PART II

ACADEMIC DEPARTMENTS

Biotechnology
Chemical Engineering
Chemistry
Civil Engineering
Computer Science and Engineering
Design
Electronics and Communication Engineering
Humanities and Social Sciences
Mathematics
Mechanical Engineering
Physics

ACADEMIC CENTRES

Centre for Energy
Centre for the Environment
Centre for Nanotechnology

CENTRALISED SERVICES AND PROGRAMME

Centre for Educational Technology
Central Instruments Facility
Centre for Mass Media Communication
Computer Centre
Quality Improvement Programme
INTRODUCTION

Biotechnology continues to expand rapidly with new discoveries and often life-saving products at a breathtaking pace. This industry, a merger of science and business, demands a multi-disciplinary workforce skilled in basic-research, product development, regulatory affairs and commercialization. The Department of Biotechnology of the Institute, started in year 2002, offers students both undergraduate (B Tech) and postgraduate (PhD) academic programmes. The Department is unique in North-Eastern India, imparting quality education and providing excellent research environment.

The major thrust of the Department includes biochemical engineering, plant biotechnology, nano-biotechnology, computational biology and proteomics. The Department has initiated efforts to establish advanced research laboratories in all the thrust areas. Apart from fundamental research, the goals of the Department are also targeted to meet the demands of the biotechnology based industries.

ACADEMIC ACTIVITIES

The Department is currently offering two programmes - B Tech and PhD. The B Tech degree offers comprehensive education in biotechnology focusing on basic concepts and techniques in biotechnology and allied engineering sciences. The programme consists of core and elective courses, seminars, summer training and a final year research project. The Department also offers a Modern Biology course as a core subject to first year B Tech students of all disciplines.

The Department offers research programme leading to the award of the PhD degree in the following areas: Protein Folding and Aggregation; Computational molecular biophysics, structural-function-folding relationship, protein engineering, protein function, in silico drug design, Computer Simulation to study Drug-Resistance of HIV-protease, Enzyme and Microbial Technology; Plant Cell and Tissue Culture, Plant Genetic Engineering; Gene Therapy for Viral and Metabolic Diseases; Molecular Fingerprinting and Expression Systems in Food Grade bacteria; Biochemistry and Molecular Biology of Carbohydrate Enzymes; Fungal Biotechnology and Bio-pesticides, Biological Control of Insect Pests; Environmental bioremediation, Bioprocess development (upstream to downstream), Metabolic Engineering.

STUDENT INTAKE

Student intake in the academic session 2006-2007:
PhD: 10
B Tech: 33

Out of 19 B Tech students of the Department registered with the Placement Cell, 17 students have been placed in companies like Tata Consultancy Services Ltd., IBM Global Services (I) Pvt. Ltd., Global Analytics India Pvt. Ltd., Flextronics Software Systems, etc. Highest and lowest salary offered is Rs.32.27 lakhs per annum and Rs.2.7 lakhs per annum respectively. The average salary offered is Rs.6.15 lakhs per annum. Many of the passed out students are opting for higher studies and have received offers from prestigious universities like Johns Hopkins, University of Pittsburgh, University of Southern California, etc.

FACULTY STRENGTH

Faculty strength as on 31 March 2007: 16 (Sixteen)
Associate Professor: 3 (Three)
Assistant Professor: 13 (Thirteen)

MAJOR EQUIPMENT AND FACILITIES

The Department has developed fully equipped B Tech laboratories for Biochemistry, Microbiology, Molecular Biology and Plant Biotechnology. The Department has procured major equipment like Super speed centrifuges, Ultracentrifuge, Inverted fluorescence microscopes, PCR machine, Steady state fluorimeter, UV-Visible thermostat control spectrophotometer, Ultrasoundicator, Fermenters, Gel documentation system, Fraction collector, Cell disrupter, Atomic force microscope, HPLC, Tensiometer, etc. In addition to that the Department has created facilities like mammalian cell culture laboratory, transgenic greenhouse containment and biochemical engineering laboratory. The Department has a separate computational laboratory with the following facilities:

Desktop Computers: 29 in number; Operating systems: Windows/Linux; Connected to Servers at the Institute Computer Centre through LAN.

Dedicated departmental server for computational biology work: 1 in number; Model: Atlas G710, ACER; Dual Intel Xenon Processor 3.2 GHz; Extended memory 64 technology; Hyperthreading; 800 MHz FSB chipset.

Dedicated departmental RISC Workstation: 1 in number; Model: Sun Blade 2500, Sun Microsystems, with 2*1.228 GHz Ultra SPARC III Processor.
Access to GARUDA grid of C-DAC: Being a member institution of GARUDA grid, our Department has access to this network and used for large scale computational biology works.

Software for computational Biology: SYBYL modules (Tripos) – SYBYL Base, Biopolymer, Dynamic. These modules are used for molecular modelling and molecular dynamic simulations.

Apart from these facilities, each of the faculties is provided with personal desktop computers connected to the LAN.

RESEARCH AND DEVELOPMENT ACTIVITIES

The Department is committed to research in all aspects of biotechnology. Research projects sponsored by Department of Science and Technology (DST), Ministry of Human Resource and Development (MHRD), Council of Scientific and Industrial Research (CSIR), and Department of Biotechnology (DBT) are currently in progress. Twenty five PhD students are pursuing research for their doctoral degrees. The research in the Department is carried out in diverse areas like Protein aggregation with emphasis on structural characteristics of aggregates and detection of protein aggregates in solution, Effect of macromolecular crowding on enzyme kinetics, structure-function-folding relationship of proteins, Biomaterials for drug delivery and tissue engineering, Development of redox and lipolytic enzymes for regio and enantio-selective synthesis of pharmaceutical compounds and development of biosensors and enzymatic biofuel cell; Genetic engineering of grain legumes for biotic and abiotic stress tolerance, marker free transgenic; Identification of plus trees and mass cultivation in biofuel plants; Segregation of abiotic stress genes in mapping population of rice; Phylogenetic analysis of emerging infectious viruses, Gene-therapy approaches for viral and metabolic diseases; Molecular fingerprinting of industrial food grade microorganisms, Identification of bioactive compounds from metagenomic library, Molecular analysis of carbohydrate enzymes; Biological control of insect pests, Plant tissue culture and biochemical analysis; Environmental bioremediation, Biodydrometallurgy; Bioprocess development (upstream to downstream), Bioreactor design and control, Metabolic engineering, Bioenergy; Computational Biology, In silico drug design; Biomolecule Immobilization, Biosensors, Analytical Biochemistry and Bioassays.

SPONSORED RESEARCH PROJECTS

New Projects

Title: Tracking the growth of soluble protein aggregates in real time using fluorescence and subsequent manoeuvres to inhibit their growth.
Investigator: Dr. R. Swaminathan

Sponsoring Agency: CSIR
Duration: 3 years

Title: Electrospun nanofiber scaffolds for hepatic tissue regeneration with emphasis on structural characteristics of aggregates and detection of protein aggregates in solution
Investigator: Dr. U. Bora
Co-Investigator: Dr. P. Goswami, Dr. R.R. Bhaned (National Centre for Cell Sciences, Pune)
Sponsoring Agency: DBT
Duration: 3 years

Title: Sleeping Beauty (SB) transposon mediated sequence specific delivery and activation of prodrug gene in heptocellular carcinoma cells
Investigator: Dr. S.S. Ghosh
Sponsoring Agency: CSIR
Duration: 3 years

Title: Synthesis of Biodegradable Nanocarriers for Targeted Drug Delivery
Investigator: Dr. U. Bora
Co-Investigator: Dr. P. Goswami
Sponsoring Agency: DBT
Duration: 3 years

Ongoing Projects

Title: Genetic engineering of cowpea (Vigna unguiculata L. Walp) for storage pest resistance.
Investigator: Dr. L. Sahoo
Sponsoring Agency: DST
Duration: 3 years

Title: Computer simulation to study drug resistance of HIV-Protease.
Investigator: Dr. P. Bandyopadhyay
Sponsoring Agency: DST
Duration: 3 years

Title: Structural, functional and biochemical analyses of modular cellulases.
Investigator: Dr. A. Goyal
Sponsoring Agency: CSIR
Duration: 3 years

Title: Genetic evaluation and mass production of entomopathogenic fungi for development as a potent biopesticide.
Investigator: Dr. G.K. Saini
Sponsoring Agency: DST
Duration: 3 years

Title: Evaluation of Beauveria bassiana (Bals.) Vuill and Metarhizium anisopliae (Metsch.) Sorokin isolates for virulence, development of DNA markers and transformation studies.
Investigator: Dr. G.K. Saini

Sponsoring Agency: CSIR
Duration: 3 years
Sponsoring Agency: MHRD
Duration: 3.5 years

Title: In vitro morphogenesis and biochemical analysis of neem (Azadirachta indica A. Juss).
Investigator: Dr. R. Chaturvedi
Sponsoring Agency: DST
Duration: 3 years

Title: Collection of Pongamia germplasm from North Guwahati for identification of plus trees and mass cultivation in wasteland.
Investigator: Dr. L. Rangan
Sponsoring Agency: DST
Duration: 3 years

Title: Effect of NaCl on expression of translation initiation factor (eIF1) gene in leaf and roots of rice varieties and mapping of the gene in segregating populations.
Investigator: Dr. L. Rangan
Sponsoring Agency: CSIR
Duration: 3 years

Title: Glucose sensor based on evanescent wave induced fluorescence spectroscopy.
Investigator: Dr. S. K. Khijwania (Department of Physics)
Co-Investigator: Dr. U. Bora
Sponsoring Agency: BRNS, DAE
Duration: 3 years

Title: Engineering nanoscale materials and their applications in nanotechnology.
Investigator: Dr. A. Chattopadhyay (Department of Chemistry)
Co-Investigator: Dr. S.S. Ghosh
Sponsoring Agency: DST
Duration: 3 years

*Title: Development of micropropagation technology for large-scale cultivation of Jatropha: A potential biofuel plant.
Investigator: Dr. L. Sahoo
Sponsoring Agency: NEDFi
Duration: 3 years

*Title: Cloning of Elite Germplasm of Jatropha for Large Scale Plantation.
Investigator: Dr. L. Sahoo
Sponsoring Agency: DARL
Duration: 2 years

* Ongoing under the Centre for Energy of the Institute.

Completed Projects

Title: Signature gene mediated specific identification and molecular fingerprinting of industrial strains of lactic acid bacteria.

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Investigator: Dr. A. Ramesh
Co-Investigator: Dr. S.S. Ghosh
Sponsoring Agency: MHRD
Duration: 2 years

Title: Construction of environmental library to access microbial diversity for identification of bioactive compounds.
Investigator: Dr. A. Ramesh
Co-Investigators: Dr. S.S. Ghosh and Dr. R. Swaminathan
Sponsoring Agency: DBT
Duration: 2 years

Title: Construction of a hybrid pro-drug-suicide gene transduction system.
Investigator: Dr. S.S. Ghosh
Co-Investigator: Dr. A. Ramesh
Sponsoring Agency: MHRD
Duration: 3 years

Title: Protein Folding: Looking for residual structures in denatured proteins.
Investigator: Dr. R. Swaminathan
Sponsoring Agency: MHRD
Duration: 3 years

Title: Studies on the metabolic machinery involved in the assimilation of alkane by filamentous fungi.
Investigator: Dr. P. Goswami
Sponsoring Agency: DST
Duration: 3 years

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PUBLICATIONS

International Journal


National Journal


Book Chapters


Proceedings


PAPER PRESENTED IN CONFERENCES/ WORKSHOPS/ SYMPOSIA

International


‘Consensus sequence and its significance in the sequenced genome of rice, O. sativa.’ 2nd International Rice Congress, New Delhi, India, 9-14 October 2006, pp. 103


‘Effect of simulation protocol and force-field on the flap dynamics of HIV-1 protease’, International conference on bioinformatics (INCOB), Delhi, December 2006

‘Inventory of methane and nitrous oxide emission from agricultural soils of India: Assam as a case study’, 2nd International Rice Congress, New Delhi, India, 9-14 October 2006, pp. 461

‘Regeneration and reuse of a fungal biosorbent in removing heavy metals from wastewaters’, Fourth International Symposium on Southeast Asian Water Environment, 6-8 December 2006, Bangkok, Thailand, pp. 269

‘Microwave mediated rapid synthesis of chitosan from chitin’, Indo-US symposium on Nanotechnology in Advanced Drug Delivery, NIPER, Chandigarh, 5-6 October 2006


