainly in Central Library etc.

v) To keep pace with faster development of the academic curricular, many of the new machines, instruments were installed in the places like Central Research Facility, Steel Technology Centre and different Departments. Redistribution of wiring was done in those places for proper load balancing.

INSTITUTE WATER WORKS

PROFESSOR-IN-CHARGE : Professor Ashok Kumar Gupta

Officer :

Biswas, Shyamal Kumar Engineer

To meet the additional water demand from the increased student and faculty strength and also to maintain the existing water supply system, Water Works Section of the Institute has taken up several new water related works. They are in different stages of progress as listed below :

Works completed :

The following works have been completed :

i) Laying of 250 mm dia main water pipeline between Underground Pump House and Hall area

ii) Construction of Iron removal filter for new deep tubewell near BC Roy Technology Hospital

iii) Laying of pipeline between deep tubewells of pumphouse no. 3 & 1 at Anicut Pumphouse

iv) Providing water connection for newly constructed blocks at RP & RK Hall of Residences

v) Construction of two deep tubewells near RP Hall & Tank No. 3

vi) Diversion of water pipelines from the construction site of VSRC (SRIC Quarters) at Dandakaranya area

vii) Laying 200 mm dia water main between Radar Tank and Dandakaryana Tank

viii) Renovation of water pipelines and fittings at Gokhale Hall of Residence.

On-going works :

The following new projects are being implemented :

i) Providing overhead water tanks & replacement of old pipelines at Dandakaranya Area (Part A & Part B)

Works in the pipeline :

i) New Water Supply Project for IIT Kharagpur.

KALPANA CHAWLA SPACE TECHNOLOGY CELL

CHAIRMAN : **Professor Somnath Sengupta**

FACULTY

Professor :

Sengupta, Somnath	Ph.D., Image & Video Processing
Sarkar, B. K.	Ph.D., RF & Microwave Engineering
Das, S. K.	Ph.D., Control System
Sen, S.	Ph.D., MEMS
Patra, Amit	Ph.D., Power System & VLSI Design
Sanyal, S.	Ph.D., RF & Microwave Engineering
Chakraborti, S.	Ph.D., Communication
Bandyopadhyay, S. S.	Ph.D., Cryogenic Engineering
Bandyopadhyay, K.	Ph.D., Satellite Communication
Manna, I.	Ph.D., Material
Ray, G.	Ph.D., Control System
Sengutpa, I.	Ph.D., Mobile Communication, VLSI
Chowdhury. D. R.	Ph.D., Audio Encompression
Das, P. K.	Ph.D., Nano Fluid
Banerjee, S.	Ph.D., VLSI based embedded system design for signal / image processing , Biomedical Instrumentation
Chaki, T. K.	Ph.D., Rubber

Associate Professor :

Saha, G.	Ph.D., Communication
Chakrabarty, C.	Ph.D., Control System
Sant, S. B.	Ph.D., Material
Datta Majumdar, J.	Ph.D., Nano fluid based
Bhattacharya, T. K.	Ph.D., RF MEMS

Assistant Professor :

Sinha, M.	Ph.D., Aerospace Engineering
Bhattacharya, A.	Ph.D., RF & Microwave Engineering
Chakraborty, P. K.	Ph.D., Solid-State Science and Technology
Mitra, A.	Ph.D., Nutraceuticals & herb based medicine / Diabetology, Drug encapsulation, Clinical Trials
Das, Soumen	Ph.D., MEMS & Microsystems
Nandi, T. K.	Ph.D., Cryogenic Engineering

Emeritus Professor :

Naryanan, K. G.	Ph.D., Microwave Engineering

Chair Professor :

Sarkar, B. K.	Ph.D., RF & Microwave Engineering

Visiting / Adjunct Faculty :

Bose, A.	M.E., Mechanical Engineering
Dasgupta, S.	Ph.D., Control System
Das, B. B.	Ph.D., Control System

Officer :

Ghosh, Saswati	Ph.D., EMI / EMC, RF Microwave Circuit & Antenna
Guchhait, P. K.	M.Tech., Nano fluid

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

Faculty Appointed as Emeritus Professor :

Dr. K. G. Narayanan	Professor

Faculty Retirement :

Prof. S. L. Maskara	Professor
Prof. S. K. Lahiri	Professor
Prof. T. S. Lamba	Professor

RESEARCH AND DEVELOPMENT

Brief 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 :

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

i) Multimedia and Video Processing :

An FPGA – based state – of – the art video codec is being developed. The system under development finds its usage in Digital Video Broadcasting (DVB) system and performs real time encoding of colour videos frams size (352×288 pixels) at 30 frames / sec.

ii) Radiation patterns of antennas on satellite :

Radiation due antennas in free space can be readily computed and measured. However, when the antenna platform, that is the satellite structure need to be accounted for, then it becomes impractical to measured even in the must modern Anechoic Chambers of the world. Also, numerical techniques fail to predict the effect of the large structure on antenna radiation due to the limitations of computer memory and speed, even in today's world. Hence, analytical like STD needs to be developed for this purpose. This has been the field of study for the present investigator.

iii) Monopulse Comparator :

Design of highly compact comparator for monopulse radar application using reduced height Ku-band waveguided.

iv) DRA :

Design, Simulation and fabrication of CPW feed DRA to the narrow band application.

v) IRA (Impulse Radiating Antenna) :

Impulse Radiating Antenna is an UWB, directive and non-dispersive antenna. It was modeled and simulated using CST microwave studio and various parameters line Reflection Coefficient, VSWR, Gain, directivity and Radiation patterns were studied.

A detailed study and simulations of various models for use of this antenna for high power applications was carried out.

vi) MPCA :

Miniaturized Printed Circuit Antenna Design, Simulation and fabrication, Testing of Antenna for different Applications like Mobile, UMTS etc.

vii) RFID :

Radio Frequency Identification – Design Implementation of Tracking Algorithm and the simulation of the Antenna.

viii) MTMs :

Gain Enhancement of electrically small antennas using Metamaterials:- Design and Simulation of an electrically small antenna surrounded by Metamaterial shell/sphere

ix) MOM :

Method of Moment (MOM) analysis, design, fabrication and testing of various types of waveguide slot excited Dielectric resonator Antennas (DRAs)

x) Electromagnetic Modelling of high frequency electronic systems to estimate EMC :

Electromagnetic interference is becoming a crucial issue in the design of modern high frequency electronic systems. In the conventional design methodology, EMC issues in the design of modern high frequency electronic systems. In the conventional design methodology, EMC issues are addressed only after a prototype is built. However, this process has a potentially significant impact on the cost and time – to – market of the products. This needs to develop an accurate and efficient electromagnetic analysis and modeling to analyze the performance of high frequency electronic circuits for verifying the design against all sorts of electromagnetic interference before fabrication. This has been taken up as the present work. Different conducting and dielectric bodies have been modeled using Method of Moments and the radiation and reception characteristic have been studied.

xi) GPS :

Global positioning system (GPS), Adaptive Equalizer, Adaptive Array Antenna (Smart Antenna), Digital Signal Processing, Microwave Communication, Image processing & Numerical Techniques in Electromagnetic.

xii) Antenna Design :

Project title: Reduction of Mutual Coupling between microstrip antennas.
Use Software: HFSS, CST

xiii) Impulse Radiating Antenna (IRA) :

CST MS Software is being used to design and simulate an Ultra wideband Impulse Radiating Antenna (IRA), a TEM horn antenna (sensor), a 50 to 100 ohm impedance transformer and a splitter (50 ohm to 100 ohm coaxial cable) for differential feed to a full (4 arm) IRA.

xiv) Site-Specific Propagation Channel Modeling :

Our goal is to develop deterministic propagation channel model for micro and Pico cell scenario. Now-a-days, industry are using statistical channel modeling to characterize the wireless channel but following the reduction in call size, accurate characterization of channel becomes of vital significance. This leads to further investigation into the model which accurate, deterministic and amenable to industry requirement.

xv) Ka Band Propagation Channel Modelling for Satellite Communication System :

Communication systems, vapour, fog, oxygen, rain and several other gases which make up the air, cause propagation attenuation. Among these different atmospheric constituents, rain induced attenuation is the most severe, except for the degradation that occur near 22 GHz or 60 GHz die to vapour or oxygen. In particular, if a high frequency band of 10GHz and above is used the propagation attenuation due to rainfall is most dominant to overcome a signal degradation even on emust either avoid it or compensate for it.

xvi) Satellite Navigation :

Study and implementation of CDMA codes Binary offset carrier (BOC) modulation techniques and code tracking methods for Indian Regional Navigation Satellite Systems (IRNSS).

xvii) Development of thiol terminated and PU polymers based nanocomposites adhesive for cryogenic propellant tank insulation applications :

The research work relates to the development of formulation of adhesive and coating nanocompounds consisting of thiol terminated polymers and / or polyurethane polymers, filled with nanostructured materials and room temperature curators. These coating have barrier properties who find uses over cryogenic propellant tank multilayer layer – insulation.

b) Thrust Areas :

i) Liquid Combustion, Propulsion and Cryogenics
ii) Space Communications and EMI/EMC
iii) Micromachine Sensors
iv) Control , Navigation and Guidance
v) Embedded Systems and IP-Cores
vi) Life Support Engineering
vii) Smart Materials & Exotic Materials
viii) Power Electronics

ix) Space Education
x) Electronics Devices
xi) Cryogenics

c) New Acquisitions :

i) CST Software-Microwave studio, version-5
ii) IE3D – version – 9 by Zeland Software Inc.
iii) WIPL-D
iv) HFSS
v) VCO-Model no – ZOS-1025, Freq. Range – 685 -1025 MHz
vi) LNA -
  a) Model – ZEL – 0812 LM, Freq. Range- 800-1200 MHz
  b) Model – ZHL – 0812 HLN, Freq. Range – 800 -1200 MHz
  c) Model – ZHL – 2HAD, Freq. Range – 50-1000 MHz
  d) Model – ZFL – 1000VH2, Freq. Range- 10 -1000 MHz
vii) Filters -
  a) LOW PASS FILTER:- Model.no- BLP-550, Freq. Range – DC-520
  b) HIGH PASS FILTER :- Model no- NHP-1000, Freq. Range-DC – 550
viii) Mixers -
  a) Model. No- ZLW – 2, Freq. Range – 685-1025MHz
  b) Model.No. – ZEM-4300, Freq. Range- 300-4300MHz

ON-GOING RESEARCH PROJECTS

Sponsored Projects :

#	Title of the Project	Sponsoring(s)
1.	Antenna Patterns on Satellite in Orbit Model	ISRO-IIT Kharagpur Cell
2.	Development of Algorithim for Adaptive Antenna Array for Satellite Communication	ISRO-IIT Kharagpur Cell
3.	Design of an Optimal Control Strategy for gSLV MK3	ISRO-IIT Kharagpur Cell
4.	Attitude Control of Launch Vechiles	ISRO-IIT Kharagpur Cell
5.	Development of Speaker Recognition Software for Telephone Speech	ISRO-IIT Kharagpur Cell
6.	Development & Characterization of Copper based Brazing Alloy by Rapid Solidification and Mechanical Alloying	ISRO-IIT Kharagpur Cell
7.	Analysis and Development of Conceptual Design Methodologies for Air Collection and Enrichment System of Air Breathing Propulsion	ISRO-IIT Kharagpur Cell
8.	Design and Fabrication of High Sensitivity Micromachined Silicon Tunneling Accelerometer with Micro-g Resolution	ISRO-IIT Kharagpur Cell
9.	Audio Encropression- Encryption of Audio Data In Compressed Domain	ISRO-IIT Kharagpur Cell
10.	Design and Development of CMOS based 8 Bit 250 to 500 MSPS Analog to Digital and Digital to Analog Converter	ISRO-IIT Kharagpur Cell
11.	Development of RF MEMS Capacitive Shunt Switch in Application as Phase Shifters for Satellite Communication	ISRO-IIT Kharagpur Cell

	Systems	
12.	FPGA-based design and development of H-264 codec	ISRO-IIT Kharagpur Cell
13.	Design and Development of Hydrostatic Journal Bearings for Cryogenic Rocket Engine Turbopump	ISRO-IIT Kharagpur Cell
14.	Feasibility Study of Microwave Imaging for Material Resource Exploitation in Planetary Missions	ISRO-IIT Kharagpur Cell
15.	Development of Advanced Polymeric Materials for Improved Electrical / ESD properties Uisng Nano Additives for Space Application	ISRO-IIT Kharagpur Cell
16.	Ka Band Propagation Experiments Over Indian Tropical Region For Improvement of Ka Band Satellite Communicaition	ISRO-IIT Kharagpur Cell
17.	Studies on the Construction and Performance Evaluation of Multiplexed Binary Offset Carrier (MBOC) Spreading Modulation for Improved Satellite Radio Navigational Signal and System Design	ISRO-IIT Kharagpur Cell
18.	Study of CDMA codes for satellite navigation	ISRO-IIT Kharagpur Cell
19.	Error resilient Scheme for Satellite TV System	ISRO-IIT Kharagpur Cell
20.	Studies on Fade Mitigation Control for Microwave Satellite Signal Propagation	ISRO-IIT Kharagpur Cell
21.	Handset Normalization and Reduction of Noise and Distortion for Voice Authentication	ISRO-IIT Kharagpur Cell
22.	Analysis and Development of Conceptual Design Methodologies for Air Collection and Enrichment System of Air Breathing Propulsion-Phase II	ISRO-IIT Kharagpur Cell
23.	Development of a MEMS based Assay fro bio-medical diagnostics	ISRO-IIT Kharagpur Cell
24.	Silicon Carbied as high temperature MEMS and MOSFET devices	ISRO-IIT Kharagpur Cell
25.	Nano-fluid Based Coolant and Combustion Fuel System	ISRO-IIT Kharagpur Cell
26.	Design of radiation hardened data converters	ISRO-IIT Kharagpur Cell
27.	Study on Improvement of adhesion of EPDM based nanocomposites in Solid Rocket Motor Thermal Insulation applications	ISRO-IIT Kharagpur Cell
28.	Design of an Integrated Code for Authentication and Error Correction	ISRO-IIT Kharagpur Cell
29.	Interplanetary Satellite Orbit Determination Using Ground Based Observations	ISRO-IIT Kharagpur Cell
30.	Synthesis of satellite footprint patterns from planar array antennas by combination of particle Swarm Optimization and Fast Fourier transform	ISRO-IIT Kharagpur Cell
31.	Analysis of Different Conducting and Dielectric Structure as EMI Sensors	ISRO-IIT Kharagpur Cell
32.	Test bed for Marine Vessel Location System	ISRO-IIT Kharagpur Cell
33.	Design, Simulation and Development of MM-Wave six port receiver	ISRO-IIT Kharagpur Cell
34.	Multiple Access array antenna system at S band using digital beam forming techniques	ISRO-IIT Kharagpur Cell
35.	Design and Development of Application tool for InSAR to Determine Ground Surface Movement	ISRO-IIT Kharagpur Cell

36.	Design & Development of High-Speed Miniaturized RF MEMS Switched Capacitor	ISRO-IIT Kharagpur Cell

Consultancy Projects :

#	Title of the Project	Sponsor(s)
1.	Preparation of Vision/theme and feasibility report	Tirupati Assets Pvt. Ltd., Kolkata
2.	Development of Educational Complex	Tirupati Assets Pvt. Ltd., Kolkata
3.	RF Fundamentals for Wireless Network	WMNet Serv Ltd., Bangalore
4.	Mast Clamp current probe antenna	Naval EMC Centre, Mumbai

LECTURE BY VISITING EXPERT

1.	Dr. P. S. Goel Ministry of Earth Science	1st Kalpana Chawla Memorial Lecture on "Space – The Challenging Frontier" on August 22, 2010

INVITED LECTURES BY FACULTY MEMBERS

1.	Prof. Somnath Sengupta	Image Compression and JPEG-2000 at Integrated Test Range, Chandipur, DRDO on August 20, 2009
2.	Prof. Somnath Sengupta	Video Coding: Past, Present and Future at LNMIIT, Jaipur
3.	Prof. Somnath Sengupta	Human Detection for Video Surveillance at Jadavpur Univeristy, Kolkata
4.	Prof. Ajay Chakrabarty	EMI/EMC at Space Application Centre-ISRO, Ahmedabad, August 18-20, 2009
5.	Prof. Ajay Chakrabarty	EMI/EMC at JNU, New Delhi, November 5-6, 2009
6.	Prof. Ajay Chakrabarty	Radar Signal Processing at Behrampur Engineering College, Behrampur, Orissa
7.	Prof. Ajay Chakrabarty	Electromagnetic Scattering at RCI, Hyderabad
8.	Prof. Ajay Chakrabarty	Introduction to Radar Systems at C.V. Raman College of Engineering, Bhubaneswar, Orissa
9.	Prof. Ajay Chakrabarty	Antenna and Mesurement at Puroshattam Engineering College, Rourkela, Orissa
10.	Prof. Amit Patra	Power Management Circuits at National Semiconductor Corporation, Santa Clara, USA
11.	Prof. Amit Patra	Power Management Circuits at Intel Corporation, Portland, Oregon, USA
12.	Prof. Amit Patra	Online Testing of Digital VLSI Circuits at Intel Corporation, Portland, Oregon, USA
13.	Prof. I. Sengupta	Delivered Keynote Talk at the ICCSN 2010 Conference, Singapore

14.	Prof. B. K. Sarkar	Radar Signal Processing at Behrampur Engineering College, Behrampur,Orissa
15.	Prof. B. K. Sarkar	Electromagnetic Scattering at RCI, Hyderabad
16.	Prof. B. K. Sarkar	Introduction to Radar Systems at C.V.Raman College of Engineering, Bhubaneshwar, Orissa
17.	Prof. B. K. Sarkar	Antenna and Measurement at Puroshattam Engineering College, Rourkela, Orissa
18.	Dr. Soumen Das	BioMEMS at NEHU, Shillong, March 25-27
19.	Dr. Soumen Das	Mobile diagnostics : A MEMS perspective at Texus Instruments, Bangalore, October 26-27
20.	Dr. Soumen Das	R&D activities on MEMS at IITKGP at IIT Bombay, March 17
21.	Dr. Soumen Das	Introduction to MEMS at IIT Kharagpur, July 3-17
22.	Dr. A. Mitra	Role of computer applications in life science experiments at Rayagada, Orissa MIT
23.	Dr. A. Mitra	Technology in health care : Prospects and Challenges at Sri Aurobindo Society, Kolkata
24.	Dr. G. Saha	"Automatic Speaker Recognition" at Second International Conference on RF & Signal Processing Systems (RSPS2010), K. L. University, Vijaywada, 2010

THESES (Doctoral and MS)

#	Name of Scholar	Title of Thesis
1.	Mainak Mukhopadhyay	Some Studies of Global Postioning System Anti-Jamming Technique for GPS and Smart Antennas
2.	Debendra Panda	Analysis of longitudinal Rectangular Waveguide Power Dividers / Combiners Using Multicavity Modeling Technique
3.	Y. K. Singh	Design, Simulation and Fabrication of Microstrip and Waveguide Filters.
4.	Moutushi Mondal	Analysis of waveguide slot array antenna for wireless communication
5.	Susmita Ghosh	

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

1.	Prof. Swapna Banerjee	Emerging Research Areas in VLSI and Electronics Engineering, 2010 (ERA-2010). Organized by SMDP-II, CCE, MDEC and ECED at National Institute of Technology, Hamirpur, Mary 20-21, 2010
2.	Prof. Swapna Banerjee	ZOPP Workshop, organized by MCIT at IISc Bangalore, February 18-19, 2010

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

1.	"Efficient Systems for Microwave Transmission and Radiation" January 18-23, 2010	January 18-23, 2010

NATIONAL CADET CORPS (NCC)

COMMANDING OFFICER : Wg. Cdr. V. K. Gupta

AIMS & OBJECTIVES

i) To develop qualities of character, courage, comradeship, discipline, leadership, secular outlook, spirit of adventure & sportsmanship and the ideas of selfless service among the youth to make them useful citizens.

ii) To create a human resource of organized, trained and motivated youth, to provide leadership in all walks of life including the Armed Forces and be always available for the service of the nation.

iii) To create suitable environment to motivate the youth to take up a career in the Armed Forces.

