ANNUAL REPORT

2012-2013

INDIAN INSTITUTE OF TECHNOLOGY BHUBANESWAR

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CONTENTS

FROM DIRECTOR'S DESK

For the IIT Bhubaneswar family, 2012-13 has been momentous with the first batch of 93 B.Tech. students graduating in July 2012 and the first Ph.D. student of the Institute receiving degree. Every member of our family is committed to our zeal of widening the frontiers of knowledge and entering into the unchartered territories of human experience. The past Chairman of the BoG, Padma Vibhushan Prof. P. Rama Rao, and new Chairman Mr. S.K. Roongta have been a source of inspiration to this family.
Few important milestones of our journey are presented here.

New campus

The new campus site at Arugul (a 936 acre land area; 25 km away from the city center) is buzzing with construction activities. Work on boundary wall, roads, hostels, residential quarters, guest house along with greening of the campus are all in full swing. The Institute Project Monitoring Committee (IPMC) has been continuously monitoring the work.

Academics

Academic Schools & Activities

The Institute began its journey with a mission to promote a borderless academic environment with the concept of Schools, rather than Departments to enable and encourage the academic staff and students to work in an interdisciplinary environment. At present the Institute has the following schools:

- School of Basic Sciences (Physics, Chemistry, Mathematics, Bioscience and Engineering)
- School of Earth, Ocean and Climate Sciences (Earth science, Ocean science and Climate science)
- School of Electrical Sciences (Electrical Engineering, Electronics and Communication Engineering, Computer Science and Engineering)
- School of Humanities, Social Sciences and Management (Economics, English, Psychology)
- School of Infrastructure (Structural Engineering, Transportation Engineering, Water Resource Engineering)
- School of Mechanical Sciences (Thermal and Fluid Engineering, Design Engineering, Manufacturing and Industrial Management)
- School of Minerals, Metallurgical and Materials Engineering

The following schools are proposed to be set up in the second phase:

- School of Chemical and Biochemical Engineering
- School of Design and Creative Arts

The Institute is running the B.Tech. programme in three core engineering branches, joint M. Tech.–Ph. D. in five specializations and Ph.D programme in Sciences, Engineering, Humanities and Social Sciences. The following new programme will be launched in the autumn semester 13-14 (starting in July 2013): B.Tech. in Computer Science and Engineering; joint M.Sc.-Ph.D. in Chemistry, Mathematics, Physics, and Earth Sciences.

It is heartening to note that the first batch of undergraduate students, who have received their degree, are all placed. Five out of ninety-three students have joined prestigious universities abroad, which include Stanford University, University of Illinois at Urbana Champaign, Ohio State University, University of Texas, and Imperial College of London.

Awards and Honours

A number of recognitions have been bestowed on our students, teachers and staff in 2012-13. The Institute has been declared as one of the three "Outstanding Engineering Institutes" in Eastern India by *ET Now*.

Prof. M. Chakraborty, Director, IIT Bhubaneswar has been awarded ET Now National Education Leadership Award in recognition of leadership & development of IIT Bhubaneswar and creation of a strong academic and industry interface for IIT Bhubaneswar. Prof. G. Panda has been elected as a Fellow of Institution of Engineering and Technology, UK. Prof. S. C. Dutta has been elected as a Fellow by West Bengal Academy of Science and Technology. Dr. P.K. Sahu has been elected as a senior Member IEEE. Dr. S. R. Samantaray has been awarded the IEEE PES PSDP Technical Committee Prize Paper Award. Dr. C. N. Bhende and Dr. S. Chatterjee received the Indo-Australia Early Career Science and Technology Visiting Fellowship 2012 from INSA, India. Dr. S. Chatterjee received DAAD Fellowship-2012 under the DAAD-IIT faculty exchange program. Dr. Dukhabandhu Sahoo received the best paper award at CPR South-7 conference in the ICT and Growth Segment in Mauritius. Dr. K. K. Sahu's research work featured in International Innovation, October 2012. Dr. S. Pati has received the Young Professional Leader Award from the Minerals, Metals and Materials Society (TMS), San Antonio, USA, March 2013. Shri Sandip Nandi, Research Scholar, School of Basic Sciences has been awarded the Dr. D. S. Bhakuni Award at 49th Annual Convention of Chemists of Indian Chemical Society in Bhopal during December 2012.

Publications

Within four years of existence in the city of Bhubaneswar, the faculty members have already contributed to creating new knowledge by publishing more than 300 research papers in National and International Journals of repute. The publication record in 2012-13 is as follows: 144 research papers and 5 patents filed. This aside, 74 papers have been presented in various conferences in India and abroad.

Sponsored Projects and Consultancy

The Institute has received a number of sponsored projects from various funding agencies like DST, CSIR, BRNS, DRDO, CPRI, ICSSR, NPOL, BRFS and UKIERI and consultancy from industries worth more than 10.43 crores.

International Collaborations

Since inception, the Institute has started collaborative activities with many universities abroad. In 2012- 13, MoU has been signed with the State University of New York at Buffalo for research collaboration, faculty and student exchange. It is heartening to note that as a result of partnership understanding set in the past years by IIT Bhubaneswar, active academic interaction in research and teaching is going on between our faculty members and their counterpart in the following universities: Warwick University, University of Southampton, University of Massachusetts at Dartmouth, University of Western Ontario, McGill University and many others.

Distinguished Professors & Honorary Institute Professors

The Institute is guided by the wisdom and expertise of many leading academicians, and chief executives from industries. It is my pleasure to sincerely acknowledge the help and support of the following Distinguished Professors and Honorary Institute Professors.

Distinguished Professors:

Prof. Lord Kumar Bhattacharyya, Director of WMG (Warwick Manufacturing Group), UK.
Prof. Asit K. Biswas, President of the Third World Centre for Water Management, Mexico.
Dr. B. B. Rath, Associate Director of Naval Research Laboratories, US Navy, USA

Honorary Institute Professors:

Prof. K.L. Chopra, Justice Markandey Katju, Prof. O. N. Mohanty, Prof. Lalu Mansinha, Prof. Amitabha Ghosh, Dr. T. C. Rao, Prof. Avijit Gangopadhyay

Workshop/Conferences

A number of conferences and workshops have been organized by the institute to foster scholarly exchange of ideas and research collaboration. A Short Term Course on Computational Fluid Dynamics & Heat Transfer was organized by the School of Mechanical Sciences from 14-18 May 2012. A Workshop on "Environmental Impact Assessment: Issues, Challenges, and Policy Implications in India" (EIA-2012) was organized by the School of HSS & M during 9-10 June 2012. The School of Electrical Sciences has organized a National Workshop on Swarm Intelligence: Theory and Applications from 25-27 June 2012. The School of Earth, Ocean and Climate Sciences in collaboration with the Centre for Atmospheric Sciences, IIT Delhi organized "Indo-US Advance Workshop and Colloquium on Modelling and Data Assimilation for Tropical Cyclone Predictions" during 9-14 July 2012. The Fifth International Conference on Solidification Science and Processing (ICSSP5) was jointly organized by School of Minerals, Metallurgical and Materials Engineering and School of Mechanical Sciences from 19-22 November 2012. The School of Earth, Ocean and Climate Sciences also organized a workshop on Evolution of Water within the Ganga River Basin, Natural vs Anthropogenic Contributions: Implications for River Basin Management and Climate Change during 17-19 December 2012. A workshop on Indian Water Management in 21st Century and Symposium on Sustainable Infrastructure Development, IWMSID 2013 was organized by the School of Infrastructure during 7-9 February 2013.

Summer Internships & Placement

Our students have received support from various Universities and Industries in India and Abroad for summer internships. Some of these Universities and Industries abroad are the University of Massachusetts at Dartmouth, University of Warwick UK, Finisar (Malaysia), KIMS (South Korea), Wonkwang (South Korea), Harbin Engineering College (China), MINGCHI (Taiwan), VU University (Holand), Fraun-Hofer (Germany), Tsukuba University (Japan), Int. Atomic Energy Agency (Austria), Philips (NXP), University of Malaysia, NUS Singapore, IO state University (USA),Trinity College (Ireland), University of Alberta, HITACHI Research Lab (Japan), Hokkaido University (Japan), Rajamangala (Thailand), ECP (France), Institute of Plasma Physics (Belgium) TCS (R&D), Tata Steel (Jamshedpur), Tata Motors (Pune), DRDL(Hyderabad), DRDO(Bangalore), ALCON GOA, BARC Mumbai, Hindustan Colas etc.

Events of the Institute

Celebrations

The 1st batch of graduating students had participated in the PANIIT event at Bhubaneswar on 5th May, 2012 and have formed the IIT Bhubaneswar Alumni Foundation.

The 5th Institute Day was celebrated on 22 July 2012. Shri Baijayant Panda, Hon'ble Member of Parliament and Member Consultative Committee, Ministry of HRD graced the occasion as the Chief Guest.

The 1st Annual Convocation of the Institute was organized on 31st August 2012. Eminent nuclear Scientist and former Chairman of Atomic Energy Commission of India Shri Anil Kakodkar delivered the convocation address.

A quiz session on engineering marvels of India was organized at the Institute to observe Engineer's day commemorating the birthday of Sir Mokshagundam Vishveshwariah on September 15th 2012.

IIT Bhubaneswar participated in the PAN IIT Global conference, organized at Science City, Kolkata during 7 – 9 December 2012. Prof. M. Chakraborty and Prof. S.C. Dutta led a group of student and staff at the event.

The 5th Foundation Day of the Institute was celebrated on 12th February 2013. Shri R. Gopal Krishnan, Executive Director, Tata Sons Limited graced the occasion and delivered the 2nd Foundation Day Lecture.
The 3rd National Science Day Lecture was delivered by Prof. U.R. Rao on 28th February 2013. The Research Scholar Day was also organized on 28th February 2013.

Student Activities

The students under the Students Gymkhana are quite active and have organized various activities. They have formed several societies like Sports Society, Technical Society, Socio-Cultural Society. The socio-cultural festival (**Alma Fiesta**) and Techno-Management festival (**Wiessenaire**) was organized successfully in 18-20 January-2013 with support from many sponsors/industries, and have drawn participations from various colleges/institutions of the country. The students also took part in the inter-IIT sports meet, inter-IIT social and cultural events. Mr. Ramesh Chandra Meena and Mr. Muhammadali M.S brought accolades to the Institute by winning silver and bronze medals in the 48th Inter IIT sports meet held at IIT Roorkee during 17th-24th December 2012.

BOARD OF GOVERNORS

Shri S. K. Roongta Ex-CMD, SAIL and MD, Vedanta Aluminium Ltd. Core-6, 3rd Floor, Scope Complex 7-Lodhi Road, New Delhi	Chairman (From 02.11.2012)
Professor P. Rama Rao Chairman, Governing Council International Advanced Research Centre for Powder Metallurgy and New Material (ARPI) &Former Secretary to the Government of India (Department of Science & Technology) Balapur, Hyderabad	Chairman (Till 01.11.2012)
Professor Madhusudan Chakraborty Director, IIT Bhubaneswar	Member
Shri Bijay Kumar Patnaik, IAS Chief Secretary & Chief Development Commissioner Government of Odisha, Bhubaneswar	Member
The Secretary Department of Higher Education Ministry of Human Resource Development , Government of India	Member
Professor Samir K. Brahmachari Director General, CSIR & Secretary, Department of Scientific & Industrial Research, Government of India, New Delhi	Member
Shri T. V. Mohan Das Pai Chairman, MEMG International India Pvt. Ltd #70, Grace Towers, 3rd Floor, Millers Road, Bangalore-560 052	Member
Professor Subhasish Tripathy Professor, School of Earth, Ocean & Climate Sciences IIT Bhubaneswar	Member
Professor Sujit Roy Professor, School of Basic Sciences, IIT Bhubaneswar	Member
Professor Ganapati Panda Dy. Director IIT Bhubaneswar	Special Invitee
The Director IIT Kharagpur Kharagpur – 721 302	Special Invitee
Shri B.K. Ray Registrar, IIT Bhubaneswar	Secretary

FINANCE COMMITTEE

Shri S. K. Roongta Ex-CMD, SAIL and MD, Vedanta Aluminium Ltd. Core-6, 3rd Floor, Scope Complex 7-Lodhi Road, New Delhi	Chairman (From 02.11.2012)
Professor P. Rama Rao Chairman, Governing Council International Advanced Research Centre for Powder Metallurgy and New Material (ARPI) &Former Secretary to the Government of India (Department of Science & Technology) Balapur, Hyderabad	Chairman (Till 01.11.2012)
Professor Madhusudan Chakraborty Director, IIT Bhubaneswar	Member
The Additional Secretary Department of Higher Education Ministry of Human Resource Development Government of India	Member
The Joint Secretary & Financial Advisor Deptt. Of Higher Education Ministry of Human Resource Development Government of India, New Delhi	Member
Shri T.V. Mohan Das Pai Chairman MEMG International India Pvt. Ltd #70, Grace Towers, 3rd Floor, Millers Road, Bangalore-560 052	Member
Professor Sujit Roy Professor, School of Basic Sciences IIT Bhubaneswar	Member
Professor Ganapati Panda Dy. Director IIT Bhubaneswar	Special Invitee
Shri B. K. Ray Registrar, IIT Bhubaneswar	Secretary

BUILDING & WORKS COMMITTEE

Professor M. Chakraborty Director, IIT Bhubaneswar	Chairman
Professor S.C.Dutta Head, School of Infrastructure IIT Bhubaneswar	Member
Head, School of Electrical Sciences IIT Bhubaneswar	Member
Shri S. R. Sethy Chief Engineer, Buildings Public Works Department, Government of Orissa	Member
Chief Engineer (EZ-II) CPWD, Patna	Member
Chief Engineer CESU, Orissa	Member
Professor G.C. Mitra, PIC IIT KGP Extn. Centre, Bhubaneswar	Special Invitee
Shri B.K.Behera Superintendent Engineer, IIT Bhubaneswar	Special Invitee
Shri B. K. Ray, Registrar IIT Bhubaneswar	Member Secretary

ADMINISTRATION

Director
Professor Madhusudan Chakraborty

Deputy Director
Professor Ganapati Panda

Deans and Advisor

Professor S.C. De Sarkar
Technical Adviser

Professor Subhasish Tripathy
Dean (Academic Affairs)

Professor Sujit Roy
Dean (Faculty and Planning)

Professor Sekhar Chandra Dutta
Dean (Alumini Affairs, International Relations and Continuing Education)

Professor Swarup Kumar Mahapatra
Dean (Students' Affair)

Professor V. R. Pedireddi
Dean (Sponsored Research and Industrial Consultancy)

Officers

Shri B.K. Ray
Registrar

Shri Manas Kumar Behera
Assistant Registrar (F & A)

Shri Asit Kumar Sahu
Assistant Executive Engineer (Civil)

Shri Dharmaraja Mohanty
Assistant Executive Engineer (Electrical)

Shri B.K.Behera
Superintending Engineer (Civil)

Shri Somnath Tripathy
Chief Security Officer

Shri Basudev Mohanty
Assistant Librarian

Shri N.R.Maiti
Officer-on-Special Duty (Academic Affairs)

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ACADEMIA

Schools at IIT Bhubaneswar

School of Basic Sciences

Head of School

Professor Saroj Kumar Nayak [From:01.03.13]
Professor V.R.Pedireddi [Up to: 28.02.13]

Faculty Members

Professors

Professor Saroj Kumar Nayak
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Professor Sujit Roy
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Assistant Professors

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Visiting Professor
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The **School of Basic Sciences** is a cluster of disciplines like Bioscience, Chemistry, Mathematics and Physics with faculty strength of 24, having expertise in contemporary fields of research. The School of Basic Sciences at IIT Bhubaneswar envisages to become a state-of-the-art department with high quality education and cutting edge interdisciplinary research in science. The School started its Ph. D. program in the year 2010; presently about 40 research students have enrolled, pursuing research in various disciplines. The School has also initiated postdoctoral program to motivate researchers and scientists to build their career in academics and industries.

The faculty members of the School seek to establish a platform in various research fronts, which will be bench-marked by high-quality publications, international patents, and close collaboration with other academia and industries. Presently the School is endowed with various research and consultancy projects funded by agencies like DST, CSIR, BRNS, UGC-DAE, DBT as well as by various industries. Also, most of the faculty are bestowed with recognitions and awards of National and International stature like Fellows of academics, medal recipients and also serve as members of many of the prominent national bodies and research/academic boards of universities.

The School has procured state-of-art equipment to pursue advanced research. In addition, advanced instrumentation facilities like X-ray diffractometers (XRDs), Scanning Electron Microscope (SEM), Raman Spectrophotometer, Rheometer, NRM, PPMS, etc., are being created and collaborations with KEK, Japan and CERN, Geneva are being explored. The School is fully equipped with a central computing server system and is fully integrated and functional for all sorts of high computing research and analysis.

The School is supported with other central services of the institute, especially Central Library and Central Instrumentation Facility.

Research Activities

The School of Basic Sciences conducts research in various areas of Science with special focus in Biosciences, Chemistry, Mathematics, Physics and in various frontier areas of contemporary research fields.

We are involved in design and development of metal complexes towards catalysis and anti-cancer drugs, functionalization of nanoparticles and nanoparticles based biosensors. We perform research in the areas of coordination chemistry, magnetic materials and magnetostructural correlation and bio-inspired coordination chemistry. We are also actively involved in the fields of organometallic chemistry, homogeneous catalysis, multimetallic catalysis, C-H functionalization and metallocenes. Major ongoing program is in “Catalysis for Fine Chemicals” within the platform of sustainable and green chemistry. We also study chemistry beyond the molecules through molecular recognition, with the knowledge of non-covalent interactions, for the synthesis of exotic organic and organic-inorganic hybrid materials. We use classical molecular dynamics simulation to study the structure and dynamical properties of the hydrogen bonding system.

The research work in biosciences is focused on G-protein coupled receptor biology, peptide/protein design and engineering, molecular modeling, computational biology and the structure and function of various proteins of eye lenses, leprosy, tuberculosis etc.

We study black holes, tunneling in AdS, entanglement entropy, topological insulators and AdS/CFT correspondence. Precise measurement of charge-conjugation-parity (CP) violation in B-meson decays are performed. In the photonics and plasmonics laboratory, we design, fabricate and characterize optical devices based on plasmonics and utilize fiber optics to develop micro- and nano-structured devices. We study the interactions of charged particles with biomolecules, clusters, aromatic hydrocarbon etc., quantum interference of diatomic molecules and nanostructure formation on materials by ions in the accelerator-based physics laboratory. The condensed matter theory group studies the phase coherent transport in mesoscopic electronic systems. In the magnetic materials laboratory, we work with the

materials with unconventional magnetic and electronic properties. We are also involved in the study of nano-structure materials and energy storage devices, molecular dynamics simulations, quantum transport and quantum biology.