Vatsyayan, P., Kumar, A.K., Goswami, P., Papori and Goswami, Pranab (2006)
‘Cytochrome-P450-monoxygenase of Aspergillus terreus MTCC 6324’, International Conference on Biomaterials (BIND-06), IIT Kanpur, 8-11 December 2006

National
‘Structure-function relationship studies of multimeric alcohol oxidases from Aspergillus terreus MTCC 6324’, 11th ADNAT Convention: Advances in Structural Biology and Structure Prediction, 23-25 February 2007, P-40, pp. 113

‘Crystalization and 3-dimensional structure determination of a family 26 glycoside hydrolase of a bifunctional cellulase from Clostridium thermocellum’, 36th National Seminar on Crystallography (NSC-36), 22-24 January 2007, University of Madras, Chennai, India, pp. 1. (3-Dimensional Structure of Lichenase enzyme of Clostridium thermocellum was selected for Cover Page of the Abstract Book)


‘Binding characteristics of family 11 Carbohydrate Binding Module (CBM11) from Clostridium thermocellum’, 75th Annual Meeting of Society of Biological Chemists of India (SBCI), 8-11 December 2006, Jawahar Lal Nehru University, New Delhi, India

‘Molecular characterization of a bifunctional cellulase of Clostridium thermocellum’, 47th Annual Conference of Association of Microbiologists of India (AMI), 6-8 December 2006, University of Barkatullah, Bhopal, India, pp. 174

‘Biochemical properties of lichenan hydrolyzing family 26 glycoside hydrolase from Clostridium thermocellum’, CARBO XXI, an ACCTI sponsored conference on Recent Development in Carbohydrate Chemistry, 26-29 November 2006, University of Delhi, Delhi, India, pp. 30

‘Molecular cloning, expression and characterization of a bifunctional cellulase from Clostridium thermocellum’, 75th Annual Meeting of Society of Biological Chemists of India (SBCI), 8-11 December 2006, Jawahar Lal Nehru University, New Delhi, India.

Kumar, A.K., Vatsyayan, P. and Goswami, P (2006)
‘Purification and specific functional characterization of alcohol oxidases from Aspergillus terreus MTCC 6324’, 75th Annual Conference of SBCI, JNU, New Delhi, 8-11 December 2006. Abstract No. PI-114, pp. 69

‘Optimization of conditions for production of dextranase, a glycoside hydrolase of family 70 from Leuconostoc dextranicum NRRL B-1146’, 75th Annual Meeting of Society of Biological Chemists of India (SBCI), 8-11 December 2006, Jawahar Lal Nehru University, New Delhi, India

‘Purification of dextranase, a glycoside hydrolase of family 70 from Leuconostoc dextranicum NRRL B-1146 by polyethylene glycol’, 47th Annual Conference of Association of Microbiologists of India (AMl), 6-8 December 2006, University of Barkatullah, Bhopal, India, pp. 176

Mahanty, B., Pakshirajan K. and Dasu, V.V. (2006)

‘Purification and characterization of a sucrose hydrolyzing enzyme from Leuconostoc mesenteroides NRRL B-640’, 75th Annual Meeting of Society of Biological Chemists of India (SBCI), 8-11 December 2006, Jawahar Lal Nehru University, New Delhi, India

‘Production and purification of dextranase, a family 70 glycoside hydrolase from Leuconostoc mesenteroides NRRL B-640’, 47th Annual Conference of Association of Microbiologists of India (AMI), 6-8 December 2006, University of Barkatullah, Bhopal, India, pp. 191-192

‘Rapid in vitro plant regeneration from nodal explant of Andrographis paniculata Nees – a valuable medicinal plant’, National seminar on Biodiversity and Indigenous Knowledge System, 25-26 October 2006, Centre with Potential for Excellence in Biodiversity, Rajiv Gandhi University, Arunachal Pradesh


‘Enzymatic synthesis and corresponding functionalization of Au nanoparticles’, Indo-Australian Symposium on Nanoscience and Nanotechnology, 31 March – 1 April 2006, Indian Institute of Science, Bangalore

‘Effect of pH and aeration on production of dextranase from Leuconostoc mesenteroides NRRL B-640 in batch and fed-batch fermentations’, 75th Annual Meeting of Society of Biological Chemists of India (SBCI), 8-11 December 2006, Jawahar Lal Nehru University, New Delhi, India

Uzma Mustafa and Gurvinder Kaur (2006)
‘Stress-tolerant entomopathogenic fungi : High affirmations for commercial market’, 47th Annual Conference of Association of Microbiologists of India, 6-8 December 2006, Barkatullah University, Bhopal, pp. 68


Vatsyayan, P., Kumar, A.K., Goswami, Papori and Goswami, Pranab (2006)
‘Localization and broad substrate Cytochrome P450-monoxygenase activity in the cells of Aspergillus terreus MTCC 6324’, 75th Annual Conference of SBCI(I), JNU, New Delhi, 8-11 December 2006, Abstract No. PI-115, pp. 69

‘A molecular approach for detection and typing of lactic acid bacteria from fermented samples’, 18th Indian Convention of Food Scientists and Technologists (ICFOST), Acharya N.C. Ranga Agricultural University (Angrau), Hyderabad, 16-17 November 2006
CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED

International

Dr. U. Bora
Indo-US symposium on Nanotechnology in Advanced Drug Delivery, NIPER Chandigarh, 5-6 October 2006

Dr. K. Pakshirajan
Fourth International Symposium on Southeast Asian Water Environment, 6-8 December 2006 at Asian Institute of Technology, Bangkok in Thailand

Dr. L. Rangan
2nd International Rice Congress, New Delhi, India, 9-14 October 2006

Dr. L. Rangan
4th International Symposium on Biotechnology and Biocontrol, Madurai, TN, India, 27-29 November 2006

Dr. P. Bandyopadhyay
Practicing Chemistry with Theoretical Tools, Maui, USA, 15-18 January 2007

Dr. V. Venkata Dasu
Short-term course on Cell Culture Technology, IIT Bombay, Mumbai, 10-12 January 2007

Dr. A. Goyal
Conference on Recent Development in Carbohydrate Chemistry, CARBOXXI, sponsored by Association of Carbohydrate Chemists and Technologists of India (ACCTI), 26-29 November 2006, University of Delhi, Delhi, India

Dr. A. Goyal
47th Annual Conference of Association of Microbiologists of India (AMI), 6-8 December 2006, University of Barkatullah, Bhopal, India

Dr. A. Goyal
75th Annual Meeting of Society of Biological Chemists of India (SBCI), 8-11 December 2006, Jawahar Lal Nehru University, New Delhi, India

National

Dr. U. Bora
DBT Workshop on Biomaterials for Medical Devices and Drug Delivery, 17 February 2007, IIT Delhi

Dr. U. Bora
2nd International Conference on Recent Advances in Composite Materials, 20-23 February 2007, New Delhi

INVITED LECTURES OF FACULTY

Dr. P. Goswami
‘How to live longer? – A thought of Biochemists’, Foundation Day talk at Institute of Advance Studies in Science and Technology (IASSST), Guwahati, 3 November 2006

Dr. L. Sahoo
Invited speaker and resource person at National Workshop cum Exhibition on Bio-Diesel in North East, inaugurated by Hon’ble President of India at Guwahati, Assam, India, 17-19 October 2006 (Title of the talk: Micropropagation Technology for Biofuel Plants)

Dr. L. Sahoo
Invited speaker and expert at Defence Agricultural Research Lab, Base Station, Haldwani for Workshop cum DARL’s progress evaluation meeting on ‘Biotechnology for High Altitude Agriculture’ held on 12-13 November 2006. (Title of the talk: Genetic Engineering of Pulses for Biotic and Abiotic Stress Tolerance)

Dr. L. Sahoo
Invited speaker and resource person at National Workshop on Biofuel at National Institute for Rural Development, Khanapara, Guwahati, Assam, 27-29 November 2006 (Title of the talk: In Vitro Cloning of Biofuel Plants: Promise to Generate Commercial Scale Planting Material)

Dr. L. Rangan
Invited speaker at 2nd International Rice Congress, New Delhi, India, 9-14 October 2006 (Title: Consensus sequence and its significance in the sequenced genome of rice, O. sativa)

Dr. L. Rangan
Invited speaker at 4th International Symposium on Biotechnology and Biocontrol, Madurai, TN, India, 27-29 November 2006 (Title: Building public-private partnership in agricultural biotechnology)

Dr. L. Rangan
Speaker and resource person for Regional Seminar on IPR and Patents for Capacity Building, IIT Guwahati, 15-17 September 2006 (Title: Introduction to Intellectual Property Rights)

Dr. U. Bora
Invited speaker at DBT Workshop on Biomaterials for Medical Devices and Drug Delivery on 17 February 2007 at IIT Delhi (Title: Application of Photochemical Technology in Biomaterial Development: Current Status and Future Scope)
Dr. P. Bandyopadhyay
Invited speaker at Practicing Chemistry with Theoretical Tools, Maui, USA, 15-18 January 2007 (Title: Enhanced conformational sampling of water clusters using 2-surface Monte Carlo method)

Dr. K. Pakshirajan
Delivered two lectures (a) Bioreaction Engineering and (b) Biocatalyst in Organic Chemical Synthesis in QIP - Short Term Course on Green Chemistry - Green Technology conducted during 5-9 June 2006 at IIT Guwahati

Dr. K. Pakshirajan
'Regeneration and reuse of a fungal biosorbtent in removing heavy metals from wastewaters', in the Fourth International Symposium on Southeast Asian Water Environment held during 6-8 December 2006 at Asian Institute of Technology, Bangkok, Thailand

Dr. A. Goyal
'Molecular characterization of a bifunctional cellulase of Clostridium thermocellum', at 47th Annual Conference of Association of Microbiologists of India (AMI), 6-8 December 2006, University of Barkatullah, Bhopal, India

VISITORS FROM OTHER INSTITUTES/UNIVERSITIES

Prof. Amitabha Chattopadhyay from Centre for Cellular and Molecular Biology, Hyderabad, 29-30 November 2006

Dr. Bhaswati Pandit from Department of Pediatrics and Human Genetics, Centre for Molecular Cardiology, Mount Sinai School of Medicine, NY, USA, 8 December 2006

Dr U.S.N. Murty, Deputy Director and Head, Biology Division, Indian Institute of Chemical Technology (CSIR), Hyderabad, 9 November 2006

Dr. Debasis Dan, Indiana University, Bloomington, USA, 2 February 2007 (Title: Identifying Core Promoter Elements in Drosophila)

Mr. Kalyan Gayen, Department of Chemical Engineering, IIT Bombay, 25 January 2007

SHORT-TERM COURSES

'Fundamental Techniques in rDNA Technology' at IIT Guwahati held during 3-7 July 2006


SEMINARS/WORKSHOPS/CONFERENCES ORGANIZED

Symposium on Entrepreneurship in Biotechnology: Scope and Prospects in North East India, jointly organized by Department of Biotechnology, IIT Guwahati and North East Chamber of Commerce and Industry. 20-21 January at IIT Guwahati

Regional seminar organized under MHRD sponsored scheme on 'Awareness programme on Intellectual Property Rights and Patents for Capacity Building' at IIT Guwahati, 15-17 September 2006

INVITED LECTURES/VISITORS

Prof. Amitabha Chattopadhyay from Centre for Cellular and Molecular Biology, Hyderabad, 29-30 November 2006 (Title of talk given on 29 November 2006: Monitoring Organization and Dynamics of Membranes and Proteins using the Wavelength-Selective Fluorescence Approach. Title of talk given on 30 November 2006: Interaction of the Serotonin_1A Receptor with Membrane Lipids: Implications in Receptor Function and Organization)

Dr. Bhaswati Pandit from Department of Pediatrics and Human Genetics, Centre for Molecular Cardiology, Mount Sinai School of Medicine, NY, USA, 8 December 2006 (Title: Molecular Insights into Noonan Syndrome)

Dr. U.S.N. Murty, Deputy Director and Head, Biology Division, Indian Institute of Chemical Technology (CSIR) Hyderabad, 9 November 2006 (Title: Integrated Information System for the control of Vector Borne Diseases)

Dr. Debasis Dan, Indiana University, Bloomington, USA, 2 February 2007 (Title: Identifying Core Promoter Elements in Drosophila)

Mr. Kalyan Gayen, Department of Chemical Engineering, IIT Bombay, 25 January 2007 (Title: Evaluation of phenotypic space in metabolic networks using elementary modes)

AWARDS AND HONOURS

Dr. A. Goyal has been conferred Fellow of Association of Microbiologists of India.