MAJOR ACTIVITIES

During the training year 2009-2010, 203 cadets of 1st year and 2nd year of engineering were trained as NCC cadets. One Service Officer, one Associated NCC Officer and 11 service personnel were involved in imparting NCC training to the IIT students. Following social service and social awareness were also undertaken by the NCC cadets.

SOCIAL SERVICE ACTIVITIES

Activities	Date
Sadbhavana Run	August 22, 2009
Blood Donation Camp at 25 Bn NCC	November 15, 2009
Donated dry rations & fresh rations to the Seema Center (Charitable Organisation)	December 07, 2009

SOCIAL AWARENESS ACTIVITIES

Activities	Date
Anti Dowry & Anti Female Foeticide Pledge	August 08, 2009
Cancer Awareness Rally	November 07, 2009
Lecture on Anti Drug	November 14, 2009
National Anti Leprosy Awareness Rally	January 30, 2010

LECTURES BY VISITING EXPERTS

Cadets got a chance to visit Air Force Station Kalaikunda, have an exposure with all military equipments and the Air Force environments. Experts were invited from Air Force Station Kalaikunda to deliver lectures to the cadets regarding Fire Extinguisher & First Aid.

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

1.	A Combined Annual Training Camp was conducted for all 1st year NCC cadets at behind Seema Center IIT Campus, Kharagpur, organized by the unit. The cadets were made to experience the military field conditions. Drill practice, Physical training, Games, Debates, Quiz competition and cultural programs kept the cadets glued with thrill and excitement. Prof. D Acharya, Director, IIT Kharagpur and Group Commander of NCC GP HQ Kharagpur also paid visit to the camp.	28th November – 7th December 2009

NATIONAL SERVICE SCHEME (NSS)

HEAD : Professor P. K. Bhowmick

STUDENTS ACTIVITIES RELATED TO NSS

National Service Scheme (NSS) Unit of the Institute is functioning with registered 639 undergraduate students of 1st and 2nd year level. It took up several service oriented activities in the fringe villages of IIT Kharagpur campus under the direct guidance and supervision of eight faculty Program Officers and five faculty volunteers besides the Head, NSS and the coordinator, EAA. The important activities performed during the session include, providing basic education (3Rs) to the illiterate children working in the shops, stalls, canteens etc., in the locality, special coaching to about 83 school going and dropouts; developing supplementary education material for class IX-XII NCERT books, plantation and up keeping of more than 550 forest plants under environment protection programme; preparation and demonstration of scientific and technological models with Nehru S & T Museum at the Institute; conducting health and nutrition survey in the villages, organizing health awareness campaigning programme, etc. One of the free coaching centre run by NSS volunteers in a nearby slum comprising of 22 children arranged one competition of curricular and co-curricular activities on last working day of this semester. Prizes and sweets were distributed to all at the end of the function.

The annual camp held at village Ghagra Paschim Pathri was very effective on both counts. On one hand, it helped the budding engineers to face real India and realize their duties and responsibilities towards the country. It also helped the local village population as students volunteers toiled hard to make some difference in the village life. They cleaned roads, filled up pot-holes, sanitized wells, drains; distributed winter clothes collected from IIT campus and made them aware of social evils through procession, short play, song and recitation. It was great to see the students befriending local youth, working with them on these issues and playing a friendly cricket match on the final day. The volunteers practiced austerity and collected Rs. 5000 among themselves for renovating the toilet of the village school.

A large number of NSS volunteer besides their NSS work are supporting several initiatives where students not connected with NSS are coming together and are trying to address certain needs of the underprivileged. These group are Vigyan-Vivek, Goonj, Gopali Youth Welfare Society, CRY, Engineering without Borders etc. to name a few.

An initiative is made to work in tandem with local administration in implementing Government welfare schemes. Towards this, S.D.O. Kharagpur addressed NSS Program Officers and NSS volunteers at S.N. Bose Auditorium on March 20, 2010. S.D.O. requested NSS IIT Kharagpur to work as facilitator in various programmes. Subsequently, NSS volunteers interacted with S.D.O. Kharagpur office and one Deputy Magistrate has been appointed as point of contact.

A series of lecture-demonstration on “AIDS & We” was conducted by Ms. Vanesse, a student from Brazil under the student exchange programme of AIESEC. It total 242 NSS volunteers of the Institute and 96 students of Midnapore Homoeopathic Medical College attended the lectures.

RAJBHASHA VIBHAG

CHAIRMAN : Professor Parmeshwary Dayal Srivastava

Officer :

Rawat, Rajeev Kumar (Dr.) Hindi Officer

It is the pride of Rajbhasha Vibhag that it is situated in the historical heritage building known as “Hijli Saheed Bhavan” of Indian Institute of Technology Kharagpur. The building is the eyewitness of freedom struggle and the sacrifice of many innocent countrymen.

The aim to set up an independent Rajbhasha Vibhag is to make efforts to implement the Rajbhasha policies formulated by Government and enhance the progressive use of Hindi in official correspondence of the institute.

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 Teacher, Hindi Teaching Scheme and 97 employees have been trained so far 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 2009-2010, the following events took place :

i) Prof. H. C. Verma, an eminent professor of Physics in IIT Kanpur was invited for a Hindi seminar. He delivered a lecture in Hindi on the life and works of famous scientists of the world. He also gave a Institute lecture for the benefit of the Institute

students, employees as well as students of nearby schools and elaborated “How were the Elements Formed”.

ii) During January 12-14, 2010, a Hindi workshop was organized for the employees. In this, Dr. Rajeev Kumar Rawat, Hindi officer briefed the employees about the techniques for doing their day to day official work in Hindi.

iii) Rajbhasha Vibhag organized a National Seminar on “Technical and Scientific writing in Hindi” during February 17-18, 2010. In which eminent speakers Shri Ishwar Chandra Mishra, Translation / Training Officer, CTB Bengaluru, Dr. P. S. R. Murty, Senior Hindi Officer, NAL, Bengaluru were invited for lectures. During this national seminar several faculty and students of our Institute too, presented their technical / research papers and delivered lectures in Hindi.

iv) On March 24, 2010 a Seminar on the topic "The Role and Duties of Officers in attaining the Rajbhasha Programme Targets : Practical Suggestion for Implementation" was organized for the Group 'A' Officers and Section in-Charges, in which, eminent speaker, Shri. J. N. Singh, Hindi Officer, Ministry of Defence, gave practical tips to attain the annual Rajbhasha targets.

v) Hindi Officer Dr. Rajeev Kumar Rawat participated in the national Rajbhasha seminar organized by MHRD in Pondichery University on November 05, 2009.

Celebration of Hindi Divas :

During the month of September, Rajbhasha Vibhag has organized "Hindi Saptah" during September 08-14, 2009. 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 cash 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 Software 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.

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 750 books of different writers on literature, fiction, poetry, prose, play and various subjects of translation and language.

Bilingual Website :

The Rajbhasha Vibhag has made its website bilingual. Useful information links are available on Vibhag Website regarding training programmes, incentives schemes, different tools etc.

COMMITTEES

Official Language Implementation Committee and Progress Measurement Committee :

The Institute has constituted two committees named as Official Language Implementation Committee (OLIC) and Progressive Measurement Committee (PMC) for the implementation of Rajbhasha Policies and monitors the progressive use of Hindi in the Institute in day-to-day work. A combined meeting of the OLIC and PMC is held quarterly and is chaired by the Director. The Progressive Measurement Committee (PMC) inspects each department and monitors the progressive use of Hindi in the Department and submits the report to Director.

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 28 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. D. Acharya has nominated Prof. P.D. Srivastava, 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 August 24, 2009 and January 29, 2010. 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.

SPONSORED RESEARCH & INDUSTRIAL CONSULTANCY

DEAN : Professor Partha Pratim Chakrabarti

Research plays an integral role in Indian Institute of Technology Kharagpur's vision of a technological university and is a critical contributor to graduate and undergraduate education programs. The discovery and application of new scientific concepts and technologies are core goals for faculty, staff, and students. As one of the nation's top technological institute, IIT Kharagpur is improving lives through the discovery and dissemination of knowledge addressing significant interdisciplinary research challenges. IIT Kharagpur's research programs reach across the campus and beyond, linking together 19 departments, 15 academic centers and a large number of advanced R&D laboratories, stimulating the integration of inquiry, new knowledge, and education.

IIT Kharagpur works closely with government research agencies and the policy-makers who initiate and guide research initiatives at the national level. This has enabled IIT Kharagpur to participate in a variety of cutting-edge scientific and technological areas, including *computation and information technology, life sciences and biotechnology, energy and the environment, nanotechnology* etc. Private funding is also central to IIT Kharagpur's research programs, and many large corporations use the broad expertise of the faculty in science, engineering, business and policy.

During the year 2009-2010, the Institute received from the Government, private and international funding agencies / enterprises 194 research projects for a total value of Rs. 141.92 crores (31.56 million USD) and 129 consultancy projects worth Rs. 10.12 crores (2.25 million USD) aggregating a total of 323 projects for Rs.152.04 crores (31.81 million USD).

Over the years IIT Kharagpur has gained special expertise in *advanced chip design and CAD for VLSI and MEMS,* software development, planning, management and ERP working closely with all major national and international organizations. Research has also been initiated on specialized areas such as MEMS based components for RF application and an advanced facility for research in reliability engineering has been established. The large gamut of specialized *software technologies* include *power management software*, *telemedicine software* (currently used in several remote sites in several states), *communication empowerment software for physically challenged*, software for medical measurements and tools for *security* and *biometric authentication*. Other important software developed include a specialized *bond-graph based technology*, simulators for *biomechanics* and a fluid mechanics and ocean dynamics based *software for storm surge* measurements. Two mission projects for development of Virtual Labs and pedagogy and e-learning involving premier Institutes of the Nation have been initiated.

In the areas of Life Sciences, the Institute has an artificial heart development program that is undergoing phase II trials. A unique *male contraceptive, RISUG* is undergoing third phase of trials. Interdisciplinary research is being carried out in areas of, *non-invasive measurements, advanced image processing, medical implants, protein structure analysis and drug design, orthopedic biomechanics*. Green technology routes have produced unique protocols for *insect*

resistant cotton, jute, bio-hydrogen, separation and purification of anti-carcinogenic components from green tea leaves, etc. Research in biotechnology has resulted in a number of high quality *enzymatic processes for a variety of food technologies*. Research work is being carried out on high pressure processing on high value perishable commodities, development of novel nano-biocomposite osteogenic matrices for cell based bone tissue engineering, production of pure variety disease free potato seeds through in-vitro culture technique, Aloe Vera processing and bio depolymerisation of low grade lignite.

The major research initiatives in nanotechnology and *nano-materials* include work on nano-composites, nano-wires, semiconductors and metal alloys. A major research initiative in the development of MBE cluster tool nano-semiconductor infrastructure and nano-devices has been initiated. The area of *micro-fluidics and bio-nano-mems* has developed new techniques for *DNA hybridization, micro-scale cooling for electronic components and digital microfluidics*.

The energy research program at IIT Kharagpur has got a major boost during the last year with the formal initiation of P. K. Sinha Centre for Bio-energy. A major research activity on hydrogen production through biological routes has been started. The other works include *fuel cell based systems and energy materials, production of renewable hydrogen combined with* CO_2 *capture* etc. The development of a solar powered aircraft as a major student-led funded research project has underscored the active participation of the students in niche areas.

An MOU for setting up of a Centre for Railway Research has been signed with Ministry of Railways, Government of India. A major grant has been received from the Ministry of Communications & Information Technology, Government of India for development of MBE cluster tool based epitaxial nano-semiconductor infrastructure facility. Two other major projects have also been received from the Government of India for seismic hazard assessment and evaluation of vulnerability for the city of Kolkata, and National Programme on technology enhanced learning.

Industry–academia partnership at IIT Khargpur is thriving with industries forming partnerships in joint research projects, acquiring technologies developed in the institute and seeking consultancy supports from the Institute. Some of the major research initiatives in recent years include Steel Technology Center, major R&D Centers in Energy Sector in collaboration with DVC, Tea Engineering Research Center, Vodafone-ESSAR-IIT Kharagpur Centre of Excellence in Telecommunications, National Program in Marine Hydrodynamics, Centre of Excellence in Information Assurance, National facilities for EPMA, General Motors Collaborative Research Laboratory in Electronics Controls and Software (ECS) and a Regional Center for Rural Technology Action Group (RUTAG) are some of the recent such successful initiatives.

IIT Kharagpur has a long tradition of protecting inventions and has received numerous patents (109 in number) over the years. The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell under SRIC is responsible for the licensing and the transfer of technologies developed by faculty members, students and other researchers at IIT Kharagpur to the commercial sector. Total 41 numbers of technology have been transferred. The Entrepreneur Cell under SRIC supports a variety of incubation programmes funded by the Government.

SCIENCE & TECHNOLOGY ENTREPRENEURS' PARK

MANAGING DIRECTOR : Professor Dhrubes Biswas

MAJOR ACTIVITIES

i) School of Engineering Entrepreneurship (SoEE) establishment decision
The Senate has passed the functioning of of SoEE and classes at STEP premise. It has been decided that there will be construction of faculty rooms, classrooms and the innovation lab at STEP for SoEE.

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

iii) High-end Video conferencing facility class room established for International Projects.

iv) The new corporate looks has been created at STEP premise in line with the number of visitors from different parts of the country and world. The good gardening and landscaping has also been done in consonance with the other premises of IIT Kharagpur. The area is now at par with other incubation centers of the country.

v) The development infrastructural facilities have been made in accordance with the requirement of the office space as well as other important necessities.
   (a) Remodeling of the STEP office seating space.
   (b) Creation of additional seating capacity (to accommodate Entrepreneurs including Students, Faculties & General Public).
   (c) Purchase of PCs for improvement of accounting & computing infrastructure.
   (d) Maintenance of existing PCs with new software tools to facilitate finance & accounts.
   (e) The Guest House of STEP has been renovated to provide three star facilities.

vi) Appointment of experienced professionals for reorganization and proper working of the new projects of STEP.

RESEARCH AND DEVELOPMENT, IF ANY

i) Thrust Areas of Research
   (a) Education – Enterprise business models for university based co-creation
   (b) Health problem mitigation with technology interventions
   (c) Technology interventions of Growth Ventures

ii) Brief descriptions of on-going entrepreneurial activities at STEP
   (a) Total No. of companies : 36
   (b) STEP IIT Kharagpur Campus : 25
   (c) STEP Gopali Campus : 11

Companies at STEP IIT Kharagpur premises :

#	Companies of STEP / TBI	Major Entrepreneurial Activity
1.	P2 Power solutions	Work in the domain of Power Quality enhancement at distribution level
2.	Data Resolve Technologies Pvt. Ltd.	All the products and services of company revolve around the issue of securing different forms of electronic data which is potentially under theft
3.	Electro soft consultants	Involved in several sponsored and consultancy projects dedicated towards empowerment of physically challenged people
4.	Centre for Advanced Communication	Interactive Software Integrated Learning System (ISILS) is the heart beat, nerve centre, brain, driving force of our overall system
5.	Sankalp Semiconductor Pvt. Ltd	Analog Mixed Signal services and solutions specializing in end-to-end solutions for IOs, analog and mixed signal chip design / layout
6.	Nucleodyne computer system Pvt. Ltd.	Software Development and education based consultancy services
7.	Intellisys	Video Conferencing Systems, Live collaboration software, Embedded Technologies
8.	High tech consultants	Modeling, simulation, Control, Fault Detection and Isolation
9.	Focus R&D	Software Research
10.	Greenhat Technologies	Web Based Education Systems
11.	Sparsha Learning Technologies	Education Technology Development, Develop and market software, teaching, learning in different areas
12.	Intinno Technologies Pvt. Ltd.	Education based collaboration software used by students and professsors. This has launched new software called “Pathshala”
13.	Lalaland	Customized Printing and export of attire
14.	Biswanath Dey	ATM card billing system. The proprietor is a

		grass-root innovator
15.	RISUG	Created a new drug molecule in medical science for male contraception
16.	Softlore Solutions	Customized ERP module creation and installation in educational institutes

Companies at STEP Gopali premises :

#	Companies of STEP / TBI	Major Entrepreneurial Activity
1.	Electro Thermal Insulation	In the field of Insulation wires and polymer insulations
2.	Sandhya Glass works	Glass cutting work. Design of glass mirrors
3.	Gulton Rubber works	Making of Risk husk rollers
4.	Balaji Mushroom	Engaged in the production of mushrooms
5.	Raghunath Fertilizer	Vermi-compost and organic vegetables
6.	Puja Enterprise	Printing and manufacture of eco-friendly bags
7.	Renuka Polymer	Rubber husk polishers for rice mills
8.	KE Technical Textile Pvt. Ltd.	Facilities of weaving, processing and coating of fabric with various Polymers & Resin systems

There are other 8 companies under the incubation of TIETS, SRIC, IIT Kharagpur.

iii) Other Assistance of Entrepreneurial Activities

(a) Entrepreneurship support through MSME grant.
STEP has successfully established the MSME center which supports the local people to take loans for small industries working. 5 proposals have been duly granted sanction. One of them includes our trained grass-root entrepreneur.

(b) Commercialization of prototypes by TREMAP support.
TREMAP supports developed innovative prototype commercialization by refinement and industry collaboration.

(c) Conducting Entrepreneurship Awareness camps
E-Cell has played a very vital role in helping STEP for successfully promoting the benefits of initiating venture creation at various departments to sensitize the student and faculty members for start-up. The result has been huge with many students coming forward to get their companies registered at STEP.

iv) New Initiatives taken

(a) Construction Decision for School of Engineering Entrepreneurship (SoEE) building at STEP

(b) Extension of the STEP Main Building by constructing 1st floor for SoEE faculty rooms,
(c) Renovation of the STEP Old Building for SoEE Class-rooms
(d) Renovation of the Tea Processing Lab as Innovation Lab for the SoEE students entrepreneurs.

v) Alternative incubation facilities decision for entrepreneurs at STEP - Gopali Campus and creation of a cluster.