The main focus of research in mathematical analysis is on variational inequalities and complementarity problems, complex dynamics and fractals. Research is being carried out in combinatorial matrix theory, graph theory, generalized inverses of matrices, optimization theory, geometric programming and queueing theory. Some of us are actively engaged in computational areas of research such as computational fluid dynamics, stochastic modeling and simulation, computational applied probability models, numerical methods, soft computing and artificial neural networks.
We also work in interdisciplinary areas especially in the field of material science towards generating nanomaterials for the development of devices based on nanotechnology assembling and clustering.

Thrust areas

- Synthesis and Characterization of Materials
- Organic Synthesis
- Organometallic Chemistry
- Catalysis for Fine Chemicals
- Supramolecular Chemistry
- Biophysical Chemistry
- Protein Chemistry, Protein Engineering & Spectroscopy
- G-protein coupled receptor biology
- Theoretical and Experimental High Energy Physics
- Nano and Bio Photonics
- Atomic, Molecular and Surface Physics
- Theoretical and Experimental Condensed Matter Physics
- Nanotechnology
- Quantum Transport and Quantum Biology
- Spectral Graph Theory
- Complex Dynamics & Fractals
- Optimization Theory
- Queueing Theory
- Higher Order Compact Schemes

Sponsored Research Projects

Projects	Principal Investigator	Sponsoring Agency
Development of transition metal functionalized gold nanoparticles and their potential applications	Dr. S. Patra	CSIR
Neutron Diffraction studies of field induced magnetic transitions in Er_5Si_3	Dr. N. Mohapatra	UGC-DAE Consortium for Scientific Research, Mumbai
Synthesis and study of thermoelectric properties of Half-Heusler Alloys with non-trivial topological order	Dr. N. Mohapatra	BRNS
Role of C-terminal Region of Mycobacterium Tuberculosis Hsp16.3 for its Structure, Stability and Chaperon Function-A Biophysical and Site Directed Truncation Study	Dr. A. Biswas	CSIR
Multi-objective Decision making tools for Environmental and Regional Planning	Dr. A.K.Ojha	CSIR

Validity of quasi-static approximation in MHD flows and heat transfer – a numerical study	Dr. T.V.S. Sekhar	CSIR
Asymmetric Synthesis of Embellished Carbocycles from Carbohydrates via Intramolecular 1,3 Dipolar Cycloaddition Reaction: Studies Towards Total Synthesis of Naplanosine F	Dr. S. Pal	DST, India
Intramolecular 1,3-dipolar cycloaddition of nitrile oxides to embellished bicyclo[2.2.2]octenones and its derivatives: studies on the synthesis of isotwistane framework of pupukeananes	Dr. S. Pal	Prof. G. N. Mahapatra Endowment Award from Utkal University

Achievements

- Dr. S. Chatterjee received Indo-Australia Early Career Science and Technology Visiting Fellowship 2012 from INSA, India.
- Dr. S. Chatterjee received DAAD Fellowship -2012 under DAAD-IIT faculty exchange program.

Visit Abroad

Dr. S. Chatterjee	Visiting Faculty, UMass, Dartmouth, USA, June-July, 2012
Dr. S. Chatterjee	Visiting Scientist, HZDR, Dresden, Germany, May 2012
Dr. A. D. Banik	Research, CEMAT, Instituto Superior Tecnico, AvRoviscoPais 1, 1049-001 Lisboa, Portugal
Dr. T.V.S. Sekhar	Indo-German conference 2012, 5-7 Sept. 2012 held at T. U Darmstadt, Germany

Journals

- **S. Bahinipati**, C.M. Kuo, et. al. for CMS collaboration, "Search for excited leptons in pp collisions at sqrt(s) = 7 TeV", Phys.Lett. B720 , 2013, 309 - 329
- Salil Bedkihal, **Malay Bandyopadhyaya** and Dvira Segal, "Flux-dependent occupations and occupation difference in geometrically symmetric and energy degenerate double-dot Aharanov-Bohm interferrometers", Physical Review B, 2013, 87, 45418
- **Chandrasekhar B**., Mukherji S., Sahay, A. and Sarkar S., "A Comparative Note on Tunneling in AdS and in its Boundary Matrix Models", Journal of High Energy Physics, 2012, 4, 1205
- **S. Chatterjee**, A.Agnihotri, C. R.Stia, O. A. Fojon,R. D. Rivarola andL. C. Tribedi, "Ionization of H2 and He in collision of 3 keV electrons and the Bethe binary encounter peak", J. Phys. Conf.Ser., 2012, 388, 052038
- Chatterjee, Paresh Nath; Maity, Arnab Kumar; Mohapatra, Swapna Sarita; **Roy, Sujit**, "Heterobimetallic Ir-Sn catalysis: aza-Friedel-Crafts reaction of N-sulfonyl aldimines", Tetrahedron, 2013, 69(13), 2816-2826.
- Chatterjee, Paresh Nath; **Roy, Sujit**, "Allylic activation across an Ir-Sn heterobimetallic catalyst: nucleophilic substitution and disproportionation of allylic alcohol", Tetrahedron, 2012, 68(19), 3776-3785.
- **S. Chowdhuri** and S. K. Pattanayak, "Pressure dependence on the single-particle dynamics and hydrogen bond structural relaxation of water-DMSOmixtures under ambient and cold conditions", Mol. Phys., 2013, 111, 135
- **S. Chowdhuri** and S. K. Pattanayak, "A molecular dynamics simulations study on the behavior of liquid N-methylacetamide in presence of NaCl: Structure, dynamics and H- bond properties", J. Mol. Liq.,2012, 172, 102
- S. Damodaran and **T. V. S. Sekhar**, "Rear separation in a rotating fluid at moderate Taylor numbers", World Academy of Science, Engineering and Technology,2012,68,1396-99

- Das, Debjit, Pratihar, Sanjay, **Roy, Sujit**, "Heterobimetallic Pd-Sn catalysis: highly selective intermolecular hydroarylation of α-methyl substituted aryl alkenes", Tetrahedron Letters, 2013, 54(4), 335-338.
- Das, Debjit; Pratihar, Sanjay; **Roy, Sujit**, "Heterobimetallic Pd-Sn Catalysis: A Suzuki, Tandem Ring-Closing Sequence toward Indeno[2,1-b]thiophenes and Indeno[2,1-b]indoles", Organic Letters, 2012, 14(18), 4870-4873
- A. Dearden, B. Callahan, P. Van Roey, U. Kumar, M. Belfort and **S. K. Nayak**, "A conserved threonine spring-loads precursor for intein splicing", Protein Science, 2013, 22, 557-563.
- Jena L. and Pani S., "Index-Range Monotonicity and Index_Proper Splittings of Matrices", Numerical Algebra Control and Optimization(NACO), 2013, 3 (2), 379-388
- Jena L. , Mishra D., and **Pani S**., "Convergence and Comparison Theorems for Single and Double Decomposition of Rectangular Matrices", Calcolo DOI 10.1007/s10092-013-0079-3
- Shamik Gupta and **Malay Bandyopadhyay**, "Free energy of a charged oscillator in a magnetic field and coupled to a heat bath through the momentum variables", Journal of Statistical Mechanics : Theory and experiment, 2013, P04037
- Pradeep K. Maharana & **Rajan Jha**, "Chalcogenide Prism and Graphene Multilayer based Surface Plasmon Resonance affinity Biosensor for High Performance",Sensors and Actuators B, 2012, 169, 161-166
- Pradeep K. Maharana, T. Srivastava & **Rajan Jha**, "Ultrasensitive plasmonic Imaging biosensor based on graphene and Silicon", IEEE Photonics Technology Letters, 2013, 25(2), 122-125
- Maity, Arnab Kumar; Chatterjee, Paresh Nath; **Roy, Sujit**, "Multimetallic Ir-Sn_3-catalyzed substitution reaction of π-activated alcohols with carbon and heteroatom nucleophiles", Tetrahedron, 2013, 69(2), 942-956.
- Maity, Arnab Kumar; **Roy, Sujit**, "A Multimetallic Piano-Stool Ir-Sn3 Catalyst for Nucleophilic Substitution Reaction of γ-Hydroxy Lactams through N-Acyliminium Ions", Journal of Organic Chemistry, 2012, 77(6), 2935-2941
- S. K. Pattanayak and **S. Chowdhuri**, "Behavior of peptide bond environments in presence of NaCl and KCl:Structure, dynamics and H-bond properties of concentrated salt solutions of liquid N-methylacetamide", Mol. Phys.,2013, DOI:10.1080/00268976.2013.,783240
- S. K. Pattanayak and **S. Chowdhuri**, "Pressure effects on the dynamics of ions and solvent molecules in liquid methanol under ambient and cold conditions: Importance of solvent's H-bonding network", Mol. Liq. 2013,180, 172
- S.R.Perumalla; **V.R.Pedireddi**; C.C.Sun, "Protonation of Cytosine: Cytosinium VS Hemicytosinium Duplexes", Crystal Growth & Design, 2013, 13, 429-432
- **T.V.S. Sekhar** and B. Hema Sundar Raju, "An efficient higher order compact scheme to capture heat transfer solutions in spherical geometry", Computer Physics Communications, 2012,183, 2337-45
- **T.V.S. Sekhar** and B. Hema Sundar Raju, "Fourth order accurate free convective heat transfer solutions from a circular cylinder", World Academy of Science, Engineering and Technology, 2012, 68, 1437-41
- Amardeep Singh, **Srikanta Patra**, Md. Rajibul Akanda, Haesik Yang, "Colorimetric bioassay using the catalytic ester hydrolysis by esterase-like Cu2+", Sensors and Actuators B, 2012, 171-172, 866– 871
- T. Srivastava, R. Das & **Rajan Jha**,"Highly sensitive plasmonic temperature sensor based on photonic crystal surface plasmon waveguide", Plasmonics, 2012, 10.1007/s11468-012-9421-x.
- T. Srivastava, R. Das & **Rajan Jha**, "On the high performance of channel photonic crystal waveguide comprising different plasmonic active metals",Applied Physics B, 2012, 108(3), 629-634

Papers Presented at Seminars/Workshops/Conferences

- Malay Bandyopadhyay, Manas Kukarni, and Dvira Segal, "Transport and dynamics in multisite susbsystems", APS March Meeting, 2013, Baltimore, USA, APS: Bulletin of the American Physical Society, March 2013, 58 (1) BAPS.2013.MAR.R43.2
- Salil Bedkihal, Malay Bandyopadhyay, and Dvira Segal, "Flux dependent effects in degenerate and symmetric double dot Aharanov-Bohm interferrometer with and without interaction", APS March

Meeting, 2013, Baltimore, USA, APS: Bulletin of the American Physical Society, March 2013, 58 (1) BAPS.2013.MAR.Y20.1

- A. D. Banik, S. K. Samanta, "Controlling packet loss of bursty and correlated traffics in a variant of multiple vacation policy",ICDCIT-2013, LNCS Volume 7753, Page 208-219, 2013
- S. Chatterjee, "Electron emission from diatomic molecules and biomolecules induced by electron collision", Young scientist research award meet, BARC, Mumbai during November 26-28, 2012, 145
- R. Das, T. Srivastava and Rajan Jha, "Avoided-crossings in dispersion properties of photonic-crystal-surface-plasmon-waveguides",Proc. of the 10th International conference of Fiber Optics and Photonics-PHOTONICS-2012, IIT Madras, India, December, 2012
- P. Maharana, T. Srivastava and Rajan Jha, "Surface plasmon resonance imaging biosensor based on graphene multilayer", Proc. of the 10th International conference of Fiber Optics and Photonics-PHOTONICS 2012, IIT Madras, India, December, 2012
- S. Bharadwaj, P. Maharana, R. Das, and Rajan Jha, "Effect of chalcogenide glass and plasmonic metal on electric field enhancement in surface plasmon resonance sensor", Proc. of the 10th International conference of Fiber Optics and Photonics-PHOTONICS 2012, IIT Madras, India, December, 2012
- Pradeep K. Maharana and Rajan Jha, "Plasmonic biosensor based on graphene multilayer", XXXVII National Symposium of Optical Society of India, University of Pondicherry, January, 2013
- GPradeep K. Maharana, S. Pillai and Rajan Jha, "Graphene based long range surface plasmon resonance sensor for near infrared", XXXVII National Symposium of Optical Society of India, University of Pondicherry, January, 2013
- P. Padhy and Rajan Jha,"Nanocircuits: extending circuit theory to optical regime", Recent trend in Laser and Photonics, Ranvenshaw University, 9-11 Feb, 2013
- P. Padhy and Rajan Jha,"Nanosphere as a parallel combination of nanoinductor and nanocapacitor", XXXVII National Symposium of Optical Society of India, University of Pondicherry, January, 2013

Invited Lectures by Faculty Members

- "Search for excited leptons at CMS using 5fb^{-1} data", S. Bahinipati, Belle Analysis Workshop, 2013, during January 21-31, 2013, TIFR, Mumbai
- "Controlling packet loss of bursty and correlated traffics in a variant of multiple vacation policy", A. D. Banik, International Conference on Distributed Computing and Internet Technology (ICDCIT-2013), Bhubaneswar, India, during February 5-8, 2013
- "Tunneling in AdS and Boundary Matrix Models", C. Bhamidipati, Institute of Mathematical Sciences, Chennai, on April 20, 2012
- "Effect of small molecules on the structure and chaperone function of Alpha-crystallin", Dr. A. Biswas, Madurai Kamaraj University, Madurai, on December 18, 2012
- "Electron emission from diatomic molecules and biomolecules induced by electron collision", S. Chatterjee, Young scientist research award meet, Bhabha Atomic Research Center, Mumbai during November 26-28, 2012
- "Optical fiber device: From principle to practice", R. Jha, OSI Lecture series, Odisha, 2012
- "Sensor based on Photonic Crystal Fiber", R. Jha, Recent trend in Laser and Photonics, during Feb 9-11, 2013, Ranvenshaw University, Cuttak
- "Optical fiber Sensor", R. Jha, National conference on Optical fiber and its Industrial Application, during March 16-17, 2013, Bhubaneswar.
- "Large Scale Electronic Structure and Quantum Transport at Nanoscale", S. K. Nayak, Electronic Structure Approaches to Atoms, Molecules, Clusters and Solids", Meeting at University of Hyderabad, during January 7-11, 2013.
- "Large Scale Electronic Structure for Designing Next Generation Nanoelectronics: e-ph Tuning to Dielectrics Engineering", S. K. Nayak, International Symposium on Science of Clusters, Nanoparticles and Nanoscale Materials (SOCNAM), Jaipur, during March 4-7, 2013.
- "Introduction to density functional theory and high performance computing", S. K. Nayak, Advance School on High Resolution Transmission Electron Microscopy, Institute of Physics, Bhubaneswar, during March 4-8, 2013.

- “Designing Next Generation Nanoelectronics using Large Scale Electronic Structure and Quantum Transport”, S. K. Nayak, First National Conference on Mapping the Materials Genome at Shiv Nadar University, UP, during March 8-10, 2013.
- “Omitted values and Herman rings with small periods”, T. Nayak, ICTS Program on Group, Geometry and Dynamics, during December 3-16 December, 2012, CEMS, Almora, Kumaon University, Uttarakhand
- “Higher order compact scheme to capture low pressures within a wake and heat transfer solutions in spherical geometry”, T. V. S. Sekhar, during September 5-7, 2012, TU Darmstadt Germany.

School of Earth, Ocean and Climate Sciences

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The School has established with a premise of generating highly skilled manpower in different specialized areas of earth system sciences. It is interdisciplinary in nature with a common goal to achieve an integrated systemic understanding of Earth-Ocean-Atmospheric interaction processes for sustainable development.

The School is offering joint M. Tech. – Ph.D. courses in Applied Geosciences and Climate Science and Technology. It has highly experienced and motivated faculty members with different specializations in Earth System Sciences. Currently the specializations include Environmental Geochemistry, Waste Utilization, Hydro-geochemistry, Soil and Water Contamination, Environmental Impact Assessment, Tropical Cyclone Modeling, Cloud microphysics, Monsoon Variability, Hydrology, Oceanography and Polar Research etc. The School has joint collaborations with several overseas premier academic and research institutes such as University of Ontario, Canada, University of Massachusetts Dartmouth USA, University of Southampton UK, National Oceanography Centre (NOC) UK for exchange of students and faculties. It is also

in the process of establishing joint collaborations with Woods Hole Oceanographic Institution and University of Rhode Island USA. The School will offer M. Sc. in Earth Sciences from academic year 2013-14.

The School will have a start-of-art Modeling and Visualization laboratory, a High Performance Computing (HPC) facility in near future to cater the needs of computational and data storage requirements to carry out numerical modeling exercises using couple General Circulation Models, Regional models…etc. to quantify the understanding of different components of the Earth System Sciences. On the analytical front the School is in the process of establishing a modern geochemistry laboratory equipped with ICP-MS, XRF, Ion Chromatograph, Microwave Digestion System, UV-Spectrophotometer…etc. In addition laboratories for Seismology, Petrology and GIS and remote sensing will be established and will be equipped with modern instruments such as Ground Penetrating Radar System, Multi-Channel Exploration Seismograph etc.

The School in association with Indian Space Research Organization (ISRO) has installed and operationalized a Mini Boundary Layer Mast (MBLM) observation tower at the Institute's Argul Campus. It is also in the process of establishing Bay of Bengal Coastal Observatory (BoBCO) at the Innovation Centre for Climate Change (IC^3) in the marine campus of the Institute at Puri-Konark. Four M.Tech Climate Science and Technology students are visiting NOC UK (3 Students) and University of Massachusetts Dartmouth USA (1 Student) to carry out their research projects in June-July 2013.

Research Activities

The School in association with Indian Space Research Organization (ISRO) has installed and operationalized a Mini Boundary Layer Mast (MBLM) observation facility at Argul Campus. It is one of the observation premises out of the 28 such installations to be step up all over the country by ISRO under a Prediction of Regional Weather with Observational Meso-Network and Atmospheric Modelling (PRWONAM) Program. The observation tower records various meteorological parameters such as temperature, wind speed/direction, humidity etc. at different heights at every second and averages the values at every 4 minutes.

The School has conducted international workshops, brain storming sessions on challenging research areas in Earth System Science. The revised proposal to establish Bay of Bengal Coastal Observatory (BoBCO) at Innovation Center for Climate Change (IC^3) has been submitted to the Ministry of Earth Sciences. This proposal is a step forward towards establishing a marine campus of the Institute. The School has participated in the ITRA water research proposal developed in a consortium framework is already shortlisted for funding.

The School has established joint collaboration with University of Massachusetts Dartmouth, USA, University of Southampton, U.K. A UKIERI project has been awarded jointly to the School, National Oceanography Centre (NOC), University Southampton and University of Massachusetts Dartmouth

Exchange visits of faculty members between the School and the aforementioned institutes have already started. The modalities for joint M. Tech. project supervision are in place. Currently, three M. Tech. students from the School will be visiting NOC, UK for their project work and one student will be carrying out the project at University of Massachusetts Dartmouth, USA.