Dr. A. Goyal has appointed as Associate Editor, Indian Journal of Microbiology (AMI publication) January 2007.

Dr. A. Goyal has been appointed as reviewer, Journal of Food Biochemistry, from UC Davis, California, USA, (Blackwell Publishers), since 2006.

Partial financial grant awarded to Dr. P. Bandyopadhyay to attend an international conference honouring Prof. Mark Gordon held in USA in January 2007 from three agencies, namely (a) DST (b) CSIR and (c) INSA.
Dr. P. Bandopadhyaya included for inclusion in Marquis WHO'S WHO IN SCIENCE AND ENGINEERING 2006-2007.

Dr. Vikash Kumar Dubey nominated as editorial board member of Biotechnology and Molecular Biology Reviews (http://www.academicjournals.org/bmbr) starting from 1 January 2007.

FACULTY MEMBERS

P. Bandopadhyaya  
PhD (Institute for Molecular Science–Graduate University for Advanced Studies, Japan)  
Assistant Professor  
Areas of Interest: Computational molecular biophysics, Structural biology, Protein function, in silico drug design

U. Bora  
PhD (Institute of Genomics and Integrative Biology, Delhi)  
Assistant Professor  
Areas of Interest: Biomaterials for drug delivery, Tissue engineering and biosensors, Ethnomedicine

B. Bose  
PhD (All India Institute of Medical Sciences)  
Assistant Professor  
Areas of Interest: Therapeutic recombinant antibodies

R. Chaturvedi  
PhD (Delhi University)  
Assistant Professor  
Areas of Interest: Plant cell, tissue and organ culture, Protoplast isolation and culture, Synthetic seeds production, Biochemical, Cytological and Histological analysis of In Vitro raised plants

V.V. Dasu  
PhD (IIT Madras)  
Assistant Professor  
Areas of Interest: Bioprocess development (upstream to downstream), Metabolic engineering, Microbial proteomics, Bioenergy

V.K. Dubey  
PhD (Banaras Hindu University)  
Assistant Professor  
Areas of Interest: Protein Engineering and Structure-Function Relationship of Protein

S.S. Ghosh  
PhD (Indian Institute of Chemical Biology, Kolkata)  
Assistant Professor  
Areas of Interest: Development of new generation of gene therapy vectors (Viral and Non-Viral) and tests their therapeutic potential on cell culture based systems, Development of reversible immortalized cell lines for drug and therapeutic gene testing, Nanobiotechnology

P. Goswami  
PhD (Gauhati University)  
Associate Professor and Head  
Areas of Interest: Biocatalysis biosensor, enzymatic biofuel cell and biotransformation

A. Goyal  
PhD (IIT Kanpur)  
Associate Professor  
Areas of Interest: Molecular biology, Protein engineering, Structural and functional proteomics of carbohydrate enzymes and other industrial enzymes

D.P. Nayak  
PhD (National Chemical Laboratory, Pune)  
Assistant Professor  
Areas of Interest: Novel bioreactor design, fabrication and biological reaction engineering, Biological Process Integration, Biological Process intensification, Chromatographic separation of organic and biological compounds, Membrane based separations, Rational design of downstream Processing

K. Pakhirajan  
PhD (IIT Madras)  
Assistant Professor  
Areas of Interest: Biotechnology: Environmental and Separation, Bioprocess kinetics and optimization, Biohydrometallurgy, Artificial Intelligence

A. Ramesh  
PhD (Central Food Technological Research Institute, Mysore)  
Assistant Professor  
Areas of Interest: Molecular fingerprinting of food-grade lactic acid bacteria, Bionanotechnology

L. Rangan  
PhD (Madras University, International Rice Research Institute, Phillipines)  
Assistant Professor  
Areas of Interest: Functional genomics, Molecular markers, Genetic transformation, Plant tissue culture

L. Sahoo  
PhD (Maharshi Dayanand University, Rohtak)  
Assistant Professor  
Areas of Interest: Transgenic crops, Insect pest resistance, Abiotic stress tolerance

G.K. Saini  
PhD (Andhra University)  
Assistant Professor  
Areas of Interest: Fungal biotechnology, Biological control of insect pests using entomopathogenic fungi, DNA fingerprinting of entomopathogenic fungi for virulence and other characteristics of economical importance, Development of biopesticide as an alternative to chemical pesticides to sustain agriculture

R. Swaminathan  
PhD (Tata Institute of Fundamental Research, Mumbai)  
Associate Professor  
Areas of Interest: Protein Structure, Folding and Aggregation, Effects of Macromolecular crowding on physiological media
DEPARTMENT OF CHEMICAL ENGINEERING

INTRODUCTION

Since its inception in 2002, the Department of Chemical Engineering has showed marked growth on fronts of education and research. Although the youngest in the Institute, it now stands as one of the most vibrant Department endowed with young, innovative and hard working faculty. The Department now has 15 faculty members working in diverse areas of chemical engineering ranging from conventional to state-of-the-art fields such as nanotechnology and molecular simulations and dynamics. The Department has developed a highly sophisticated analytical laboratory comprising of several ultra-modern and high-precision equipment. The undergraduate laboratories and the computational facilities in the Department are also well-equipped to give the students a valuable and lasting educational experience. The faculty is actively involved in research, consultancy and education. Several research papers from the Department have appeared in esteemed international journals. The faculty members and students also participated in the national and international conferences earning accolades for the Department. During 2006-2007 the Department received as many as 5 new research projects from various funding agencies such as DST, DRL and DRDL. Some faculty members have also undertaken consultancy projects with the industries.

ACADEMIC ACTIVITIES

The Chemical Engineering Department currently offers BTech, MTech and PhD programmes. The BTech programme (started in 2002) comprises of 21 theory courses (including two Department electives), 4 laboratory courses and a seminar course, along with a project course spread over the last two semesters. Various subjects and electives offered in the BTech programme offer comprehensive tutoring in the basic chemical engineering principles and their applications including process design. First batch of the BTech students from the Department graduated in May 2006. Most notably, one of the students of this batch, Mr. Ashwin Subramanian was awarded President’s Gold Medal for highest CGPA. The placement record of the first BTech batch was excellent with students getting job offers from renowned companies such as IOCL, Techspan, IBM, HPCL and Cognizant. Several students from the first BTech batch also secured admission with financial aid in reputed universities in UK and USA such as Cambridge University, Princeton University, University of Wisconsin (Madison), etc. The MTech programme of the Department started in 2004. This programme offers specialization in Petroleum Refinery Engineering and comprises of 10 theory courses (including 3 electives) and a seminar in the first year. These courses give an advanced outlook of various important chemical engineering subjects. The second year of the programme is dedicated to thesis work. The first MTech batch from the Department graduated in May 2006. This batch also had an excellent placement record with students getting offers from renowned companies such as GE, L&T, TCS and Wipro.

The PhD programme of the Department has shown significant growth in the past four and half years. The Department offers opportunities in diverse research fields in fundamental and applied areas of chemical engineering. Many faculty members have inter-disciplinary research interests overlapping areas of biotechnology, mechanical engineering, chemistry and environmental engineering. Presently the Department has 21 research scholars working in different research areas such as waste pyrolysis, nanotechnology, combustion engineering, solar photocatalysis, membrane reactors, sono-chemical waste water treatment, membrane separation, auto-catalytic solid fluid reactions, gas-liquid reactions, zeolite membranes, model predictive control, etc. Some faculty members of the Department are research supervisors of PhD students in various Centres (Nanotechnology, Environment and Energy) of the Institute.

STUDENT INTAKE

MTech (2006 batch): 23
BTech (2006 batch): 40
PhD: (2006-2007): 07
Total continuing students: 165

FACULTY STRENGTH

Associate Professor: 1
Assistant Professor: 13
Senior Lecturer: 1

MAJOR EQUIPMENT AND FACILITIES

In the year 2006-2007 the Department acquired several new equipment and installed new facilities. Some of them are listed below:

- Waste Water analysis kit
- Millipore water purification system (Elix water purification system)
- Trinocular Trasmited Light Microscope
- JEIOTECH heating and refrigerating circulator
- Continuous stirred Utrafiltration set up
- Peristaltic pump
- Digital Phosphor Oscilloscope
- Programmable Arbitrary function generators with software
In addition to the above equipment, 10 more computers were installed in various research wings in the Department.

RESEARCH AND DEVELOPMENT ACTIVITIES

During 2006-2007, five new research projects were received in the Department in addition to three ongoing projects. A total of 9 new research scholars (including one under QIP scheme) joined the Department. Several papers appeared in renowned international journals. Students and faculty presented many papers in the national and international conferences (details of which are given below). The major M.Tech/Ph.D projects carried out (and ongoing) in the Department are as follows:

Catalyst synthesis for removal of VOCs through absorption
Catalyst synthesis for plastic waste pyrolysis
Technologies for removal of fluoride, arsenic and iron from wastewater
Membrane synthesis for removal of oil from oil-water emulsion
Membrane synthesis for gas separation applications such as separations of hydrogen and acid gases
Liquid membrane for wastewater treatment
Phenolic wastewater treatment by microorganism and sonication
Generation of bio-diesel from microalgae
Research and Developmental activities on Fuel Cells (Polymer Electrolyte Fuel Cell, Direct Methanol and Ethanol Fuel Cell and Solid oxide Fuel Cell)
Wavelet based control
Hydrodynamics study of slurries and CFD
Synthesis of bio-degradable membrane composites
Interfacial reactions
Microkinetics and modelling in hydrocarbon processing
Surfactant based enhanced oil recovery
Molecular simulations for phase equilibria
Molecular Dynamics
System Engineering and Nonlinear analysis

SPONSORED PROJECTS

Ongoing Projects

Title: Binary coalescence of drops in viscous media
Investigator: Dr. P. Ghosh
Sponsoring Agency: DST
Duration: 2 years

Title: Development of a generic model for simultaneous absorption of carbon dioxide and hydrogen sulfide into blended alkanolamines
Investigator: Dr. B. Mandal
Sponsoring Agency: DST
Duration: 3 years

Title: Optimization studies in ultrasound based advanced oxidation technology (sonolysis) for wastewater.
Investigator: Dr. V.S. Moholkar
Sponsoring Agency: DST
Duration: 3 years

New Projects

Title: Development of indigenous technology for fluoride free drinking water
Investigator: Dr. M.K. Purkait (PI); Dr. A.K. Das (Co-I, Department of Design); Dr. B. Mondal (Co-I, Department of Chemistry)
Sponsoring Agency: DRDO
Duration: 3 years

Title: Improvement of the existing Iron removal unit developed by DRL - Tezpur
Investigator: Dr. M.K. Purkait (PI); Dr. A.K. Das (Co-I, Department of Design); Dr. B. Mondal (Co-I, Department of Chemistry)
Sponsoring Agency: DRDO
Duration: 2 years

Title: Development of lightweight Iron Removal Unit based on the principle developed by Defense Research Laboratory, Tezpur
Investigator: Dr. M.K. Purkait (PI); Dr. A.K. Das (Co-I, Department of Design)
Sponsoring Agency: DRDO
Duration: 6 months

Title: Enhancement of Synthesis of Lipids from Microalgae (Microalgal Oil) for Biodiesel Production: Optimization Using Mechanistic Approach
Investigator: Dr. V.S. Moholkar (PI); Dr. M.K. Purkait (Co-I)
Sponsoring Agency: DRDO
Duration: 2 years

Title: Study on Free surface flow of concentrated suspensions
Investigator: Dr. A. Singh
Sponsoring Agency: DST
Duration: 3 years
CONSULTANCY

Title: Evaluation of coal samples
Investigator: Dr. S. Gumma and Dr. A.K. Ghoshal
Sponsoring Agency: Vinay Cement Ltd., Guwahati

Title: Evaluation of xylenne percentage
Investigator: Dr. S. Gumma and Dr. A.K. Ghoshal
Sponsoring Agency: Assam Carbon Pvt. Ltd.