NEW ACQUISITIONS

#	Name of Company	Area of working
1.	PervCom Consulting Pvt. Ltd.	Developing devices and system solutions for remote tracking and monitoring.
2.	Aptsource Software Pvt. Ltd	Business workflow automation and integration, business intelligence and decision support, and service-oriented architecture/enterprise.
3.	Delta Electrical Indisteies	Green lighting manufacturing and commercialization have created polymeric mould which makes the led lighting multi-directional.
4.	Ikure Tech Soft Pvt. Ltd	Health applications to facilitate the patients data delivery. Create and manage a huge database of patients, doctors and hospitals.
5.	Meridian Software Technology (P) Ltd.	Development of a software tool for SPICE modeling and parameter extraction
6.	Aunwesha Knowledge Technologies	The major products of the company have been migrated to the new LearnITy framework.
7.	Brolly	Works on rural technology adoptions, standardization, and appropriations of microfinance. The company has received (UNDP) grants.
8.	Techsys India.	Focused on creating value and trust for our clients in changing business scenarios.
9.	Biswajit Das	Sampling various varieties of fruits like HYV grafts of fruits, foliage and indoor plants
10.	Ashtami Enterprise	Manufacturing the rubber works for industrial purpose

11.	Balaji Enterprise	Manufacturing the ball bearing assembly material for Tata Matalinks.

SHORT-TERM COURSES

1. SIDBI grass-root entrepreneurship and skill development training program
2. Vermi-compost training programs to promoting organic farming and green practices
3. Tea Board supported tea garden maintenance program

COLLABORATIVE EFFORTS

1. Celebrated the STEP day in April 2010 with the honorable Director, IIT, Kharagpur. He along with other esteemed members took decision for proposed SoEE in STEP Campus
2. Celebrated Saraswati Puja in January 2010 jointly with Entreprenrus and E-Cell students as requested by the existing incubatees of STEP / TBI
3. Prof. Ikhlaq Siddhu, University of Berkeley visited STEP for inaugurating the “Cleantech Challenge” B Plan contest organized by Nation Growth Venture Lab (NGVL)
4. Conducted proposal screening for West Bengal Venture Capital Ltd., The Official venture capital of organization of West Bengal
5. National Global Venture Lab has been set up to promote research interactions with international universities like UC Berkeley and University alliance, Finland
6. Collaboration with the N. L. Khan Women’s college for the entrepreneurship awareness among women students. E Cell has been created and the faculties have been given training on how to motivate their students for business creation
7. STEP committee on the request of Bengal National Chamber of Commerce & Industries (BNCCI) to nominate IIT official for joint ventures, collaboration with them to conduct programs jointly for mutual benefit

LECTURE BY VISITING EXPERT

1. Prof. Ikhlaq Siddhu, Director of Center for entrepreneurship and technology (CET) University of Berkeley, California in October 2010
2. Prof. Hekki Hanka , Director of the Department of Art and Culture Studies and Professor in Art History at University of Jyväskylä, Finland in December 2010

3. Prof. Dipankar Chakarborty, Vice dean for The Johns Hopkins Carey Business School Baltimore, MD in March 2010

4. Mr. Vasant Subhramanium, Presidet, TiE Kolkata visited in the month of October 2010

SEMINARS / WORKSHOPS / CONFERENCES ORGANIZED BY THE UNIT

Ongoing Training Programs under the space of STEP

Various training programs have been conducted to facilitate entrepreneurship and innovation ecosystem at STEP. These include the

1. SIDBI skill upgradation programs for grass-root entrepreneurs

2. Tea Processing Training Program

3. Training for Vermi-compost manufacturing and sale

TRAINING & PLACEMENT SECTION

PROFESOR-IN-CHARGE : Professor Suneel Kumar Srivastava

PLACEMENT DETAILS

The Training and Placement Section is responsible for arranging practical training for 3rd year students and job placement of final year students graduating from the Institute. The Section is actively engaged in forging synergistic relationships between the Institute and various industries and user systems of technical and scientific manpower. Based on these interactions, the Training & Placement Section gives feedback to the Institute on the academic programmes.

143 companies / organizations visited the campus for recruitment and 20 others preferred to have telephonic interview, videoconference and call the students for interviews to their offices during 2009-2010. The details of number of students who had registered for placement and those actually placed through campus interviews including those who expected to have opted for higher studies / got jobs through off campus as on 06-05-2010 are as follows :

Course/Degree	No. of students registered	No. of students placed
B.Tech. (Hons.)	395	365
B.Arch. (Hons.)	018	017
M.Sc.	186	134
Dual Degree M.Tech.	202	176
M.Tech./MCP	542	330
M.B.M.	077	073
Ph.D./ MS	027	022
Total	**1447**	**1117**

SUMMER TRAINING

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 abroad, for summer training. An emergent trend is that more and more students are seeking summer training abroad.

A total of 1456 companies / organizations in India were contacted for training facilities for the current summer vacations in May-July 2010. Among these 124 in India had offered training facilities, out of which 55 organizations had extended out-of pocket allowances (covering 220 students) and many other extended subsidized transport, subsidized canteen, subsidized accommodation and to-and fro 3AC fare for our students/ The highest out of pocket allowance of Rs. 30,000.00 per month was paid by DE Shaw, Barclays Capital, Deutsche Bank, Google, Qualcomm, Microsoft, Yahoo extended Rs. 25,000.00 per month,

ITC, Deloitte, Oracle, Amazon, IBM Limited extended Rs 20,000.00. There are about 15 companies like Bharat Dynamics, ACC Limited, Mentor Graphics, Tega Industries, Reliance India Limited, Infosys, Innopark, Dr. Reddy's Lab, Siemens, Tata Steel, Schlumberger, Goldman Sachs offered stipend in the range Rs. 10,000.00 to 20,000.00 per month and around thirty companies offered below Rs. 10,000.00 per month.

About 240 students will take up summer training in organizations abroad during the summer 2010. During summer 2010, a total of 772 third / fourth year B.Tech. / Dual Degree and M. Sc. students were placed for summer training. The Department of Mining Engineering handled the placements of their students for summer training separately. A number of B.Tech. / Dual / M.Sc. students were also placed for optional training where MOU to the Institute.

STUDENT PARTICIPATION

To harness the student power, a formal system of student participation in the process had been initiated during 2005-2006. This has evolved and the 2009-2010 placement saw students participating in running placement process. In fact, through this participation it was possible to run up to seven / eight companies per day and round the clock. Students take active part in calling up companies and managing the logistics of placement.

TECHNOLOGY TELECOM CENTRE

PROFESSOR-IN-CHARGE : Professor Sant Sharan Pathak

Officer :

Gupta, Pankaj Engineer

NEW PLANNING

i) To install a LIM with optical fiber connectivity in the Guest House.

ii) Planning to lay cable to the newly built A-type quarters in the Dandakaranya area.

iii) To provide STD facility in the Guest House with local billing provisions.

iv) To provide connections to the rooms of V. Niwas Guest House (VGH) and its neighbourhood from a new distribution box of LIM at Guest House.

WORK CARRIED OUT

i) Laying of underground cable to each independent quarter (B and C1-type) in Dandakaranya area to minimize the maintenance problem.

ii) Emergency telephone service have been provided in every block of the Vikram Sarabhai Research Complex.

iii) The capacity of DSLAM is upgraded by 48 parts.

iv) Nearly 30 nos. of new connections have been given to new faculties and new laboratories.

ROUTINE MAINTENANCE

i) Facility has been created for complaint to be lodged in person, over phone and also online through Institute website.

ii) Complaints have been attended and problems rectified within 2 days in almost every case.

TECHNOLOGY STUDENTS' GYMKHANA

PRESIDENT : Professor Manish Bhattacharjee

ACTIVITIES

Inter IIT Sports Meet

The 45th Inter IIT Sports Meet began with the Inter IIT Aquatic Meet held during October 2-5, 2009, at IIT Kanpur. IIT Kharagpur secured the overall THIRD position in Swimming (Men's) and overall SECOND position in Swimming (Women's). Once again the brilliant performance of Chirag Fialoke, a third year UG student, was the highlight of the meet. He won four Gold Medals and created one new meet record in 200 m freestyle.

The second phase of the Inter IIT Sports Meet was held during December 11-18, 2009. Highlights of IIT Kharagpur team performance was a Silver Medal in Table Tennis (M), and Bronze Medals in Football and Weight Lifting.

Inter Hall Competitions in Sports & Games

During the Autumn Semester, Inter Hall Competitions started with the Inter Hall Aquatic competitions in the month of August 2009. Chirag Fialoke of RP Hall won the Individual Championship. Inter Hall Athletics Meet was held during November 14-15, 2009.

In the Spring Semester, the second phase of Inter Hall Competitions in badminton, basketball, cricket, football, hockey, table tennis, tennis, volleyball and weight lifting were held. Patel Hall of Residence won the General Championship in Sports & Games.

The Inter Hall Competitions among the girl's hostels were also conducted in table tennis, badminton, swimming and basketball.

Inter Hall Competitions in Social & Culture Events

As usual the Inter Hall Competitions in various social and culture events were organized. The traditional Inter Hall Illumination & Rangoli competition was held with all the Halls of Residence participating with great spirit and fervor. Professionals drawn from relevant fields were invited from Kolkata to judge the event.

Inter Hall Competitions in Technology

Inter Hall Competitions in Technology were held in various categories.

MAJOR EVENTS ORGANISED

Shaurya'09

Technology Students' Gymkhana organized SHAURYA'09, an Inter-College Sports Meet, from 31st October to 3rd November 2009. This year few more games were included. Competitions in Badminton, Basketball, Cricket, Tennis, Volleyball, Hockey and Table Tennis were held. Five colleges, namely, St. Xavier's, Ranchi, KIIT, Bhubaneswar, Marine Engineering College, Kolkata, NIT, Trichi, Benaras Hindu University, St. Xavier's, Kolkata and IIT Kharagpur took part. IIT Kharagpur won Gold in Badminton and Silver in Basketball, Volleyball, Table Tennis, Football, Hockey and Tennis.

Spring Fest'10

The Annual Social Cultural Festival, Spring Fest '10, was celebrated in the month of January 2010 from 21st to 24th. Spring Fest'10 witnessed the usual overwhelming participation from various prestigious institutions and colleges across the country. For the first time, Star Nites were held in the Jnan Ghosh Stadium which turned out to be a huge success. Highlights from the fest include performances by eminent artists such as renowned music composer Pritam Mukherjee, Kailash Kher and India's most renowned heavy metal band, Kryptos. Spring Fest played host to the internationally acclaimed play 'Dance Like A Man'; performance by the slide guitarist Debashish Bhattacharya and jazz performance by Gilad Dobrecky and Freddie Bryant. Other major attractions were classical dance by 'Sahaj Padma', MTV Stunt Mania, Youth Marathon and a Blood Donation Camp.

Kshitij'10

Kshitij – the annual techno management festival was organised from 28th January to 31st January 2010. Around 5000 students from various colleges in India and abroad took part in various events like Business Plan, Case Studies to Paper Presentations, Industrial Design Problems, Computer Programming and Robotics. Prizes worth Rs. 50.0 Lakh were awarded to participants. Kshitij played host to numerous towering personalities in technical as well as managerial domains including the likes of Sir Anthony Leggett (Nobel Prize Winner), Dr. A. Sivathanu Pillai (CEO and MD of Brahmos Aerospace), Prof. Chris Phillips (the Invisible man) and Robin Chase (One of Time's 100 most Influential people). Hands-on workshops on varied topics like those on Ethical Hacking, Microcontrollers, Hot Air Ballooning, Patenting and Autonomous Robots gave the students an opportunity to learn from the experts in the respective fields. A multitude of exhibitions from the one on Solar Car to Fog Screen to DRDO, proved to be a visual treat for the audience with its rare blend of technology, science and entertainment. Kshitij is associated with world renowned organizations in ASME (American Society of Mechanical Engineers), ACM, ASHRAE and IMechE. The fest drew participation from all corners of the country and even abroad in a wide array of events organized to gauge the technical dexterity and managerial acumen of bright young minds.

OUTSIDE PARTICIPATIONS

The Cricket Team of IIT Kharagpur participated in the Inter University Twenty-20 Cricket tournament organized by the Cricket Association of Bengal.

DEVELOPMENTS

Technology Students' Gymkhana has formed a Technology Adventure Sports Society started with a few student members. In April-May 2010, a team of 20 students including two girls trekked to Pindari Glacier with Mr. Sudhir Kumar, PTI (TA) leading the team.

FACILITIES

i) Gymnasium with modern equipment
ii) Billiards
iii) Athletics stadium with modern training facilities
iv) Two cricket fields with two turf wickets. One practice net having two turf wickets and one concrete wicket.
v) One hockey and one football field in the Tata Steel Sports Complex
vi) One jogging-cum-walking track inside the Tata Steel Sports Complex.
vii) Six tennis courts including two floodlit courts
viii) Two floodlit volleyball courts
ix) Two floodlit Basketball courts
x) One wooden surface badminton court
xi) Table tennis room with four tables
xii) Standard swimming pool

ANNUAL PRIZE DISTRIBUTION CEREMONY & FAREWELL PROGRAMME FOR GRADUATING STUDENTS

The Prize distribution ceremony and farewell to final year students was held on 15th April, 2010. Director Prof. D. Acharya presided over the function. Eight Institute Blues in Sports & Games, Five Order of Merit in Soc. & Cult and in Technology were awarded to final years for their outstanding achievements in respective fields. Mr. Bipul Kumar, an outgoing final year UG student, was awarded the prestigious Bhandarkar Trophy for his outstanding performance in Athletics and Hockey. Mr. Chirag Fialoke, a third year UG student, received the Alumni Trophy for his brilliant performance in the Inter IIT Aquatics Meet. Mr. Vikash Kumar received the Ankik Dhar Memorial Trophy for all round performance in sports, social & culture and technology. This trophy is introduced in the name of Ankik Dhar, a brilliant performer in academics, sports and social & culture.

PART - III

STATISTICAL INFORMATION

Table A-1 **ADMISSION TO UNDERGRADUATE (B.TECH. / B.ARCH. / M.SC. / DUAL DEGREE) COURSES IN THE SESSION 2009-2010**

Table A-2 **ADMISSION TO 2-YEAR M.SC. COURSES, 2009–2010**

Table A-3 **DISCIPLINE-WISE BREAK-UP OF STUDENTS AWARDED M.C.M. SCHOLARSHIP 2009-2010**
Rate of Scholarship : Rs.1000/- p.m. plus Free-tuitionship

Table A-4A **STUDENTS AWARDED ONLY FREE TUITIONSHIP 2009-2010**

Table A-4B **STUDENTS GRANTED TUTION FEE EXEMPTION (ONLY SC / ST) 2009-2010**

Table A-5 **STUDENTS (SC & ST) AWARDED FINANCIAL ASSISTANCE 2009-2010**
Rate : Pocket Allowance Rs.250/- p.m. plus Free Messing

Table A-6 **A. STUDENTS AWARDED ENDOWMENT PRIZES : 2009–20108**
B. STUDENTS AWARDED ENDOWMENT MERIT SCHOLARSHIP : 2009-2010

Table A-7 **STUDENTS AWARDED SCHOLARSHIPS BY EXTERNAL AGENCIES (2009-2010)**

Table A-8 **STUDENTS FROM FOREIGN COUNTRIES ON ROLL OF UNDERGRADUATE COURSES, CLASS WISE, 2009–2010**

Table A-9 **COUNTRY-WISE DISTRIBUTION OF FOREIGN STUDENTS (2009-2010)**

Table A-10 **STUDENTS ON ROLL – UNDERGRADUATE (B.TECH. / B.ARCH. / M.SC. / DUAL DEGREE) COURSES AT THE BEGINNING OF THE SESSION 2009–2010**

Table A-11 **STATEMENT OF RESULTS (UNDERGRADUATE) 2009–2010**

TABLE : B-1

ADMISSION TO POSTGRADUATE COURSES IN 2009-2010

Dept./ Centre	Specialisation	Admt	Reg-ular	SP	QIP	DF	GN	SC	ST	PH	OBC	M	F
AE	Aerospace Engineering	19	15	00	00	04	09	02	01	00	07	17	02
AgFE	Farm Machinery & Power	15	15	00	00	00	06	03	02	00	04	15	00
	Soil & Water Conservation Engg.	12	12	00	00	00	03	02	01	00	06	08	04
	Dairy & Food Engineering	15	15	00	00	00	09	02	01	00	03	13	02
	Applied Botany	14	14	00	00	00	07	02	01	00	04	09	05
	Water Resource Dev. & Mangt.	11	11	00	00	00	06	03	00	00	02	05	06
	Agricultural Systems & Management	10	10	00	00	00	05	02	00	00	03	05	05
	Post Harvest Engineering.	17	17	00	00	00	10	02	00	00	05	15	02
ARP	City Planning	24	21	02	00	01	15	05	00	00	04	13	11
ChE	Chemical Engineering.	62	62	00	00	00	30	10	05	00	17	53	09
Civil	Hydraulic & Water Res. Engineering.	06	06	00	00	00	04	02	00	00	00	04	02
	Transportation Engineering.	15	13	00	00	02	06	02	01	01	05	15	00
	Geotechnical Engineering	11	11	00	00	00	06	01	01	00	03	08	03
	Structural Engineering.	17	15	00	00	02	09	02	02	00	04	15	02
CSE	Computer Science & Engineering.	43	30	03	04	06	27	04	03	01	08	42	01
EE	Mach. Drives & Power Elect.	16	16	00	00	00	09	03	01	00	03	16	00
	Control System Engineering.	18	16	00	01	01	10	01	02	00	05	17	01
	Power System Engineering	14	13	01	00	00	07	03	01	00	03	14	00
	Instrumentation	15	14	00	01	00	08	03	02	01	01	14	01
E&ECE	Fibre Optics and Lightwave Engg.(EC 1)	05	05	00	00	00	04	01	00	00	00	05	00
	Micro Electronic & VLSI Design(EC 2)	26	23	01	01	01	17	03	02	00	04	22	04
	RF & Microwave Engg. (EC 3)	24	23	00	00	01	16	04	02	00	02	20	04
	Telecomm. Systems Engg. (EC 4)	23	20	00	01	02	13	04	02	00	04	21	02
	Visual Infor. & Embedded System(EC 5)	25	23	00	01	01	14	04	02	00	05	24	01
GG	Exploration Geosciences	08	08	00	00	00	05	02	00	00	01	06	02
	Computational Seismology	01	01	00	00	00	01	00	00	00	00	01	00
SIT	Information Technology	23	16	00	04	03	15	02	01	01	04	22	01
MA	Comp. Sc. & Data Processing	27	27	00	00	00	10	05	00	00	12	26	01
ME	Manufac. Science Engineering.	25	23	01	00	01	14	06	02	00	03	23	02
	Thermal Science & Engg.	28	24	01	00	03	19	03	00	00	06	28	00

Dept./ Centre	Specialisation	Admt	Reg-ular	SP	QIP	DF	GN	SC	ST	PH	OBC	M	F
	Mechanical System Design	35	24	01	01	09	23	03	00	00	09	35	00
MT	Metallurgical & Materials Engineering.	34	31	03	00	00	22	05	00	01	06	30	04
MI	Mining Engineering.	11	11	00	00	00	03	03	01	00	04	11	00
OE	Ocean Engineering & Naval Arch.	16	14	01	00	01	08	03	01	00	04	14	02
PH	Solid State Technology	15	15	00	00	00	11	01	00	01	02	13	02
BT	Biotechnology & Biochemical	19	19	00	00	00	09	02	01	00	07	13	06
CR	Cryogenic Engineering.	07	06	01	00	00	05	01	00	00	01	07	00
HS	Hum. Resources Dev. & Managmt.	08	08	00	00	00	04	02	00	00	02	08	00
IEM	Industrial Engg. & Management.	15	14	00	01	00	04	05	00	00	06	13	02
RE	Reliability Engineering.	05	03	01	00	01	04	01	00	00	00	05	00
MS	Material Sc. & Engineering.	16	14	00	00	02	11	02	00	00	03	16	00
RT	Rubber Technology	14	12	01	00	01	09	02	00	00	03	13	01
ID	Infrastructure Design & Management	11	11	00	00	00	06	02	00	00	03	06	05
WM	Water Management	07	06	01	00	00	04	01	00	00	02	04	03
VGSOM	Business Administration	86	00	86	00	00	55	11	06	02	12	77	09
SMST	Medical Imaging & Image Analysis	05	04	00	00	01	03	02	00	00	00	04	01
	Medical Science & Technology	15	13	02	00	00	08	03	01	00	03	14	01
MT	PG Diploma in Steel Technology	13	00	13	00	00	12	00	00	00	01	12	01
CL	CORAL	12	12	00	00	00	07	03	00	00	02	11	01
RGSOIPLLLBIPR	LLB (IPR)	29	00	29	00	00	25	02	00	00	02	17	12
	Total	**942**	**736**	**148**	**15**	**43**	**547**	**142**	**45**	**8**	**200**	**819**	**123**