Thrust Areas

Climate Modeling, Tropical Cyclone Modeling and Cloud Physics, Monsoon Variability, Air-Sea Interactions, Atmospheric Chemistry, Aerosol Cloud Interaction, Carbonaceous Aerosols, Application of Space Technology for the study of the Earth System Science.

Hydro-geochemistry, Soil and Water Contamination, Pollution Pathways, Environmental Geochemistry, Waste Utilization, Sustainable Development.

New Acquisitions (Equipment)

- The Indian Space Research Organization (ISRO) Mini Boundary Layer Mast (MBLM) has been installed and operationalized at IIT BBS Argul Campus.

Sponsored Research Projects

List of Projects	Principal Investigator	Sponsoring Agency
Lateral variability in the distribution of arsenic in agriculture fields and its mass balancing - a study from West Bengal	Dr. Syed Hilal Farooq	D.S.T.
Atmospheric chemistry and evaluation of organic/inorganic aerosols: Implications to radiative forcing	Dr. Kirpa Ram	D.S.T.

Visits Abroad

Prof. S. Tripathy	Thematic partnership, University of Southampton and National Oceanography Centre (U.K.), March 2-10, 2013
Prof. P. C. Pandey	Thematic partnership, University of Southampton and National Oceanography Centre (U.K.) March 2-10, 2013

Journals

- Sk. Md. Equeenuddin, **S. Tripathy**, P.K. Sahoo and M.K. Panigrahi, "Metal behaviour in sediment associated with acid mine drainage stream: role of pH, Journal of Geochemical Exploration, 2013, 124, 230-237.
- P.K. Sahoo, **S. Tripathy**, M.K. Panigrahi and S. M. Equeenuddin, "Mineralogy of Fe-precipitates and their role on metal retention from an acid mine drainage site in India", Mine Water and the Environment, 2012, 31, 344-352.
- D. Sharma, M. Dash and **P. C. Pandey, "**Usual Circulation pattern during Indian summer monsoon failure in July 2002 and June 2009", Natural Hazards, 2013,65, 295-302
- M. Dash, **P. C. Pandey**, N. K.Vyas and J. Turner, "Variability in ENSO-induced southern hemispheric circulation and Antartctic sea ice event", International Journal of Climatology, 2013, 33, 778-783
- **S. Pattnaik**, S. Abhilash, S., De, A.K. Sahai, R. Phani, B.N.Goswami, "Influence of convective parameterization on the systematic errors of Climate Forecast System (CFS) model over the Indian monsoon region from an extended range forecast perspective,", Climate Dynamics, 2013, *Published online*, DOI: 10.1007/s00382-013-1662-7
- S. Abhilash, A.K Sahai,**S. Pattnaik**, B.N Goswami, A Kumar, "Extended range prediction of active-break spells of Indian summer monsoon rainfall using an ensemble prediction system in NCEP Climate Forecast System, International Journal of Climatology, 2013, *Published online.* DOI: 10.1002/joc.3668
- X. Liu, Y. Kondo, **K. Ram**, H. Matsui, K. Nakagomi, T. Ikeda, N. Oshima, R.L. Verma, N. Takegawa and M. Koike, "Seasonal variation of black carbon observed at a remote mountain site Happo in Japan", J. Geophys. Res.-Atmospheres, 2013, *Published online.*DOI: 10.1002/jgrd.50317

Papers Presented at Seminars/Workshops/Conferences

- Thambidurai P., Chandrasekharam, D.,Chandrashekhar, A. K., Farooq, S. H., **"**Source of arsenic in the contaminated groundwater regime of Barak Valley - Assam and adjacent Mizoram: A novel approach", *Annual International Conference on Geological & Earth Sciences (GEOS 2012)* Singapore, December 2012, Global Science and Technology Forum (GSTF), Pg-97-100.
- Vinay, G., Chandrasekharam, D., Nair, B., Trupti, G. and Farooq S.H., **"**Role of phosphate in mobilizing arsenic from soil to groundwater in West Bengal – an experimental investigation" *4th International*

Congress on Arsenic in the Environment, Cains, Australia, July 2012, Taylor & Francis Group, London, Pg-280-281

- Thambidurai, P., Chandrasekharam, D., Chandrashekhar, A.K., and Farooq, S.H., **"**Arsenic contamination in groundwater of Surma basin of Assam and Mizoram, North Eastern India" *4th International Congress on Arsenic in the Environment,* Cains, Australia, July 2012, Taylor & Francis Group, London, Pg-47-49
- Chandrashekhar, A. K., Farooq, S. H.*, Chandrasekharam, D., Thambidurai P., "Extent of Arsenic Contamination in the Groundwater of Thuwal and Bishnupur Districts of Manipur (India)", *7th European congress on Regional Geoscientific cartography and Information systems (EUREGEO),* Bologna, Italy, June 2012, EuroGeoSurveys, Pg-440 – 441
- Farooq, S.H., Chandrasekharam, D., Thambidurai, P., Chandrashekhar A.K., Bobby, P. M., and Stüben D., "Need of seasonal groundwater monitoring for sustainable water management", *Fifth International Groundwater Conference (IGWC-2012),*Aurangabad, December 2012, IGWC -2012
- Chandrashekhar, A. K., Farooq, S. H.*, Chandrasekharam, D., Thambidurai P., "Seasonal variability in arsenic concentration in the groundwater of Manipur, North-eastern state of India", *Fifth International Groundwater Conference (IGWC-2012),* Aurangabad, December 2012, IGWC -2012

Lecture by Visiting Expert

- Prof. J. Bull from National Oceanography Centre, UK on "Application of Geophysical Methods in Ocean Exploration" – 3rd October 2013

Invited Lectures by Faculty Members

- Dr. S. H. Farooq delivered a lecture on "Arsenic Contamination of Groundwater in Lower Ganga Plains" at JNU, New Delhi during 3-4 October 2012.
- Dr. S. Pattnaik has been invited to participate a Brainstorming session on "Study of Ocean-Land-Atmosphere Coupling and Extreme Events (SOLACE)" March 07-09, 2013 at Cotton College State University, Guwahati. This event is sponsored by Department of Science and Technology (DST), Government of India.
- Brain storming session on the Establishment of Innovation center for Climate Change and designing of observational experiments in the first phase of the proposal are held on 26th of February 2013. Prof. Avijit Gangopadhya UMASSD, Dr Glen Gawarkiewicz WHOI, Prof. Arun Chakraborty IITKGP, Dr V.S.N Murty NIO along with the faculty from the School participated in the meeting.
- Prof. P. C. Pandey Chair a Session on "Observed Changes in the Frozen Oceans Remote Sensing for Polar Sciences" at Pan Ocean Remote Sensing Conference (PORSEC)-2012 held at Kochi, during 05-09 November, 2012.
- Prof. S. Tripathy and Prof. P C Pandey have participated in the Scientific Advisory Committee meeting of Integrated Coastal Zone Management (ICZMP), Odisha.
- Prof. P C Pandey and Dr S Pattnaik have participated in the one day workshop entitled "Ground Water Security and Sustainbility in Odisha – Vision 2025" jointly organized by Central Ground water Authority & Central Ground Water Board South Eastern Region, Bhubaneswar on 20th March 2013.

Seminars/Workshops/Conferences Organized by the Schools

- Workshop on Indo-US Advanced Workshop and Colloquium on Modelling and Data Assimilation for Tropical Cyclone Predictions during 9 – 14 July 2012
- Evolution of Water within the Ganga River Basin, Natural vs Anthropogenic Contributions: Implications for River Basin Management and Climate Change during 17-19 December 2012

Visitors

- Prof. Avijit Gangopadhyay, University of Massachusetts Dartmouth and Dr. Glen Gawarkiewicz, Woods Hole Oceanographic Institute (U.S.A.) visited the School of Earth, Ocean and Climate Sciences during 26 - 28 February 2013

School of Electrical Sciences

Head of School

Professor Ganapati Panda [Up to 28.02.2013]

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The mission of the **School of Electrical Sciences** is to shape graduates into hardcore professionals who would become effective leaders and noteworthy innovators in the technological areas of Electrical Engineering, Electronics and Communication Engineering, Instrumentation Engineering, Computer Science and Knowledge Engineering. The School is engaged in a wide spectrum of research in established and emerging technologies through nationally and internationally funded sponsored research and industrial consultancy as well as through various research collaborations.

The school, widely known for its multidisciplinary programs, currently focuses on five major research areas: Communications and Signal Processing, Power and Renewable Energy Systems, Control Systems, Power Electronics and Drives, Microelectronics and Semiconductor Devices, and Computing Techniques and Systems. In its role as research-oriented School, it will help solve the most challenging social, cultural, technical, and health- related problems through both basic and applied research. The School also aims to produce effective leaders and noteworthy innovators in the broad aspects of Electrical Sciences.

While producing competent professionals and responsible citizens, it is also the endeavour of the School to ensure that the graduates adhere to ethical values in life and be sensitive to environmental and social issues. It is also part of the mission to motivate and encourage the students to engage in lifelong learning which would help them keep abreast with contemporary developments in their fields of operation and enable them to use this power of knowledge as leverage to become outstanding performers in whatever careers they choose.

Research Activities

Some of the major on-going research activities of the School include: Antenna Design, Smart Antenna Techniques For MIMO Systems, Radio Frequency Identification System Design and Application, Non-Destructive Testing Methods, Digital Signal Processing, Speech and Real time Interactive Audio processing, Active Noise Controller, Cognitive Radio, Sensor Network, Intelligent Instrumentation, Opto-Electronics Device, Long-haul Optical Communication System Design, Optical Sensor, Communication and Wireless Communication System modeling and Design, Semiconductor Material & Device Characterization, Wide Band gap Semiconductor Devices, MMICS, Decoupling Control, Robust Control, Periodic Feedback Control, Power Quality, Custom Power Devices, Renewable Energy Sources and Application of Soft Computing Techniques to Power Systems, Intelligent Protection to Transmission Systems including Facts, Micro and Smart grids, Distributed Generation and Dynamic Security Assessment in Large Power Network Structural Health and integrity analysis and Monitoring (SHIM).

Thrust Areas

- Signal processing
- Next Generation Communication Systems
- Renewable and Alternate Energy
- Smart Grids
- Semiconductor Devices Modeling
- Adaptive and Robust Control System

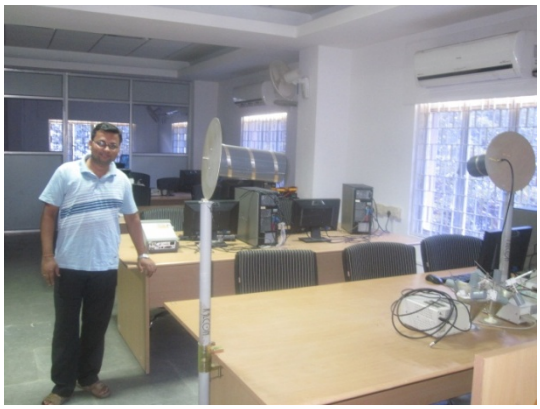
New Acquisitions (Equipment)

- Real Time Digital Simulator (RTDS) for Power System Application
- Wireless Sensor Network Setup

New Laboratory Set Up

- Power and Energy System Lab
- Wireless Sensor Network lab
- Radiating System Lab

DSP Lab



Communications Lab

Sponsored Research Projects

List of Projects	Principal Investigator	Sponsoring Agency
Design and Development of an anti-islanding protection relay for Distributed Generations	Dr. S. R. Samantaray	CPRI
Design and Development of Adaptive Distance Relay for Flexible AC transmission systems	Dr. S. R. Samantaray	DST
Decoupled LTI and periodic compensation of a Quadruple tank system	Dr. A. Ghosh	DST
Performance Studies of Silicon Carbide X-Ray Detectors in High-energy Neutron & Gamma Radiation (ITER-like) Environment	Dr. N.V.L.N. Murty	BRFST
Control of Stand-Alone hybrid "Solar-Diesel Generator-Battery" Power Supply System	Dr. C. N. Bhende	DST

Achievements

- Prof. G. Panda has been elected as a Fellow of Institution of Engineering and Technology, UK
- Dr. S. R. Samantaray has been awarded the IEEE PES PSDP Technical Committee Prize Paper Award
- Dr. C. N. Bhende has been a recipient of Indo-Australia Science & Technology Visiting Fellowship
- Dr. P.K. Sahu has been elected as a senior Member IEEE

Visit Abroad

Prof. G. Panda	University of Sheffield, UK ,Under UKIERI UK-India Staff Exchange Program (Dec 2012)
Dr. C. N. Bhende	Presented a paper at 4th Indo-German Frontiers of Engineering (INDOGFOE) Symposium, Halle- Merseburg, Germany from 13-16th June, 2012
Dr. P.K. Sahu	Presented a paper at IEEE Wireless Advanced (WIAD 2012), London, UK, from 25-27th June, 2012

Thesis: Doctoral

Sl. No.	Name of Scholar	Title of Thesis	Date of Award
1	P.M. Pradhan	Novel signal processing for spectrum sensing and cognitive radio engine design	2012
2	Nithin V. George	Development of a class of adaptive algorithms for active noise control	2012

Journal Paper Publications

- A. K. Sahoo and **G. Panda**, "Side lobe Reduction of LFM Signal Using Convolutional Windows", International Journal of Signal and Imaging Engineering, In press

- S.J.Nanda, P.M.Pradhan, **G.Panda**, L.Mansinha and K.F.Tiampo, "A Correlation Based Stochastic Partitional Algorithm for Accurate Cluster Analysis", International Journal of Signal and Imaging Systems Engineering, In press

- N.V.George, K.F.Tiampo, S.S.Sahu, S.Mazzotti, L.Mansinha, **G.Panda**, "Identification of Glacial Isostatic Adjustment in Eastern Canada Using S-Transform Filtering of GPS Observations", Pure and Applied Geophysics, 169(8), pp: 1507-1517, 2012.

- R.Majhi, B.Majhi and **G.Panda** ,"The development and performance evaluation of neural network classifiers for Indian internet shoppers" ,Expert Systems with Applications, 39(2), pp: 2112-2118, 2012.

- N.K.Rout, D.P.Das and **G.Panda**, "Particle swarm optimization based active noise control algorithm without secondary path identification", IEEE Trans on Instrumentation and Measurement, 61(2), pp: 554-563, 2012.

- N.V.George and **G.Panda**,"On the development of adaptive hybrid active noise control system for effective mitigation of nonlinear noise", Signal Processing, 92(2), pp:509-516, 2012.

- P.M.Pradhan, **G.Panda**, "Solving Multi objective Problems using Cat Swarm Optimization", Expert Systems with Applications, 39(3), pp: 2956-2964, 2012.

- S.Mishra , P.K.Dash and **G.Panda**, "Classification of Non stationary Power signals using support vector machine Based moving sum average filter", International Journal of Research and Reviews in Signal Acquisition and Processing , In press

- A.K.Sahoo and **G.Panda**, "A Multi objective Optimization Approach to Determine the Parameters of Stepped Frequency Pulse Train", Aerospace Science and Technology, DOI10.1016/j.ast.2011.10.008, In Press.

- A Samui, S.R.Samantaray and **G. Panda**, "Distribution System Planning Considering Reliable Feeder Routing", IET Generation, Transmission and Distribution, In press

- T.Panigrahi,P.M.Pradhan, **G.Panda**, B.Mulgrew, "Block Least Mean Square Algorithm Over Distributed Wireless Sensor Network", Journal of Computer Networks and Communications, DOI:10.1155/2012/601287.In Press

- T. Panigrahi, **G. Panda** and B. Mulgrew, "A Novel Distributed Bearing Estimation Technique Using Diffusion PSO Algorithm", IET Wireless Sensor Systems, In Press

- N. V. George and **G. Panda**, "A robust evolutionary feed forward active noise control system using Wilcoxon norm and particle swarm optimization algorithm", Expert Systems with Applications, 39(8), pp: 7574-7580, 2012.

- N. V. George and **G. Panda**, "A robust filtered-s LMS algorithm for nonlinear active noise control", Applied Acoustics, 73(8), pp: 836-841, 2012.

- P.M.Pradhan, **G.Panda** "Connectivity Constrained Wireless Sensor Deployment using Multi objective Evolutionary Algorithms and Fuzzy Decision Making", Ad Hoc Networks,10(6), pp: 1134-1145, 2012.

- U.K.Sahoo, **G.Panda** and B.Mulgrew, "QR-Based Incremental Minimum-Wilcoxon-Norm Strategies for Distributed Wireless Sensor Networks", Signal Processing, 92(11),pp:2657-2667, 2012.

- B.Majhi, M.Rout, R.Majhi, **G.Panda**, P.J.Fleming, "New Robust Forecasting Models for Exchange Rates Prediction ", Expert Systems with Applications,39(16),pp:12658–12670, 2012.

- N.V.George, **G.Panda**, "A particle swarm optimization based decentralized nonlinear active noise control system", IEEE Transaction on Instrumentation and Measurement,61(12), pp: 3378-3386, 2012.

- P.M.Pradhan, **G.Panda**, "Pareto optimal design of cognitive radio engine using multi objective evolutionary algorithms and fuzzy decision making", Swarm and Evolutionary Computation, DOI: 10.1016/j.swevo.2012.07.001, In Press.

- N. V. George, **G. Panda**, "Active control of nonlinear noise processes using cascaded adaptive nonlinear filter", Applied Acoustics, 74(1), 217-222, 2013.

- V.Baghel, **G.Panda**, "Development of an efficient hybrid model for range side lobe suppression in pulse compression radar", Aerospace Science and Technology, DOI:10.1016/j.ast.2012.08.002, In Press.

- N. V. George, **G. Panda**, "Advances in active noise control: A survey, with emphasis on recent nonlinear techniques", Signal Processing, 93(2), pp: 363-377, 2013

- T.Panigrahi, **G.Panda**, B.Mulgrew, "Distributed DOA Estimation Using Clustering of Sensor Nodes and Diffusion PSO Algorithm", Swarm and Evolutionary Computation, In Press.

- S.J.Nanda, **G.Panda**," Automatic clustering algorithm based on multi objective Immunized PSO to classify actions of 3D human models", Engineering Applications of Artificial Intelligence, In Press.

- M.Rout, B.Majhi, R.Majhi, **G.Panda**, "Forecasting of currency exchange rates using an adaptive ARMA model with differential evolution based training", Journal of King Saud University - Computer and Information Sciences (Elsevier), In Press

- S.J.Nanda, K.F.Tiampo , **G.Panda**, L.Mansinha, N.Cho and A.Mignan,"A tri-stage cluster identification model for accurate analysis of seismic catalogs", Nonlinear Processing Geophysics, Special issue on : Nonlinearity, scaling and complexity in exploration geophysics, In Press, 2013.

- B. Majhi, **G. Panda**, "Distributed and robust parameter estimation of IIR systems using incremental particle swarm optimization", Digital Signal Processing, In Press, 2013.