Title: Heat integration study
Investigator: Dr. R. Uppaluri and Dr. A.K. Ghoshal
Sponsoring Agency: Indian Oil Corporation Limited (IOCL), Guwahati

Title: Evaluation of zinc coating
Investigator: Dr. S. Gumma
Sponsoring Agency: Central Warehouse Corporation, Guwahati

PUBLICATIONS

International Journal

S.D. Manjare, A.K. Ghoshal

B. Saha, A.K. Maiti., A.K. Ghoshal

S.D. Manjare, A.K. Ghoshal
‘Studies on adsorption of ethyl acetate vapour on activated carbon’ Industrial and Engineering Chemistry Research, 45, 6563-6569, 2006

S.D. Manjare, A.K. Ghoshal

B. Saha, A.K. Ghoshal

B. Saha, A.K. Ghoshal

B. Saha, A.K. Ghoshal

J. Barman, A.K. Ghoshal

S. Paul, A.K. Ghoshal, B.P. Mandal

Ankur Pariyani, Abhigyan Gupta, Pallab Ghosh

M. Kishore Kumar, Pallab Ghosh
‘Coalescence of air bubbles in aqueous solutions of ionic surfactants in presence of inorganic salt’, Chemical Engineering Research and Design, 84, 703-710, 2006

M. Kishore Kumar, Tania Mitra, Pallab Ghosh

R. Amrit, P. Saha

P. Saravanan, K. Pakshirajan, P. Saha

Raphael Semiat, Avinoam Nir, Anugrah Singh

A. Maiti, S. DasGupta, S. De, M.K. Purkait

S. DasGupta, S. De, M.K. Purkait
‘Performance of TX-100 and TX-114 for the separation of chrysoidine dye using cloud point extraction’, Journal of Hazardous Materials, 137(2), 827-835, 2006

S. DasGupta, S. De, M.K. Purkait
‘Determination of design parameters for the cloud point extraction of congo red and eosin dyes using TX-100’, Separation and Purification Technology, 51(2), 137-142, 2006

Indian Institute of Technology Guwahati
S. Gupta, S. De, M.K. Purkait

Manoj Kumar, Satyam Agarwal, Anupam Shukla, Anil Kumar, G. Pugazhenthi

S. Sachan, S. Sachdeva, Anil Kumar, G. Pugazhenthi
'Hydrolysis of olive oil using lipase bonded to modified carbon membrane', AIChE Journal, 52(4) 1611-1620, 2006

R.V.S. Uppaluri, P. Linke, A.C. Kokossis, R. Smith

T. Sivasankar, A.W. Paunikar and V.S. Moholkar

K. Sampath Kumar and V.S. Moholkar

S.K. Majumder, G. Kundu, D. Mukherjee
'Energy Efficiency of Two-phase Mixing in a Modified Bubble Column', The Canadian Journal of Chemical Engineering (Accepted for publication)

S. K. Majumder, G. Kundu, D. Mukherjee

S.K. Majumder, K. Chandna, D. S. De, G. Kundu

S.K. Majumder

S.K. Majumder, G. Kundu, D. Mukherjee
'Bubble size distribution and interfacial phenomena in ejector induced downflow bubble column', Chemical Engineering Journal, 122 (1-2), 1-10, 2006

S.K. Majumder, G. Kundu, D. Mukherjee
'Efficient Dispersion in a Modified Two-phase Non-Newtonian Downflow Bubble Column', Chemical Engineering Science, 61(20), 6753-6764, 2006

M.K. Purkait, S.K. Majumder, S.K. Das

National Journal

R.V.S. Uppaluri
'Techno-economic assessment of critical energy resources for India, Energy Security', Indian Perspective Complimentary News and Features, New Delhi, 2006

S.K. Majumder, B. Kumar, G. Kundu, D. Mukherjee
'Mixing characteristics in slurry flotation column', I.E (I), (Accepted for publication, December 2006)

S.K. Majumder, G. Kundu, D. Mukherjee
'_prediction of intensity of liquid axial dispersion in a modified downflow Bubble Column', I.E (I), (Accepted for publication, January 2007)

CONFERENCE PROCEEDINGS

International

K. Srinivasulu, A. Difoe, G. Pugazhenthi and A. Verma
'Development of hybrid Nafion® membrane for direct methanol fuel cell', International Conference on Cleaner Technologies and Environment Management (ICCTEM-2007), Pondicherry, India, 4-6 January 2007

K. Srinivasulu, A. Difoe, A. Verma, G. Pugazhenthi
'Development of hybrid Nafion® membrane for direct methanol fuel cell', International Conference on Cleaner Technologies and Environment Management (ICCTEM-2007), Pondicherry, India, 4-6 January 2007

Anurag Verma, Prabhu R. Nott, Anugrah Singh
'Particle migration during Stokes flow of suspensions past a cylinder', AIChE Annual Conference, San Francisco, 13-17 November 2006

Orhan Talu, Deepam Panchal, Roger J. Briggs, Edward J. Hummelt, Sasidhar Gumma
'Adsorptive Storage of Mechanical Energy (Work) for Transportation Applications', AIChE Annual Meeting, San Francisco, November 2006

T. Sivasankar and V.S. Moholkar

Annual Report 2006-2007 47
S.K. Majumder, G. Kundu, D. Mukherjee
‘Mixing of Gas-Liquid in a Downflow Bubble Column Reactor (BCR)’, ACHEMA-2006, Exhibition Centre Frankfurt, Germany, 15-19 May 2006

National

U. Menon, S. Jami, S. Gumma, P. Saha

J. Reddy, P. Saha

P. Saravanan, K. Pakshirajan, P. Saha

K. Srinivasulu, A. Difoë, G. Pugazhenthi, A. Verma

S. Basu, A. Verma
‘Alkaline fuel cell with manganese dioxide as a non-noble metal catalyst at cathode’, 22nd National Convention of Mechanical Engineers, Guwahati, 9-10 September 2006

N. Sugali, A.K. Ghoshal, A. Verma

K. Srinivasulu, A. Difoë, A. Verma, G. Pugazhenthi

Debasis Ghosh, Pallab Ghosh, G. Pugazhenthi

M. Singla, S. Gumma

Chetan P. Borkar, S. Gumma

Shabroz Gill, Pradip Choudhury, and S. Gumma

U. Menon, Satish Jami, P.K. Saha, S. Gumma

P. Saravanan, K. Pakshirajan and P. Saha

OTHER PUBLICATIONS

Book
P. Ghosh

PAPERS PRESENTED IN CONFERENCES/WORKSHOPS/SYMPOSIA

International

K. Srinivasulu, A. Difoë, G. Pugazhenthi and A. Verma
‘Development of hybrid Naﬁon® membrane for direct methanol fuel cell’, International Conference on Cleaner Technologies and Environment Management (ICCTEM-2007), Pondicherry, India, 4-6 January 2007

K. Srinivasulu, A. Difoë, A. Verma, G. Pugazhenthi
‘Development of hybrid Naﬁon® membrane for direct methanol fuel cell’, International Conference on Cleaner Technologies and Environmental Management (ICCTEM-2007), Pondicherry, India, 4-6 January 2007
Anurag Verma, Prabhu R. Nott, Anugrah Singh
‘Particle migration during Stokes flow of suspensions past a cylinder’, AIChE Annual Conference, San Francisco, 13-17 November 2006

T. Sivasankar and V.S. Moholkar

S. K. Majumder, G. Kundu, D. Mukherjee
‘Mixing of Gas-Liquid in a Downflow Bubble Column Reactor (BCR)’, AICHE-2006, Exhibition Centre Frankfurt, Germany, 15-19 May 2006

National

U. Menon, S. Jami, S. Gumma, P. Saha

J. Reddy, P. Saha

P. Saravanan, K. Pakshirajan, P. Saha


S. Basu, A. Verma
‘Alkaline fuel cell with manganese dioxide as a non-noble metal catalyst at cathode’, 22nd National Convention of Mechanical Engineers Guwahati, 9-10 September 2006

N. Sugali, A.K. Ghoshal, A. Verma

K. Srinivasulu, A. Difo, A. Verma, G. Pugazhenthil

Debasis Ghosh, Pallab Ghosh, G. Pugazhenthil

M. Singla, S. Gumma

Chetan P. Borkar, S. Gumma

Shabroz Gill, Pradip Choudhury, and S. Gumma
‘Three-Suffix Margules Type equations for mixed gas adsorption equilibria’, accepted at the 59th Annual Session of the Indian Chemical Engineering Congress (CHEMCON 2006), Ankleshwar, Gujarat, 27-30 December 2006

U. Menon, Satish Jami, P.K. Saha, S. Gumma
‘Modelling and Simulation of Phenol Adsorption on to Polymeric Resin XAD 16’, accepted at the 59th Annual Session of the Indian Chemical Engineering Congress (CHEMCON 2006), Ankleshwar, Gujarat, 27-30 December 2006

P. Saravanan, K. Pakshirajan and P. Saha

CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED

National

Anugrah Singh attended Summer School on Advances in Petroleum Refining Industry at Indian Institute of Petroleum Management, Gurgaon, India, 3-8 July 2006

G. Pugazhenthil attended Summer School on Advances in Petroleum Refining Industry at Indian Institute of Petroleum Management, Gurgaon, India, 3-8 July 2006

INVITED LECTURES OF FACULTY

In India

A.K. Ghoshal
Session Chair in the one day national workshop on ‘Fluidized Bed Combustion Technology’ in Guwahati on 12 January 2007
Anugragh Singh
‘CFD for Material Processing’, Invited Lecture organized by CFD forum, Department of Mechanical Engineering, IIT Guwahati, 15 April 2006

Anugragh Singh
‘Stokesian Dynamics Simulation for two phase flow’, Department of Mathematics, IIT Guwahati, 29 March 2007

Mihir Kumar Purkait
‘Application of Membrane Separation Technology in Energy Generation’, National Science Day, DRL Tezpur

A. Verma

V.S. Moholkar

V.S. Moholkar
‘Science and Engineering of Sonochemical Wastewater Treatment’, DST-SERC School on Cavitationally Induced Physical and Chemical Transformations, UICT Mumbai

V.S. Moholkar
‘Mass Transfer Enhancement in Textiles with Ultrasound’, DST-SERC School on Cavitationally Induced Physical and Chemical Transformations, UICT Mumbai

VISITORS FROM OTHER INSTITUTES/UNIVERSITIES

Professor Hemanta Sarma, Reg Sprigg Chair in Petroleum Engineering, Centre for Improved Petroleum Recovery, Australian School of Petroleum, the University of Adelaide, Australia

SEMINARS/WORKSHOPS/CONFERENCES ORGANIZED


INVITED LECTURES/VISITORS

‘Biologically enhanced oil recovery’ by Professor Hemanta Sarma, Reg Sprigg Chair in Petroleum Engineering, Centre for Improved Petroleum Recovery, Australian School of Petroleum, the University of Adelaide, Australia

SPECIAL MENTION

A.K. Ghoshal
Chairman, Guwahati Regional Chapter of IIChE, 2006-2007. Nominated as one of the council members of IIChE student Chapters in the year 2006.