TABLE : B-2

POSTGRADUATE STUDENTS ON ROLL
Ist year – 2009-2010 & 2nd year 2008-2009

Dept./ Centre	Specialization	Intake Capacity	1st Year		2nd Year		Total	
			M	F	M	F	M	F
AE	Aerospace Engineering.	20	17	02	13	01	30	03
AG	Farm Machinery & Power	16	15	00	09	00	24	00
	Soil & Water Conservation Engineering.	16	08	04	07	01	15	05
	Dairy & Food Engineering.	15	13	02	09	00	22	02
	Applied Botany	17	09	05	10	03	19	08
	Water Resource Devl. & Management	15	05	06	09	02	14	08
	Aquacultural Engineering.	18	00	00	06	01	06	01
	Agril. System & Management	16	05	05	00	00	05	05
	Post Harvest Engineering.	16	15	02	08	01	23	03
ARP	City Planning	36	13	11	13	11	26	22
ChE	Chemical Engineering.	72	53	09	40	08	93	17
Civil	Hydraulic & Water Resource Engineering.	17	04	02	09	00	13	02
	Transportation Engineering.	17	15	00	14	00	29	00
	Environmental Engg. & Management	15	08	03	04	01	12	04
	Geo-Technical Engineering.	15	00	00	00	00	00	00
	Structural Engineering	16	15	02	09	01	24	03
CSE	Computer Science & Engg.	36	42	01	23	01	65	02
EE	Machine Drives & Power Electronics	17	16	00	08	00	24	00
	Control System Engineering.	16	17	01	10	01	27	02
	Power System Engineering.	15	14	00	11	01	25	01
	Instrumentation	16	14	01	13	02	27	03

Dept./ Centre	Specialization	Intake Capacity	1st Year		2nd Year		Total	
			M	F	M	F	M	F
E&ECE	Fibre Optics & Lightwave Engg.	10	05	00	00	00	05	00
	Microelectronics & VLSI Design	25	22	04	24	01	46	05
	RF & Microwave Engg.	24	20	04	14	03	34	07
	Telecommunication Systems Engineering	24	21	02	18	02	39	04
	Visual Information & Embedded System	24	24	01	14	01	38	02
GG	Exploration geosciences	20	06	02	08	00	14	02
	Computational Seismology	11	01	00	07	00	08	00
SIT	Information Technology	21	22	01	18	01	40	02
MA	Comp. Sc.& Data Processing	29	26	01	23	02	49	03
ME	Manufac. Science Engg.	35	23	02	18	01	41	03
	Thermal Science & Engineering.	33	28	00	19	01	47	01
	Mechanical System Design	30	35	00	18	02	53	02
	Mechanical System Dynamics & Control	00	00	00	14	01	14	01
MT	Metallurgical & Materials Engg.	46	30	04	18	01	48	05
MI	Mining Engineering	20	11	00	09	00	20	00
OENA	Ocean Engineering & Naval Arch.	20	14	02	11	01	25	03
PH	Solid State Tech.	21	13	02	12	03	25	05
BT	Biotechnology & Biochemical	20	13	06	07	06	20	12
CR	Cryogenic Engineering	20	07	00	05	00	12	00
HSS	Hum. Resources. Dev. & Management	20	08	00	11	01	19	01
IEM	Industrial Engg. & Managt.	26	13	02	12	00	25	02
RE	Reliability Engineerg.	20	05	00	14	01	19	01
MS	Material Science & Engg.	25	16	00	12	03	28	03
RT	Rubber Technology	20	13	01	11	01	24	02
ID	Infrastructure Design & Management	26	06	05	05	04	11	09
WM	Water Management	10	04	03	03	04	07	07

Dept./ Centre	Specialization	Intake Capacity	1st Year		2nd Year		Total	
			M	F	M	F	M	F
VGSOM	Business Administration	136	77	09	67	15	144	24
SMST	Medical Imaging & Image Analysis	13	04	01	09	01	13	02
	Medical Science & Technology	15	14	01	07	02	21	03
MT	PG Diploma in Steel Technology	25	12	01	21	00	33	01
CORAL	CORAL	26	11	01	05	02	16	03
RGSOIPL	LLB (IPR)	50	17	12	18	03	35	15
CET	Media & Sound Engg.	13	00	00	05	02	05	02
	Total	**1295**	**819**	**123**	**682**	**100**	**1501**	**223**

TABLE : B-3

STATEMENT OF RESULTS OF POSTGRADUATE EXAMINATION
M.TECH / MCP / MMST / LLB / PGDBA / PGDIPL / PGDST / PGDIT
2007-2008 BATCH OF STUDENTS

Dept./ Centre	Specialisation	Number Registered	No. Declared Successful	No. of Incomplete Results	Remarks
AE	Aerospace Engineering.	16	16	-	
AG	Farm Machinery & Power	12	10	07AG6103 07AG6112	06AG6101,06AG6113,06AG6115 (Old Batch)
	Soil & Water Conservation Engineering.	11	11		06AG6203,06AG6210 (Old Batch)
	Dairy & Food Engineering.	11	11	-	-
	Applied Botany	07	07		-
	Water Resource Development & Management	13	12	07AG6506	-
	Aquacultural Engineering.	12	11	07AG6611	
	Agril. System & Management	09	09	-	-
	Post Harvest Engineering.	12	12	-	04AG6805
AR	City Planning	20	20	-	-
CH	Chemical Engineering.	48	48	-	06CH6006,06CH6010,06CH6031 (Old Batch)
CORAL	Oceans, Rivers, Atmosphere & Land Sciences	08	08	-	-
ET	Media & Sound Engg.	09	09	-	-
CE	Hydraulic & Water Resources Engineering	06	05	07CE6108	-
	Transportation Engineering.	08	07	07CE6205	-

Dept./ Centre	Specialisation	Number Registered	No. Declared Successful	No. of Incomplete Results	Remarks
	Environmental Engg. & Management	05	04	07CE6303	-
	Geo-Technical Engineering.	07	06	07CE6407	-
	Structural Engineering	12	12	-	-
CS	Computer Science & Engg.	24	24	-	-
EE	Mach. Drives & Power Electronics	12	11	07EE6102	-
	Control System Engineering	05	04	07EE6203	-
	Power System Engg.	11	11	-	06EE6304
	Instrumentation	11	10	07EE6410	-
E&ECE	Microelectronics & VLSI Design	19	19	-	-
	RF & Microwave Engg.	16	15	07EC6310	-
	Telecommunication Systems Engineering	17	17	-	-
	Visual Information & Embedded System Engg.	17	17	-	-
GG	Earth & Environmental Sciences	09	09	-	-
	Computational Seismology	08	08	-	-
SIT	Information Technology	15	15	-	-
MA	Computer Science & Data Processing	19	19	-	-
ME	Manufacturing Science & Engineering.	18	18	-	-
	Thermal, Energy & Environmental Engg.	23	23	-	06ME6216
	Mechanical System Design	19	18	07ME6301	-

Dept./ Centre	Specialisation	Number Registered	No. Declared Successful	No. of Incomplete Results	Remarks
	Mech. Sys. Dynamics & Control	12	12		05ME0702
MT	Metallurgical & Materials Engg.	27	27	-	04MT6008,05MT6017,06MT6023 (Old Batch)
MI	Mining Engineering.	08	08	-	-
NA	Ocean Engg. & Naval Architecture	09	09		04NA6001
PH	Solid State Technology.	09	09	-	-
BT	Biotechnology & Biochemical	14	14	-	-
CR	Cryogenic Engineering.	07	07	-	06CR6011
HS	Hum. Resources. Dev. & Management	13	13	-	-
IM	Industrial Engg. & Management	19	17	07IM6008 07IM6011	06IM6008,06IM60019 (Old Batch)
RE	Reliability Engineering	16	16	-	-
MS	Materials Sc. & Engg.	13	13	-	-
RTC	Rubber Technology	12	12	-	05RT6002
VGSOM	Business Administration	115	115	-	-
PGDIT	Information Technology	00	00	-	06IT5507
SMST	Medical Imaging & Image Analysis (2 Yr.)	08	08	-	-
MMST	Medical Science & Technology (3 Yr.)	07	07		04MM6002
VGSOM	PG Diploma in Business Administration	45	45	-	06BM5522,06BM5556,06BM5113
MT	PG Diploma in Steel Technology (1 Yr.)	21	21	-	-

Dept./ Centre	Specialisation	Number Registered	No. Declared Successful	No. of Incomplete Results	Remarks
RGSOIPL	PGDIPL (3 Yr.)	33	33	-	-
RGSOIPL	IPL (1Yr. 6 Month)	09	09	-	-
	Total	**866**	**851**	**15 Nos.**	**25 Nos.**

TABLE : C-1

NUMBER OF RESEARCH SCHOLARS ENROLLED FOR THE PH.D. DEGREE DURING 2009-2010
(01/07/2009 TO 30/06/2010)

Deptt./Centre School	Institute Scholar	Sponsored Scholar	Scheme/CSIR/ UGC/ QIP	Self-Financing	Teach. /Non-teaching	Total	Genl	SC	ST	OBC	M	F
AE	02	01	-	-	-	03	03	-	-	-	01	02
AG	10	02	23	-	-	35	29	04	-	02	20	15
AR	01	-	-	-	-	01	01	-	-	-	-	01
AT	07	01	06	-	-	14	14	-	-	-	09	05
BT	04	-	10	-	-	14	13	01	-	-	08	06
CY	-	-	29	-	-	29	28	-	-	01	20	09
CH	13	01	02	-	-	16	11	02	-	03	12	04
CE	07	02	03	-	-	12	09	02	-	01	10	02
CS	08	02	09	-	-	19	18	01	-	-	16	03
CR	03	-	01	-	-	04	02	-	01	01	03	01
ET	-	-	-	-	-	-	-	-	-	-	-	-
CL	01	01	05	-	-	07	05	-	-	02	05	02
EE	08	-	01	-	-	09	08	-	-	01	08	01
EC	11	-	10	-	-	21	15	01	01	04	20	01
GG	11	-	14	-	-	25	19	02	-	04	19	06
GS	-	-	03	-	-	03	03	-	-	-	03	-
HS	10	01	03	-	-	14	13	-	-	01	07	07
IM	03	01	01	-	-	05	05	-	-	-	05	-
IP	02	01	-	-	02	05	05	-	-	-	05	-
MS	06	01	07	-	-	14	12	01	-	01	09	05

Deptt./Centre School	Institute Scholar	Sponsored Scholar	Scheme/CSIR/ UGC/ QIP	Self-Financing	Teach. /Non-teaching	Total	Genl	SC	ST	OBC	M	F
MA	05	-	03	-	-	08	07	-	-	01	08	-
ME	20	01	03	-	-	24	14	05	-	05	24	-
MT	12	02	04	-	-	18	13	02	01	02	17	01
MI	02	-	03	-	-	05	04	01	-	-	04	01
NA	01	-	-	-	-	01	01	-	-	-	01	-
PH	07	-	09	-	-	16	12	01	-	03	13	03
RE	01	-	-	-	-	01	01	-	-	-	01	-
RT	04	01	03	-	-	08	05	01	-	02	08	-
RD	01	-	-	-	-	01	01	-	-	-	-	01
MM	-	01	05	-	-	06	05	01	-	-	04	02
IT	01	-	03	-	-	04	03	01	-	-	03	01
BM	02	05	-	-	-	07	06	01	-	-	05	02
WM	03	-	-	-	-	03	03	-	-	-	03	-
TOTAL	**166**	**24**	**160**	**-**	**02**	**352**	**288**	**27**	**03**	**34**	**271**	**81**

TABLE : C-2

NUMBER OF MS STUDENTS ENROLLED DURING 2009-2010
(01/07/2009 TO 30/06/2010)

Deptt./Centre/ School	Total	Genl.	SC	ST	OBC	Male	Female
AG	03	03	-	-	-	02	01
AT	03	02	-	-	01	02	01
CS	15	15	-	-	-	13	02
CR	01	01	-	-	-	01	-
CH	01	01	-	-	-	01	-
EC	07	07	-	-	-	06	01
EE	03	03	-	-	-	02	01
GS	03	03	-	-	-	02	01
MS	01	01	-	-	-	01	-
IT	04	04	-	-	-	03	01
MI	01	01	-	-	-	01	-
MT	05	04	01	-	-	05	-
RE	02	02	-	-	-	-	02
MM	06	06	-	-	-	04	02
TOTAL	**55**	**53**	**01**	**-**	**01**	**43**	**12**

TABLE : C-3

NUMBER OF POST DOCTORAL FELLOWS ENROLLED DURING 2009-2010
(01/07/2009 TO 30/06/2010)

Deptt./Centre/ School	Total	Genl.	SC	ST	OBC	Male	Female
-	-	-	-	-	-	-	-

TABLE: C-4

UGC SCHOLARS ENROLLED DURING 2009-2010
(01/07/2009 TO 30/06/2010)

Dept/Centre/ School	Total Number	General	SC	ST	OBC	Male	Female
AG	01	01	-	-	-	01	-
BT	02	02	-	-	-	02	-
CY	06	05	-	-	01	04	02
RT	01	01	-	-	-	01	-
TOTAL	**10**	**09**	**-**	**-**	**01**	**08**	**02**

TABLE: C-5

NUMBER OF RESEARCH SCHOLARS FROM *OTHER COUNTRIES*
(01/07/2009 TO 30/06/2010)

NIL

TABLE : C-6

NAMES OF THE PH.D. DEGREE RECIPIENTS

Department / Centre / School	Name of the Degree Recipients
Aerospace Engineering	Haraprasad Roy, Sintu Singha
Agricultural and Food Engineering	Moumita Chakraborty, Yashwant Prabhakar Khandetod, Prabhat Kumar Nema, Bhabatarini Panda, Sudhamoy Mandal, Jippu Jacob, Pardeshi Ishvar Lakhichand, Akhilesh Kumar Singh, Paramita Mahapatra, Arpita Mondal, Menon Rekha Ravindra, Xavier K Jacob, V Anguselvi, Priyabrata Santra, Kamal Nayan Agrawal, Tapati Bhanja, Pothula Srinivasa Brahmanand, Smita Tripathi, Sinija V R., Akhlash Kumar
Architecture and Regional Planning	Maitreyi Maiti, Somen Chakraborty
Biotechnology	Dibyarupa Pal, Chitrangada Acharya, Rupesh Dash, Srirupa Das, Tumpa Dutta, Shireen Meher Kotay, Chaithanya Madhurantakam, Sujit Kumar Bhutia, Palashpriya Das
Chemical Engineering	Mitali Das, Raj Mohan B., Saptarshi Majumdar, Biswajit Sarkar, Animes Kumar Golder, Chittaranjan Mohanty, Pratik Swarup Dash, Jaya Narayan Sahu
Chemistry	Debabrata Seth, Debasis Dhak, Sipra Naskar, Debashree Mandal, Abhijit Tarafdar, Anindya Hazra, Arjun Ghosh, Kalyan Sundar Ghosh, Sudeshna Ray, Tarun Kumar Pal, Soumya Kanti Biswas, Aswini Kumar Giri, Subhra Jana, Nabakumar Pramanik, Bijaya Ketan Sahoo, Sutapa Ray, Jobin Jose, Arijit Roy, Sudip Chakraborty, Tapas Kuila

Department / Centre / School	Name of the Degree Recipients
Civil Engineering	Sudhanshu Sekhar Das, Sanghamitra Kundu, Debasis Basu, Sridhar R., Debasish Bandyopadhyay, Tushar Kumar Nath, Malay Kanti Ghosh, Pradyumna S., Namita Nanda, Pradeep Kumar Sahoo, Pabitra Ranjan Maiti, Kapileswar Mishra, Bappaditya Manna
Computer Science and Engineering	Themrichon Tuithung, Sandip Aine, Santosh Biswas, Monalisa Sarma, Bhaskar Pal, Samit Bhattacharya, Ashok Kumar Das, Dipankar Das
Cryogenic Engineering	Arunkumar Samanta
Electrical Engineerintg	Sharmili Das, Savier J. S., Bani Kanta Talukdar, Sourav Patra, Mukti Barai, Jagabondhu Hazra, Somnath Maity, Kundu Prasanta, Arun Kishore W.C., Suman Maiti, Archana Gopal Thosar, Umesh Chandra Pati
Electronics and Electrical Communication Engineering	Debashis Dutta, Shaik Rafi Ahamed, Sandipan Chakroborty, Chandan Giri, Prasant Kumar Sahu, Sumanta Gupta, Priyanka Mondal, Santanu Dwari, Saurabh Chaudhury, Sameer S.M., Soumitra Debnath, Siddarama Ramachandrappa Patil, Kurukundu Rama Naidu, Ashis Kumar Mal, Mainak Mukhopadhyay, Aneek Adhya, Abdulla P., Jayashree Ratnam, Pabitra Mohan Khilar, Kailash Chandra Ray, Abhishek Mitra, Sarbajit Pal, Viswanath K., Ashudeb Dutta
Geology and Geophysics	Lopamudra Saha, M. Yanger Walling, Soma De, Raj Kumar Singh, Jagatbikas Nanda, Sanjit Kumar Pal, Dinesh Pandit, N. Sulekha Rao, Pritam Nasipuri, Sukhen Majumder
G. S. Sanyal School of Telecommunications	Preetam Kumar
Humanities and Social Sciences	Kakulavarapu Manasa, Anathbandhu Patra, Smriti Kumari, Indiwar Misra, Mahua Verma, Atri Sengupta, Tirumala Santra, Usha Lenka, Supriti Mishra, D Baby Moses, Laxmi Bilash Hota

Department / Centre / School	Name of the Degree Recipients
Industrial Engineering and Management	Sooraj P., Pradip Kumar Bala, Santanu Sinha, N S Arunraj, Deepayan Shome, Anupam Das
Information Technology	Rajiv Misra, Soumya Pandit
Materials Science	Arfat Anis, Jayanta Maity, Anurag Gautam, Madhumita Mukherjee, Puspanjali Tripathy, Goutam Kumar Jana, Anindita Ghosh, Sandeep Kumar, Ram Naresh Mahaling, Sarika Mishra, Tanmoy Rath, Gajendra Prasad Singh, Ingale Babita Dashrath, Akhilesh Mishra, Aamir Hussain Bhat, Anupama Chanda, Dibakar Behera, Ruchi Bana
Mathematics	Shanta Kumari Sunanda, Jayanta Kumar Dash, Amit Kumar Verma, Debasis Giri, Ashok Kumar Singh, Chanchal Kundu
Mechanical Engineering	Alok Kumar Nandy, Sharifuddin Mondal, Sargade Vikas Gulabrao, Gajendra Kumar Agrawal, Pradip Kumar Talapatra, Kona Mrunalini, Ramjee Repaka, Santosh Kumar Sahu, Somnath Sarangi, Sukhomay Pal, Satyajit Panda, Anil Kishan P., V Pandu Ranga, Anindya Sundar Das, Probir Saha
Metallurgical and Materials Engineering	Basava Kumar K G., Bhimavarapu Siva Basivi Reddy, Radhakanta Rana, Debdas Roy, Sashanka Sekhar Nayak, Manoj Kumar Chopkar, Amit Biswas, Suhrit Mula, Pallab Majumdar, Barekar Nilam Shankarrao, Ravi K. R.
Medical Science and Technology	Shantanu Sur
Mining Engineering	Ravi Krishnarao Jade, Kaushik Pal, Bijay Mihir Kunar, Gnananandh Budi, Tukkaraja Purushotham
Ocean Engineering and Naval Architecture	Mihir Chandra Manna, Pankaj Biswas, Mihir Kumar Pandit, Debabrata Karmakar, Rajesh Kumar R.