- Ankita Samui, **S.R.Samantaray** "Wavelet Singular Entropy based Islanding Detection in Distributed Generation", IEEE Transactions on Power Delivery, vol.18, no.-1, pp. 411-418, 2013.

- **S. R. Samantaray**, "Fast S-Transform based Distance Relaying in Transmission line", Electric Power System Research, Elsevier Science, vol.95, pp. 268-274, February 2013.

- **S.R.Samantaray**, "A systematic Fuzzy Rule Based approach for Fault Classification in Transmission Lines", Applied Soft Computing, Elsevier Science, vol.13, issue-2, pp.928-938, February 2013.

- **S.R.Samantaray**, "Ensemble Decision Trees for High Impedance Fault Detection in Power Distribution Network", International Journal of Electrical Power and Energy Systems, Elsevier Science, Vol. 43, issue-1, pp 1048-1055, December 2012.

- **S.R.Samantaray** , L.N.Tripathy, P.K.Dash, "Differential Energy based Relaying for Thyristror Controlled Series Compensated line", International Journal of Electrical Power and Energy Systems, Elsevier Science, Vol. 43, issue-1, pp 621–629, December 2012.

- **S.R.Samantaray**, R.K.Dubey, B.Chitti Babu, "A novel Time-Frequency Transform based Spectral Energy function for Fault Detection during Power Swing", Electric Power Components and Systems, vol 40, issue-8, pp. 881-897, April 2012.

- Ankita Samui, **S. R. Samantaray**, G. Panda, "Distribution System Planning Considering Reliable Feeder Routing", IET Generation, Transmission & Distribution, vol.6, issue-6, pp-503-514, 2012.

- B. Patnaik , **P.K. Sahu**, "Inter-satellite optical wireless communication system design and simulation", IET Communication, Volume 6, Issue 16, pp. 2561–2567, 2012

- B. Patnaik, **P.K. Sahu**, Ultra high capacity 1.28 Tbps DWDM system design and simulation using optimized modulation format, Optik - Int. J. Light Electron Opt. (2012), http://dx.doi.org/10.1016/j.ijleo.2012.04.019.

- Bijayananda Patnaik, **P.K. Sahu**, "Optimized ultra-high bit rate hybrid optical communication system design and simulation", Optik 124, pp.170– 176 2013.

- Bijayananda Patnaik; **P.K. Sahu**, "Design and study of high bit-rate free-space optical communication system employing QPSK modulation," DOI: 10.1504/IJSISE.2013.051501

- **A. Ghosh**, T.R Krishnan, and B. Subudhi, "Robust proportional-integral-derivative compensation of an inverted cart-pendulum system: An experimental study", IET Control Theory and Applications, vol. 6, no. 8, pp 1145-1152, 2012.

- **A. Ghosh** and S.K das, "Decoupled periodic compensation for multi-channel output gain margin improvement of continuous-time MIMO plants", IET Control Theory and Applications, vol. 6, no. 11, pp 1735-1740, 2012

- J.K Pradhan and **A. Ghosh**, "Design and implementation of decoupled compensation for a twin rotor MIMO system", IET Control Theory and Applications, In Press, doi: 10.1049/iet-cta.2012.0162

- **A. Ghosh**, “Decentralized simultaneous stabilization of a class of two MIMO systems using a continuous-time periodic controller”, Automatica, In press, http://dx.doi.org/10.1016/j.automatica.2013.02.063

- S. Ganguly, **N. C. Sahoo**, and D. Das, "Multi-objective Planning of Electrical Distribution Systems using Dynamic Programming", International Journal of Electrical Power and Energy Systems (Elsevier), Vol. 46, 2013, pp. 65-78.

- S. Ganguly, **N. C. Sahoo**, and D. Das, "Recent Advances on Power Distribution System Planning: A State-of-the-art Survey", Energy Systems (Springer), January 2013, DOI 10.1007/s12667-012-0073-x

- **Sankarsan Mohapatro** and B S Rajanikanth, “Online NOX Removal from Stationary Diesel Engine Exhaust by Barrier Discharge Plasma," International Journal of Plasma Environmental Science & Technology, vol. 6, no. 2, 2012, pp. 177-182

- S. G. Malla and **C. N. Bhende**, “Novel Control of Photovoltaic based Water Pumping System without Energy Storage”, International Journal of Emerging Electric Power Systems, Issue 4, Vol. 13, 2012.

Papers Presented at Seminars/Workshops/Conferences

- R. Dash, P. K. Dash, B. B. Misra, G. Panda, “Greedy polynomial neural network for classification task in data mining”, WICT 2012, Oct. 30 2012-Nov. 2 2012, Trivandrum, Kerala.
- T Panigrahi, G Panda, “Robust Distributed Learning in Wireless Sensor Network using Efficient Step Size”, ICCCS 2012, 6-8 October 2012, Rourkela, Odisha.
- A. K. Sahoo, G. Panda and Babita Majhi, “A technique for pulse radar detection using RRBF neural network”, World Congress on Engineering(WCE 2012), International Conference of Computational Intelligence and Intelligent Systems, London, UK, pp. 684-689, 4-6 July 2012.
- S. Mishra, G. Panda, Babita Majhi and R. Majhi, “Improved portfolio optimization combining multi-objective evolutionary computing algorithms prediction strategy”, World Congress on Engineering(WCE 2012), International Conference of Financial Engineering, London, UK, pp. 470-474, 4-6 July 2012.
- S. J. Nanda, G. Panda, “Automatic clustering using MOCLONAL for classifying actions of 3D human models”, IEEE SHUSER 2012, 24-27 June 2012, Kuala Lumpur, Malaysia.
- P. M. Pradhan, G. Panda and Babita Majhi, “Multi-objective Cooperative Spectrum Sensing in Cognitive Radio using Cat Swarm Optimization”, IEEE 2012 Wireless Advanced, King’s College, London, 25-27,June 2012.
- N. V. George, G. Panda, “A reduced complexity adaptive legendre neural network for nonlinear active noise control”, IWSSIP 2012, 11-13 April 2012, Vienna, Austria.
- S. J. Nanda, G Panda, “Accurate partitional clustering algorithm based on immunized PSO”, IEEE ICAESM, 2012, 30-31 March 2012, Nagapattinam, Tamil Nadu.
- P.K. Rout, U.K. Nanda, D.P. Acharya, G. Panda, “Design of LC VCO for optimal figure of merit performance using CMODE”, RAIT-2012, 15-17 March 2012, Dhanbad, India.
- R. Majhi, G. Panda, T. Rahul, “Investigation on identification of profitable target markets for Indian online shoppers”, IRCMET-2012, 02-03 March 2012, Bangkok, Thailand.
- T. Panigrahi, G. Panda, and B. Mulgrew, “Robust distributed Block LMS over Wireless Sensor Network in Impulsive Noise”, **ICDCIT – 2012**, Bhubaneswar, Odisha, 2-4th Feb. 2012..
- Himansu Shekhar Pradhan, P. K. Sahu, “Spontaneous Brillouin Scattering Based Distributed Fiber Optic Temperature Sensor Design and Simulation using Phase Modulation and optimization Technique” IEEE Proceeding of Sixth International Conference on Sensing Technology (ICST), pp. 300-304, 2012

- Bijayananda Patnaik, P.K. Sahu, “Optimized Hybrid Optical Communication System for First Mile and Last Mile Problem Solution of Today’s Optical Network”, ELSEVIER Procedia Technology 6, pp. 723 – 730, 2012
- Bijayananda Patnaik, P. K. Sahu, “Novel QPSK Modulation for DWDM Free Space Optical Communication System”, Wireless Advanced (WiAd) London, pp. 170-175, 2012
- Bijayananda Patnaik, P. K. Sahu, “ Novel QPSK modulation technique for DWDM free space optical communication system," 21st Annual Wireless and Optical Communications Conference (WOCC), 2012,pp-140-145, Kaohsiung, Taiwan
- Ankita Samui and S.R.Samantaray, “Performance Assessment of Wavelet Transform Based Islanding Detection Relay”, IEEE INDCON-2012.
- Deepak Kumar and S.R.Samantaray. “Feeder Routing in DG interfaced Power Distribution Networks Using MSTB-GT Approach”, IEEE INDCON-2012.
- J.K Pradhan and A. Ghosh, “Decoupling using unity output feedback PC-GSHF based dynamic compensation” 5th IFAC Workshop on Periodic Control Systems, Caen, France, 3-5th July, 2013, Accepted for presentation
- L. Pappula, D. Ghosh, “Linear Antenna Array Synthesis using Invasive Weed Optimization”, 2013 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Florida, USA, July 2013.
- L. Pappula, D. Ghosh, “Linear Antenna Array Synthesis for Wireless communications using Particle Swarm Optimization”, International Conference on Advanced Communications Technology 2013, South Korea, January 2013.
- L. Pappula, D. Ghosh, “Application of Real Coded Genetic Algorithm for Target Sensing”, International Conference on Sensing Technology (ICST), Kolkata, India, December 2012

Workshop Organized by the School

- National Workshop on Swarm Intelligence: Theory and Applications: By Prof. G. Panda, from 25 June 2012 to 27 June 2012

Lecture by Visiting Expert

- Prof. Chitta Das, Dept of CSE at Pennsylvania State University, USA, “Role of Network-on-Chips in Designing Multicore Architectures” – 10 January 2013
- Prof. Amit Mishra, Dept of EE, University of Cape Town, Soth Africa, “COMMRAD: Away forward in the history of Radars” – 16 January 2013

Patents

- Dr. E Sardariani, Dr. T. Birunbaum, Dr. **Debalina Ghosh**, and Dr. S. Ramisetti, “Inverted F Antenna System and RFID Device Having The Same”---US Patent Application No. 13/532,694, Filed on 25 June 2012 (Other members are from USA)

School of Humanities, Social Sciences and Management

Head of School

Dr. Dukhabandhu Sahoo

Faculty Members

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Dr. Amrita Satapathy
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The School of Humanities, Social Sciences and Management at Indian Institute of Technology Bhubaneswar corroborates all the academic disciplines by shedding light on the underlying assumptions in teaching and research across language, culture, social policy, technological development, economic planning, psychological behaviors and public and private values. Study of the humanities provides students with a cultural perspective and awareness besides the ability to express clearly and accurately. The discipline enables pupils to evaluate critically ideas and actions, and to make choices on shared values and priorities. Its scope is international and approach is interdisciplinary. The School works at the intersections of Environmental Economics, Natural Resources Economics, Macroeconomics, Development, Economics & Rural Development, and Indian Writing in English, Post-Colonial Literature, Travel Writing, Business Communication, American Literature, Canadian Literature, ELT, Cross Cultural Communication, Autobiography, Consumer Behavior, Cyber Psychology, Clinical Psychology, Cognitive Psychology, Cognitive Neuroscience, Psycholinguistics, Psychology of Personality and Marketing. Students and faculty work together in the development of the human being. The School's aim is to help students develop the communicative, analytic, and cultural knowledge to thrive in all aspects of their future lives. Currently the School offers courses for the B. Tech. programme and doctoral programs in Economics, English and

Psychology. Along with our diverse academic departments, the School is home to a wide variety of interdisciplinary collaborations, path-breaking research projects, and unique areas of study.

Research Activities

The current research areas of the School includes Environmental Economics, Natural Resources Economics, Macroeconomics, Development, Economics & Rural Development, Indian Writing in English, Post-Colonial Literature, Travel Writing, Business Communication, American Literature, Canadian Literature, ELT, Cross Cultural Communication, Autobiography, Consumer Behavior, Cyber Psychology, Clinical Psychology, Cognitive Psychology, Cognitive Neuroscience, Psycholinguistics, Psychology of Personality, Marketing.

Thrust Areas

Environmental Economics, Natural Resources Economics, Macroeconomics, Development, Economics & Rural Development, Indian Writing in English, Post-Colonial Literature, Travel Writing, Business Communication, American Literature, Canadian Literature, ELT, Cross Cultural Communication, Autobiography, Consumer Behaviour, Cyber Psychology, Clinical Psychology, Cognitive Psychology, Cognitive Neuroscience, Psycholinguistics, Psychology of Personality, Marketing.

New Acquisitions (Equipment)

- Workstation

Sponsored Research Projects

Projects	Principal Investigator	Sponsoring Agency
Solid Waste Management in Indian cities	Dr. Dukhabandhu Sahoo	ICSSR, New Delhi
Impact of JFM on Stress Migration	Dr. N.C.Sahu	ICSSR, New Delhi

Visit Abroad

Dr.Anamitra Basu	Went to UMASSD, USA as a Visiting Professor during June 3 – July 5, 2012
Dr. Amrita Satapathy	Presented a Paper titled "Reconsidering the West in Early Autobiographies and Travel Writing in Indian Writing in English", Singapore 9-10 July 2012
Dr.Punyashree Panda	Presented a Paper titled "Mapping the World", Bangkok, Thailand 13-14 Dec 2012
Dr.Dukhabandhu Sahoo	CPR South 7 conference in the ICT and Growth Segment in Mauritius,4-5 Nov 2012
Dr Naresh Chandra Sahu	Presented a Paper in the 4th International Conference on Environment and Development, in Dubai, UAE during 18-22, Jan 2013

Achievements

- Dr. Dukhabandhu Sahoo received the best paper award at CPR South 7 conference in the ICT and Growth Segment in Mauritius

Journals

- **A Shukla**. "Website Characteristics and Website Satisfaction: Role of Computer Self Efficacy: International Journal of Information Systems Management Research and Development", 2012, 2(1), 1-16
- Parija, Soma, **A Shukla**. "Impact of online flow Experience on personality variables subjective happiness and satisfaction with life: IOSR Journal of Humanities and Social Sciences", 2012, 5(1), 37-43
- Mishra, Rojalin, **Shukla A.** "Impact of creativity on role stressors, job satisfaction and organizational commitment : Journal of Organisation & Human Behaviour", 2012, 1(3), 18-26
- Parija, Soma, **Shukla A.** "The life of virtual humans: the relationship between self efficacy depression, subjective happiness and satisfaction with life: Cyber Times International Journal of Technology and Management" 2012, 5(2), 170-180
- Parija, Soma, **Shukla A.** "Loneliness, happiness and satisfaction in virtual experience: International Journal of Business Management and Social Sciences", 2013, 2(7), 68-71
- Parija, Soma, **Shukla A.** "Life in cyberspace: Role of personality and loneliness: International Journal of Innovative Research and Development", 2012, 1(8), 82-108
- **Basu A.** "Enhanced embodied response following ambiguous emotional processing: Cognitive processing international Quarterly of cognitive science", 2012, 13, No-3, 103-106
- **Basu A**: Why do people switch to new technologies? Developing a conceptual model to explain technology transition : Archived supplement international Journal Psychology: 2012, 47,37, ISSN 0020-7594
- **Satapathy A.** "The Idea of England in Eighteenth century", Indian Travel Writing ISSN 1481-4374, 2012, 14, Issue-2
- **Satapathy A.** "Fictional Representations of London in Indian Writing in English", International Journal of management and Social Sciences, New Delhi ISSN 2249-0191, 2012, 2(1), 21-29
- **Satapathy A**. "Reconsidering the West in Early Autobiographies and Travel Writing in Indian Writing in English", Journal of Law and Social Sciences, GSTF, Singapore, ISSN 2251-2853, 2012, 2(1), 177-182
- Mohanty, Sulagna, **Panda, Punyashree** :Myth and storytelling: the new Language of postcolonial voices: International Journal of Business Management and Social Sciences: 2013, 2.7, 31-34
- Mohanty, Sulagna, **Panda, Punyashree**: Trickster Discourse: A Postcolonial Perspective: Humanities and Social Science Studies: 2013, 2.1, 32-39
- Mohanty, Sulagna, **Panda, Punyashree**: The multifarious Aspects of Conflict in *The Mistress of Spices:* A Study of the characters in Conflicts: Alternative Discourse: 2013, 1.3, 1-5
- **Sahoo, D.** Efficiency of the ITC Sector in India: Journal of Infrastructure Development: 2012, 4.1, 41-58
- **Sahoo, D.** Farmers' educational level and agriculture productivity: a study of tribals of KBK districts of Odisha: The International Journal of Education Economics and Development: 2012, 3.4, 39-43
- T.Subba Lakshmi, **Dukhabandhu Sahoo**, "Health Infrastructure and Health Indicators: The Case of Andhra Pradesh, India",*IOSR Journal Of Humanities And Social Science (IOSR-JHSS*), Volume 6, Issue 6 (Jan. - Feb. 2013), PP 22-29. ISSN: 2279-0837, ISBN: 2279-0845.
- T.Subba Lakshmi, **Dukhabandhu Sahoo**, "Healthcare Financing Mechanisms in India: An Examination of Health Insurance, *International Journal of Scientific Research*, Vol.2, No.1, 2013, pp.160-163. ISSN: 2277 - 8179.
- Mishra, Diptimayee, **Sahu, N. C.** "Status of Infrastructure and the scope for its Development in Odisha after Liberalization: Journal of Utkal Economic Papers", 2012, 15, 51-67
- **Dr S K Mund**, "Odia Writing in English: A Critical Survey", *The Meher Journal of English Studies, 2012*

Papers Presented at Seminars/Workshops/Conferences

- Dr A Shukla: Impact of Personality and Lonliness on Life: Role of online Flow Experience: International Conference on Cyber psychology and Computing Psychology: WASET Singapore: Sep-12-12, 2012

- Dr A Shukla: Online Flow Experience: The role of Personality and Loneliness: XXII Annual Convention of national Academy of Psychology: Bangalore: Dec-10-12, 2012
- Dr A Basu: Cognitive Psychology and Bilingualism : XXII Annual Convention of national Academy of Psychology : Bangalore: XXII NAOP Bangalore: Dec-10-12, 2012, p-134-135
- Dr A Basu: Why do people switch to New Technologies?- Developing a conceptual model to explain technology transition: International conference of Psychology 2012: Cape Town South Africa: July-22-27 2012, p-341-345
- Dr A Basu: Why do people switch to New Technologies?- Proposing a Conceptual Model to explain Technology Transition: Ancillary proceedings of the 20th European Conference on Information Systems 2012: Barcelona, Spain: June 10-13 2012: p-1-4
- Dr A Satapathy: Reconsidering the West in Early Autobiographies and Travel Writing in Indian Writing in English: 1st Annual International Conference on language, Literature & Linguistics: Singapore GSTF: 2012: p-279-284
- Dr D Sahoo: Convergence through Connectivity: CPR South 7: 2012: p-1-13
- Dr S K Mund: Enlightenment Postcolonialism: Reading Colonial Modernism through Jagan Mohan Lala's *Babaji Nataka* (1877), the First 'Modern' Odia Drama : Indian Drama in English and Translations: Crossroads of Thoughts: Dept. of English, Bhangar Mahavidyalaya, West Bengal
- T.Subba Lakshmi**,** Presented a paper entitled " Rajiv Aarogyasri Health Insurance Scheme: A Beneficiary Assessment" at Sixth Doctoral Theses Conference organised by ICFAI Business School, Hyderabad, India in collaboration with Broad College of Business, Michigan State University, USA during 26-27 April 2013.