A. Verma
Technical Committee member, Indian Conference at IIT Delhi.


FACULTY MEMBERS

P. Balasubramanian
PhD (IIT Madras)
Assistant Professor
Areas of Interest: Reaction Engineering, Single Event MicroKinetics, Nonlinear Analysis in Delay System

T. Banarjee
PhD (IIT Kanpur, Thesis submitted 2006)
Senior Lecturer
Areas of Interest: Phase Equilibria of Ionic Liquids, Statistical Thermodynamics, Molecular Dynamics, Genetic Algorithms

P. Ghosh
PhD (IIT Bombay)
Assistant Professor
Areas of Interest: Interfacial hydrodynamics, Interfacial reactions, Membrane separation

A.K. Ghoshal
PhD (IIT Kharagpur)
Associate Professor and Head
Areas of Interest: Waste pyrolysis, Adsorption, Membrane separation, Pollution control, Modelling and simulation of separation processes

S. Gumma
PhD (Cleveland State University)
Assistant Professor
Areas of Interest: Molecular simulation, adsorption, Gas separations, Synthesis of zeolites

Indian Institute of Technology Guwahati
B.P. Mandal
PhD (IIT Kharagpur)
Assistant Professor
Areas of Interest: Reactive absorption, Photocatalytic reactions, Pollution control, Membrane separation, Modelling and simulation of separation processes

S.K. Majumder
PhD (IIT Kharagpur)
Assistant Professor
Areas of Interest: Multiphase flow and reactor, Computational fluid dynamics in gas-liquid reactor, Mineral processing, Bio-separation

K. Mohanty
PhD (IIT Kharagpur)
Assistant Professor
Areas of Interest: Industrial pollution control, Environmental biotechnology, Bioseparation, Membrane technology, Adsorption

V.S. Moholkar
PhD (University of Twente, Netherlands)
Assistant Professor
Areas of Interest: Bubble dynamics, CFD, Sono-process engineering, Bio-mass gasification

G. Pugazhenthi
PhD (IIT Kanpur)
Assistant Professor
Areas of Interest: Membrane separation, polymer nanocomposites, Synthesis of nanomaterials, Catalysis

M.K. Purkait
PhD (IIT Kharagpur)
Assistant Professor
Areas of Interest: Surfactant based separation techniques, Membrane reactors

P.K. Saha
PhD (IIT Madras)
Assistant Professor
Areas of Interest: Process Modelling, Optimization and control, Photocatalytic reactions

A. Singh
PhD (IISc. Bangalore)
Assistant Professor
Areas of Interest: Stokesian dynamic simulation, Multiphase flow, CFD, material processing, rheology

R.V.S. Uppaluri
PhD (UMIST, Manchester)
Assistant Professor
Areas of Interest: Computer aided process design, Chemical and biochemical process optimization, Process integration, Refinery processes, Homogenous and heterogeneous catalytic reactions, Membrane reactors, Autocatalytic solid-fluid reactions

A. Verma
PhD (IIT Delhi)
Assistant Professor
Areas of Interest: Fuel Cells, Hydrogen Production, Photocatalytic treatment of wastewater
INTRODUCTION

The Department of Chemistry, with faculty strength of 17 at various levels, is engaged in pursuing excellence in higher learning through teaching and research in modern topics in Chemistry and related interdisciplinary fields of interest. The faculty members of the Department are engaged in implementing a large number of research and development sponsored projects. A sizeable number of students those who obtained various degrees from the Department are engaged in research all over the globe. The Department has received fund under FIST Programme (Level II) of the Department of Science and Technology, New Delhi.

ACADEMIC ACTIVITIES

B Tech Core (Theory and Laboratory) and elective courses in Chemistry
M Sc (2 year)
B Tech in Chemical Science and Technology
PhD

STUDENT INTAKE

The student intake in the Department in the academic year 2006-2007:

B Tech (from the Institute’s Engineering Departments)
M Sc: 30
B Tech in Chemical Science and Technology: 20
PhD: 18

FACULTY STRENGTH

The total numbers of faculty as on 31 March 2007 is

Professor: 5
Associate Professor: 4 (1 lien)
Assistant Professor: 8

MAJOR EQUIPMENT AND FACILITIES

The Department of Chemistry has sophisticated instrumentation facility to support research and teaching at various levels. Among the important instruments that are currently available are:

(i) UV-Visible Spectrophotometer: Hitachi
(ii) FT-IR-Spectrophotometer: Nicolet
(iii) Fluorescence Spectrophotometer: Simadzu
(iv) Elemental Analyzer: Perkin Elmer
(v) Gas Chromatograph: Hewlett Packard
(vi) High Performance Liquid Chromatogram and Gel Permeation Chromatogram: Waters
(vii) Electrochemical Analyzer: CH Instruments
(viii) Magnetic Susceptibility Balance: Sherwood Scientific
(ix) Fluorescence Life time measurement equipment
(x) Pressure Reactor
(xi) Langmuir Blodgett Film maker
(xii) Thermogravimetric analyzer and differential scanning calorimeter: Mettler
(xiii) FT-IR with far IR: Perkin Elmer
(xiv) Cryocooler: Julabo
(xv) Polarimeter: Perkin Elmer
(xvi) UV-Visible: Perkin Elmer
(xvii) Rotary Evaporator System: Buchi
(xviii) GC-MS: Perkin Elmer
(xix) H_2, N_2, O_2 gas generator: Peak Scientific Laboratory
(xx) X-ray single crystal diffractometer: Bruker
(xxi) Glove box: Mbraun
(xxii) Hydrogenation Apparatus
(xxiii) Cryostat: Oxford

In addition to these, the Department can access to some important equipment like scanning electron microscope, 400 MHz nuclear magnetic resonance (NMR) spectrometer and electronic spin resonance spectrometer (ESR) in Central Instruments Facility of the Institute. It has also access to workshop facilities of Mechanical Engineering Department and central computing facilities in the Computer Centre.

A large number of international journals are subscribed and good number of text and reference books are made available in library. On line access to many journals are made available through INDEST consortium.

RESEARCH AND DEVELOPMENT ACTIVITIES

The Department is engaged in various research and development activities such as:

SPONSORED RESEARCH PROJECTS

New Projects

Title: Dioxygen Reactivities of Mono-Copper Complexes with Tridentate N-donor Ligands: Models for Dopamin b-Hydroxylase and Peptidylglycine-Hydroxylating Monooxygenase
Investigator: Dr. Biplab Mondal
Sponsoring Agency: DST
Amount Sanctioned: Rs.23.77 lakh
Duration: 3 years

Title: Development and Reactivity Studies of Di-Copper(I)/ (II) Complexes with Tridentate N-donor Ligands: Models for Tyrosinases and Catechol Oxidases
Investigator: Dr. Biplab Mondal
Sponsoring Agency: DAE
Amount Sanctioned: Rs.7.5 lakh
Duration: 3 years

Title: Further Exploration of 1,2-Dipyridinium Tribromide Ethane (EDPBT) in Organic Syntheses
Investigator: Prof. B. K. Patel
Sponsoring Agency: DST
Amount Sanctioned: Rs.12 lakh
Duration: 3 years

Title: NEW Stereo electronic effects on the photoisomerization by Hula-Twist
Investigator: Dr. G. Krishnamoorthy
Sponsoring Agency: CSIR
Amount Sanctioned: Rs.11.5 lakh
Duration: 3 years

Title: Mechanisms of Photochemical Reactions in Ionic Liquids
Investigator: Dr. G. Krishnamoorthy
Sponsoring Agency: DST
Amount Sanctioned: Rs.24 lakh
Duration: 3 years

Ongoing Projects

Title: Desulfurization and Denitrogenation of Diesel
Investigator: Prof. M.K. Chaudhuri
Sponsoring Agency: IOCL
Amount Sanctioned: Rs.12.34 lakh
Duration: 3 years

Title: Synthesis of Novel Conducting Polymers for application in Organic Light Emitting Diodes
Investigator: Dr. P. K. Iyer
Sponsoring Agency: DST
Amount Sanctioned: Rs.19.83 lakh
Duration: 3 years

Title: New Electro luminescent Polymers for Optoelectronic Device Application
Investigator: Dr. P. K. Iyer
Sponsoring Agency: CSIR
Amount Sanctioned: Rs.9.71 lakh
Duration: 3 years

Title: Polymer Anchored Chiral Catalysts for Asymmetric Synthesis
Investigator: Dr. T. Punniyamurthy
Sponsoring Agency: CSIR
Amount Sanctioned: Rs.9.76 lakh
Duration: 3 years

Title: Model studies on the function of supramolecular architecture in the process of biomineralization
Investigator: Dr. Gopal Das
Sponsoring Agency: CSIR
Amount Sanctioned: Rs.8.18 lakh
Duration: 3 years

Title: Development of Green Synthetic Methodologies
Investigator: Dr. B.K. Patel
Sponsoring Agency: CSIR
Amount Sanctioned: Rs.8 lakh
Duration: 3 years

Title: Synthesis of molecular container of different size and shape through self-assembly of chiral transition metal complexes
Investigator: Dr. M. Ray
Sponsoring Agency: DST
Amount Sanctioned: Rs.12.5 lakh
Duration: 3 years

Title: Newer methods of synthesis and assembly of nanomaterials for improved optical, electrical and catalytic applications
Investigator: Dr. (Ms.) A. Paul
Sponsoring Agency: CSIR
Amount Sanctioned: Rs.8.73 lakh
Duration: 3 years

Title: Nanolithography in Color and Design of Microfluidic Devices
Investigator: Dr. A. Chattopadhyay
Sponsoring Agency: DST
Amount Sanctioned: Rs.35 lakh
Duration: 3 years

Title: Study of Inter- and Intra-molecular Interaction and Molecular Recognition in Polyaromatic Compounds
Investigator: Dr. J.B. Barua
Sponsoring Agency: CSIR
Amount Sanctioned: Rs.6.88 lakh
Duration: 3 years
Title: Synthesis and characterisation of assembled dicarboxylic acids and study of their supramolecular aspects

Investigator: Dr. J.B. Baruah

Sponsoring Agency: DST

Amount Sanctioned: Rs.17.44 lakh

Duration: 3 years

CONFERENCES/WORKSHOPS/SEMINARS

M.K. Chaudhuri
‘Workshop on Green Chemistry’, University of Delhi, Delhi, 9-10 March 2007

M.K. Chaudhuri
‘Green Chemistry’, NEERI, Nagpur, 28 February 2007

P.K. Iyer and B. Mondal
‘Proton Induced Redox Tuning of Ruthenium Monoterpyridine Complex with 2,6-bis(benzimidazol-2-yl)pyridine Ancillary Ligand: Synthesis, Characterization and Crystal Structure’, 9th Chemical Research Society of India National Symposium, Delhi University, Delhi, 1-4 February 2007

J.B. Baruah
Invited lecture: Indian Science Congress, Anamalainagar, Tamilnadu, January 2007

J.B. Baruah
‘Indo-Singapore chemistry co-operation conference’, Invited lecture, National University of Singapore, February 2006

G. Das
‘Luminescence Spectroscopy: Application in analytical chemistry’, UGC refresher course on Current Trends in Chemistry with special emphasis on Analytical Techniques, Gauhati University, Guwahati, Assam, 11-31 March 2007

T. Punniyamurthy and S. Jammi
‘Design and Development of Stereoregular Chiral Main Chain polymers for Asymmetric Synthesis, ICOb-5 and ISCNP-25 IUPAC’, International Symposium on Biodiversity and Natural Products, Fukuoka, Japan, 30-31 July 2006 (Poster presentation)

T. Punniyamurthy
‘Chiral polymers for Asymmetric Synthesis, ICOb-5 and ISCNP-25 IUPAC’, International Symposium on Biodiversity and Natural Products, Fukuoka, Japan, 30-31 July 2006 (Invited lectures)

L. Rout and T. Punniyamurthy

S. Jammi and T. Punniyamurthy

V.K. Akkilagahunta, L. Rout, S. Sanyasi and T. Punniyamurthy

M. Ray
National Symposium on Advances in Chemistry and Environmental Impact (ACE-2006), Department of Chemistry, NEHU, Shillong, 1-2 November 2006 (Invited lecture)

A.T. Khan
National Symposium on Advances in Chemistry and Environmental Impact (ACE-2006), Department of Chemistry, NEHU, Shillong, 1-2 November 2006 (Invited lecture)

R.R. Koner and M. Ray
‘Effects of Substituent in the Ligand on the Assembly and Disassembly of a Capsule shaped Cu(II) complex’, National Symposium on Advances in Chemistry and Environmental Impact (ACE-2006), Department of Chemistry, NEHU, Shillong, 1-2 November 2006 (Poster presentation)

M. Ray
‘Application of EPR spectroscopy’, UGC refresher course on Current Trends in Chemistry with special emphasis on Analytical Techniques, Gauhati University, Guwahati, 11-13 March 2007

S.C. Sahoo and M. Ray
‘Synthesis, structural characterization and electrochemical properties of a set of Cu (II) complexes with ferrocene and amino acid derived bidentate ligands’, National Symposium on Advances in Chemistry and Environmental Impact (ACE-2006), Department of Chemistry, NEHU, Shillong, 1-2 November 2006 (Poster presentation)

A.T. Khan
International Symposium on Current Perspectives in Organic Chemistry, IACS, Kolkata, 7-9 December 2006 (Poster presentation)

B.K. Patel
International Symposium on Current Perspectives in Organic Chemistry, IACS, Kolkata, 7-9 December 2006 (Poster presentation)

A.T. Khan
43rd Annual Convention of Chemists 2006, organized by Indian Chemical Society, Kolkata, at Aurangabad in Maharashtra, 23-27 December 2006 (Invited lecture)
A.T. Khan
Refresher Course in Chemistry on Current Trends in Chemistry with Special emphasis on Analytical Techniques, Department of Chemistry, Gauhati University, Guwahati, 29 March 2007 (Invited lecture)