Department / Centre / School	Name of the Degree Recipients
Physics and Meteorology	Supriyo Paul, Sk. Saiyad Ali, Tarun Kumar Barik, Srimanta Pal, M. Vasundhara, Raj Kishore Mishra, Sandeep S., Saumya Ranjan Mohapatra, Kanan Kumar Datta, Vinodkumar, Sunanda Kumari Patri
Reliability Engineering	Saravana Kumar K., Annamraju Syamsundar, Dokiburra Edwin Vijay Kumar
Rubber Technology	Haimanti Datta, Jinu Jacob George, Sukanya Satapathy, Anjan Biswas

TABLE : C-7

NAMES OF THE MS DEGREE RECIPIENTS

Department / Centre / School	Name of the Degree Recipients
Chemical Engineering	S. Manigandan
Computer Science and Engineering	Avishek Saha, Sayak Ray, Pratyush Banerjee, Sandipan Dandapat, Rajdeep Mukhopadhyay, Sudip Roy, Prashant Agrawal, Amiya Kumar Maji, Tirthankar Dasgupta, Sunandan Chakraborty, Sandeep Chakraborty
Cryogenic Engineering	Soumen Kar
Electrical Engineering	Ananyo Sengupta, Subhasish Mukherjee, Subho Chatterjee, Ashis Maity, Jyotirmoy Ghosh
Electronics and Electrical Communication Engineering	Bodhisatwa Mazumdar, Atanu Roy, Susmita Ghosh, Anindya Kundu, Moutusi Mondal, Sounak Roy, Santanu Sarkar, Sharmistha Dey
G. S. Sanyal School of Telecommunications	Siva Ram Krishna Vadali
Industrial Engineering and Management	Sumanas Bhattacharya, Venkata Pallavi A
Information Technology	Chinmaya Misra, Somak Bhattacharya, Amlan Kundu, Alokes Chattopadhyay, Syamantak Das, Suprio Das, Subhendu Aich

Department / Centre / School	Name of the Degree Recipients
Materials Science	R. Rajasekar, Pravin Bhimrao Sawai
Mechanical Engineering	Abhijit Verma
Mining Engineering	Vinayak N. Deshpande
Reliability Engineering	Neelesh Bhattacharya

INDIAN INSTITUTE OF TECHNOLOGY
KHARAGPUR

RECEIPT AND PAYMENT ACCOUNT FOR THE YEAR ENDED 2009–2010

#	R E C E I P T S	AMOUNT (Rs.)	#	P A Y M E N T S	AMOUNT (Rs.)
I	**Opening Balance (Bank Balances)**		**I**	**EXPENSES**	
	a) In Current accounts	913280589.00		a) Establishment Expenses	1963310100.00
	b) In Deposit accounts	0.00		b) Administrative Expenses	385304497.00
	c) In Savings accounts	7678179.00			
II	**Grants Received**		**II**	**Investments and deposits made**	
	From Government of India			a) Out of Earmarked / Endowment Funds	970448960.00
	a) Non-Recurring (Plan)	440000000.00		b) Out of Institute Development Fund	345550008.00
	b) Recurring (Non-Plan)	1946700000.00		c) Out of Own Funds & Others	3184605000.00
	c) OSC-PLAN	784005000.00			
III	**Income on Investments from**		**III**	**Expenditure on Fixed Assets & Capital Work-in-progress**	1363759155.00
	a) Earmarked / Endowment Fund	228694875.00			
	b) Institute Development Fund	28732940.00			
	c) Own Funds	37829719.00			
IV	**Interest Received**		**IV**	**Other Payments**	587886481.00
	a) On Bank deposits	4808845.00			
	b) Recoverable Advances	5207586.00			

V	**Other Income**	302973559.00	**V**	**Closing Balances**	
				a) In current accounts	525785386.00
VI	**Amount Borrowed**	83706447.00		b) In savings accounts	268564282.00
VII	**Other Receipts**	4811596130.00			
	TOTAL	**9595213869.00**		**TOTAL**	**9595213869.00**

RESEARCH PUBLICATIONS

DEPARTMENT OF AEROSPACE ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF AGRICULTURAL & FOOD ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF ARCHITECTURE & REGIONAL PLANNING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF BIOTECHNOLOGY

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF CHEMICAL ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF CHEMISTRY

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF CIVIL ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF ELECTRICAL ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF ELECTRONICS & ELECTRICAL COMMUNICATION ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF GEOLOGY & GEOPHYSICS

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF INDUSTRIAL ENGINEERING & MANAGEMENT

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF MATHEMATICS

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF MECHANICAL ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF MINING ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF OCEAN ENGINEERING & NAVAL ARCHITECTRUE

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

DEPARTMENT OF PHYSICS & METEOROLOGY

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

CENTRE FOR EDUCATIONAL TECHNOLOGY

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

CENTRE FOR OCEANS, RIVERS, ATMOSPHERE AND LAND SCIENCES

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

CRYOGENIC ENGINEERING CENTRE

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

MATERIALS SCIENCE CENTRE

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

RELIABILITY ENGINEERING CENTRE

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

RUBBER TECHNOLOGY CENTRE

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

RURAL DEVELOPMENT CENTRE

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

RAJIV GANDHI SCHOOL OF INTELLECTUAL PROPERTY LAW

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

SCHOOL OF INFORMATION TECHNOLOGY

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

SCHOOL OF MEDICAL SCIENCE & TECHNOLOGY

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

VINOD GUPTA SCHOOL OF MANAGEMENT

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.

ADVANCED TECHNOLOGY DEVELOPMENT CENTRE

RESEARCH PUBLICATIONS

Journals :

1. Magnetic semiconducting diode of p-Ge1-xMnx/n-Ge layers on silicon substrate *By* S. Majumdar, A. K. Das and S. K. Ray, *Applied Physics Letters*, 94, 122505 (2009)
2. Synthesis and temperature dependent photoluminescence properties of Mn doped Ge nanowires *By* S. Majumdar, A. K. Das & S. K. Ray, *Journal of Applied Physics*, 105, 024302 (2009)
3. Phase Inhomogeneity and Electrical Characteristics of Nickel Silicide Schottky Contacts Formed on 4H-SiC *By* I. Nikitina, K. Vassilevski, A. Horsfall, N. Wright, A. G. O'Neill, S. K. Ray and C. M. Johnson, *Materials Science Forum*, 2, p. 615 (2009)
4. Temperature dependent leakage current behavior of pulsed laser ablated SrBi2Ta2O9 thin films *By* A. Roy, S. Maity, A. Dhar, D. Bhattacharya and S. K. Ray, *Journal of Applied Physics*, 105, 044103 (2009)
5. Temperature- and Time-Dependent Shape Transformation of ZnO Nanostructures Grown by Vapor–Solid Method *By* S. Mandal, S. K. Lahiri, A. Dhar, and S. K. Ray, *J. Nanoscience & Technology Letters*, 1, p. 57 (2009)
6. Growth and Photoluminescence Characteristics of ZnO Tripods *By* S. Mandal, A. Dhar and S. K. Ray, *Journal of Applied Physics*, 105, 033513 (2009)
7. Carrier transport mechanism in aluminum nanoparticle embedded AlQ3 structures for organic based memory devices *By* V.S.Reddy, S. Karak, S. K. Ray and A.Dhar, *Organic Electronics*, 10, p.138 (2009)
8. Silicon Dioxide Embedded Germanium Nanocrystals Grown Using Molecular Beam Epitaxy for Floating Gate Memory Devices *By* S. Das, R. K. Singha, K. Das, A. Dhar, and S. K. Ray, *Journal of Nanoscience and Nanotechnology*, 9, p. 1 (2009)
9. Memory Characteristics of Nickel Nanocrystals with High-k Dielectric Tunneling Barriers *By* D. Panda, S. Maikap, A. Dhar and S. K. Ray, *Electrochemical and Solid State Letters*, Volume: 12 Issue: (2009)
10. Temperature dependent leakage current behavior of pulsed laser ablated SrBi2Ta2O9 thin films *By* A. Roy, S. Maity, A. Dhar, D. Bhattacharya and S. K. Ray, *Journal of Applied Physics*, 105, 044103 (2009)
11. Cross-axis sensitivity reduction of a silicon MEMS piezoresistive accelerometer *By* A. Ravishankar, S. Das and S.K. Lahiri, *Microsystem Technologies*, 15, 511-518 (2009)
12. Performance enhancement of a silicon MEMS PZR single axis accelerometer with electroplated gold on proof mass *By* A. Ravishankar, S.K. Lahiri and S. Das, *Journal of micromechanics and microengineering*, 19, 10pp (2009)
13. Study of high energy Mn+1 implantation in GaAs By A. Chanda, H. P. Lenka, C. Jacob, Applied Physics A, 94(1), 89 (2009)
14. ZnO nanorod growth with silver catalyst - effect of annealing By S. K. Panda and C. Jacob, Physica E, 41(5), 792 (2009)
15. Annealing effect of evaporated Mn thin films on GaAs By A. Chanda, H. P. Lenka, C. Jacob, Journal of Superconductivity and Novel Magnetism, 22(4), 401 (2009)
16. C.L. Sones, K.S. Kaur, P. Ganguly, D.P. Banks, Y.J. Ying, R.W. Eason, and S.

Mailis, “Laser-Induced-Forward-Transfer: A rapid prototyping tool for fabrication of photonic devices”, Accepted in *Appl. Phys. A-Mater. Sci. Process.*, 2010

17. P.K. Dey, B. Pramanik, A. RaviShankar, P. Ganguly, and S. Das, “Microstructuring of SU-8 resist for MEMS and Bio-applications”, *Int. J. on Smart sensing and intelligent systems*, 3, pp. 118-129, 2010
18. C.L. Sones, P. Ganguly, Y.J. Ying, E. Soergel, R.W. Eason, and S. Mailis, “Spectral and electro-optic response of UV-written waveguides in lithium niobate single crystals”, *Optics Express*, 17, pp.23755-23764, 2009
19. M. Ravi Kumar, P.K. Sahu, K. Esakki Muthu, S. Maji, P. Ganguly, S. Mahapatra, and S.S. Pathak, “Design of zero-gap directional coupler based mode separators for Ti:$LiNbO_3$ technology”, Communicated to *Appl. Opt*., 2009
20. Pranabendu Ganguly, Collin Lawrence Sones, Yungjun Ying, Hendrik Steigerwald, Karsten Buse, Elisabeth Soergel, Robert William Eason, and Sakellaris Mailis, “Determination of refractive indices from the mode profiles of UV-written channel waveguides in $LiNbO_3$-crystals for optimization of writing conditions”, *J. Lightwave Technol*., 27, pp.3490-3497, 2009
21. Growth temperature dependence of partially Fe filled MWCNT using chemical vapor deposition *By* J. Sengupta and C. Jacob, *Journal of Crystal Growth*, 311(23-24), 4692 (2009)
22. Surface enhanced Raman scattering and photoluminescence properties of catalytic grown ZnO nanostructures *By* S. K. Panda and C. Jacob, *Applied Physics A: Materials Science and Processing*, 96 (4), pp. 805-811 (2009)
23. Synthesis of beta-SiC core-sheath nanowires by CVD technique using Ni as a catalyst *By* S. K. Panda, J. Sengupta and C. Jacob, *Journal of Nanoscience and Nanotechnology*, 10(5), 3046-3052 (2010)
24. Pre-heating effect on the catalytic growth of partially filled carbon nanotubes by chemical vapor deposition *By* J. Sengupta and C. Jacob, *Journal of Nanoscience and Nanotechnology*, 10(5), 3064-3071 (2010)
25. The effect of Fe and Ni catalysts on the growth of multiwalled carbon nanotubes using chemical vapor deposition *By* J. Sengupta and C. Jacob, *Journal of Nanoparticle Research*, 12(2), 457-465 (2010)
26. Lithographically defined site-selective growth of Fe filled multi-walled carbon nanotubes using a modified photoresist with metallorganic molecular precursor *By* J. Sengupta, A. Jana, N. D. Pradeep Singh and C. Jacob, *Carbon* 48 (8) 2371 (2010)
27. Performance enhancement of a silicon MEMS piezoresistive single axis accelerometer with electroplated gold on a proof mass *By* A. Ravi Sankar, S.K. Lahiri and S. Das, *J. Micromechanics and Microengineering*, 19, 025008 (2009)
28. Cross-axis sensitivity reduction of a silicon MEMS piezoresistive accelerometer *By* A. Ravi Sankar, S. Das and S.K. Lahiri, *Microsystem Technologies*, 15, 511-518 (2009)
29. Compatibility study of diamond-like nanocomposite thin films with hydrazine propellant for MEMS microthruster *By* P. Kundu, A. Ray Chaudhuri, S. Das and T. K. Bhattacharyya, *Advanced Materials Research*, 74, 179-182 (2009)
30. Correlating RCCA Blood Flow Characteristic with ECG Features in hypertensive subjects *By* P. Purwar, B.P. Chatterjee, A. Mitra, J. Chatterjee and S. Das, *Ultrasound in Medicine.*, Submitted (2010)
31. A technique to improve the linearization of frequency – voltage characteristic of LC-VCO by Debashis Mandal and T.K. Bhattacharyya, Analog Integrated Circuits and Signal Processing, Vol. 62, No.2, 253-257 (2010)
32. Compatibility study of diamond – like nanocomposite thin films with hydrazine

propellant for MEMS microthruster by P. Kundu, A. Ray Chaudhuri, S. Das and T.K. Bhattacharyya, Advanced Materials Research, Vol.74, pp.269-272 (2009)

33. Development and characterization of surface micro-machined MEMS based varactor by Subha Chakraborty, A. Bhattacharya, Ashesh Ray Chaudhuri and T.K. Bhattacharyya, International Journal on Smart Sensing and Intelligent System, Vol.3, No.1, 2010

Seminars / Workshops / Conferences :

1. Srijita Patra, T.K.Bhattacharyya "Design and Fabrication of High Sensitivity Surface Micromachined Tunneling Accelerometer with Micro-g Resolution", International Conference on MEMS, 2009, IIT Madras, India
2. Srijita Patra, T. K Bhattacharyya "Design and Fabrication of Micromachined Tunneling Accelerometers with Micro-g resolution and their comparison" International Conference on Electron Devices and Semiconductor Technology, 2009, IIT Bombay
3. P. Kundu, S.K.Shah, B. Pramanik, T. K. Bhattacharyya and S. Das, "Design and development of hydrazine based MEMS microthruster (ICMEMS09)" International Conference on MEMS, IIT-Madras, India, Jan. 2-4, 2009
4. A Ravi Sankar, Swamy K.B.M., Pijus Kundu, Soumen Das, "Corner Compensation Analysis of Silicon Microstructures in CMOS Compatible Anisotropic Etching", International Conference on Active/Smart materials, TCE, Madurai, Jan. 7-9, 2009
5. A Ravi Sankar, Swamy K.B.M., Pijus Kundu, Soumen Das, "Damping and Temperature Drift Analysis of a Silicon Piezoresistive Acceleration Sensor", International Conference on Active/Smart materials, TCE, Madurai, Jan. 7-9, 2009
6. *Swamy K.B.M*, T. Praveen Singh, S. Kar, S.Das, S.Sen, "Design of Centrally Anchored In-Plane Micro-Accelerometer", International Conference on MEMS (ICMEMS 2009), IIT-Madras, Jan. 3-5, 2009
7. *Swamy K.B.M*, T.Praveen Singh, Sougata Kar, S.Sen, "Design of Different Structural Element Configurations for Applications in Micro Sensors and Actuators "International Conference on Active/Smart materials, TCE, Madurai, Jan. 7-9, 2009
8. S P Mondal, A Dhar and S K Ray, Core-shell Ge/CdS Nanowire Heterostructures for Photovoltaic Devices, PVSEC18, Kolkata, 33, (2009)
9. S.Karak, V.S.Reddy, S.K.Ray and A.Dhar, Effect of Pentacene Crystallinity on Photovoltaic Energy Conversion of PCBM Based Heterojunctions, PVSEC18 2009, Kolkata, 35, (2009)
10. V. Sivaji Reddy, D.V. Maheswar Repaka, Supravat Karak, S.K. Ray and A. Dhar, Organic Bistable Memory Devices Based on Donor-Acceptor Systems, International Conference on Hi-Tech Materials 2009, IIT Kharagpur, 176, (2009)
11. S. Majumdar, A. K. Das and S. K. Ray, Field Dependent Transport Property of Magnetic Semiconducting p-Ge1-xMnx/n-Ge Diode, Homi Bhaba Centenary DAE-BRNS Natinal Conference on Spintronics and Magnetoelectronics Materials and Devices, Puri, India, p. 45, (2009)
12. Ravi Sankar and S. Das, Experimental Analysis of Galvanic Corrosion of Al-Cr-Au Metals Stack for MEMS Application, International Conference on MEMS, IIT Madras, (2009)
13. Ravi Sankar, S. Das and S. K. Lahiri, Fabrication and Testing of Single Axis Silicon MEMS PZR Accelerometer with Enhanced Performance using Electroplated Gold on

Proofmass, International Conference on MEMS, IIT Madras, (2009)