Invited Lectures by Faculty Members

- Dr A Shukla was invited as Resource Person by Utkal University VaniVihar, Bhubaneswar to deliver a lecture on "Research Design" on Feb 2013.
- Dr A Basu was invited as Resource Person by Polyjama LLC to deliver a lecture on "Role of language in team building".
- Dr S K Mund was invited as Resource Person by DDCE, Utkal University, VaniVihar, Bhubaneswar to deliver a lecture on 'Rethinking Pedagogy in India' on 25 March 2013.
- Dr S K Mund was invited as Resource Person by UGC Refresher Course to deliver a lecture on *Literature and Globalization: Issues in Identity and Representation* on 08 January 2013.
- Dr S K Mund was invited as Resource Person by University of Hyderabad to deliver a lecture on 'The Interminable Anxiety: Odia Language Movement in Colonial Odisha' on 26-27 February 2013.
- Dr S K Mund was invited as Resource Person by University of Hyderabad to deliver a lecture on ''New Literatures in English: Issues of History and Post coloniality' on 28 February 2013.
- Dr S K Mund was invited as Resource Person by University of Hyderabad to deliver a lecture on 'Situating India through British Victorian Literature on 28 February 2013.
- Dr S K Mund was invited as Resource Person by University of Hyderabad to deliver a lecture on 'Research Work in Indian English Academe' on 28 February 2013.
- Dr S K Mund was invited as Resource Person by B.J.B. Autonomous College, Bhubaneswar to deliver a lecture on 'Feminism: The Indian Context' on 27 January 2013.
- Dr S K Mund was invited as Resource Person by M.H.D College, Chhatia to deliver a lecture on 'Dalit Movement: Rethinking History, Literature and Identity' on 23 September 2012.

Seminars/Workshops/Conferences Organized by the Schools

- Workshop on "Environmental Impact Assessment: Issues, Challenges, and Policy Implications in India"(EIA-2012) during 9-10 June 2012 at Indian Institute of Technology, Bhubaneswar

School of Infrastructure

Head of School

Professor Sekhar Chandra Dutta

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At the backdrop of worldwide infrastructural escalation, **School of Infrastructure** at IIT Bhubaneswar has come up to dedicated excellence in engineering education, creation of knowledge, and innovation in research and leadership in professional services. The mission of the School is to offer unbounded academic environment in undergraduate and postgraduate teaching, doctoral program, research, and public service. Presently, the school is offering B.Tech, M.Tech and PhD programs in Civil Engineering. The School promotes students to engage in extra-curricular activities and research oriented assignments to nurture their organizational skills and innovation.

Research Activities

Concrete Technology

a) Chemical and mineral admixtures in concrete
b) Self compacting and high performance concrete
c) Non-destructive testing techniques.

Environmental Engineering

a) Treatment and Reuse of Textile Wastewater using a combination of Physico-chemical/Advanced Oxidation and Biological Treatment system.
b) Removal of Nutrients from Domestic Sewage in a Decentralized manner.

Geotechnical Engineering

a) Optimal design of offshore wind turbine foundation system to withstand extreme unanticipated long term cyclic wind and wave loads due to climate change to minimize the energy production cost
b) Development of semi-analytical solution of probabilistic linear and non-linear soil structure interaction problems.

Structural Engineering

a) Research has been going on studying the behavior of masonry structure under seismic loading produced through the shake-table facility available at school of infrastructure
b) Investigation has also been extended to explain the behavior of structure under Tsunami loading.
c) Seismic analysis and design of buried pipelines
d) Soil-pile-structure interaction for Structures in liquefiable soils.

Transportation Engineering

a) Identification of Factors Influencing the use of bike mode for home-based trip
b) An Investigation on causal parameters for the use of private vehicle for school travel
c) Forecasting traffic growth rate on highway
d) Effects of drainage on performance of flexible pavements.
e) Characterization of granular lateritic soils for mechanistic design of pavements.
f) Traffic flow modeling

Water Resources Engineering

a) Fluvial hydraulics: sediment transport, local scour around hydraulic structures
b) Open channel hydraulics: submerged wall jets, experimental fluid mechanics, mathematical flow modeling, Simulations of flow processes
c) Environmental hydraulics: flow through emergent vegetation, lateral and longitudinal dispersion through emergent vegetation
d) Reservoir sedimentation
e) Fluid-Structure interaction: Tsunami loading on coastal structures

Thrust Areas

- Concrete Technology
- Inelastic seismic behaviour of structures
- Seismic design of masonry structures
- Seismic safety of earthen dam
- Energy geotechnology
- Probabilistic geomechanics
- Travel demand modeling
- Transportation system planning and policy address
- Structural dynamics and earthquake engineering
- Seismic design of asymmetric structures
- Seismic behavior of elevated water tank
- Study on Non-engineered structures
- Soil-structure interaction
- Behaviour of structures under tsunami loading
- Traffic flow modeling

- Pavement analysis and design
- Low volume road
- Sustainable design of offshore foundation
- Reclamation of domestic and industrial waste water
- Unsaturated soils behavior
- Contaminant transport modeling
- Flow through emergent vegetation and Fluid-Structure interaction
- Travel behaviour analysis
- Traffic flow on urban transportation network
- Pavement evaluation and maintenance
- Foundation response in liquefiable soils
- Waste utilization: fly ash, red mud
- Environmental geotechnics
- Flow around hydraulic structures

Sponsored Research Projects

Projects	Principal Investigator	Sponsoring Agency
Treatment of textile wastewater via ultrasonic and biological anaerobic and aerobic treatment route	Dr. P. Bhunia	DST
Multi-Objective Decision making tools for Environmental and regional planning	Dr. P. Bhunia	CSIR
Investigation of cyclic behaviour of offshore Wind Turbine mono-pile foundation considering the effect of climate change	Dr. S. Haldar	DST
Characterization of granular lateritic soils for mechanistic design of pavements.	Dr. U. C. Sahoo	DST
Fate of Microbial Pathogens in existing wastewater treatment Systems: Sand filtration as a polishing option for treated effluent	Dr. R.R.Dash	DST
Establishment of swelling and cracking characteristics of expansive soils from suction measurements	Dr. B. Hanumant Rao	CSIR
Hydraulics of submerged structures subjected to shallow submergence	Dr. Arindam Sarkar	DST

Consultancy Project

Title	Name of the Investigator (s)	Sponsors
Design of rock socketed pile foundations for 220KV transmission line towers between Kantapali to Hindalco in the Mahanadi river bed, Orissa	Dr. S.Haldar, Dr. D.Pasla, Dr. A.Sarkar	Hindalco Industries Limited
Proof checking of design and drawing of three nos. Box bridges under railway loading in connection with construction of railway siding to serve Koderma thermal power plant (2×500MW) of DVC.	Prof. S.C.Dutta, Dr. S.Haldar, Dr. S.R.Dash, Dr. A.Sarkar, Dr. D.Pasla	Rites Ltd.
Proof checking of proposed residential quarters at HAL, Sunadeba, Koraput, Odisha	Prof. S.C.Dutta, Dr. S. Haldar, Dr. A.Sarkar, Dr. D.Pasla, Dr. R.R.Dash, Dr. P.P.Dey, Dr. Phunia	Hindustan Aeronautics Ltd. (HAL)
Technical scrutiny of DPRs for roads and bridges under PMGSY in the states of	Dr. U.C.Sahoo, Dr. P.P.Dey, Dr. D.Basu, Dr. S.R.Dash	NRRDA, Govt. of India.

Jharkhand and Odhisha.		

Achievement

- Prof. S. C. Dutta has been Elected as Fellow by West Bengal Academy of Science and Technology during 2012

Visit Abroad

- Prof. Sekhar Chandra Dutta visited University of Massachusetts, Dartmouth, USA during June 3 – July 5 2012 for teaching a course and doing research at Civil and Environmental Engineering

Journals

- **Sarkar, A**. "Vortex excited transverse surface waves in an array of randomly placed circular cylinders", Journal of Hydraulic Engineering, ASCE, 2012, 138(7), 610-618
- **Basu, D**., Hunt, J.D. "Valuing of Attributes Influencing the Attractiveness of Suburban Train Service in Mumbai City: A Stated Preference Approach", Transportation Research Part A (Elsevier), 2012, 47, 1465-1476
- Verma, A.K., **Bhunia, P., Dash, R.R**. "Effectiveness of Aluminum Chlorohydrate (ACH) for Decolorization of Silk Dyebath Effluents", Industrial & Engineering Chemistry Research, 2012, 51(25), 8646-8651.
- Verma, A.K., **Bhunia, P., Dash, R.R**. "Decolourisation and Chemical Oxygen Demand Reduction Efficiency of Ferrous Suphate for the Treatment of Synthetic Textile Wastwater-A Comprehensive Study", International Journal of Geotechnics and Environment, 2012, 4(1), 73-87
- **Dash, R.R.** "Use of ecotoxicology for municipal solid waste and leachate from sanitary landfill", Standards India, 2012, 26 (5), 5-10
- **Rao, B.H**., Singh, D.N. "Establishing SWCC and Determination of Unsaturated Hydraulic Conductivity of Kaolin by Ultra Centrifugation and Electrical Measurements", Canadian Geotechnical Journal, 2012, 49(12), 1369-1377
- **Dutta, S.C.,** Mukhopadhyay, P., Goswami, K. "Augmenting strength of collapsed unreinforced masonry junctions: The principal damage feature due to moderate Indian earthquakes", Natural Hazards Review, ASCE, Sep, 2012, doi:10.1061/(ASCE)NH.1527-6996.0000096
- Mandal, B.,Roy, R., **Dutta, S.C**. "Lateral Capacity of Piles in Layered Soil: A Simple Approach", Structural Engineering and Mechanics, Techno Press, 2012, Vol. 44, No. 5.
- **Dutta, S.C.,** Chowdhury,R. "Effect of Gravity Loading on Inelastic Seismic Demand of Structures", Journal of Earthquake and Tsunami, 2012, Vol 06, Issue 04
- Nayak, **S., Dutta, S.C.,** Dinakar, P. "Dynamic characteristics of masonry walls", The IUP Journal of Structural Engineering, 2012, Vol. 5, No. 1, 33-53
- **Sahoo,U. C**., Reddy, K.S. "Equivalent linear elastic modulus of granular layer for low volume roads", Int. Journal of Pavement Engineering and Asphalt Technology, 2012, Vol.13, Issue 2, 37-47.
- Sarkar, A., Sahoo, G., **Sahoo, U.C.** "Application of fuzzy logic in transport planning", International Journal of Soft Computing", 2012, Vol. 3, No.2, 1-21
- Sarkar, A., **Sahoo, U.C.,** Sahoo, G. "Accidents prediction models for urban roads", International Journal of Vehicle Safety, 2012, Vol.6 No.2, 149-161
- Sharma, N.,Swain, S., **Sahoo, U.C**. "Stabilization of a clayey soil with fly ash and lime- A micro level investigation", Geotechnical and Geological Engineering, Springer, 2012, Vol.30, Issue 5., 1197-1205
- **Haldar, S.**, Basu, D. "Response of Euler-Bernoulli beam on spatially random elastic soil", Computers and Geotechnics, Elsevier, 2013, 50, 110-128
- **Dinakar, P.,** Shethy, K.P., **Sahoo, U.C.** "Design of selft-compacting concrete with ground granulated blast furnace slag", Materials and Design, Elsevier., 2013, Vol.43, 161-169

Papers Presented at Seminars/Workshops/Conferences

- Sarkar, A., Ratha, D. "Flow separation over backward facing step with transitions", International Congress on Computational Mechanics and Simulation, ICCMS, IIT Hyderabad, Dec, 2012, Pg No: 1-9
- Sarkar, A. "Time variation of maximum equilibrium scour depth around submerged structures", Workshop on Indian Water Management in 21st Century and Symposium on Sustainable Infrastructure Development, IWMSID 2013, IIT Bhubaneswar, Feb, 2013, Pg No: 442-449
- Basu, D., Stefan, K., Hunt, J.D. "Developing a Tour Level Destination Choice Model for Non-mandatory Travel", International Conference "Transportation Planning and Implementation Methodologies for Developing Countries" (TPMDC-2012), IIT Bombay, Dec,2012
- Basu, D. "Discrete Choice Experiment: A Tool to Analyze the Effect of On-Road Traffic Information", Workshop on Indian Water Management in 21st Century and Symposium on Sustainable Infrastructure Development, IWMSID 2013, IIT Bhubaneswar, Feb, 2013, Pg No: 339-345
- Sahoo, U.C. "Design criteria for low volume roads", Workshop on Indian Water Management in 21st Century and Symposium on Sustainable Infrastructure Development, IWMSID 2013", IIT Bhubaneswar, Feb, 2013, Pg No: 322-331
- Dinakar, P., Sethy, K., Sahoo, U.C. "Development of high strength self-compacting concrete with ground granulated blast furnace slag: A new mix design methodology", The International Conference on Sustainable Built Environment, Kandy, Sri Lanka, 14th-16th Dec, 2012
- Dinakar, P., "Fire resistance performance of concrete exposed to high temperatures", The 3rd International Conference on Concrete repair, Rehabilitation and Retrofitting, Cape Town, South Africa, 2012
- Dash, S.R., Bhattacharya, S "Mechanism of failure of three pile-supported structures during three different earthquakes", 15th World Conference on Earthquake Engineering, Lisboa, Lisbon, 24-28 Sept, 2012
- Dash, R. R., Dash, R. R., Verma, A. K., Bhunia, P. "Sand filtration: An effective post treatment option for aerobically treated wastewater", International conference of Environmental Research, 22nd - 24th November, 2012, Terengganu, Terengganu, Malaysia, Jerad Pub., Nov, 2012, ICER/PS
- Verma, A. K., Bhunia, P.**,** Dash, R.R. "Supremacy of magnesium chloride for decolourisation of textile wastewater: A comparative study on the use of different coagulants", JCESD 2012 1st Journal conference on Environmental Science and Development, 7th-8th April, 2012, Bangkok, Thailand
- Verma, A.K., Bhunia, P., Dash, R.R. "Decolourisation of simulated reactive dye bath effluents using aluminium and mangnesium based pre-hydrated salts", International Symposium of Southeast Asian water Environment, 8th-10th November, 2012, Hanoi, Vietnam, The University of Tokyo, Nov, 2012, Vol.10 (Part I) 179-186
- Rao, B.H., Srinivas, K., Abhishek, P.A. "Parameters Influencing Performance of Geopolymer Concrete: A Review", Workshop on Indian Water Management in 21st Century and Symposium on Sustainable Infrastructure Development, IWMSID 2013, IIT Bhubaneswar, Feb, 2013
- Dinakar, P. "Experimental prediction of time of cracking of concrete under electric potential with reference to rebar corrosion", International Conference on Rehabilitation Restoration of Structures, Chennai, 2013

Invited Lectures by Faculty Members

- Dr. B. Hanumantha Rao delivered a lecture at IGS Bhubaneswar, on Introduction to Environmental Geotechnics on 22nd Aug, 2012
- Prof. S.C. Dutta delivered a lecture at CSIR-CGCRI, Kolkata on Seismic vulnerability of India: a few major challenges on 24th Nov, 2012
- Dr Suresh R Dash, delivered a lecture at International Workshop on Seismic Requalification of Geotechnical Structures, New Delhi on Design of Pile Foundations Using p-y Curves, on 17th Dec, 2012
- Prof. S. C. Dutta, delivered a lecture at NIT Rourkela on Seismic vulnerability of India on 2nd Jan, 2013

- Prof. S. C. Dutta, delivered a lecture at IWMSID, School of Infrastructure, IIT Bhubaneswar on Natural disasters: the greatest threat to human civilization, on 8th Feb, 2013
- Dinakar, P. delivered a lecture at International Conference on Rehabilitation Restoration of Structures, Chennai on Experimental prediction of time of cracking of concrete under electric potential with reference to rebar corrosion during 13th-16th Feb, 2013
- Dr. Sumanta Halder, delivered a lecture at Training Programme on Design, Construction and Maintenance of Rural Roads under PMGSY, IIT Bhubaneswar on Soil Characterization, Subgrade Soil Stabilization during 11th-13th Jan, 2013
- Dr. Debasis Basu, delivered a lecture at Training Programme on Design, Construction and Maintenance of Rural Roads under PMGSY, IIT Bhubaneswar on Community Participation in PMGSY Projects, during 11th -13th Jan, 2013
- Dr. U.C.Sahoo, delivered a lecture at Short-term Course on Finite Element Method of Analysis and Its Application, College of Engineering and Technology, Bhubaneswar on Application of Finite Element for Analysis of Flexible Pavements during 15th to 20th Mar, 2013
- Dr. Sumanta Halder, delivered a lecture at Short-term Course on Finite Element Method of Analysis and Its Application, College of Engineering and Technology, Bhubaneswar, on Application of Finite Element Method in Geotechnical Engineering, during 15th -20th March, 2013
- Dr. Sumanta Halder, delivered a lecture at College of Engineering and Technology, Bhubaneswar, on Advanced Geotechnical Investigation on 23rd March, 2013
- Dr. B. Hanumantha Rao, delivered a lecture at Institution of Engineers, Rural works Circle Berhampur, on Interpretation of SPT Data and its Applicability on 27th Jan, 2013
- Dr. Arindam Sarkar, delivered a lecture at Training Programme on Design, Construction and Maintenance of Rural Roads under PMGSY, IIT Bhubaneswar on Rural Road Drainage during 11th-13th Jan, 2013.

Seminars/Workshops/Conferences Organized by the Schools

- Training Programme on Design, Construction and Maintenance of Rural Roads under PMGSY during 11-13 January 2013 at IIT Bhubaneswar
- Workshop on Indian Water Management in 21st Century and Symposium on Sustainable Infrastructure Development, IWMSID 2013 during 7-9 February 2013 at IIT Bhubaneswar

Lecture by Visiting Expert

- Dr. Goloka Behari Sahoo, Assistant Project Scientist, Dept. Of Civil and Environmental Engineering and Tahoe Environmental Research Center, “Effects of Climate and Land-Use changes on water quality and quantity in Lake Tahoe (CA-NV), USA”- 01 August 2012
- Dr. Ramakrishna Bag, Cardiff University, UK, “Thermo-hydro-mechanical (THM) behaviour of MX80 bentonite” – 07 September 2012
- Prof. Abani Patra, Faculty at Dept of Mechanical and Aerospace Engineering, The State University of N.Y., Buffalo , “Probabilistic Hazard Analysis of Large Scale Mass Flow” – 16 November 2012
- Prof. B. M. Das, Dean Emeritus, California State University, Sacramento, USA “Origin of Geotechnical Engineering” – 07 March 2013

School of Mechanical Sciences

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The **School of Mechanical Sciences** provides an excellent educational experience for its students. This experience includes an emphasis on the technical, communication, teamwork and life-long learning skills in which graduate engineers need to excel at the workplace and in the society in general. Presently, the responsibility of inculcating right kind of academic growth of the school has been shouldered by nine faculty members, who accepted the challenge of running B.Tech programme, M.Tech Programme with two specializations (Machine Design and Thermal Sciences) and Ph.D programme.