A. Paul
‘Electrochemical Actuation of Growing Copper Dendrimers in Water’, First Mid year Meeting of the Chemical Research Society of India, IIT Madras, 13 July 2006 (Invited presentation)

A. Paul
‘Surface Studies Using Ultra High Vacuum Techniques’, Refresher course in Chemistry (IX): Current trends in Chemistry with special emphasis on Analytical Techniques, Gauhati University, Guwahati, 26 March 2007 (Invited lecture)

A.K. Saikia
‘Palladium Catalyzed addition reaction of CFBr₃ and CF₂Br₂ to olefins’, International Conference on Molecules to Materials, Sant Longwals Institute of Engineering and Technology, Longowal, 3-4 March 2006

P.K. Iyer
‘Polymeric materials: Current Trends’, UGC refresher course on Current trends in Chemistry with special emphasis on Analytical Techniques, Gauhati University, Guwahati, 11-31 March 2007 (Invited lecture)

Amardeep, B. Chetia, P.K. Iyer and B. Mondal
‘Proton Induced Redox Tuning of Ruthenium Monoterpyridine Complex with 2,6-bis(benimidazol-2-yl)pyridine Ancillary Ligand: Synthesis, Characterization and Crystal Structure’, 9th Chemical Research Society of India National Symposium, Delhi University, Delhi, 1-4 February 2007

‘Novel low temperature chemical synthesis and characterization of Zinc oxide nanostructures’, Advanced Nano Materials (ANM-07), IIT Bombay, Mumbai, 8-10 January 2007 (Poster presentation)

‘Chemical synthesis of multiwalled carbon nanotubes’, Advanced Nano Materials (ANM-07), IIT Bombay, Mumbai, 8-10 January 2007 (Poster presentation)

P.J. Sarmah, P.K. Iyer
‘Electroluminescent polymers for blue light emission’, 9th Asian Symposium on Information Display, India Habitat Centre, New Delhi, 8-12 October 2006 (Poster presentation)

A. Jain, M. Katiyar, P.K. Iyer
‘Effect of processing parameters on Poly (9,9-dioc-tylfluorene-co-bithiophene) based organic field-effect transistors’, 9th Asian Symposium on Information Display, India Habitat Centre, New Delhi, 8-12 October 2006 (Poster presentation)

P.K. Iyer
Brainstorming Session on Futuristic R&D for Plasma Display Panel, Samtel Color Limited, Ghaziabad, India, 15 July 2006

‘Functionalization of Carbon Nanotubes and Study of its Optical and Structural Properties’, International Conference on Nanoscience and Nanomaterials, CIT, Coimbatore, India, June 2006 (Oral)

PUBLICATIONS

Journal Papers:

Mihir K. Chaudhuri, Sanjay K. Dehury, Sahid Hussain, A. Durah and Nayanmoni Gogoi

Mihir K. Chaudhuri and Sahid Hussain

Mihir K. Chaudhuri and Sahid Hussain

A. Karmakar, R.J. Sarma, J.B. Baruah

N. Barooah, A. Karmakar, R.J. Sarma, J.B. Baruah

A. Karmakar, R.J. Sarma, J.B. Baruah
N. Barooah, R.J. Sarma, J.B. Baruah

K. Deka, R.J. Sarma, J.B. Baruah
'Nitrogen-oxygen bond formation during oxidative reactions of Copper(II) benzoate complexes having 3, 5-dimethylpyrazole', Inorganic Chemistry Communications, 9, pp. 931-934, 2006

N. Barooah, R.J. Sarma, J.B. Baruah

A. Karmakar, K. Deka, R.J. Sarma, J.B. Baruah
'Benzolic acid inclusion in a dimeric nickel complex and its catalytic activity', Inorganic Chemistry Communications, 9, pp. 836-838, 2006

C. Tamuly, N. Barooah, M. Laskar, R.J. Sarma, J.B. Baruah
'Fluorescence quenching and enhancement by H-bonding interactions in some nitrogen containing fluorophores', Supramolecular Chemistry, 18, 605-613, 2006

K. Deka, M. Laskar, J.B. Baruah
'Carbon-nitrogen Bond Cleavage by copper complexes', Polyhedron, 25, 2525-2529, 2006

R.J. Sarma, J.B. Baruah

R.J. Sarma, A.S. Batsanov, R. Kataly, J.B. Baruah
'Structural Investigations on Quinone Methides for Understanding their Properties in Confined Media', J. of Inclusion Phen. and Macrocyclic compounds, 55, 1-9, 2006

N. Barooah, R.J. Sarma, A.S. Batsanov, J. B. Baruah

R.J. Sarma, C. Tamuly, J.B. Baruah
'Synthesis and characterization of N-substituted bis-phenols as precursor for unsymmetrical triarylmethane cation', Dyes and Pigments, 72, 75-79, 2007

N. Barooah, R.J. Sarma, A.S. Batsanov, J.B. Baruah
'N-phthaloylglycinato complexes of cobalt, nickel, copper and zinc', Polyhedron, 25, 17-24, 2006

C.B. Singh, V. Kavala, A.K. Samal, B.K. Patel

S. Murru, V. Kavala, C.B. Singh, B.K. Patel
'A one-pot synthesis of 1,4-dithiins and 1,4-benzodithiins from ketones using the recyclable reagent 1,1'- (ethane-1,2-diyl)dipyridinium bistribromide (EDPBT)', Tetrahedron Lett., 48, 1007, 2007

C.B. Singh, S. Murru, V. Kavala, B.K. Patel
'It is Thiazolidine-2-imine and not Imidazole-2-thione as the reaction product of 1-Benzoyl-3-phenylthiourea with Br2/Enolizable Ketone', Organic Letters, 8, 5397, 2006

S. Naik, V. Kavala, R. Gopinath, B.K. Patel
'1,1-(Ethane-1,2-diyl)dipyridinium-bistribromide (EDPBT) as a Recyclable Catalyst for Acylation', ARKIVOC, XI, 21-36, 2006

R.K. Roy, V. Kavala, S. Naik, B.K. Patel

R.K. Roy, V. Usha, B.K. Patel, K. Hirao
'Acetalization of Cabonyl Compounds: A Case Study Based on Global and Local Electrophilicity Descriptors', J. Comp. Chem., 27, 773-780, 2006

B. Rama Raju, E.K. Pramod Kumar, A.K. Saikia
'Palladium(0)-catalyzed addition of CFBr3 to Olefins: synthesis of 1,1,3-tribromo-1-fluoroalkanes and 1,2-difluoroalkenes', Tetrahedron Letters, 47, 9245, 2006

J.W. John Bosco, A. Agrahari, A.K. Saikia
'Molecular iodine catalyzed selective acetylation of alcohols with vinyl acetate', Tetrahedron Letters, 47, 4065, 2006

B.M. Borah, B.J. Bhuyan, G. Das

H. Thakuria, G. Das

H. Thakuria, A. Pramanik, B.M. Borah, G. Das

H. Thakuria, G. Das
B. Chetia, P.K. Iyer

B. Chetia, P.K. Iyer

D. Knapton, P.K. Iyer, S.J. Rowan, C. Weder

P.K. Iyer, S. Wang

PATENT FILED

Arun Chattopadhyay, Anugrah Singh and Pinjala Nagaraju Rao
‘Evaporation Induced Lithography’ (Patent Application Submitted, October 2006)


‘A process for the preparation of novel chiral salen transition metal catalyst useful in enantioselective epoxidation of prochiral olefins’ (Indian (2006), IN 2000DE01160)

P.K. Iyer, P.K. Giri, S. Bhattacharyya, B. Chetia
‘Method to synthesize nano sized zinc oxide’ (India Patent application No. 563/K01/2006)

VISITORS

Prof. S. Ramakrishnan
Department of Inorganic and Physical Chemistry, Indian Institute of Science Bangalore, India

Prof. P. Selvam
Department of Chemistry, Indian Institute of Technology Madras, Chennai, India

Prof. D.W. Knight
Head, Department of Chemistry, University of Cardiff, United Kingdom

Dr. M. Ranganathan
Institute of Physical Science and Technology, University of Maryland

Dr. Sivaprasad Mitra
Department of Chemistry, North Eastern Hill University, Shillong

Prof. A. Srikirshna
Department of Chemistry, Indian Institute of Science Bangalore, India

Dr. Tapan Kr. Sau
Department of Chemistry, Punjab University, Punjab

Dr. Shankar K. Guhchait
Birla Institute of Technology and Science, Goa

Prof. B.C. Ranu
Indian Association for the Cultivation of Science, Kolkata, India

Prof. A. Basak
Department of Chemistry, IIT Kharagpur

SHORT-TERM COURSES

Green Chemistry and Green Technology during 5-9 June 2006 under QIP programme. Prof. A.T. Khan and Prof. B.K. Patel were the coordinators.

SEMINARS/WORKSHOPS/CONFERENCES ORGANIZED

Department of Science and Technology Expert Advisory Committee Meeting on Molecular Electronics, Conducting Polymer Electronics and Non-Invasive and other Biosensors on 30-31 August 2006. It was coordinated by Dr. P.K. Iyer.

AWARDS/DISTINCTION

UKIERI Research Fellowship to Dr. T. Punniyamurthy 2006 to visit Oxford University.

DAE-Young Scientist Research Award to Dr. Biplab Mondal (2006-2007).

FACULTY MEMBERS

S. Adhikari
PhD (Jadavpur University)
Assistant Professor
Areas of Interest: Molecular dynamics and laser chemistry

J.B. Baruah
PhD (IISc Bangalore)
Professor
Areas of Interest: Homogeneous catalysis, novel materials, supramolecular chemistry
S. Bhattacharaya  
PhD (Burdwan University)  
Assistant Professor  
Areas of Interest: Physical chemistry – spectroscopic and theoretical investigations on novel materials

A. Chattopadhyay  
PhD (Columbia University)  
Professor  
Areas of Interest: Thin films, membrane sciences, and nano science and technology

M.K. Chaudhuri  
PhD (IIT Kharagpur)  
Professor  
Areas of Interest: Synthesis, structure and reactivity of inorganics, newer materials and methodologies, newer reagents and protocols

G. Das  
PhD (IIT Kanpur)  
Assistant Professor  
Areas of Interest: Supramolecular, bioorganic chemistry and biomineralization

A.K. Gupta  
PhD (University of California, Los Angeles)  
Assistant Professor  
Areas of Interest: Quantum molecular dynamics

P.K. Iyer  
PhD (CSMCRI, Bhavnagar)  
Assistant Professor  
Areas of Interest: Polymer synthesis, inorganic/organometallic chemistry and device fabrication

A.T. Khan  
PhD (Kalyani University)  
Professor and Head  
Areas of Interest: Synthesis of natural products, heterocycles and carbohydrate chemistry, newer methodologies

G. Krishnamoorthy  
PhD (IIT Kanpur)  
Assistant Professor  
Areas of Interest: Organic photochemistry and spectroscopy

V. Manivannan  
PhD (Jadavpur University)  
Assistant Professor  
Areas of Interest: Coordination chemistry and organometallics

B. Mondal  
PhD (IIT Bombay)  
Assistant Professor  
Areas of Interest: Bioinorganic chemistry

B.K. Patel  
PhD (IIT Kanpur)  
Professor  
Areas of Interest: Bioorganic chemistry and newer methodologies

A. Paul  
PhD (Columbia University)  
Associate Professor  
Areas of Interest: Surface science, catalysis, thin films

T. Punniyamurthy  
PhD (IIT Kanpur)  
Associate Professor  
Areas of Interest: Synthetic organic chemistry

M. Ray  
PhD (IIT Kanpur)  
Associate Professor  
Areas of Interest: Bioinorganic and coordination chemistry

A. Saikia  
PhD (Dibrugarh University)  
Associate Professor  
Areas of Interest: New synthetic methodology and natural product synthesis
INTRODUCTION

The Department of Civil Engineering, established in the year 1998, has shown remarkable progress in academic, research and consultancy works. Faculty members continued to take the lead in strengthening their respective specializations through further development of the laboratories and research facilities. Several faculty members published their research work in leading journals or presented papers in international/national conferences. The Department has got several sponsored R&D projects in the last few years, many of which have been completed while some of them are in progress.