14. Ravi Sankar and S. Das, Squueze Film Damping and Temperature Drift Analysis of a Silicon Piezoresistive Acceleration Sensor, International Conference on Active/ Smart Materials, TCE, Madurai, (2009)
15. A. Ravi Sankar, M. Swamy, P. Kundu and S. Das, Corner Compensation Analysis of Silicon Microstructures in CMOS Compatible Anisotropic Etching,, International Conference on Active/ Smart Materials, TCE, Madurai, (2009)
16. S. K. Panda, J. Sengupta and C. Jacob, Beta SiC/SiO2 nanocables synthesized by APCVD technique, Materials Research Society of India, 20th AGM,, Kolkata, , (2009)
17. J. Sengupta, S. K. Panda and C. Jacob, Effect of reconstruction of catalyst on the catalytic growth of partially filled carbon nanotubes by chemical vapour deposition, Materials Research Society of India, 20th AGM, Kolkata, (2009)
18. S. K. Panda, J. Sengupta and C. Jacob, Hot wall and cold wall CVD grown polycrystalline beta-SiC - a comparative study, International Conference on High Tech Materials (ICHTM-09), IIT Kharagpur, (2009)
19. J. Sengupta and C. Jacob, Growth and characterization of carbon nanotubes synthesized by propane decomposition using CVD, International Conference on High Tech Materials (ICHTM-09), IIT Kharagpur, (2009)
20. Pranabendu Ganguly, Juran C. Biswas, Samir K. Lahiri, and Rajib Chakraborty, "Effective-Index-based Matrix Method: a Semi-Analytical Tool to Design Graded-Index Waveguides and Directional Coupler Devices", *Proc. 18th International Workshop on Optical Waveguide Theory and Numerical Modelling*, OWTNM 2010, P-34, Cambridge, UK, 9th and 10th April, 2010
21. C.L. Sones, Y.J. Ying, R.W. Eason, S. Mailis, P. Ganguly, and E. Soergel, "UV laser-assisted fabrication of ridge waveguides in lithium niobate crystals", *Proc. 15th European Conference on Integrated Optics*, ECIO-2010, ThP37, Cambridge, UK, 7th-9th April, 2010
22. P. Ganguly, Y.J. Ying, C.L. Sones, S. Mailis, and R.W. Eason, "Microstructuring of lithium niobate by UV-writing and poling technique", *Proc. 3rd National Conference on MEMS, Smart Structures and Materials*, ISSS MEMS 2009, pp.83-85, Kolkata, India, 14th-16th October, 2009
23. C.L. Sones, D.P. Banks, K.S. Kaur, P. Ganguly, Y.J. Ying, R.W. Eason, and S. Mailis, "Laser-Induced-Forward-Transfer: A rapid prototyping tool for fabrication of photonic devices", Poster Paper, *Photonics Day Conference*, Optoelectronics Research Centre, Southampton, U.K., 15th December, 2009
24. D.P. Banks, K.S. Kaur, C. Grivas, C.L. Sones, P. Gangopadhyay, Y.J. Ying, J.D. Mills, S. Mailis, I. Zergioti, R. Fardel, M. Nagel, T. Lippert, X. Xu, S.P. Banks, and R.W. Eason, "Femtosecond laser-induced forward transfer for the deposition of nanoscale transparent and solid-phase materials", *Proc. Int. Congress on Laser Advanced Materials Processing*, LAMP 2009, Paper No. 09-103, June 29-July 2, Kobe, Japan, 2009
25. P.K. Dey, B. Paramanik, P. Ganguly, and S. Das, "Fabrication of SU-8 based microstructures for MEMS and bio-MEMS applications", *Proc. 3rd National Conference on MEMS, Smart Structures and Materials*, ISSS MEMS 2009, pp.99-101, Kolkata, India, 14th-16th October, 2009
26. S. Mailis, C.L. Sones, P. Ganguly, Y.J. Ying, K.S. Kaur, D.P. Banks, and R.W. Eason, "Laser-Induced-Forward-Transfer: A rapid prototyping tool for fabrication of photonic devices", *10th Conference on Laser Ablation*, COLA 09, ID 409, Singapore, 22-27th November, 2009

27. P. Ganguly and S.K. Lahiri, "Design, fabrication, and characterization of single-mode Ti:$LiNbO_3$ waveguide", Poster Paper, *DAE-BRNS Them Meeting on Widely Tunable Optical Parametric Oscillator*, Bhava Atomic Research Centre, Mumbai, India, 28-29th August, 2009
28. C.L. Sones, P. Ganguly, Y.J. Ying, H. Steigerwald, K. Buse, E. Soergel, R.W. Eason, and S. Mailis, "Spectral and electro-optic characterization of UV-written waveguides in $LiNbO_3$", *12th Topical meeting on Photorefractive Materials, Effects and Devices - Control of Light and Matter*, PR09, Paper P1-14, Bad Honnef, Germany, 11-14th June, 2009
29. C.L. Sones, P. Ganguly, Y.J. Ying, H. Steigerwald, K. Buse, E. Soergel, R.W. Eason, and S. Mailis, "Spectral analysis of UV-written waveguides in $LiNbO_3$: measurement of cut-off wavelengths", *European Conf. on Lasers and Electro-optics*, CLEO / EUROPE-EQEC, Paper CK-P7, Munich, Germany, 14-19th June, 2009
30. D. Maji, S. Das and S.K. Lahiri, PDMS surface modification technique for thin film deposition, ISSS 3rd national conference on MEMS, Smart structures and materials, CGCRI, Kolkata, (2009)
31. A. Ravi Sankar and S. Das, Experimental analysis of galvanic corrosion of Al-Cr-Au metals stack for MEMS applications, International conference on MEMS,) IIT Madras, Chennai, (2009)
32. A. Ravi Sankar and S. Das, A high performance MEMS piezoresistive accelerometer with electroplated gold atop a thickness reduced proof mass, IEEE Sensors 2009 conference, Christchurch, New Zealand, (2009)
33. S.K. Lahiri and S. Das, Quartz MEMS for inertial sensing, ISSS 3rd national conference on MEMS, Smart structures and materials, CGCRI, Kolkata, (2009)
34. A. Ravi Sankar and S. Das, Gold electroplating: A method to reduce cross-axis sensitivity in piezoresistive accelerometer sensing, ISSS 3rd national conference on MEMS, Smart structures and materials, CGCRI, Kolkata, (2009)
35. S. Chakraborty, A. Ray Chaudhuri and Tarun K. Bhattacharyya, Design and analysis of MEMS cantilever based binary logic inverter, IEEE International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2009, Trivandrum, 184-188, 2009
36. S. Patra, T.K. Bhattacharyya, Design and fabrication of micromachined tunneling accelerometers with micro-g resolution and their comparison, IEEE Electron Devices and semiconductor Technology, Mumbai, 1-4, 2009
37. S. Chakraborty, A.R. Chaudhuri, T.K. Bhattacharyya, Transient analysis of MEMS cantilever based binary inverter and design of a ring oscillator, 4th InternationalConference on Computers and Devices for Communication, CODEC, Kolkata, 1-4, 2009
38. A. Bhattacharya, R.R. Chaudhuri, S. Chakraborty, T.K. Bhattacharyya, Reduced order macromodel extraction of MEMS based varactor and its system level simulation for RF applications, 4th InternationalConference on Computers and Devices for Communication, CODEC, Kolkata, 1-4, 2009
39. A.R. Chaudhuri S. Chakraborty, T.K. Bhattacharyya, Dynamic response and modal analysis of micro-machined disk resonator for RF application, Asia Pacific Microwave Conference, APMC 2009, Singapore, 516-519, 2009
40. S. Patra, T.K. Bhattacharyya, High sensitive surface micromachined out of plane tunneling accelerometers with low-g resolution, IEEE/ASME International conference on Advanced Intelligent Mechatronics, AIM 2009, Singapore, 1577-1581, 2009
41. A. Ray Chaudhuri, S. Chakraborty, A. Bhattacharya, R. Ray Chaudhuri, T.K.

Bhattacharyya, System level realization and analysis of MEMS integrated voltage controlled oscillator, Applied Electromagnetics Conference (AEMC), Kolkata, 1-4, 2009

42. R. Bhattacharya, T.K. Bhattacharyya, R. Garg, Use of TSK type fuzzy system based fitness function approximation for efficient optimization of low-profile wideband diversity PIFA by PSO, Applied Electromagnetics Conference (AEMC), Kolkata, 1-4, 2009
43. A.R. Chaudhuri, P. Kundu, S. Chakraborty, T.K. Bhattacharyya, Performance comparison and fabrication of micro machined electron tunneling accelerometers having cantilever and proof-mass structures, International Conference on Advances in Computing, Control, & Telecommunication Technologies, Trivandrum, 214-216, 2009
44. A. Sanyal, T.K. Bhattacharyya, Maximizing the sequence length in a MASH delta sigma modulator by dithering, IEEE MTT-S International Microwave Symposium Digest, Boston, USA, 1665-1668, 2009
45. R. Dutta, T.K. Bhattacharyya, Xiang Gao, E. Klumperink, Optimized stage ratio of tapered CMOS inverters for manimum power and mismatch jitter product, 23rd International Conference on VLSI Design, Bangalore, 152-157, 2010
46. P. Kundu, T.K. Bhattacharyya, S. Das, A Monopropellant Hydrazine MEMS Thruster for Attitude Control of Nanosatellites, Proceedings of the 2010 IEEE Students' Technology Symposium (TechSym) 3-4 April 2010, IIT Kharagpur, 137-141
47. S. Chakraborty, T.K. Bhattacharyya, Development of surface-micromachined binary logic gate for low frequency signal processing in MEMS based sensor applications, accepted in MicroTech Conference and Expo, 2010, to be held at CA from June 21-25, 2010
48. S. Chakraborty, T.K. Bhattacharyya, Development of MEMS based universal gate for signal processing circuit in low frequency sensor applications, IEEE TechSym 2010 conference, IIT Kharagpur, 3-4 April, 2010

COMPUTER & INFORMATICS CENTRE

RESEARCH PUBLICATIONS

Journals :

1. Plaban Kumar Bhowmick, Devshri Roy, Shudeshna Sarkar, Anupam Basu, A Framework for Manual Ontology Engineering for Management of Learning Material Repository, International Journal of Computer Science & Applications (Accepted and will be published in May 2010)
2. Sunandan Chakraborty, Devshri Roy, and Anupam Basu, Development of Knowledge Based Intelligent Tutoring System, http://www.tmrfindia.org/eseries/ebookV1.html, Advanced Knowledge-Based Systems: Models, Applications and Research, Open Access Book Series in Applicable Mathematics & Computer Science, ISBN 978-81-908426-0-0, e-Book Volume 1, 2010, pp 74-100
3. Devshri Roy, Sudeshna Sarkar and Sujoy Ghose, A comparative study of learning Object Metadata, Learning Material Repositories and Automatic Metadata Annotation, Advances in Semantic Computing. Open Access e-Book on Advances in Semantic Computing (Accepted and will be published in May 2010)

Seminars / Workshops / Conferences :

1. Sanjay Chatterji, Praveen Sonare, Sudheshna Sarkar and Devshri Roy, Grammar Driven Rules for Hybrid Bengali Dependency Parsing, 7th International Conference on Natural Language Processing (ICON 2009), NLP Tool. Contest: Indian Language Dependency Parsing, Hyderabad, India, Dec 14-17, pp 38-42
2. Sanjay Chatterji, Devshri Roy, Sudeshna Sarkar, Anupam Basu, A Hybrid Approach for Bengali to Hindi Machine Translation, 7th International Conference on Natural Language Processing (ICON 2009), Hyderabad, India, 14-17 Dec, 2009, pp 83-91
3. Devshri Roy, Sudeshna Sarkar and Sujoy Ghose, A Personalized Information Retrieval Module for Retrieving Learning Materials, International Workshop on Technology for Education (T4E), 4th-6th, August 2009, Bangalore, pp 71-78
4. Devshri Roy, Sunandan Chakraborty, Plaban Kumar Bhowmick, Anupam Basu, An Authoring System for Developing Intelligent Tutoring System, IEEE Techsym 2010, IIT Kharagpur, April 3-4, 2010

CENTRAL RESEARCH FACILITY

RESEARCH PUBLICATIONS

Journals :

1. J. Maity T. K. Pal and R. Maiti "Transient liquid phase diffusion bonding of 6061-15 % SiCp in argon environment." Journal of Material Processing and Technology Vol.209, 2009, p. 3568
2. J. Maity T. K. Pal and R. Maiti " Transient liquid phase diffusion bonding of 6061-15 % SiCp in argon environment using Cu powder interlayer." Material Science and Technology Vol.25, No.12, 2009, p. 1489
3. J. Maity, T. K. Pal, and R. Maiti "Transient liquid phase diffusion bonding of 6061-13% SiCp composite using Cu powder interlayer: mechanism and interface characterization." Journal of Material Science, 2010, (communicated)
4. Sourabh Roy, Kajal Mondal, and Partha Roy Chaudhuri, "Effects of tapering fabricated photonic crystal fibers in tailoring birefringence, dispersion and supercontinuum generation properties" *Feature issue of Applied Optics on Guided Wave optics*, vol.48, no.31, pp.G106-G113, Nov. 2009
5. Sourabh Roy, Kajal Mondal, Sudip K. Chaterjee, and Partha Roy Chaudhuri, "Design, In-House Fabrication and Analysis of Suspended Core Silica-Strand Photonic Crystal Fiber," Proceeding International conference ELECTRO 2009, Dec. 22-24, IT BHU, India
6. Sourabh Roy, Kajal Mondal, Sudip K. Chatterjee and Partha Roy Chaudhuri, "Silica-Strand Photonic Crystal Fiber for Sensing: In-House Fabrication and Analysis of Properties," accepted for Oral presetantion in the International conference APMP 2010, Apr. 26-28, The Hong Kong Polytechnic University and Jinan University, China
7. Magnetic Circular Dichroism spectroscopy in epitaxial $La_{0.7}Sr_{0.3}MnO_3$ thin films, T. K. Nath, J. R. Neal and G. A. Gehring Journal of Applied Physics, 105, 07D709/1-07D709/3 (2009)
8. Electrical properties of Pulsed Laser Deposited ZnO thin films, S. Chattopadhyay and T. K. Nath, Advanced Material Research, 67, 121 (2009)
9. Microstructural, magnetic, magneto-transport and complex impedance spectroscopy of x $La_{0.7}Sr_{0.3}MnO_3$ – (1-x) $ErMnO_3$ multiferroic ($0 < x < 1$) composites, P. Dey, T. K. Nath, S. K. Mandal and A. Das, International Journal of Modern Physics B, 23, 4889 (2009)
10. Magnetic, Electronic- and Magneto-Transport Properties of Nanocrystalline $Nd_{0.6}Sr_{0.4}MnO_3$ Manganites, S. Kundu and T. K. Nath, Advanced Materials Research, 67, 131 (2009)
11. Complex Impedance Spectroscopy of ZnO and $Zn_{0.9}TM_{0.1}O$ (TM = Co, Mn and Fe) Semiconducting Nanoparticles, S. K. Mandal, T. K. Nath and I. Manna, Nanoscience and Nanotechnology Letters 1, 99 (2009)
12. X-ray Magnetic Circular Dichroism Investigations of The Origin of Room Temperature Ferromagnetism in Fe-Doped ZnO Nanoparticles *By* Takashi Kataoka, Masaki Kobayashiy, Gyong Sok Song, Yuta Sakamoto, Atsushi Fujimori, Fan-Hsiu Chang, Hong-Ji Lin, Di Jing Huang, Chien Te Chen, Sanjay Kumar Mandal, Tapan Kumar Nath, Debjani Karmakar, and Indra Dasgupta *Japanese Journal of Applied Physics* 48, 04C200-1 to 04C200-3, (2009)

13. Electronic structure and magnetism of the diluted magnetic semiconductor Fe-doped ZnO nano-particles, T. Kataoka, M. Kobayashi, Y. Sakamoto, G. S. Song, A. Fujimori, F.-H. Chang, H.-J. Lin, D. J. Huang, C. T. Chen, T. Ohkochi, Y. Takeda, T. Okane, Y. Saitoh, H. Yamagami, A. Tanaka, S. K. Mandal, T. K. Nath, D. Karmakar, and I. Dasgupta, Journal of Applied Physics 107, 033718 (2010)
14. Synthesis of La0.67Sr0.33MnO3 and polyaniline nanocomposite with its electrical and magneto-transport properties, K. Mandal, P.C. Jana, A. K. Meikap and T. K. Nath, Journal of Applied Physics 107, 033704 (2010)
15. Probing the magnetic State by linear and non-linear ac-magnetic susceptibility measurements in underdoped manganites $Nd_{0.8}Sr_{0.2}MnO_3$, S. Kundu and T. K. Nath, J. of Magnetism and Magnetic Materials, 322, 2408 (2010)
16. Electronic structure and magnetic properties of (Fe,Co)-codoped ZnO: Theory and experiment, D. Karmakar, T. V. Chadrsekhar, T. K. Nath, et al., Phys. Rev. B, (in press, 2010)

CENTRAL LIBRARY

RESEARCH PUBLICATIONS

Seminars / Workshops / Conferences :

1. Pathak, S K [et al] (2010). Importance of Web based library services: An Indian scenario. LISA (Library and Information Services in Astronomy) VI conference hosted by Inter-University Centre for Astronomy and Astrophysics (IUCAA) and National Centre for Radio Astrophysics (NCRA) in Pune during February 14 - 17, 2010. Paper was presented. Accepted for publication
2. Pathak, S K [et al] (2010). Use of Electronic Journals in Astronomy and Astrophysics Libraries and Information Centres in India: a Librarians' perspective. LISA (Library and Information Services in Astronomy) VI conference hosted by Inter-University Centre for Astronomy and Astrophysics (IUCAA) and National Centre for Radio Astrophysics (NCRA) in Pune during February 14 - 17, 2010. Paper was presented. Accepted for publication
3. Pathak, S K and Sahu, H K (2010). New and Innovative Library Services: Moving with WEB 2.0 / Library 2.0 Technology: A case study. Submitted for presentation/publication in LISA (Library and Information Services in Astronomy) VI conference hosted by Inter-University Centre for Astronomy and Astrophysics (IUCAA) and National Centre for Radio Astrophysics (NCRA) in Pune during February 14 - 17, 2010. Accepted for publication
4. Guha Roy, Samrat (2010). Building Digital Library Using Drupal. ICDL 2010, held at TERI, New Delhi. ICDL 2010 organized by TERI during 23-26 February 2010 at New Delhi. The paper was presented and published in the conference proceedings, page No : 468 – 479. v1
5. Nandi, A, presented a paper on "Challenging role of library professionals to provide information services for the physically challenged persons" in the seminar on Role of College Libraries in Community Development Organized by Central Library Department, Mahishadal Girl's College during Feb. 05-06, 2010

CENTRAL WORKSHOP AND INSTRUMENTS SERVICE SECTION

RESEARCH PUBLICATIONS

Journals :

1. Modelling and optimization of Die-sinking EDM process using Regression Analysis, Adaptive Meuro-Fuzzy Inference system and Genetic Algorithm. By B. K. Pratihar, S.Patra. Published in International Journal of Data Mining, Modelling and Management. 2010, Vol-2, No.-1, Pp: 75-94
2. Effects of grain refinement and residual elements on hot tearing in aluminum castings. By D.B. Karmekar, S.Patra. Published in International Journal of Advance Manufacturing Technology
3. Prediction of Machinability of Sintered Iron components using Response Surface Method. By S.Patra, G. Sutradhar, P.K.Bardhan. Published in Canadian Journal of Pure and Applied Sciences (CJPAS) Vol-4, No. 1, Feb.-2010, Pp: 1119-1126
4. Effect of grain refinement and alloying elements on hot tearing in aluminum castings. By S.Patra, D.B.Karunakar. Published in International Journal of Production and Quality engineering Technology

CENTRE FOR THEORETICAL STUDIES

RESEARCH PUBLICATIONS

Journals :