The School is equipped with state of the art equipments/facilities/laboratories. Faculty members are involved in a broad range of research areas. Some of the specific areas include Computer-Aided Design and Manufacturing, Robotics and Controls, IC Engines, Multi-Phase flow, Composite Materials, Sandwich structures, Smart Materials and Structures, Fracture Mechanics, Material Science, Green Supply Chain Management, Computational Fluid Dynamics, Conjugate Heat Transfer and Acoustics.

The School is presently working in collaboration with international research groups such as Warwick Manufacturing Group (WMG), UK, and University of Massachusetts, USA.

Research Activities

School of Mechanical Sciences at IIT Bhubaneswar supports through its commitment to excellence in its teaching and research. Faculty members are involved in a broad range of research areas. Some of the specific areas include Computer-Aided Design and Manufacturing, Robotics & Controls, Turbomachinery, IC Engines, Multi-Phase flow, Turbulence, Nano-mechanics, Composite Materials, Sandwich structures, Fracture Mechanics, Material Science, Green Supply Chain Management, Productivity Studies, Computational Fluid Dynamics, MEMS & Microsysytems, Micromanufacturing and Vibro-Acoustic design.
The school is presently working in collaboration with international research groups such as Warwick Manufacturing Group (WMG), UK, and University of Massachusetts, USA. Students have the unique opportunity to get associated with organizations like CTTC, CIPET and IMMT for doing their laboratory, research, development and project related works. The school's academic vision is presently being driven by the vast experience and knowledge of a group of eminent personalities of international repute who constitute the Academic Advisory Committee of the school.

Thrust Areas

- Computer-Aided Design and Manufacturing
- Rapid Prototyping
- Robotics and Controls
- IC Engines
- Multi-Phase flow
- Nano-Mechanics
- Material Science
- Bio-Mechanics
- Experimental Fluid Mechanics
- Transport Phenomena in Material Processing
- Green Supply Chain Management
- Industrial Engineering
- Operations Management
- Computational Fluid Dynamics
- Bio-Heat Transfer
- Turbulence
- Vibration & Acoustics.
- Composite Materials
- Sandwich Structures
- Smart Materials and Structures
- Fracture Mechanics
- Condition Monitoring

New Acquisitions (Equipment)

- MACH-ZEHNDER INTERFEROMETER
- MASTER NODE, RAID STORAGE
- 400 W FIBER LASER SYSTEM
- DELL OPTIPLEX 990 MT DESKTOP
- STAR TIP
- BALL END

- TOOL SET
- JUMBO TOOL KIT
- ULTRA SONIC CLEANING SYSTEM
- DIGITAL MULTI FUNCTIONAL PRINTER
- DRAWING BOARD
- LAPTOP

New Laboratory Set Up

Hon'ble Director has agreed to the proposal for setting up of Junkyard Lab in the SMS.

Sponsored Research Projects

Project	Principal Investigator	Sponsoring Agency
Analysis and Design of Acoustic Absorber Linings for Underwater Application	Dr. Satyanarayana Panigrahi	NPOL, Kochi
CFD Modelling of 76mm Naval Gun Projectile Motion in Aid of Range Enhancement	Prof. S.K.Mahapatra	PXE, DRDO, Balasore, Odisha, India
The UK India Education and Research Initiative (UKIERI) Thematic Partnership in Low Carbon Materials Technologies, Innovation and Application (Jointly with WMG International Manufacturing Centre, University of Warwick, UK & IIT Guwahati)	Dr. Arun Kumar Pradhan	UK India Education and Research Initiative, UK
An Integrated Doctoral and Masters Programme under Joint Master"s and Split Site PhD programme of UKIERI (Indian Lead Partner- IIT Bhubaneswar & UK Lead Partner- University of Warwick).		UK India Education and Research Initiative, UK.
Impact response and damage analysis of advanced composite sandwich structures.	Dr. Mihir Kumar Pandit	Department of Science and Technology, New Delhi, India
Improved Crack and Delamination Growth Resistance Technology Development for Isotropic and FRP Composite Structural Components.	Dr. Arun Kumar Pradhan	Department of Science and Technology, New Delhi, India
Temperature Control of Phase Change Material (PCM) Based Heat Sinks under Cyclic Thermal Loading	Dr. Prasenjit Rath	SERB-DST

Consultancy Projects

Title	Name of the Investigator (s)	Sponsors
Design Modification of a Maize Sheller	Dr. Mihir Kumar Pandit	Department of Agriculture and & Food Processing (O), Odisha, India

Visits Abroad

Dr. Sathyanarayana Ayyalasomayajula	Attended the 65th Annual Meeting of the APS-DFD, San Diego during Nov 18th-20th, 2012, and presented a paper on Modeling Gravitational Settling of Inertial Particles in Turbulent Like Flow.
Dr. Akhilesh Barve	Attended the International Conference on Environmental Science and Development, Dubai, UAE, during 19-20 Jan 2013, and presented a paper on Developing a Framework for Study of GSCM Criteria in Indian Mining Industries

Visits Abroad by Faculty Members for Collaborative Research/ Training

Dr. Arun Kumar Pradhan	UKIERI Projects: • An Integrated Doctoral and Masters' Programme (Indian Lead Partner- IIT Bhubaneswar & UK Lead Partner- University of Warwick) • Thematic Partnership in Low Carbon Materials Technologies, Innovation and Application WMG, International Manufacturing Centre, University of Warwick, UK	May 01, 2013 – May 10, 2013
Dr. Mihir Kumar Pandit	UKIERI Projects: • An Integrated Doctoral and Masters' Programme (Indian Lead Partner- IIT Bhubaneswar & UK Lead Partner- University of Warwick) • Thematic Partnership in Low Carbon Materials Technologies, Innovation and Application WMG, International Manufacturing Centre, University of Warwick, UK	May 01, 2013 – May 10, 2013

Journals

- K.Muduli and **A.Barve** "Barriers to Green Practices in Health Care Waste Sector: An Indian Perspective", International Journal of Environmental Science and Development, 2012, 3, 4
- **A. K. Pradhan** and S. K. Parida "3D FE delamination induced damage analyses of adhesive bonded lap shear joints made with curved laminated FRP composite panels", Journal of Adhesion Science and Technology, 2012, DOI: 10.1080/01694243.2012.733670.
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- **S.K.Mahapatra**, S.Samantaray & A.Sarkar "Role of Prandtl Number in the Interaction Phenomenon of Surface Radiation With an Opposing Mixed Convection Within a Differential Heated Cavity", Jl. Of Heat transfer Asian Research, 2012, vol.41(4), 318-338,
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- S. P. Kar and **P. Rath** "A Phase Density Based Enthalpy Model for Laser Assisted Phase Change Process", International Communications in Heat and Mass Transfer, 2012, 40, 12-18
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- D.P. Jena, S.N. Panigrahi, Rajesh Kumar "Gear fault identification and localization using analytic wavelet transform of vibration signal" Measurement, 2013, 46(3), 1115–1124
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- **S. D. Dhandole** and S. V. Modak "Vibro-acoustic FE model updating of structural-acoustic cavities for accurate interior noise prediction", Journal of Acoustical Society of India, 2013
- S.Tripathy, P.K. Ray & **S.Sahu** "Factors Governing R&D Practices in Indian manufacturing Firms : Structural Equation Modelling", International Journal of Modelling in Operation Management, 2012, 2 (1), 45-68
- S.Tripathy, P.K. Ray & **S.Sahu**, "Interpretive Structural Modelling for Critical Success Factors of R&D Performance in Indian Manufacturing Firms", Journal of Modelling in Management, 2013, 8 (2)
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- N C Hiremath, **Sadananda Sahu**, and Manoj Kumar Tiwari "Multi objective outbound logistics network design for a manufacturing supply chain", Journal of Intelligent Manufacturing, 2012

Papers Presented at Seminars/Workshops/Conferences

- Ayyalasomayajula, S., Banerjee, S., & Warhaft, Z. "Modeling Gravitational Settling of Inertial Particles in Turbulent Like Flow" 65th Annual Meeting of the APS-DFD, San Diego, Nov 18th-20th, 2012
- K.Muduli and A. Barve "Developing a Framework for Study of GSCM Criteria in Indian Mining Industries", International Conference on Environmental Science and Development, Dubai, UAE, Elsevier, 19-20 January 2013
- P. Kumar, K. Muduli and A. Barve "To Establish Criteria for Evaluating Third Party Logistic Providers", International Conference on Best Practices in Supply Chain Management, Bhubaneswar, India, 22-23 November, 2012
- K. Muduli and A. Barve "Challenges to Waste Management Practices in Indian Health Care Sector", International Conference on Environment Science and Engineering, Bangkok, Thailand, 7th-8th April,2012,

- Vishwanath, K. Muduli, and A. Barve, “Sustainable Development Practices in Indian Mining Supply Chains” National Conference On Manufacturing And Logistics Management(NCMLM 2013), MNIT Jaipur, 8th - 9th March, 2013
- P. Siddaiah, K. Muduli, and A. Barve “Environmental Management Practices in Mining Supply Chains: An Indian Iron Ore Mining Perspective”, National Conference On Manufacturing And Logistics Management(NCMLM 2013), MNIT Jaipur, 8th - 9th March, 2013
- S. K. Parida, A. K. Pradhan and V. Hari “Adhesion failure analyses of single lap joint made with FGM”, 57th International congress of ISTAM, DIAT, Pune, 17th December, 2012
- S. K. Parida, A. K. Pradhan and V. Hari “Delamination Damage Analyses of Adhesive Bonded Lap Shear Joints in Curved Laminated FRP Composite Panels adherends”, Proceedings of 4th ICCMS, IIT Hyderabad, 11th December, 2012
- H. Jena, M. K. Pandit and A. K. Pradhan “Study the Impact Property of Laminated Bamboo-Fibre Composite Filled with Cenosphere” 4thInternational Journal Conference of Environmental Science and Development, Bangkok, Thailand, November 24-25, 2012.
- H. Jena, M. K. Pandit and A. K. Pradhan “Study on Free vibration response of laminated composite plate with cut out”, International Conference On Structural Stability And Dynamic (ICSSD-12), Malaviya National Institute of Technology, Jaipur, January 4-6, 2012
- D.P. Jena, S.N. Panigrahi “Automatic Gear Teeth Defect Localization Using Acoustic and Vibration Signal in Time Domain”, National Symposium on Acoustics (NSA – 2012), 05- 07th Dec.
- D.P. Jena, S.N. Panigrahi “Bearing and Gear Fault Diagnosis Using Adaptive Wavelet Transform of Vibration Signals”, International Conference on Advances Science and Contemporary Engineering (ICASCE 2012), Bina Nusantara University, Jakarta, Indonesia, Procedia Engineering 50, 2012, 265–274

Invited Lectures by Faculty Members

- Prof. S. Sahu delivered a lecture at NPC, Bhubaneswar on Procurement & Contract Management on February 5, 2013
- Prof. S. Sahu delivered a lecture at NALCO, Angul on Productivity & Innovation for Sustainable Development on February 13, 2013
- Professor S. Sahu was the Keynote Speaker at the National Seminar on Logistics & Supply Chain Management on February 19, 2013 at Bhubaneswar and spoke on "The Logistics & Supply Chain: Creating Competitive Advantage in a Flat World".

Workshop Organized by the School

- Short Term Course on Computational Fluid Dynamics & Heat Transfer by Prof. S.K.Mohapatra, from 14 May 2012 to 18 May 2012

Lecture by Visiting Expert

- Prof L.M. Das, IIT Delhi, “Potential of Low-emission Alternative Fuels for Transport Sector in Developing countries” – 9 November 2012

Patents

- D.P. Jena, S.N. Panigrahi. “Instrumentation for condition monitoring and operator assistance of food processors for optimal operation and current consumption” Patent Reference Number:E-2/1369/2012-KOL Application Number: 1391/KOL/2012, 2012

School of Minerals, Metallurgical and Materials Engineering

Head of School
Professor Sujit Roy

Faculty Members

Professors

Professor Madhusadan Chakraborty
Ph.D.: IIT Kharagpur, 1978
Research Areas: Solidification Processing, Scanning, Electron Microscopy, Metal Matrix Composites, T1-Based Alloy
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Research Areas: Organometalic Chemistry, Homogeneous catalysis, mono & bimetallic catalysis, C-H fictionalization, metallocenes
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Emeritus Professor

Professor Brij Kumar Dhindaw
Emeritus Professor
Ph. D.: IIT Kharagpur, India, 1971
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MGM Chair Professor

Professor N.P.H. Padmanabhan
Ph. D.: University of Mumbai, India, 1999
Research Areas: Modeling and simulation of mineral processing unit operations, Studies on development of process technologies for extracting metal/mineral values from complex ores, material balance calculations
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Assistant Professors

Dr. Animesh Mandal
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Research Areas: Alloy development for automotive applications, In-situ Metal Matrix Composites, Semi-solid processing, Structure-property correlation
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Dr. Kisor Sahu
Ph.D.: Kyoto University, 2006
Research Areas: Modeling & Simulation, Structural & Magnetic frustration of materials, Synchrotron and Neutron diffraction, 3-D Atom probe (LEAP), Metallic glasses, process modeling etc
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Dr. Partha Sarathi De
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Research Areas: Structure-Property-Processing correlations in metals, High cycle fatigue and fracture in metals, Friction stir welding /processing
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Dr. Soobhankar Pati
Ph.D: Boston University, USA, 2010
Research Areas: Extraction and Recycling of Metals, Electrochemical and Photo-electrochemical synthesis of gases, Fuels Cells, Batteries, Inert Anodes for Metal Production
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The **School of Minerals, Metallurgical and Materials Engineering** (SMMME) at IIT Bhubaneswar, established in 2012, is a unique initiative where minerals, metals and materials have come into a collaborative existence with a mission to be locally relevant and globally competitive. Located in the state of Odisha, one of the most mineral rich states of India, the school is aware of the fact that the maximum economic benefit from a mineral could be harvested via a processing route where the in-situ mineral is economically transformed to its final commercial product, leading to ultimate societal upliftment. The

school with faculty members from a diverse background of minerals, metals and materials is gearing up to achieve this end.

Currently, the focus of school activities is multi-directional with an emphasis on both research and education. Even at its incipient stage, the school has drawn a road-map to progress via partnership. Accomplishments in this direction include: (a) entering into a MoU with the Institute of Minerals and Materials Technology (IMMT) at Bhubaneswar to foster R&D and teaching by pooling of the individual inner resource; (b) setting up a collaboration with Warwick Manufacturing Group (WMG) at Warwick University, UK allowing student and faculty exchange; (c) receiving a generous endowment of 30 million INR from MGM Group (a leading mining and steel company in Odisha) to establish a permanent Chair Professorship. Further collaborative research and academic ventures with universities in Europe and USA are also in the pipeline. Currently, the school is offering Masters Program in Materials Science and Engineering and Ph.D. Program.

Research Activities

Bio-medical materials, Nano materials, Metal Matrix Composites, Alloy development, Modelling and simulation of mineral processing unit operations, Development of technologies for metal/mineral recovery from complex ores, Semi-solid processing, High cycle fatigue and fracture in metals, Friction stir welding/processing, Modeling & simulation of Materials/Metallic glasses, High purity alumina for optical applications, Process modelling, Structural & magnetic frustration of materials, Synchrotron and Neutron diffraction, 3-D Atom probe (LEAP), Green Extraction and Recycling of Metals, Inert Anodes for Metal Production, Fuels Cells, Batteries, Rare earth extraction and processing

New Laboratories

- High Temperature Processing Laboratory
- Metallographic sample preparation Laboratory
- Microscopy Laboratory
- Thermal analysis Laboratory
- Machine shop
- Mechanical testing Laboratory
- Joining Laboratory
- Amorphous materials processing Laboratory
- Mechanical metallurgy Laboratory
- Powder processing Laboratory
- Minerals processing Laboratory
- Extractive Metallurgy Laboratory
- Modelling and Simulation Laboratory

Sponsored Research Projects

Project Title	Principal Investigator	Sponsoring Agency
Modification of Low Modules, titanium Alloys by addition of interstitial solutes and/or ceramic materials for bio medical applications	Prof. M. Chakraborty	Defence Research and Development Organisation, India
UKIERI Thematic Partnership in Low Carbon Materials Technologies, Innovation and Application	Prof. M. Chakraborty	The UK India Education and Research Initiative, UK
Novel hypereutectic Al-Si-Mg alloys for automotive application	Dr. A. Mandal	Department of Science and Technology, India

Consultancy Projects

Project Title	Investigators	Sponsoring Agency
Design Modification of a Maize Sheller	Dr. A.K. Pradhan, Dr. M.K. Pandit, Dr. A. Mandal	Department of Agriculture and Food Processing (O), Odisha, India

Achievements

- Prof. M. Chakraborty, Director, IIT Bhubaneswar has been awarded ET Now National Education Leadership Award in recognition of leadership & development of IIT Bhubaneswar and creation of a strong academic & industry interface for IIT Bhubaneswar, March 2013
- Dr. S. Pati has received the "Young Professional Leader Award" from The Minerals, Metals and Materials Society (TMS), San Antonio, USA, March 2013
- Dr. K. K. Sahu's research work featured in "International Innovation", October 2012

Visit Abroad

- Prof. M. Chakraborty and Dr. A. Mandal visited the Warwick Manufacturing Group, University of Warwick, UK, under UKIERI project, "Low Carbon Material Technologies Innovation and Applications" from March 3-9, 2013
- Dr. P.S. De visited the Warwick Manufacturing Group, University of Warwick, UK, under UKIERI project, "Joint masters and split site Ph.D. programme" from March 3-9, 2013
- Dr. S. Pati organized the "Energy Technologies Symposium" at The Minerals, Metals and Materials Society (TMS), San Antonio, USA from March 2-9, 2013
- Dr. A. Mandal attended Summer Workshop on "UKIERI Thematic Partnership in Low Carbon Materials Technologies, Innovation and Application" at University of Warwick, UK from July 7-14, 2012

Patents

- Conductor of high electrical current at high temperature in oxygen and liquid metal environment, A. Powell, S. Pati , S. Derezinski, USA, Patent No. WO2013033536, 2012
- Apparatus and method for condensing metal vapour, A. Powell, S. Pati, J. Douglas, USA, Patent No. WO2013009630, 2012
- Liquid anodes and fuels for production of metals from their oxides by molten salt electrolysis with a solid electrolyte, A. Powell, S. Pati, U.B. Pal, USA, Patent No. WO2013028798, 2012