ACADEMIC PROGRAMMES

The Department is currently having BTech, MTech and PhD programmes. The MTech programme includes the following specialization:

- Structural Engineering
- Water Resources Engineering and Management
- Geotechnical Engineering
- Environmental Engineering
- Transportation Systems Engineering

Our fourth (2003 year) batch of 31 BTech students are graduating this year. All of the outgoing BTech students were selected for recruitment in various reputed organizations through campus interview. Most of the graduating students have undergone practical training during last summer in leading technical universities abroad. The PhD programme includes all areas of specialization in Civil Engineering.

STUDENT INTAKE

The student intake in 2006-2007 academic session is as follows:

- BTech: 50
- MTech: 38
- PhD: 06

FACULTY STRENGTH

Faculty strength as on 31 March 2006: 22

- Associate Professor: 8
- Assistant Professor: 14

MAJOR EQUIPMENT AND FACILITIES

Structural Engineering/Concrete Technology Laboratory

Major equipment procured during the period includes overhead EOT crane for structural test hall, universal testing machine, universal test frame, several new NDT equipment like corrosion analysing equipment, rebar locator, permeability tester, resistivity meter, extraction tester. Cooling tower has been installed for actuator system. Earthquake simulator, FFT analyzer for vibration testing of structural elements, resonant frequency meter, HBM 4 channel data acquisition system, core cutter, comoneter for structural health monitoring have been procured and installed. The testing facility for UG and PG laboratories have been enhanced by adding more conventional equipment, like vicat apparatus, mortar mixer, digital flame photometer, etc.

Environmental Engineering Laboratory Development

Laser particle size analyzer was installed. Atomic absorption spectrophotometer was delivered and installed. Ultra-pure water system ordered. Ambient air pollutant measurement sampler, CO and CO2 portable analyzer (automatic), the fine particulate sampler (PM2.5 and less; including PM10), micrometeorological monitoring equipment with required accessories and data logging system and software (automatic) magnetic stirrer, paddle stirrer, microprocessor based digital pH meter, hot plate, AIR compressor, trinocular laboratory microscope compete with essential accessories and digital camera, bench top ORP meter, horizontal shaker, bottle top dispenser, DO meter have been processed for procuring the equipment the equipment.

Transportation Engineering Laboratory

Bump integrator for pavement management, brooke field viscometer for testing of bituminous material as well as marshall design of flexible pavement facilities, HDM4 for highway development model, MXROADS for highway geometric design, rolling thin file oven, TRANSYT, TSIS, HCS software, plate compactor, CBR field apparatus, hydraulic jack have been procured and installed.

Driver vision screen tester, enoscope (as per BIS), distance measuring wheel, mapinfo professional 8.0, hot air oven, dial gauge, proctor compaction mould with hammer, water bath with thermostat, universal penetrometer for bitumen testing including automatic penetrometer timer, electric plate compactor for preparation of triaxial sample, gyratory type sieve shaker for 200 mm dia. have been processed for procuring the equipment in the current year.

Hydraulics and Water Resources Engineering Laboratory

Hydrology Apparatus in Water Resources Laboratory has been installed. An in-situ hillslope experiment set up (size = 250 m²) with fully automatic subsurface flow measurement system was designed and fabricated at the field site. This
The experimental set-up will quantify both subsurface and surface flow in a hillslope under high intensity storm events. A 50/10 m long channel, rainfall simulation apparatus for study rainfall for various studies flow. Current meter with digital recording system (cup type, propeller), under an operating head of 5 m have been processed for procuring the equipment.

Geotechnical Engineering Laboratory
De-aireing apparatus for triaxial testing, multi-channel data logging equipment, relative density apparatus, dynamic block foundation equipment.

Surveying Laboratory
In addition to conventional survey equipment, modern equipment like, EDM, total station, electronic theodolite, GIS for remote sensing, digitizer, etc. for various topographic studies are in working condition. Electronic total station has been processed for procuring the item in the current year.

Engineering Geology Laboratory
Trinocular stereo zoom microscope, petrographic microscope with digital image capturing facility, hardness box kit have been processed for procuring the equipment.

SPONSORED PROJECTS

New

Title: Development of a Simultaneous Approach for Integrated Mass Transit Planning
Principal Investigator: Dr. A. Verma
Sponsoring Agency: DST
Amount Sanctioned: Rs.10 lakh

Title: GIS based Inventory of the rivers of the Northeastern Region
Principal Investigator: Dr. A.K. Sarma and Dr. C. Mahanta
Sponsoring Agency: MOEF
Amount Sanctioned: Rs.22 lakh

Ongoing

Title: Flood Forecasting Modelling in the Brahmaputra River
Principal Investigator: Dr. A.K. Sarma and Dr. C. Mahanta
Sponsoring Agency: AICTE
Amount Sanctioned: Rs.15 lakh

Title: Rural roads pavement performance study
Principal Investigator: Dr. B. Singh
Sponsoring Agency: National Rural Roads Development Agency
Duration: 3 years
Amount Sanctioned: Rs.6 lakh

Title: Installation of strong motion array in Guwahati for site characterization and instrumentation of multi-storied buildings at Guwahati
Principal Investigator: Dr. S.K. Deb
Sponsoring Agency: DST

Title: Analytical and Inverse modelling for estimating aquifer parameters of a confined aquifer
Principal Investigator: Dr. G. Barua
Co-Principal Investigator: Dr. S.N. Bora
Sponsoring Agency: DST
Duration: 2 years
Amount Sanctioned: Rs.3.9 lakh (Total amount for the project Rs.5.95 lakh)

Consultancy

Title: Protection of Matmara Arkep-Baligaon Area from the Erosion of River Brahmaputra
Consultant: Dr. A.K. Sarma
Sponsoring Agency: Water Resources Department, Govt. of Assam

Title: Identifying Suitable Location for Inland Water Terminal
Consultant: Dr. A.K. Sarma
Sponsoring Agency: Inland Waterways Authority of India

Title: Dam Break Analysis of the proposed Debang Dam of Northeast India
Consultant: Dr. A.K. Sarma
Sponsoring Agency: National Productivity Council, India

Title: Feasibility Study for Watershed Management Project in the Kakodonga River Basin
Consultant: Dr. A.K. Sarma
Sponsoring Agency: Agricultural Department of Assam

Title: Investigation of petrography of rock samples
Consultants: Dr. C. Mahanta and Mr. A Borsaikia
Sponsoring Agency: M/s Druk Stones & Minerals Export Co. Ltd., Phuensholing, Bhutan
Title: Investigation of Nakkati quarry in connection with widening and strengthening of existing NH-31C from lane 2 to 4 lane KM 10-30.00 to KM 93.00
Consultants: Dr. C. Mahanta and Mr. A. Borsaikia
Sponsoring Agency: M/s Gayatri-ECI (JV), Site Office: Shantipara, Kajal gaon, Chirang, Assam

Title: Manufacturing bricks using stone crush dust (Phase-I)
Consultants: Dr. D. Maity and Mr. A. Borsaikia
Sponsoring Agency: Mr. N Sahewalla, C/o Mr. M.D. Sahewalla, Sivasagar, Assam

Title: Investigation on soil samples against construction of perimeter road at Barapani Airport
Consultants: Dr. Sreedeep and Mr. Kumar Pallav
Sponsoring Agency: Sr. Manager Engg. (C)-III, Airport Authority of India, Guwahati

Title: Provision of designing drainage system for LGBI Airport, Guwahati
Consultants: Dr. S. Dutta and Mr. Kumar Pallav
Sponsoring Agency: Senior Manager (C)-SG-1, AAI, LGBI Airport, Guwahati

Title: Proof checking of ROBs in Rohtak, Haryana
Consultants: Dr. A. Dutta
Sponsoring Agency: STUP Consultants Pvt. Ltd, Delhi

PUBLICATIONS

International Journal

N.B. Desu, S.K. Deb and A. Dutta
‘Coupled tuned mass dampers for control of coupled vibrations in asymmetric building’, Journal of Structural Control and Health Monitoring (Wiley Inter-Science), 13 (5), pp. 897-916, 2006

N.B. Desu, A. Dutta and S.K. Deb
‘Optimal assessment and location of tuned mass dampers for seismic response control of a plan-asymmetrical building’, Int. Journal of Structural Engineering and Mechanics, accepted for publication, 2006

M. Medhi, A. Dutta and S.K. Deb
‘Health monitoring of multistoreyed shear building using parametric state space modelling’, Int. Journal of Smart Structures and Systems, accepted for publication, 2007

A. Borsaikia, S. Talukdar and A. Dutta

Rahul, G. Sandeep, D. Chakraborty and A. Dutta
‘Multi-objective optimization of hybrid laminates subjected to transverse impact’, Composites Structures, 70, pp 260-269, 2006

N.B. Desu, S.K. Deb and A. Dutta

P.K. Ghosh and L. Philip

M.Z. Nain and M. Jawed
‘Performance of anaerobic reactors at low organic load subjected to sudden change in feed substrate types’, Journal of Chemical Technology and Biotechnology, 81 (6), pp 958-965, 2006

I. Gogoi and D. Maity

B. Sahoo and D. Maity

I. Gogoi and D. Maity

D. Maity and D. Kar

P.H. Shah, S. Sreedeep and D.N. Singh
‘Evaluation of methodologies used for establishing soil-water characteristic curve’, Journal of ASTM International, 3 (6), Page Count: 11, Published Online, April 2006

S. Sreedeep and D.N. Singh

S. Sreedeep and D.N. Singh
‘Nonlinear curve-fitting procedures for developing soil-water characteristic curves’, Geotechnical Testing Journal, ASTM, 29 (5), Page Count: 10, Published Online, May 2006

S. Sreedeep and D.N. Singh

V.K.S. Thakur, S. Sreedeep and D.N. Singh
N.V. Rajyalakshmi and S. Dutta

S. Dutta, A. Mishra, S. Kar and S. Panigrahy
'Estimating spatial curve number from satellite sensor images using linear mixture model', Journal of Spatial Hydrology, 6 (2), pp. 57-67, 2006

A. Chattopadhyay and S. Dutta

M.D. Saikia and A.K. Sarma

J.A. Ahmed and A.K. Sarma

M.D. Saikia and A.K. Sarma

S. Chakraborty and V. Tare

M. Kumar and S. Chakraborty

P. Albino Kumar, M. Ray and S. Chakraborty
'Hexavalent chromium removal from wastewater using aniline formaldehyde condensate coated silica gel', Journal of Hazardous Materials, (Accepted for publication) [DOI 10.1016/j.jhazmat.2006.08.067]

A. Verma and S.L. Dhingra
'Developing integrated schedules for urban rail and feeder bus operation', Journal of Urban Planning and Development, American Society of Civil Engineers (ASCE), 132 (3), pp. 138-146, 2006

T.R. Girija, C. Mahanta and V. Chandramouli

R.K. Goswami and C. Mahanta
'Leaching characteristics of residual lateritic soils stabilised with fly ash and lime for geotechnical applications', Waste Management, Elsevier, 2006

National Journal

N. Dharanraj, R. Tiwari and S. Talukdar

A.K. Sarma, R. Mishra and V. Chandramouli
'Application of genetic algorithms to determine optimal cropping pattern', OPSEARCH, Journal of Operational Research Society of India, 43 (3) (In press)

Conference Proceedings (International)

D. Malty and S.K. Dwivedy

Other publications (Books, Chapters, etc.)