1. Electrophilicity index within a conceptual DFT framework By P. K. Chattaraj and S. Giri, Annu. Rep. Prog. Chem., Sect. C, 105, 13 (2009)
2. Bonding, aromaticity and reactivity patterns in some all- metal and non- metal clusters By S. Duley, S. Giri, A. Chakraborty and P. K. Chattaraj, J. Chem. Sci. (S. K. Rangarajan Special Issue), 121, 849 (2009)
3. Arsenic toxicity: an atom counting and electrophlicity based protocol By D. R. Roy, S. Giri and P. K. Chattaraj, Mol. Divers., 13, 551 (2009)
4. Bonding, Reactivity and Aromaticity in Some Beryllocene Derivatives By S. Duley, P. Goyal, S. Giri and P. K. Chattaraj, Croatica Chemica Acta (Special Issue on Professor Zvonimir Maksić's 70th Birthday), 82, 193 (2009)
5. Structure, bonding, reactivity and aromaticity of some selected Zn-clusters By A. Chakraborty, S. Giri and P. K. Chattaraj, J. Mol. Struc. (Theochem), 913, 70 (2009)
6. Net electrophilicity By P. K. Chattaraj, A. Chakraborty and S. Giri, J. Phys. Chem. A, 113, 10068 (2009)
7. Dirichlet boundary conditions and effect of confinement on chemical reactivity By U. Sarkar, S. Giri and P. K. Chattaraj, J. Phys. Chem. A, 113, 10759 (2009)
8. Comparison of global descriptors calculated using various density functionals: A QSAR perspective By R. Vijayaraj, V. Subramanian and P. K. Chattaraj, J. Chem. Theo. Comp., 5, 2744 (2009)
9. Electrophilicity equalization principle By P. K. Chattaraj, S. Giri and S. Duley, J. Phys. Chem. Lett., 1, 1064 (2010)
10. Multi-decker Sandwich Complexes Using Be3(2-) and Mg3(2-) Dianions By P. K. Chattaraj and S. Giri, Int. J. Quantum Chem.(Special Issue on Professor Istvan Mayer's 65th Birthday), 109, 2373 (2009)
11. Conceptual aspects of electron densities and density functionals By Pratim K. Chattaraj and Ajit J. Thakkar, J. Mol. Struc. (Theochem), 943, 1 (2010)
12. Kinematics of flows on curved, deformable media by A. DasGupta, H.Nandan and S. Kar International Journal of Geometric Methods in Modern Physics, 6, 645 (2009)
13. Kinematics of geodesic flows in stringy black hole backgrounds by A. DasGupta, H. Nandan and S. Kar Physical Review D, 49, 124004 (2009)
14. Estimation of cosmological parameters from neutral hydrogen observations of the post-reionization epoch by Bharadwaj, Somnath; Sethi, Shiv K.; Saini, Tarun Deep Physical Review D, 79, 083538 (2009)
15. Gravitational-wave detection using redshifted 21-cm observations by Bharadwaj, Somnath; Guha Sarkar, Tapomoy Physical Review D, 79, 124003 (2009)
16. The scaleheight of NGC 1058 measured from its HI power spectrum by Dutta, Prasun; Begum, Ayesha; Bharadwaj, Somnath; Chengalur, Jayaram N. Monthly Notices of the Royal Astronomical Society, 397, L60 (2009)
17. A study of interstellar medium of dwarf galaxies using HI power spectrum analysis by Dutta, Prasun; Begum, Ayesha; Bharadwaj, Somnath; Chengalur, Jayaram N. Monthly Notices of the Royal Astronomical Society, 398, 887 (2009)

18. The scale of homogeneity of the galaxy distribution in SDSS DR6 by Sarkar, Prakash; Yadav, Jaswant; Pandey, Biswajit; Bharadwaj, Somnath Monthly Notices of the Royal Astronomical Society, 399, L128 (2009)
19. The optimal redshift for detecting ionized bubbles in HI 21-cm maps by Datta, Kanan K.; Bharadwaj, Somnath; Choudhury, T. Roy Monthly Notices of the Royal Astronomical Society, 399, L132 (2009)
20. The CMBR ISW and HI 21 cm cross-correlation angular power spectrum by Guha Sarkar, Tapomoy; Datta, Kanan K.; Bharadwaj, Somnath Journal of Cosmology and Astroparticle Physics, 8, 19 (2009)
21. Galaxy Surveys by Bharadwaj, Somnath Current Science, 97, 821 (2009)
22. CMBR Weak Lensing and HI 21-cm Cross-correlation Angular Power Spectrum by Guha Sarkar, Tapomoy; Bharadwaj, Somnath Journal of Cosmology and Astroparticle Physics, 1002, 002, 2010
23. An eigenvalue problem in two dimensions for an irregular boundary by S Chakraborty, J K Bhattacharjee and S P Khastgir Journal of Physics A: Mathematical and Theoretical(J. Phys. A: Math. Theor.), No. 42 pp 195301 (2009)
24. Steiner trees and spanning trees in six-pin soap films by Prasun Dutta, S. Pratik Khastgir, Anushree Roy American Journal of Physics (Am. J. Phys.), No. 78 pp 215 (2010)
25. Magnetoresistance in paramagnetic heavy fermion metals by D.Parihari and N.S.Vidhyadhiraja, PCM, 21, 405602 (2009)
26. Bose S K and Dey S (2009): Reynolds averaged theory of turbulent shear flow over undulating beds and formation of sand waves. Physical Review E, The American Physical Society, Vol. 80, pp. 036304
27. Bose S K and Dey S (2009): Suspended-load of sediment in flow on erodible beds. International Journal of Sediment Research, Elsevier, Vol. 24, No. 3, pp. 315-324
28. Efficient Prufer-like coding and counting labelled hypetrees By Saswata Shannigrahi and Sudebkumar Prasant Pal, Algorithmica, 54, 208-225 (2009)

KALPANA CHAWLA SPACE TECHNOLOGY CELL

RESEARCH PUBLICATIONS

Journals :

1. Semantic Concept Mining Based on Hierarchical Event Detection for Soccer Video Indexing *by* M H Kolekar, K Palaniappan, S Sengupta and G Seetaraman *JOURNAL OF MULTIMEDIA (JMM)*, Volume 4, pp.298-312 (2009)
2. Semantic concept mining in cricket videos for automated highlight generation *by* M H Kolekar and S Sengupta *Multimedia Tools and Applications:*, Vol 47, pp.545-579 (2010)
3. Miniaturized Dual-Mode bandpass filter using stub-loaded sqaure ring resonator *by* Y.K. Singh, A. Chakrabarty *Microwave and Optical Technology Letters*, 51 No. 8 (2009)
4. A Finite Edge GTD Analysis of the H-Plane Horn Radiation Pattern *by* 1. Maifuz Ali and Subrata Sanyal *IEEE Trans. Antennas Propagat.*, AP-58, No3, p969-973 (2010)
5. Microstrip rat-race couplers with predetermined miniaturization and harmonic suppression *by* 2. Vamsi. K. Velidi, D. Pandey, and S. Sanyal *Wiley Microwave and Optical Technology Letters,*, vol.52, no 1, p30-34 (2010)
6. Compact planar dual-wideband bandstop filters with cross coupling and open-ended stepped impedance resonators *by* 3. Vamsi. K. Velidi, and S. Sanyal *Electronics and Telecommunications Research Institue (ETRI) Journal*, vol32, no1, p148-150 (2010)
7. High-rejection wide-stopband lowpass flters using signal interference technique *by* 4. Vamsi. K. Velidi, and S. Sanyal *Wiley International Journal of RF and Microwave Computer-Aided Engineering*, 10.1002/mmce.20424 (2010)
8. Sharp-rejection microstrip bandpass filters with multiple tranmsission zeros *by* 5. Vamsi. K. Velidi, and S. Sanyal *Elsevier International Journal of Electronics and Communication (AEU),*, doi:10.1016/j.aeue.2 (2010)
9. Low insertion loss wideband bandpass filters with sharp rejection characteristics *by* 6. M. K. Mandal, P. Mandal, and S. Sanyal *IET Microwaves, Antennas and Prop., 2010, Vol. 4, Iss. 1, pp. 99–105*, Vol4, Iss.1,p99–10 (2010)
10. Compact sharp-cutoff wide-stopband lowpass filters using H-shaped coupled microstrip line units *by* 7. Vamsi. K. Velidi, and S. Sanyal *Wiley Microwave and Optical Technology Letters, (Wiley-MOTL-2010)*, do10.1002/mop.25166 (2010)
11. Sharp-Rejection Ultra-Wide Stopband Filters *by* 8. V. Vamsi Krishna, G. Ajaybabu and S. Sanyal, *IEEE Microwave and Wireless Components Letters (IEEE MWCL)*, Vol.19, no.8, p503-505 (2009)
12. Compact Tapped Stepped Impedance Open Stub Dual-Band Bandstop Filters With Sharp Rejection Characteristics *by* 9. V. Vamsi Krishna, G. Ajaybabu and S. Sanyal *Microwave and Optical Technology Letters (MOTL)*, V.51, n10, 2274-2277 (2009)
13. Microstrip Coupled-Line Lowpass Filter With Wide-Stopband for RF/Wireless Systems *by* 10. V. Vamsi Krishna, M. K. Mandal and S. Sanyal *Electronics and Telecommunications Research Institute (ETRI) Journal*, V31, n3, 324-326 (2009)
14. Investigating Long Range Correlation Properties in EEG during Complex Cognitive Tasks *by* Karkare, G. Saha and J. Bhattacharya *Chaos, Solitons and Fractals*, 42(4) (2009)

15. Investigating Neuromagnetic Brain Responses against Chromatic Flickering Stimuli by Wavelet Entropies *by* Bhagat Mayank, Bhushan Chitresh, Saha Goutam, Shimjo Shinsuke, Watanabe Katsumi, Bhattacharya Joydeep *PLoS ONE*, 4(9) (2009)
16. On the Use of Perceptual Line Spectral Pairs Frequencies and Higher-Order Residual Moments for Speaker Identification *by* Sahidullah, M.; Chakroborty, S.; Saha, G *International Journal of Biometrics*, In Press (2010)
17. CoopMACA:a cooperative MAC protocol using packet aggregation *by* M. G. Jibukumar, R. Datta, P. K. Biswas *Wireless Network*, in press (2010)
18. A Granular Reflex Fuzzy Min-Max Neural Network for Classification *by* A. V. Nandedkar, P. K. Biswas *IEEE Trans. on Neural Networks*, 20, pp. 1117-1134 (2009)
19. Wavelet Transcoding in the Block DCT Space *by* K. Viswanath, J. Mukherjee, P. K. Biswas *IET Image Processing*, in press (2010)
20. Enhancing File Data Security in Linux Operating System by Integrating Secure File System By Rajesh Kumar Paul and Indranil Sen Gupta, Journal of Information Assurance and Security, Vol. 4, pp. 484-492 (2009)
21. Proactive (t,n) Threshold Secret Sharing Scheme using ECC Based Signcryption Scheme By Atanu Basu, Indranil Sen Gupta and Jamuna Kant Sing, Journal of Information Assurance and Security, Vol. 5 (to appear) (2010)
22. Effect of Glitches against Masked AES S-box Implementation and Countermeasure By Monjur Alam, Santosh Ghosh, M.J. Mohan, Debdeep Mukhopadhyay, Dipanwita Roy Chowdhury and Indranil Sen Gupta, IET Information Security, pp. 1-11 (2009)
23. Parallel Crypto-devices for GF(p) Elliptic Curve Multiplication Resistant against Side Channel Attacks By Santosh Ghosh, Monjur Alam, Dipanwita Roy Chowdhury and Indranil Sen Gupta, Computers and Electrical Engineering, Vol. 35, pp. 329-338 (2009)
24. Traffic Grooming, Routing and Wavelength Assignment in an Optical WDM Mesh Network based on Clique Partitioning By Tanmay De, Ajit Pal, and Indranil Sen Gupta, Photonic Network Communications, To appear (2010)
25. A Location-Based Key Establishment Scheme for Static Wireless Sensor Networks with Multiple Base Stations By Ashok Kumar Das and Indranil Sen Gupta, International Journal of Information Assurance and Security, Vol. 5 (to appear) (2010)
26. An Adaptive Audio Watermarking Based on the Singular Value Decomposition in Wavelet Domain By Vivekananda Bhat, Indranil Sen Gupta, and Abhijit Das, Digital Signal Processing, (Accepted) (2010)
27. An Audio Watermarking Scheme using Singular Value Decomposition and Dither Modulation Quantization By Vivekananda Bhat, Indranil Sen Gupta, and Abhijit Das, Multimedia Tools and Applications, (Accepted) (2010)
28. Micro rain cell measurements in tropical India for site diversity fade mitigation estimation *by* Shukla A.K., B. Roy, S. Das, A.R.¬ Charania, K. S Kavaiya, K. Bandyopadhyay, K. S.Dasgupta *Radio Science*, vol45 (2010)
29. Two shell ionospheric model for Indian region: a novel approach *by* Ashish K Shukla, Saurabh Das, Neha Nagori, M R Sivaraman, K Bandyopadhyay *IEEE Trans. on Geoscience and Remote Sensing*, Vol 47, pp 2407-2412 (2009)
30. A Technique to Improve the Linearization of Frequency - Voltage Characteristic of LC-VCO *by* Debashis Mandal and T K Bhattacharyya *Analog Integrated Circuits and Signal Processing*, Vol 62(2), 253-257 (2010)
31. Compatibility Study of diamond-like nanocomposite thin films with Hydrazine propellant for MEMS Microthruster *by* P. Kundu, A. Ray Chaudhuri, S. Das and T.

K. Bhattacharyya *Advanced Materials Research*, Vol. 74 , pp 269-272 (2009)

32. Development and Characterisation of Surface Micro-Machined MEMS Based Varactor *by* Subha Chakraborty, A. Bhattacharya, Ashesh Ray Chaudhuri and T.K. Bhattacharyya *International Journal on Smart Sensing and Inteligent System*, Vol. 3, No. 1 (2010)
33. New Heuristic Diffraction Coefficient for Modeling of Wireless Channel *by* S.Soni & A.Bhattacharya *Progress in Electromagnetic Research C (PIER C)*, Vol. 12, pp. 125-137 (2010)
34. *"Novel Three Dimensional Dyadic Diffraction Coefficient for Wireless Channel"*, Sanjay Soni and A. Bhattacharya, accepted for publication in Microwave and Optical Technology Letter
35. Pre-compensator Selection for H-infinity Loop Shaping Control *by* Patra S., Sen S. and Ray G. *Internal Journal of Control, Automation and Systems*, vol. 8, pp.45-51 (2010)
36. Effect of the Microstructure of a Hyperbranched Polymer and Nanoclay Loading on the Morphology and Properties of Novel Polyurethane Nanocomposites. "ACS Applied Materials & Interfaces" 1(2), 289-300 (2009)
37. Influence of Number of functional Groups of Hyperbranched Polyol on Cure Kinetics and Physical Properties of Polyurethanes. "Journal of Polymer Science: Part A : Polymer Chemistry", 47(3), 731-745 (2009)
38. Morphology and thermo-mechanical Response of polyurethane Nanocomposites containing Hyperbranched Polymer. "Rubber chemistry and Technology", (Under Review)
39. Effect on nanoclays on physics – mechanical properties and adhesion of Polyester based Polyurethane nanocomposites. Structure – Property correlations, Journal of Material Science, September 44, 5861-5871 (2009)
40. Influence of nanoclay on the adhesive and physico mechanical properties of liquid polysulfide elastomer J.Adhesion Science and Technology, Vol.23, Issue No.16, pp.2013-2029, 2009
41. Influence of nanoclay on the adhesive and mechanical properties of polysulfide modified epoxy resin (Accepted in Polymers and Polymer composites", in November, 2009
42. "Liquid Polysulfide Modified epoxy hybrid nanocomposites filled with nanosilica particles" manuscript under preparation for favour of publication in the International Journal
43. Dynamic and Capillary Rheology of LDPE-EVA Based Thermoplastic Elastomer (TPE): Effect of Silica Nano-Filler *by* S. Hui, T. K. Chaki and S. Chattopadhyay *Polymer Composites*, DOI 10.1002/pc. 208 (2009)
44. Exploring the Simultaneous Effect of Nano Silica Reinforcement and Electron Beam Irradiation on a Model LDPE-EVA Based TPE System *by* S. Hui, T. K. Chaki and S. Chattopadhyay *Polymer International*, 58:680-690 (2009)
45. Thermal and Thermo-oxidative Degradation of a Model LDPE/EVA Based TPE System: Effect of Nano Silica and Electron Beam Irradiation *by* S. Hui, S. Chattopadhyay and T. K. Chaki *Polymer Composites*, DOI:10.1002/pc.20924 (2009)
46. Thermal and Mechanical Properties of Polymer-nanocomposites Based on Ethylene Methyl Acrylate and Multiwalled Carbon Nanotube *by* U. Basuli, T.K. Chaki, S. Chattopadhyay, S. Sabarwal *Polymer Composites , 2009.*, DOI 10.1002/pc.2090 (2009)
47. Influence of Acrylate Content on the Properties of Ethylene Methyl Acrylate-Multi Walled Carbon Nanotube Composites *by* U. Basuli, T. K. Chaki, and S.

Chattopahdyay *Advanced Science Letters*, Vol.3, No.1 (2010)

48. Characterization of electron beam irradiated ethylene methyl acrylate copolymer *by* Mongal, Nilambar; Chakrabarty, Debabrata; Bhattacharyya, Rupa; Chaki, Tapan Kumar; Bhattacharya, Pinaki *Journal Applied Polymer Science*, DOI 10.1002/app.3150 (2010)
49. Cryosorption storage of gaseous hydrogen for vehicular application-a conceptual design *by* Indranil Ghosh, Sudipta Naskar, Syamalendu Sekhar Bandyopadhyay *International Journal of Hydrogen Energy*, 35, 161-168 (2010)
50. Nandi, T. K., *"Manufacturing of herringbone-grooved journal bearing by chemical milling"*, J Machining and Forming Technologies, vol-1 (1/2), (2009), p.129-140
51. Dash, G. K. A., Nandi T. K. and Das, P.K., *"Exergy destruction in the double inlet pulse tube cryocooler (DIPTC): A parametric study"*, Int. J. Energy Res, vol.33, (2009), pp.1290-1308
52. Choukekar K. D., Nandi**,** T. K. George**,** Paul P**,** and Suresh**,** M. S.**, "***Hydrostatic journal bearings for cryogenic rocket engine turbopumps: a review on the developments"*, Aerospace Journal of Institution of Engineers (I), vol-90, November, (2009), pp 3-8
53. Sunil Kumar S. and Nandi, T. K., *"A numerical model for prediction of effective thermal conductivity of perforated plates in matrix heat exchangers"*, Ind. J. Cryogenics, vol-34, (2009), pp.202-207
54. Choukekar K. D., Nandi**,** T. K. George**,** Paul P**,** and Suresh**,** M. S., "*Design of LOX/LH$_2$ cooled hydrostatic journal bearings for cryogenic rocket engine turbopumps"*, Ind. J. Cryogenics, vol-35, (2010), pp.424-429
55. HPTLC Method for Determination of Carbazole Alkaloid from Murraya koenigii Leaves *by* B Dineshkumar, Analava Mitra, Manjunatha Mahadevappa *Int J Innovation*, 1(1): 24-26 (2010)
56. Phyto-pharmacology of Acalypha indica: a review *by* B.Dineshkumar, P.Vigneshkumar, SP.Bhuvaneshwaran, Analava Mitra. *Int J Biosci Agricult Technol*, 1(2): 27-32 (2010)
57. A Brief Review of Edible oils and its Nutritional Properties for a Rural Indian- A Review *by* B.Dineshkumar, Rangadar Pradhan, P.Vigneshkumar, SP.Bhuvaneshwaran, Analava Mitra *Int J Biosci Agricult Technol*, 2(1):7-11 (2010)
58. Ocimum sanctum and its Therapeutic Effects- A Review *by* Sutapa Mukherjee, B.Dineshkumar, SP.Bhuvaneshwaran, P.Vigneshkumar, Analava Mitra *Int J Biosci Altern Holistic Med*, 1(1): 23-26 (2010)
59. Antidiabetic and hypolipidaemic effects of few common plants extract in Type 2 diabetic patients at Bengal *by* Balasubramaniam Dineshkumar, Mitra Analava, Mahadevappa Manjunatha *Int J Diabetes Metabol*, Accepted (2010)
60. A Comparative Study of Alpha Amylase Inhibitory Activities of Common Anti-diabetic Plants at Kharagpur 1 Block *by* B. Dineshkumar, Analava Mitra, Manjunatha M *Int J Green Pharm*, In Press (2010)
61. Studies on the Anti-diabetic and Hypolipidemic Potentials of Mangiferin (Xanthone Glucoside) in Streptozotocin-induced Type 1 and Type 2 Diabetic Model Rats *by* B Dineshkumar, Analava Mitra, M Manjunatha. *J Advances in Pharm Sci*, 1, 75-85 (2010)
62. Antidiabetic and Hypolipidemic Effects of Mahanimbine (carbazole alkaloid) from Murraya koenigii (Rutaceae) Leaves *by* B Dineshkumar, Analava Mitra, Manjunatha Mahadevappa *Int J Phytomedicine*, Accepted (2010)
63. Nuts and Seeds Bioactive Compounds and Related Nutraceutical Properties- A Review *by* B.Dineshkumar, P.Vigneshkumar, SP.Bhuvaneshwaran, Analava Mitra,