Journals

- Dry sliding wear behaviour of Mg-Si alloys, K.K. Ajith Kumar, U.T.S. Pillai, B.C. Pai, **M. Chakraborty,** 2013, Wear 303, 56-64
- Low-Convection-Cooling Slope Cast AlSi7Mg Alloy: A Rheological Perspective, R. Ritwik, A.K. Prasada Rao, and **B.K. Dhindaw**, Journal of Materials Engineering and Performance, ASM, USA, 2013, DOI: 10.1007/s11665-013-0530-2
- Corrosion Behavior of a Mg Alloy AE42 Subjected to Friction Stir Processing, H.S. Arora, H. Singh, and **B.K. Dhindaw**, Corrosion, 2013, 69, No.2, 122-135
- High speed Twin Roll Casting of Aluminum-Copper Strips Having Layered Structure, S. Sahoo, Amitesh Kumar, **B. K. Dhindaw** and S. Ghosh, Materials and Manufacturing Processes, 2013, 28, 61-65
- Processing and microstructure of Magnesium in-situ composite with Titanium and Boron based reinforcement, K.K. Ajith Kumar, K. Raghukanadan, U.T.S. Pillai, B.C. Pai and **M. Chakraborty**, 2012, Materials Science Forum, 710, 389-394
- Tribological behaviour of Mg-Mg_2Si in-situ composite, K.K. Ajith Kumar, U.T.S. Pillai, B.C. Pai and **M. Chakraborty**, 2012, Materials Science Forum, 710, 401-406
- Influence of in situ TiB reinforcements and role of heat treatment on mechanical properties and biocompatibility of β Ti-alloys, P. Majumdar, S.B. Singh, S. Dhara, **M. Chakraborty,** 2012, Journal of the Mechanical behavior of biomedical materials, 10, 1-12
- Modeling and Experimental Validation of Rapid Cooling and Solidification during High-Speed Twin-Roll Strip Casting of Al-33 wt pct Cu, S. Sahoo, Amitesh Kumar, **B. K. Dhindaw** and Sudipto Ghosh, Metallurgical and Materials Transactions B, 2012, 1-10

- Effect of Microstructural Evolution on the Properties of Friction Stir Processed Al 6061 Alloy Under Different Cooling Conditions, H.S. Arora, H. Singha, **B. K. Dhindaw**, and H.S. Grewal, Advanced Materials Research, 2013, 620, 77-81
- Simulation of Cooling of Liquid Metal in an Inclined Slope to Predict the Condition for Semi Solid Forming and Its Experimental Validation, **B.K. Dhindaw,** M. Kumar and A. Kumar, Transactions of the Indian Institute of Metals, December, 2012, 65, Issue 6, 581-586
- Some Investigations on Friction Stir Processed Zone of AZ91 Alloy, H.S. Arora, H. Singh, **B.K. Dhindaw,** H.S. Grewal, Transactions of the Indian Institute of Metals, December, 2012, 65, Issue 2, 735-740
- Detection of hidden structures for arbitrary scales in complex physical systems, P. Ronhovde, S. Chakrabarty, D. Hu, M. Sahu, **K. K. Sahu**, K. F. Kelton, N. A. Mauro and Z. Nussinov, Scientific Reports, 2012, Vol.2, 329
- **M. Chakraborty**, A. Mandal, G.S. Vinod Kumar, K.R. Ravi, I.G. Siddhalingeshwar, R. Mitra, B.S. Murty, Recent developments in Aluminium alloy reinforced Titanium diboride in-situ composites, Indian Foundry Journal, 2012, 58, 29-34

Papers presented at Seminars/Workshops/Conferences

- S. Pati, Energy Technologies and CO_2 Management Symposium, The Minerals, Metals and Materials Society (TMS) Annual Meeting, San Antonio, USA, 2013
- S. Aich, B. Geetha Priyadarshini, M. Gupta, S. Ghosh, M. Chakraborty, Formation of crystalline and amorphous phases during deposition of Ni_xTi_{1-x}, thin films on silicon substrates interpretation of experimental results using molecular dynamics simulations, The Minerals, Metals and Materials Society (TMS) Annual Meeting, Orlando, USA, 1 , 633-640, 2012
- Kachem Anand Rao, N.P.H. Padmanabhan and A.K. Suri, Kinetic model coupling particle size distribution for alkaline leaching of uranium, XXVI International Mineral Processing Congress, New Delhi, Proceedings of IMPC, Paper No. 477, 2356-2369, 2012

Lectures by Visitors

A two day seminar series on “Deformation and Mechanical Properties of Amorphous Materials” was organised by the School on August 21-22, 2012. Dr. David Klaumünzer from ETH Zurich, Switzerland presented his research work.

Seminars/Workshops/Conferences organized by the School

The Fifth International Conference on Solidification Science and Processing (ICSSP5) was jointly organized by School of Minerals, Metallurgical and Materials Engineering and School of Mechanical Sciences from 19-22 November 2012. The conference was attended by 120 delegates from India and abroad. The Conference had delegates from fifteen nations.

Delegates at ICSSP5, IIT Bhubaneswar, November 19-22, 2012

Industrial visits

The School organised two industrial visits to give the students a firsthand experience of rare-earth and stainless steel production starting from the ore to the finished product. During these visits faculty members also had fruitful discussion regarding future research collaboration between IIT Bhubaneswar and industries.

- Jindal Stainless Limited (JSL), Kalinganagar, Odisha, March 23, 2013
- Orissa Sands Complex (OSCOM) Plant of Indian Rare Earths Limited, Chhatrapur, Odisha, October 12, 2012

Visit to Jindal Stainless Limited, Kalinganagar, Odisha by SMMME

Central Library

The Central Library plays a vital role in furthering the academic and research mission of IIT Bhubaneswar and facilitates creation and dissemination of knowledge. The range and quality of services offered by the library are comparable to any modern libraries in India of International standard. Soon after the formal appearance of the Central Library in the year 2009, immediate emphasis was given for a good collection development on Text Books and Reference Books. Besides holding an excellent print collection of over 7600 volumes of books, it also provides access to popular magazines, selected journals, theses, reports, e-books, e-journals and online databases in Engineering & Technology, Sciences, Humanities, Social Sciences and Management. The library made a significant progress during the year the year 2012-13 by empanelling 18 vendors through bidding process to give a boost to the procurement process.

Apart from the procurement on print books, the Central Library achieved phenomenal progress in the subscription of e-resources by increasing its budget from 1.2 crore to 5.0 crores. During the year it added 15 more new e-resources (full text as well as bibliographical databases) to its digital collection making "24 x 7 Library" in real scene on institute-wide network.

Library Collection:

The total collection of library as on March 2013 stands as follows:

- Printed Books (Text as well as Reference Books): 7616 Nos.
- Journals & Magazines: 24 Nos.
- Daily Newspapers: 12 Nos.
- Full text online databases: 21 Nos.
- Bibliographical e-databases: 04 Nos
- CD/Mutli-media database: 01 No.

Digital Library:

Central Library provides web-based "24X7" access to its resources at (http://www.iitbbs.ac.in/ > *Central Library*). The library is a part of the institute-wide network and has adequate computing infrastructure to cater to the needs of the users. The systems in the reading area continue to attract users to have seamless access to its IP authenticated electronic resources. The Central Library provides web-based access to over 25 databases 24 x 7 on institute-wide network as per the following details:

Full Text Online-DATABASES:

- American Chemical Society http://pubs.acs.org/
- American Institute of Physics http://journals.aip.org/
- American Physical Society http://publish.aps.org/browse.html
- American Society of Civil Engineers http://ascelibrary.org/
- ASME http://www.asmedl.org/
- Annual Reviews Journals http://arjournals.annualreviews.org
- Cell Press Science Journals http://www.sciencedirect.com/science/journal
- Geo Science World http://www.geoscienceworld.org
- IEEE Xplore Digital Library http://ieeexplore.ieee.org/Xplore/guesthome.jsp?reload=true
- IOP Science Extra http://iopscience.iop.org
- NATURE http://www.nature.com/
- Optical Society of America http://www.opticsinfobase.org/
- Project Muse http://muse.jhu.edu/browse/
- Proquest Dissertation & Theses http://search.proquest.com/
- Royal Society of Chemistry http://www.rsc.org/
- Sage EMS Collection http://online.sagepub.com/browse/by/discipline
- Science Direct Option-1 http://www.sciencedirect.com/

- SIAM Journals http://epubs.siam.org/
- Taylor & Francis Online (Sc. & Tech) http://www.tandfonline.com/
- Wiley Online http://onlinelibrary.wiley.com
- WIPS Global Advanced http://adv.wipsglobal.com

BIBLIOGRAPHIC E-DATABASES:

- SCIFINDER Scholar (web enabled version) http://scifinder.cas.org
- MATHSCINET http://www.ams.org/mathscinet/
- SCOPUS http://www.scopus.com/home.url
- Web of Science (SCIE) http://www.webofknowledge.com

Library Services:

Central Library is committed to help users to make full use of library resources and services. It provides necessary assistance to users in locating information or document of their choice. The Library loaned 6977 books and other documents to its members during the year. In addition to its existing 628 members, around 97 numbers of new members enrolled including students, research scholars, faculty members, and administrative staff during the year and used the library. The OPAC (Online Public Access Catalogue) provided from the library home page encourages users to avail the services virtually. The library continues to alert the users about the latest information of their interest by providing following services:

- Fully automated Circulation Services through VTLS
- OPAC with Parton's transaction status
- Online Search and Online Book Reservation
- Photocopying service
- New Arrival Display & alert services
- Reserve Collection in reading area
- Special Collection for Scheduled Castes & Scheduled Tribes
- Rajbhasha Collection
- Display of Scholarship and fellowship information
- Display of Forthcoming conferences, other events, employment opportunities, and prospectus of foreign universities
- Announcements on Orientation Programmes

Forthcoming Plans/Services:

- Implementation of RFID for better management and future growth of Library
- Opening up a state of the art "Digital Library" with 30 systems for enhancing usage of e-resources.

Career Development Cell

Students Placement for 2012-13

- 25 esteem Companies visited during the campus placement year 2012-13. Some of them are Finisar, Tata Steel, Texas Instrumentation, BPCL, IOCL, HPCL, ONGC, DRDO, United Health Group, Flipkart, Altair, SAMSUNG, L&T, TEOCO, TCE, INFOSYS, COGNIZANT, TRICON Infotech, TCS, Affine Analytics etc.
- From the companies we received 98 offers.
- The average salary (CTC) package for the graduating B.Tech. is INR 7.17 L PA
- Highest CTC offered was from ONGC (PSU) of INR 11.2 LPA
- Out of 107 students from 2009 batch 98 students were eligible for the placement process.
- Out of 98 students approximately 90% are placed till date 22.04.2013. In addition 6 students have qualified but placed in wait-list for 3 different organizations. The results are expected shortly.
- There was an interaction meeting between final year students and CDC team on 16-10-2012 (Tuesday) at 5.45 PM in the auditorium, Samantapuri campus. With the honourable Director Prof. M. Chakraborty & Prof. Srikanth Sundararajan present to address various issues.
- Prof. Ravi Kumar Bhaskaran, Honorary Professor adviser for the Career Development Cell, IIT Bhubaneswar visited IIT Bhubaneswar during 29-31, January 2013. There was an interaction meeting with all third year and final year students, CDC team on 30-01-2013 (Wednesday) at 5.30 PM in the auditorium, Samantapuri campus. Prof. Bhaskaran delivered a talk on the placement activities in general and gave advise/tips to the students. The honorable director Prof. M. Chakraborty was also present.
- Dr. T. V. S. Sekhar, Professor in Charge, Career Development Cell Participated in two meetings of Professors-in Charge of all IITs of Career and Placement Cell on September 22, 2012 held at IIT Mandi and 16-17 February 2013 held at IIT Kharagpur.

Internships

Most of the 3rd year B. Tech students got summer internships in reputed organizations abroad and in India. From Mechanical Sciences 13 students received offers from Foreign Universities/organizations like U Mass D (USA), WMG (UK), Finisar (Malaysia), KIMS (South Korea), Harbin Engineering College (China), MINGCHI (Taiwan), VU University (Holand), Fraun-Hofer (Germany). Other students got offers from reputed organizations in India like TCS (R&D), Tata Steel, Tata Motors, DRDL etc.

From Electrical Sciences 16 students got offers from foreign universities/organizations like U Mass D (USA), WMG (UK), Tsukuba University (Japan), Int. Atomic Energy Agency (Austria), Philips (NXP), University of Malaysia, NUS Singapore, IO state University (USA),Trinity College (Ireland), University of Alberta, HITACHI Research Lab (Japan), Institute of Plasma Physics (Belgium) and others got it in India like Tata Motors, IISc, IIT Delhi, IIT Kharagpur, DRDO etc.

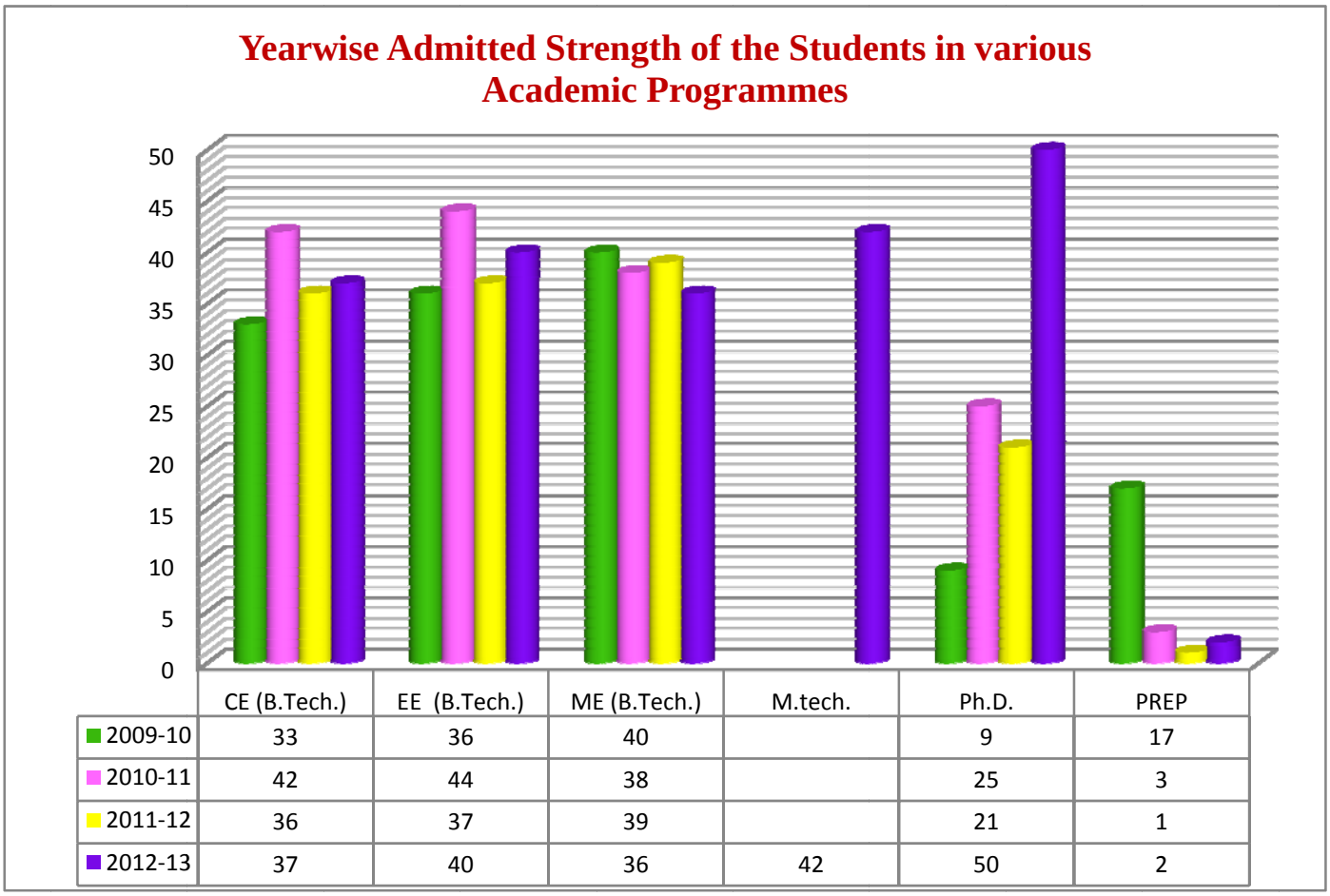
From School of Infra structure 7 students obtained offers from foreign universities/organizations for internships. Mubeena Fatima was shortlisted for the prestigious S.N. Bose scholars program (Jointly organized by The **Science and Engineering Research Board**, Department of Science and Technology (DST), Govt. of India, the **Indo-U.S. Science and Technology Forum** (IUSSTF) and the **University of Wisconsin-Madison**) to work at University of Wisconsin (USA). Others received foreign internships from U Mass D (USA), Tohoku University (Japan), Rajamangala (Thailand), ECP (France), Wonkwang (South Korea), Hokkaido University (Japan). The remaining students got internships from Indian reputed organizations like ALCON GOA, L&T Jajpur, BARC Mumbai, Hindustan Colas etc.

ACADEMIC INFORMATION FOR 2012 - 13

Programmes Offered:

School of Basic Sciences: Ph.D.
School of Earth, Ocean and Climate Sciences: Joint M. Tech.- Ph.D./ Ph.D.
School of Electrical Sciences: B.Tech. in Electrical Engineering, Joint M. Tech.- Ph.D. and Ph.D.
School of Infrastructure: B.Tech. in Civil Engineering , Joint M. Tech.- Ph.D. and Ph.D.
School of Mechanical Sciences: B.Tech. in Mechanical Engineering, Joint M. Tech.- Ph.D. and Ph.D.
School of Minerals, Metallurgical and Materials Engineering: Joint M. Tech. - Ph.D. and Ph.D.
School of Humanities, Social Sciences and Management: Ph.D.