A.K. Sarma and P. Goswami
Developing Intensity Duration Curve with Limited Rainfall Data, Jain Brothers, New Delhi, pp. 187-194, November 2006

R. Kumar, K.U. Ahamad and M. Jawed

M. Jawed and M.Z. Nain

A. Verma

A.K. Sarma and P. Goswami
'Developing Intensity Duration Curve with Limited Rainfall Data', Prediction in Ungauged Basins for Sustainable Water Resources Planning and Management, Jain Brothers, New Delhi, pp. 187-194, November 2006
B. Singh  
Web-based course on 'Soil Mechanics' for NPTEL, Ministry of Human Resource Development

Technical Book

D. Maity  

PAPER PRESENTED IN CONFERENCES/ WORKSHOPS/ SYMPOSIA

International

S.A. Kurian, S.K. Deb and A. Dutta  

S.K. Deb and V.K. Geddam  

A. Dutta, S.K. Deb and M. Medhi  

A.K. Dutta, S.K. Deb and A. Dutta  
'Active control of a cable stayed bridge against multiple support seismic excitations', Proc. of 13th Symposium of Earthquake Engineering, IIT Roorkee, 18-20 December 2006

A.K. Dutta, S.K. Deb and A. Dutta  
'Active control of cable stayed bridge against seismic excitation: a case study', Proc. of International Congress on Computational Mechanics and Simulation (ICCMS-06), IIT Guwahati, 8-10 December 2006

S. Sreedeep and D.N. Singh  
'Comparison of methods used for establishing contaminant retention in a fine-grained soil', Proceedings of International Conference on New Developments in Geoenvironmental and Geotechnical Engineering, University of Incheon, Republic of Korea, 9-11 November 2006

S. Sreedeep and D.N. Singh  
'A study on the correlation between physical properties of the soil and soil-water characteristic curve', International Conference on Soil and Rock Engineering, Colombo, Sri Lanka, 7-11 August 2007 (Abstract submitted)

N.T. Singh and B. Singh  

D. Sudhakar and S. Chakraborty  
'Chemical decolorization of bismark brown azo dye using zero-valent iron powder', Proceedings of the International Conference on Civil Engineering in the New Millennium: Opportunities and Challenges (CENeM-2007), Bengal Engineering and Science University, Shibpur, West Bengal, 11-14 January 2007

N. Garg, C.N. Raj, D. Maity and U.K. Saha  
'Response control of baffled liquid storage tank considering fluid structure interaction', CD Proceedings of the International Conference on Civil Engineering in the New Millennium: Opportunities and Challenges (CENeM-2007), Bengal Engineering and Science University, Shibpur, West Bengal, 11-14 January 2007

R. Ayothiraman, D. Maity and G. Kashung  

I. Gogoi and D. Maity  


M.D. Saikia and A.K. Sarma  
'Simulation modelling for planning and management of river basins under flood disaster', Proceedings of the International Perspective on Environmental and Water Resources, EWRI, ASCE, New Delhi, India, 18-20 December 2006

M.D. Saikia and A.K. Sarma  

M.D. Saikia and A.K. Sarma  
'Computational aspects for simulating dam break flood in natural channels', Proceedings of 2nd International Conference of Computational Mechanics and Simulations, IIT Guwahati, 8-10 December 2006
M.D. Saikia and A.K. Sarma
'Dam break flood forecasting with simple numerical model', Third APHW (Asia Pacific Hydrology and Water Management Association), Bangkok, Thailand, 16-18 October 2006

M.D. Saikia and A.K. Sarma

A.K. Sarma and M.D. Saikia
'Dam break hydraulic in natural river', Proceedings of EWRI-ASCE Conference, Omaha, USA, 21-25 May 2006

A. Verma
'A GIS based Decision Support System (DSS) framework for transportation planning of Guwahati city', 7th International Workshop on Transportation Planning and Implementation Methodologies for Developing Countries: Transportation Infrastructure Projects (IPMDC-06), IIT Bombay, Mumbai, 1-4 December 2006

C. Mahanta
'Fluvial nutrient transfer from the Brahmaputra catchments to the Indian Ocean shelf: potential climatic impact on the primary productivity and food web', Global Environmental Change: Regional Challenges, Beijing, 9-12 November 2006

C. Mahanta
'Future of CO₂ uptake in the Bay of Bengal: potential impact of the southwest monsoon freshwater pulse', Global Environmental Change: Regional Challenges, Beijing, 9-12 November 2006

C. Mahanta and N. Pathak
'Environmental feasibility of the MSTG link of River Linking Project of India', An International Perspective on Environmental and Water Resources, American Society of Civil Engineers, New Delhi, 18-20 December 2006

C. Mahanta

National

M.D. Saikia and A.K. Sarma

M.D. Saikia and A.K. Sarma

S. Sreedeep and D.N. Singh

B. Singh and R.K. Goswami

M. Jawed
'Impact of arsenic laden irrigation waters on soil and agricultural produce', Proc. Seminar on Mitigation of Arsenic Menace in Groundwater in the State of Assam, Institution of Public Health Engineers (I), Guwahati Regional Centre, pp. 68-72, 10 June 2006

M. Jawed
'Surviving with energy shortages', Proc. 22nd National Convention of Mechanical Engineers on Energy Technologies – Strategies for Optimal Utilisation of Natural Resources, Institution of Engineers (India), Assam State Centre, 9-10 September 2006

M.Z. Nain and M. Jawed

N. Chetia and S. Talukdar

P. Baruah and S. Talukdar

C. Mahanta
'The concept of a digital Brahmaputra', NEGeo Conference, Guwahati, 21-23 September 2006

CONFERENCES/WORKSHOPS/SYMPOSIA ATTENDED

National

M. Jawed
'Seminar on Mitigation of Arsenic Menace in Groundwater in the State of Assam', Institution of Public Health Engineers (I), Guwahati Regional Centre, 10 June 2006

M. Jawed
'22nd National Convention of Mechanical Engineers on Energy Technologies – Strategies for Optimal Utilisation of Natural Resources', Institution of Engineers (India), Assam State Centre, 9-10 September 2006

Annual Report 2006-2007
M. Jawed

INVITED LECTURE

S.K. Deb

S.K. Deb

A.K. Sarma

A.K. Sarma
‘Simulating Flood due to failure of Dam/levee in natural river’, North Dakota State University, Fargo, ND, USA, 3 June 2006

M. Jawed

M. Jawed
‘Energy from Waste Organics – An Overview’, Training Programme on Biogas Technology and Improved Chullah, Centre for Energy, IIT Guwahati, 6-7 June 2006

M. Jawed
‘Judging Adaptability of Anaerobic Biomass to Changed Feed Substrates through Methanogenic Activity Tests and its Verification’, Training Programme on Biogas Technology and Improved Chullah, Centre for Energy, IIT Guwahati, 6-7 June 2006

M. Jawed
‘Challenges in Water Treatment’, QIP short term course on Green Chemistry and Green Technology, Department of Chemistry, IIT Guwahati, 5-9 June 2006

M. Jawed
‘Challenges in Wastewater Treatment’, QIP short term course on Green Chemistry and Green Technology, Department of Chemistry, IIT Guwahati, 5-9 June 2006

B. Singh

D. Maity

M. Jawed
‘Judging Adaptability of Anaerobic Biomass to Changed Feed Substrates through Methanogenic Activity Tests and its Verification’, Training Programme on Biogas Technology and Improved Chullah, Centre for Energy, IIT Guwahati, 6-7 June 2006

A. Verma
‘Frontiers of Transportation Research’, Civil Engineering Association, IIT Guwahati, 12 April 2007

A. Verma

A. Verma

A. Verma
‘GIS for Transportation (GIS-T)’, Training Course on Geo-Informatics and its Applications, Department of Civil Engineering, IIT Guwahati, 18-20 September 2006

A. Verma
‘Pavement Management Systems (PMS)’, All India Seminar on Rehabilitation and Retrofitting of Civil Engineering Structures, Department of Civil Engineering, GMR Institute of Technology, Rajam (AP), India, 10-11 August 2006

A. Verma
‘Integrated Public Transport Planning/Comprehensive Transportation Study for Mumbai Metropolitan Region (MMR)’, Civil Engineering Association, IIT Guwahati, 21 April 2006

C. Mahanta
‘Flood Management’, MoDONER Training Workshop, IIT Guwahati, 2 December 2006

C. Mahanta
‘Environmental Studies and Research’, Refresher Course, Academic Staff College, Gauhati University, Guwahati, 24-25 December 2006

C. Mahanta
Three lectures at NPREE short-term courses at IIT Guwahati

C. Mahanta
Gave a talk at PHED Groundwater Arsenic Mitigation Strategy Workshop at Institution of Engineers, Guwahati on 10 June 2006
SEMINARS/WORKSHOPS/CONFERENCES ORGANIZED

2nd International Congress on Computational Mechanics and Simulation (ICCMS-06), IIT Guwahati, 8-10 December 2006. Convener of the programme was Dr. D. Maity.

SHORT-TERM COURSES

Organised MDONER sponsored short-term training course on Recent Practices in Transportation Planning and Traffic Engineering during 15-19 January 2007. It was coordinated by Dr. A. Verma.

Organised MDONER sponsored short-term training course on Flood Hazard Mitigation and Watershed Management held during 1-5 December 2006. The course was coordinated by Dr. A. K. Sarma.

Organised MDONER sponsored short-term training course on Water Quality Monitoring for Water Treatment Plant Operators of Northeastern States held during 26-30 June 2006. Dr. M. Jawed and Dr. S. Chakraborty were the coordinators.

Organised AICTE sponsored QIP short-term training course on Recent Developments in Wastewater Treatment using Anaerobic Reactors during 26-30 December 2006. Dr. S. Chakraborty and Dr. M. Jawed were the coordinators.

Organised AICTE sponsored QIP short-term training course on Recent Trends in Dam Engineering during 5-9 June 2006. It was coordinated by Dr. D. Maity.

Training on Computer Aided Seismic Design of RC Buildings sponsored by DONER to Professional Engineers of Northeastern States held during 12-16 June 2006. It was coordinated by Dr. D. Maity.

Training Programme on Earthquake Risk Management under NPCBEERM, sponsored by MHA, GOI, 8/5/06 to 24/5/06 (Phase-I) and 19/6/06 to 7/7/06 (Phase-II). Coordinated by Dr. S. Talukdar.

One week training programme on Hydroinformatics and Flood Management, 16-20 October 2006. Coordinated by Dr. S. Dutta.

Three days training programme on Geoinformatics and its Application, 18-20 September 2006. Coordinated by Dr. S. Dutta.

Two day training programme on Geotechnical and Highway Projects for practicing engineers in association with National Academy of Construction, Hyderabad.

NPEEE sponsored short-term course on Seismic Retrofitting of Reinforced Concrete Buildings: Conventional and Structural Control Based Approaches held during 27 November to 1 December 2006. The course was coordinated by Dr. S. K. Deb.

AWARDS AND HONOURS

IGS-ONGC biennial prize to Dr. B. Singh for the paper titled Behaviour of Suction Anchors under Pullout Loading. It was awarded by Indian Geotechnical Society in December 2006.

Dr. A. Verma was honoured with Editorial Board Member of Journal of Urban Planning and Development, American Society of Civil Engineers from 2007 onwards.

FACULTY MEMBERS

R. Ayothiraman
PhD (IIT Madras)
Assistant Professor
Areas of Interest: Soil dynamics and Earthquake geotechnical engineering

G. Barua
PhD (IIT Kharagpur)
Assistant Professor
Areas of Interest: Flow through porous media

S.C. Chakraborty
PhD (IIT Bombay)
Assistant Professor
Areas of Interest: Environmental engineering (Water treatment, Wastewater treatment)

S.K. Dash
PhD (IIT Madras)
Assistant Professor
Areas of Interest: Geotechnical engineering (Reinforced soil structures)

S.K. Deb
PhD (IIT Roorkee)
Associate Professor
Areas of Interest: Structural and Earthquake engineering

A. Dutta
PhD (IIT Delhi)
Associate Professor and Head
Areas of Interest: Structural Engineering

S. Dutta
PhD (IIT Kharagpur)
Assistant Professor
Areas of Interest: Irrigation and Hydraulics engineering

P.K. Ghosh
PhD (IIT Kharagpur)
Assistant Professor
Areas of Interest: Environmental science and engineering
S.B. Gokhale  
PhD (IIT Delhi)  
Assistant Professor  
Areas of Interest: Environmental engineering (Air quality modelling)  

M. Jawed  
PhD (IIT Kanpur)  
Associate Professor  
Areas of Interest: Environmental engineering  

C. Mahanta  
PhD (JNU)  
Associate Professor  
Areas of Interest: Environmental science and engineering, Engineering geology  

D. Maity  
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Areas of Interest: Transportation engineering  

Sreedep S.  
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Areas of Interest: Geotechnical engineering  

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Areas of Interest: Hydraulics and Water resources engineering  

A.K. Singh  
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Assistant Professor  
Areas of Interest: Computational mechanics, IT in construction management  

B. Singh  
PhD (IIT Delhi)  
Associate Professor  
Areas of Interest: Geotechnical engineering and Geoenvironmental engineering  

K.D. Singh  
PhD (Southampton University)  
Assistant Professor  
Areas of Interest: Structural engineering  

G. Suresh Kumar  
PhD (IISc Bangalore)  
Assistant Professor  
Areas of Interest: Water resource engineering (Flow and transport through fractured media)  

S. Talukdar  
PhD (IIT Kanpur)  
Associate Professor  
Areas of Interest: Structural engineering  

A. Verma  
PhD (IIT Bombay)  
Assistant Professor  
Areas of Interest: Transportation engineering