Manjunatha M, Dhara S, Chatterjee J *Int J Food Safety Nutr, Public Health Technol*, 2(1): 1-8 (2010)

64. Non-Conventional Approaches to In-vivo Drug Tracking and Targeting - A Review *by* SP Bhuvaneshwaran, B Dinesh Kumar, Vignesh Kumar P, Analava Mitra. *Int J Biol Sci Technol*, 2(1): 1-10 (2010)
65. Green Technology and its Benefits- A Review *by* P Vignesh Kumar, B Dinesh Kumar, SP Bhuvaneshwaran, Analava Mitra *Int J Bioengineering Technol*, 1(1): 23-29 (0)
66. Effect of flaxseed gum on reduction of blood glucose & cholesterol in Type 2 diabetic patients *by* Thakur G, Mitra A, Pal K, Rousseau D *Int J Food Sci Nutr*, 60(s6):126-136. (2009)
67. Some common antidiabetic plants of the Indian subcontinent *by* Thakur G, Pal K, Mitra A, Mukherjee S, Basak A, Rousseau D *Food Reviews International*, Accepted (2009)
68. In vitro Assay of Alpha amylase inhibitory activity of Indian Medicinal Herb Acalypha indica *by* Nandhakumar M, Tamil Iniyan G, Senthilkumar M, Dinesh Kumar B, Mitra A *J Clin Diag Res*, 3(2): 1475-1478 (2009)
69. Role of Chlamydia infection in essential hypertension. *by* Mitra A, Som N.K *Indian J Practising Doctor*, 5(4):5-8 (2009)
70. Some Salient Points in Type 2 Diabetes Prevalence in Rural Bengal *by* Rangadhar Pradhan, B. Dinesh Kumar and Analava Mitra *Studies in Ethno-medicine*, 3(2): 127-131 (2009)
71. Long term effects of carbohydrate rich diet to rural Bengali in respect to their fasting blood sugar, lipid profile and serum insulin values *by* Mukherjee S, Thakur G, Kumar BD, Mitra A, Chakraborty C *J Diabetes*, 1(4):288-295 (2009)
72. Significance of Different Dietary Habits in Sections of Indian Diabetics *by* Mitra A, Basu B, Mukherjee S *Int J Hum Ecol*, 26(2): 89-98 (2009)
73. Importance of Heart-Healthy Diet *by* Mitra A, Pradhan R, Mukherjee S *Int J Hum Ecol*, 27(1): 53-61 (2009)
74. Health Effects of Palm Oil *by* Mukherjee S, Mitra A *Int J Hum Ecol*, 26(3): 197-203 (2009)
75. In vitro and in vivo studies of anti-diabetic Indian medicinal plants-A Review *by* B Dineshkumar, Analava Mitra, M Manjunatha *J Herbal Med Toxicol*, 3(2), 9-14 (2009)
76. Role of Natural products from Mangifera indica Linn. *by* B Dineshkumar, Analava Mitra, M Manjunatha *Int J Med Sci Technol*, 2(2), 24-28. (2009)
77. Effects of Edible oils in Type 2 Diabetes Mellitus *by* B. Dineshkumar, S. Mukherjee, R. Pradhan, A. Mitra, C. Chakroborty *J Clin Diag Res*, 3(2): 1389-1394 (2009)
78. A Review on Some Common Indian Herbal Plants with Anti-Diabetic Activities *by* B. Dinesh Kumar, Analava Mitra, Manjunatha M *J Med Aromatic Plant Sci*, 31, In Press (2009)
79. Safety Drug Regulations in Different Countries *by* B.Dineshkumar, SP.Bhuvaneshwaran, P.Vigneshkumar, Analava Mitra *International Journal of Pharmaceutical Research*, Accepted (2010)
80. Advanced Drug Designing Softwares and their Applications in Medical Research *by* B Dineshkumar, Vignesh Kumar P, SP Bhuvaneshwaran, Analava Mitra *International Journal of Pharmacy and Pharmaceutical Sciences*, Accepted (2010)
81. Performance enhancement of a silicon MEMS piezoresistive single axis accelerometer with electroplated gold on a proof mass *by* A. Ravi Sankar, S.K. Lahiri and S. Das *J. Micromechanics and Microengineering*, 19, 025008 (2009)

82. Cross-axis sensitivity reduction of a silicon MEMS piezoresistive accelerometer *by* A. Ravi Sankar, S. Das and S.K. Lahiri *Microsystem Technologies*, 15, 511-518 (2009)
83. Compatibility study of diamond-like nanocomposite thin films with hydrazine propellant for MEMS microthruster *by* P. Kundu, A. Ray Chaudhuri, S. Das and T. K. Bhattacharyya *Advanced Materials Research*, 74, 179-182 (2009)
84. Correlating RCCA Blood Flow Characteristic with ECG Features in hypertensive subjects *by* P. Purwar, B.P. Chatterjee, A. Mitra, J. Chatterjee and S. Das *Ultrasound in Medicine.*, Submitted (0)
85. Neural Network Based Partial Differential Method to Extract Aerodynamic Derivatives from Flight Data *by* Das, S., Kuttieri, R. A., Sinha, M., and, Jategaonkar, R. V. *Journal of Guidance, Control and Dynamics*, 33 (2) (2010)
86. Lunar Gravity Field Modeling Critical analysis and challenges *by* Sinha, M., Gopinath, N. S., & Malik N. K. *Advances in Space Research*, Vol. 45, 322-249 (2010)
87. Fuzzy State Noise Driven Kalman Filter for Sensor Fusion *by* Chauhan, S., Patil, C., Sinha, M., Halder, A. *Journal of Aerospace Engineering, Proceedings of the Institution of Mechanical Engineers*, Part G, V. 223(G8) (2009)
88. Neural Network for Preliminary Orbit Determination *by* Sinha, M, Kalra, P. K. *Journal of Institution of Engineers*, Vol. 90 (2009)
89. Aircraft Parameter Estimation using Neural Sensitivity Analysis *by* Rajesh, A. K., Das, S., Sinha, M. *Journal of Institution of Engineers*, to appear (2010)
90. "An FFT based Fast Reconstruction Algorithm for 3D Computed Tomography", International Journal of Tomography & Statistics, Fall 2010, Vol. 15, No. F10. (Co-author: Abhishek Mitra)
91. "An Efficient Architecture for 3-D Discrete Wavelet Transform", IEEE Transactions on Circuits and Systems for video technology, vol. 20, No. 2, February 2010, pp. 286-296. (Co-author: Anirban Das and Anindya Hazra)
92. "Architectural Design and FPGA Implementation of Radix-4 CORDIC Processor", Accepted for publication in Microprocessors and Microsystems (MICPRO, Elsevier) Embedded Hardware Design, 2010. (Co-author: Kaushik Bhattacharyya, Rakesh Biswas, Anindya S. Dhar)
93. "Architectural design of a Radix-4 CORDIC – based Radix-4 IFFT algorithm and its FPGA implementation", Accepted for publication in Int. Journal Signal and Imaging Systems Engineering, 2010. (Co-author: Kaushik Bhattacharyya, Anindya Hazra, Indranil Hatai)

Seminars / Workshops / Conferences :

1. Anil Kumar Sahu and B. K. Sarkar, Reduction of Actuation Voltage of RF MEMS Capacitive Switch
2. Nanolayer Reinforcement of Elastomeric Polyurethane Network, in "India International Rubber Conference" on 1st – 3rd November, 2007 at Udaipur Rajasthan, India
3. Morphology, structure and properties of polyurethane / layered silicate nanocomposites, in "International Conference of Rubber and Rubber Like Materials" on 8th – 10th January, 2008 at IIT Kharagpur, Kharagpur – 721302, India
4. Sunil Kumar S., and Nandi T. K., *"Three dimensional modeling of matrix heat exchangers"*, presented in Asian Conference on Applied Supperconductivity and

Cryogneics (ACASC2009), Cryogenic Association of Japan, Matuse, Japan, 6-8 Dec, 2009

5. "A High Speed BIT Plane Coder For JPEG 2000 and It's FPGA Implementation", The 17th European Signal Processing Conference, 24-28 Aug. 2009, Glasgow, Scotland. (Co-author: Kishor Sarawadekar)
6. "An Embedded Solution of 2-D Fast Affine Transform for Biomedical Imaging Systems", 13th IEEE VLSI Design and Test Symposium (VDAT 2009), 8-10 July 2009, Bangalore, India. (Co-author: Pradyut Kumar Biswal)
7. "Multirate Scan Conversion of Ultrasound images using warped distance based adaptive bilinear interpolation", The 22nd IEEE CBMS 2009, 3rd to 4th Aug 2009, Albuquerque, New Maxico, USA. (Co-author: Deep Bera and Leeladhar Agarwal)
8. "An 8-bit 1.8V 500 MSPS CMOS Segmented Current Steering DAC", Proceedings of IEEE Computer Society Annual Symposium on VLSI 2009 (ISVLSI 2009), Tampa, Florida, May 13-15, 2009. (Co-author: Santanu Sarkar)
9. "Efficient VLSI architecture for bit plane encoder of JPEG 2000", Proceedings of IEEE International Conference on Image Processing 2009, Cairo, Egypt, November 7-11, 2009. (Co-author: Kishor Sarawadekar)
10. "A parallel pipeline ADC with a sub-ADC employing an improvised dynamic comparator", Proceedings of IEEE TENCON conference on Computer and IT, Electronics & Electrical, Telecommunication, Suntec, Singapore, 23-26, November 2009. (Co-author: Sounak Roy and Sanjoy Kr. Dey)
11. "Pipelined DSP Implementation of Nonlinear Anisotropic Diffusion for Speckle Reduction of USG Images", Proceedings of IEEE ICCET, Chengdu, China, 16-18 April 2010. (Co-author: Deep Bera)
12. "A Feasibility Study on Noninvasive Blood Glucose Measurement Using Photoacoustic Method", The 4th International Conference on Bioinformatics and Biomedical Engineering (ICBBE 2010), Chengdu, China, June 18-20, 2010. (Co-author: Omkar C Kulkarni, Pralay Mandal, Shib Shankar Das)
13. 1. B.Dinesh kumar, Analava Mitra, Manjunatha M, Inhibitory activity of Murraya koenigii against porcine pancreatic amylase., International Herbal Conference-2009 - Herbal Medicine-Evaluation of Quality, Efficacy and Safety, Bangalore, (2009)
14. Thakur G, Pal K, Rousseau D, Mitra A, and Basak A, Genipin crosslinked gelatin solid emulsion gel matrix for a controlled delivery, 22nd European Conference on Biomaterials, Lausanne, Switzerland, (2009)
15. Anil Kumar Sahu and B K Sarkar *"Reduction Of Actuation Voltage Of RF MEMS Capacitive Switch"* accepted for presentation at the International Radar Symposium India (IRSI-2009) at Bangalore during the period Dec.08-11, 2009
16. Anil Kumar Sahu and B K Sarkar *"A Novel Low Actuation Voltage RF MEMS Shunt Capacitive Switch"* accepted for presentation at the IEEE Applied Electromagnetic Conference (AEMC-2009) at Kolkata during the period Dec.14-16, 2009
17. Arun Kumar Shukla and B.K.Sarkar *"Design Considerations Of High Power Impulse Radiating Antenna For Directed Energy Weapon System"* accepted for presentation at the International Conference on Electronic Warfare to be held at Bangalore in Feb. 10, 2010
18. Rakesh Gautam and B.K.Sarkar *"Design Of S-Band 2-Bit Distributed Mems Transmission Line (Dmtl)Phase Shifter"* accepted for presentation at the International Aerospace Electronics, Communications and Instrumentation-2010, Jan.-6-07,2010 Siddhartha Engg. College, Vijaywada, AP
19. B.K.Sarkar *" Smart Antenna for Interference Rejection"*accepted for presentation at

the International Aerospace Electronics, Communications and Instrumentation-2010, Jan. 06-07,2010 Siddhartha Engg. College, Vijaywada, AP

20. Sarkar, G.; Saha, G, Efficient pre-quantization techniques based on probability density for speaker recognition system, TENCON 2009 - 2009 IEEE Region 10 Conference, Singapore, (2009)
21. Sahidullah, M.; Chakroborty, S.; Saha, G, Improving Performance of Speaker Identification System Using Complementary Information Fusion, 17th International Conference on Advanced Computing and Communications (ADCOM 2009), Bangalore, (2009)
22. Sahidullah, M.; Saha, G, On the Use of Distributed DCT in Speaker Identification, India Conference (INDICON), 2009 Annual IEEE, Gandhinagar, (2009)
23. Sarkar, G.; Saha, G, Analysis of Distance Measures for Pre-Quantization before Feature Extraction in Automatic Speaker Recognition, India Conference (INDICON), 2009 Annual IEEE, Gandhinagar,IEEE (2009)
24. Sahidullah, M.; Saha, G, In Search of Auto Correlation Based Vocal Cord Cues for Speaker Identification, Second International Conference on RF & Signal Processing Systems (RSPS2010), Vijaywada, (2010)
25. Vir, S.; Saha, G, A Study on Feature Vector Selection and Compressed Domain ASR on VoIP using SVD-GMM and G.729 Coded Speech, Second International Conference on RF & Signal Processing Systems (RSPS2010), Vijaywada, (2010)
26. Sahidullah, Md.; Saha, G, On the use of perceptual Line Spectral Pairs Frequencies for speaker identification, National Communication Conference (NCC) 2010, Chennai, (2010)
27. Kamalika Datta and Indranil Sen Gupta, A Robust Encrypted Audio Watermarking Scheme using Discrete Wavelet Transformation, 13th World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2009), Orlando, USA (2009)
28. Kamalika Datta and Indranil Sen Gupta, A Redundant Audio Watermarking Technique using Discrete Wavelet Transformation, 2nd International Conference on Communication Software and Networks (ICCSN 2010), Singapore, IEEE Computer Society Press (2010)
29. Atanu Basu, Jamuna Kant Singh and Indranil Sen Gupta, Verifiable (t,n) Threshold Secret Sharing Scheme using ECC Based Signcryption, International Conference on Information Systems, Technology and Management, Bangkok, Springer (2010)
30. Ipshita Datta, Kamalika Datta and Indranil Sen Gupta, EXE Watermarking by Exploring the Binary Format for Executables in Windows and Unix, Indo-US Conference & Workshop on Cyber Security, Cyber Crime and Cyber Forensics, Kochi, India, (2009)
31. *"Discrimination of Canonical Scatterer Based on Singularity Expansion Method"*, Dhiraj Kumar Singh and Amitabha Bhattacharya, Proceeding of 14th International Symposium on Antennas and Electromagnetics and The American Electromagnetics Conference, ANTEM/AMEREM 2010, Ottawa, ON, CANADA, July 5-9, 2010 accepted for presentation
32. *"Novel Heuristic Diffraction Coefficient for Modeling of Radio Channel"*, Sanjay Soni and Amitabha Bhattacharya, Proceeding of 12th International Symposium on Wireless Personal Multimedia Communication, WPMC-2009, Sendai, Japan, Sep. 7-10, 2009
33. *"Improved Three Dimensional Dyadic Diffraction Coefficient for Wireless Channel"*, Sanjay Soni and Amitabha Bhattacharya, Proceeding of 12th International Symposium on Wireless Personal Multimedia Communication, WPMC-2009, Sendai, Japan, Sep. 7-10, 2009

34. *"Rigorous Maliuzhinets Diffraction Coefficient Applied to Hilly Terrain Scanario"*, Sanjay Soni, Santanu Goswami and Amitabha Bhattacharya, Proceeding of IEEE 2009 International Symposium on Microwave, Antenna, Propagation and EMC Technologies for Wireless Communications (MAPE 09), pp. 165-168, Beijing, China, 2009
35. *"Roof-top Modeling of Building for Microcellular Systems Using Double Diffraction Coefficient"*, Sanjay Soni and Amitabha Bhattacharya, Proceeding of 4th IEEE International Conference on computers & Devices for Communication, Kolkata, 978-81-8465-152-2/09/WMT, Dec. 14-16, 2009
36. *"A Novel and Versatile Modeling of Powerline Channel"*, Syed Samser Ali, Amitabha Bhattacharya and Dipak Ranjan Poddar, Proceeding of 4th IEEE International Conference on computers & Devices for Communication, Kolkata, 978-81-8465-152-2/09/CIS, Dec. 14-16, 2009
37. "*Powerline Communication Modeling using Turbocoding*", Syed Samser Ali and A. Bhattacharya, National Seminar on Frontiers in Electronics, Communication, Instrumentation and Information Technology (FECIIT-2008), Indian School of Mines University, Dhanbad, pp. 288-291, (2008)
38. "*Electromagnetic Radiation on Board Ships-Hazards to Personnel"*, P. Misra, A.Bhattacharya and A. Chakrabarty, World Maritime Technology Conference & Exhibition (WMTC 2009) 21st -24th January, 2009, Technical Paper No. 2B(1)
39. "*Miniaturized Planar 90° Hybrid Coupler with Unchanged Bandwidth Using Single Characteristic Impedance Line*", Vamsi Krishna and A. Bhattacharya, 2008 China – Japan Joint Microwave Conference, pp. 396-399
40. "*Electromagnetic Modeling of Powerline Channel"*, S. Samser Ali and A. Bhattacharya, Proceeding of APSYM 2008, Cochin University of Science & Technology, Cochin, pp. 136-139, Dec. 29-31, 2008
41. *"A Stub Tapped Compact Hybrid coupler with Broad-Band Harmonic Rejection"*, Vamsi Krishna Velidi and A. Bhattacharya, TENCON 2008, Hyderabad
42. "*Multiconductor Transmission Line Based Modeling of Powerline Channel*" A. Bhattacharya and K. Panayappan, 10th International Conference on Electromagnetic Interference and Compatibility (INCEMIC-2008) 26-27 November 2008, pp 419-421
43. "*Impulse Response Determination of Asymptotic Conical Monopole Using Conjugate Gradient Method",* A. Bhattacharya, Dhiraj K. Singh and D. C. Pande, 10th International Conference on Electromagnetic Interference and Compatibility (INCEMIC-2008) 26-27 November 2008, pp 445-448