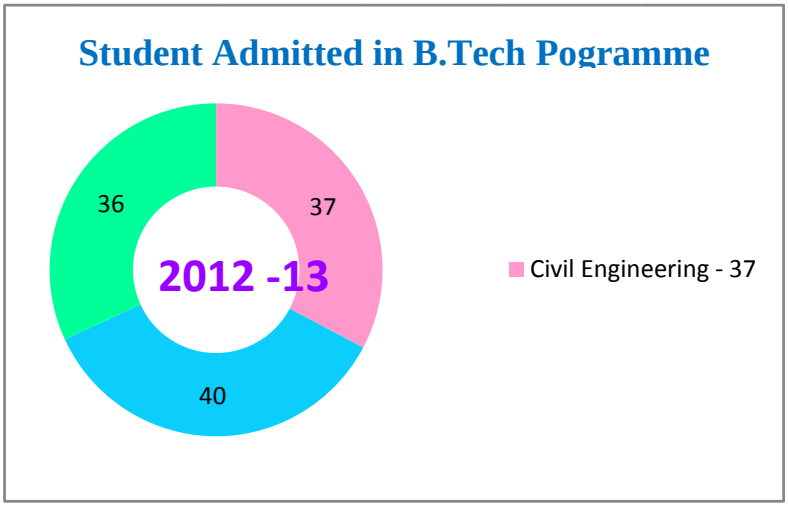
Graphical Representation of different Academic Programmes up to 2012-13
(Based on admission records)

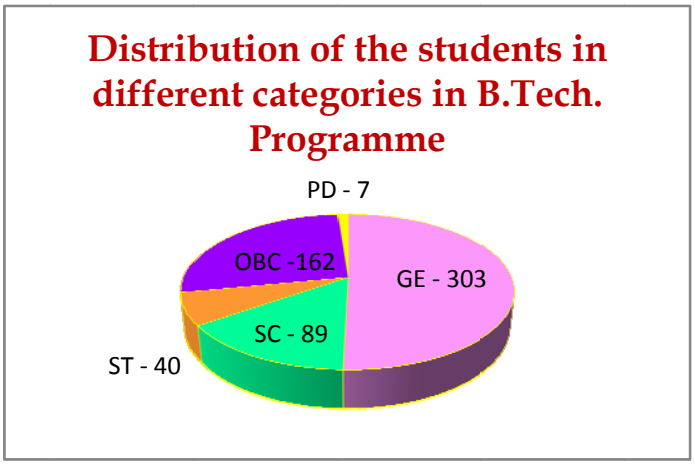


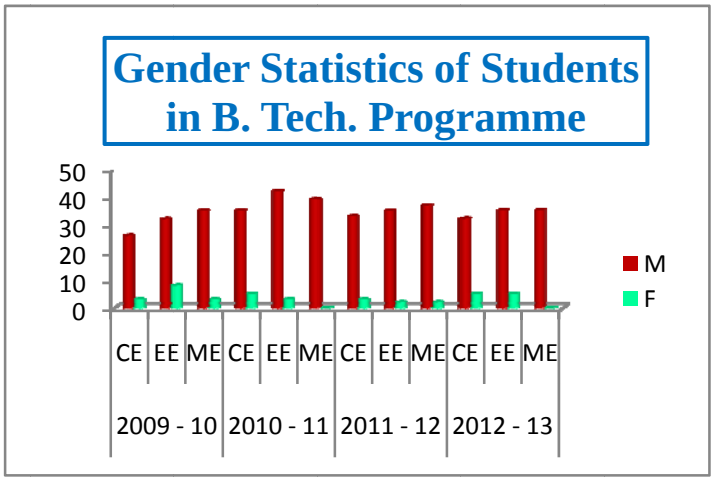
	CE (B.Tech.)	EE (B.Tech.)	ME (B.Tech.)	M.tech.	Ph.D.	PREP
2009-10	33	36	40		9	17
2010-11	42	44	38		25	3
2011-12	36	37	39		21	1
2012-13	37	40	36	42	50	2

*** Out of nine (9) Ph.D. scholars, four (4) scholars have already submitted their thesis.**

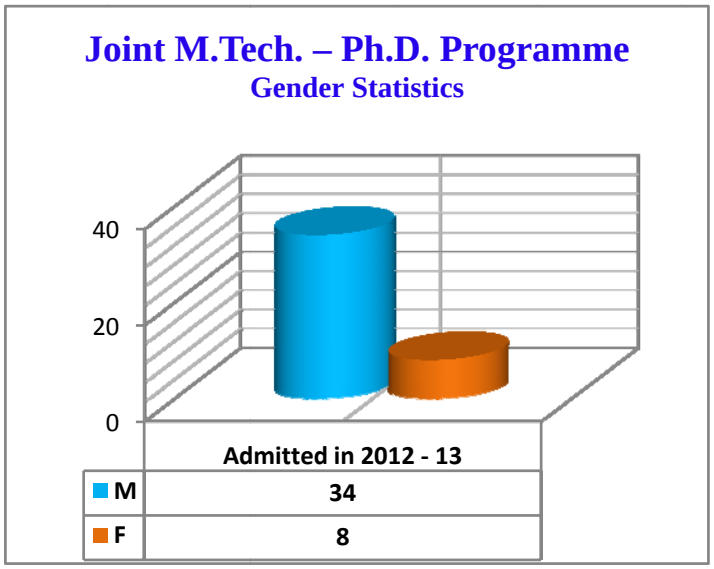
B.Tech. Programme

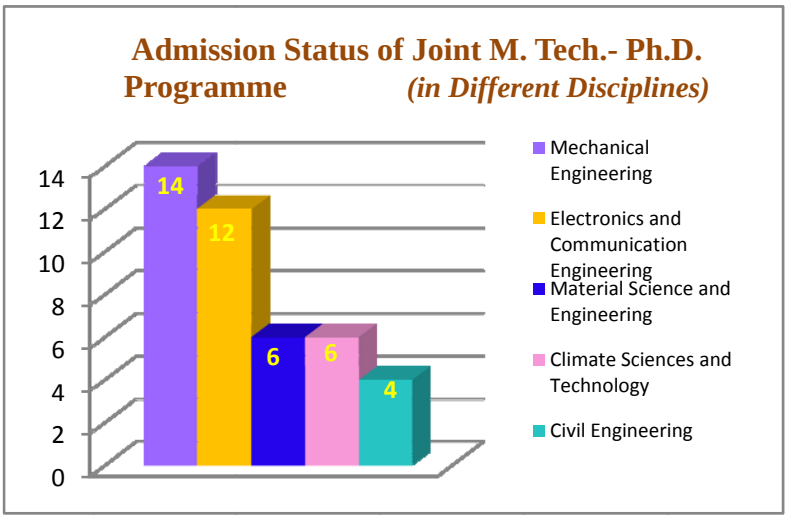


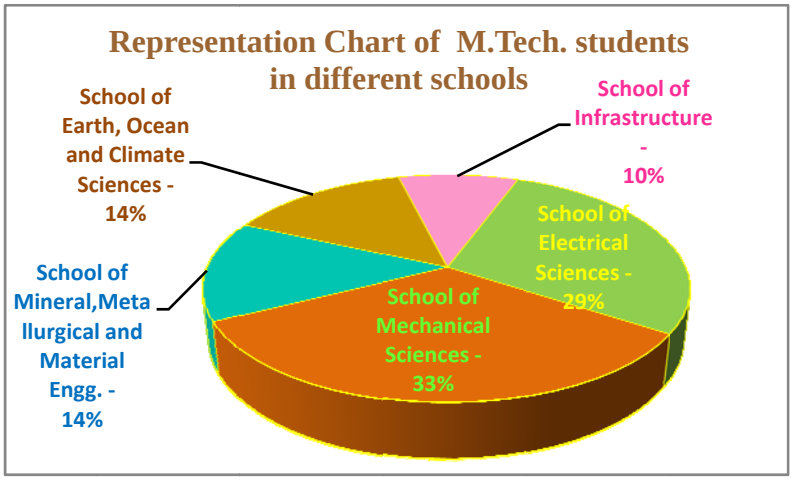


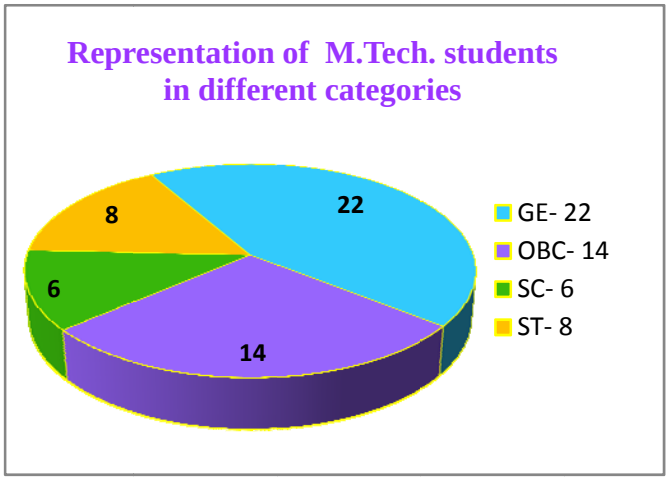


Joint M.Tech. – Ph.D. Programme

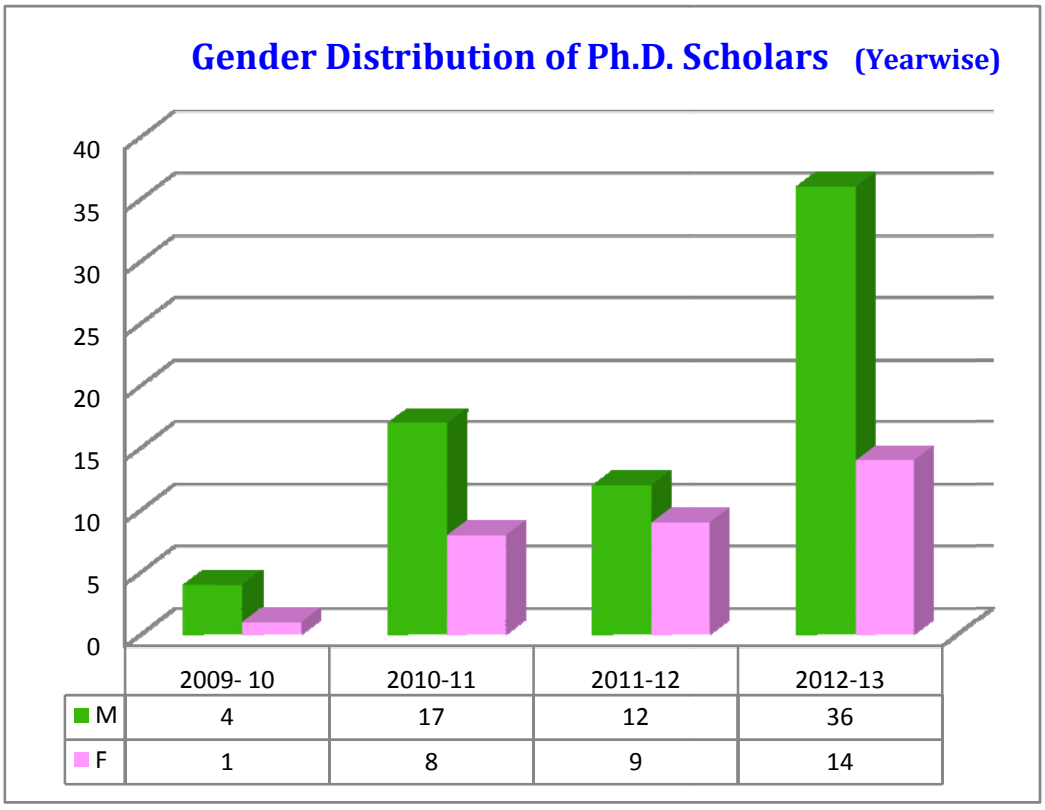


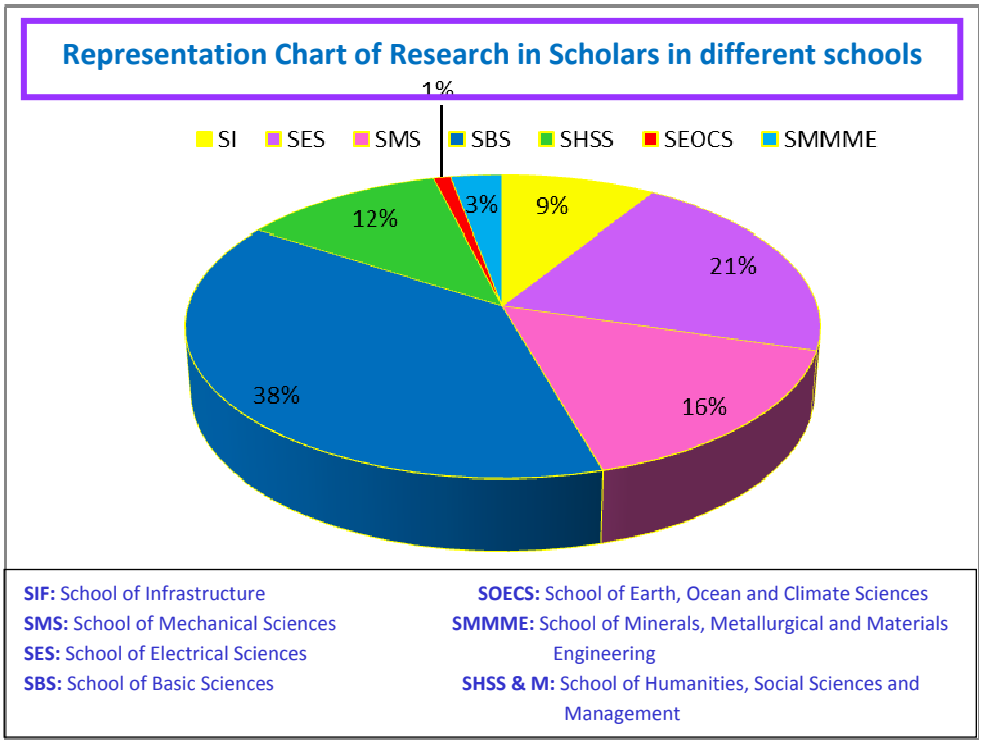




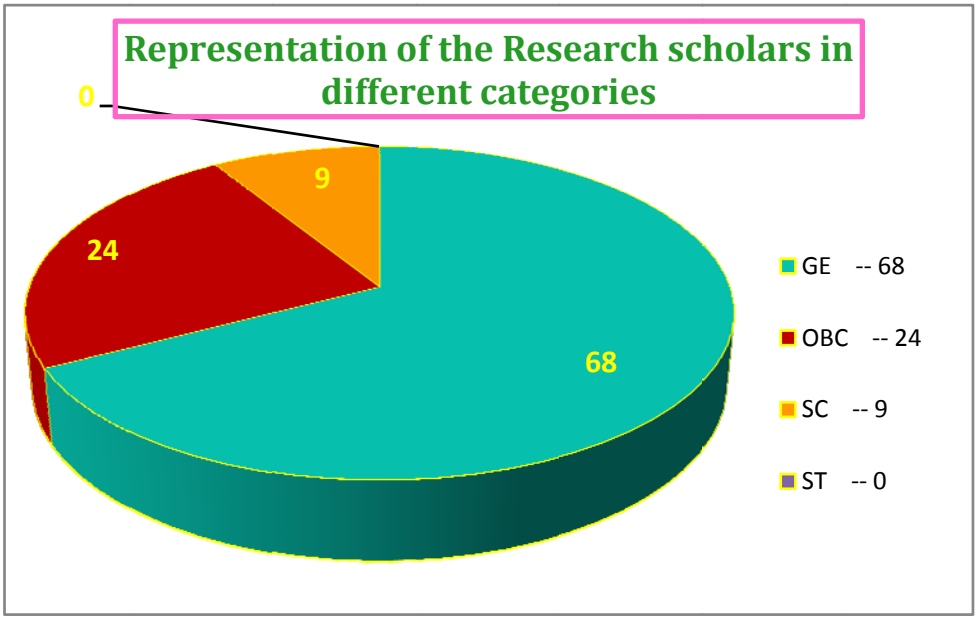


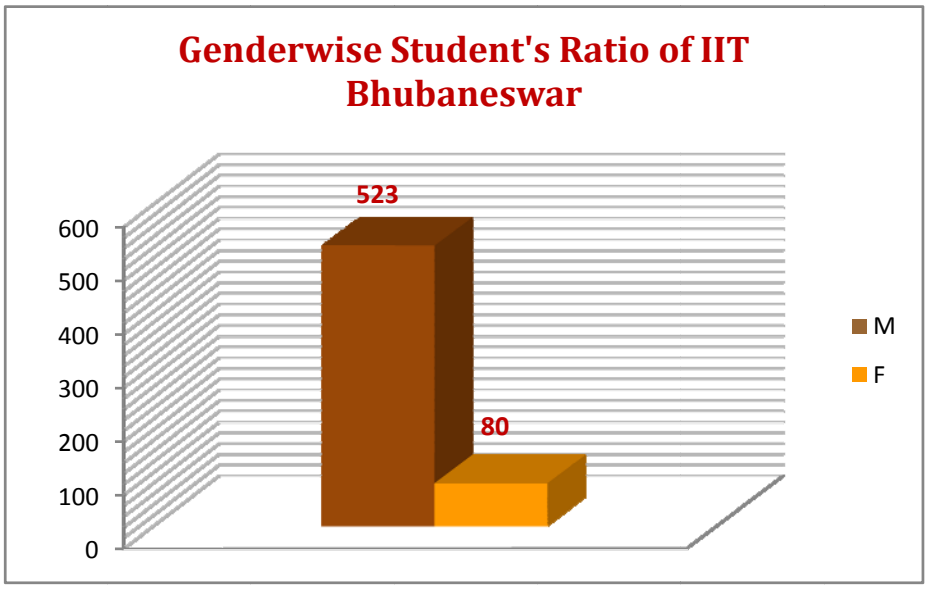
Ph.D. Programme





SIF: School of Infrastructure
SMS: School of Mechanical Sciences
SES: School of Electrical Sciences
SBS: School of Basic Sciences
SOECS: School of Earth, Ocean and Climate Sciences
SMMME: School of Minerals, Metallurgical and Materials Engineering
SHSS & M: School of Humanities, Social Sciences and Management





Scholarships

During 2012-13, 115 students have been awarded Merit-cum-Means (MCM) scholarships, along with tuition fee waiver. A sum of Rs. 1000/- per month is given as scholarship while the amount of free studentship is Rs. 5000/- per month subject to a maximum of Rs. 25000/-. 41 other students have been awarded tuition fee waiver.

List of Scholarships received by Students of IIT Bhubaneswar in 2012 -13

Name of Scholarship	2012 -13 (Batch)	2011 -12 (Batch)	2010-11 (Batch)	2009-10 (Batch)
MCM Scholarship 2012-13	28	28	32	27
Free Studentship 2012-13	11	11	11	8
CSSS for Top Class Education (SC Students)	4	7	6	7
CSSS for Top Class Education (ST Students)	3	1	1	
Financial and other assistance for ST students	2	1	6	
NCERT Scholarship		2		
Scholarship (MECON Ltd.)				1
Rajashree Shahu Mararaj Merit Scholarship			2	
District Welfare (Bihar)		2		
State Bank Scholarship	1	2		
Railway Scholarship		2	2	
Prime Minister Scholarship		1		1
MHRD (CSSS for Colleges and Universities)			1	4
KVPY Scholarship		1		
Steel Plant Scholarship	1			
BSNL Scholarship			1	
Telecom Scholarship				1
Sail Scholarship				
Chief Minister's Scholarship (Bihar)			1	
Total	**50**	**58**	**63**	**49**

DISTINGUISHED VISITORS

- Shri Baijayant Panda, Hon'ble Member of Parliament and Member Consultative Committee, Ministry of HRD visited the Institute on its 5th Institute Day celebration on 22nd July 2012 and graced the occasion as the Chief Guest.
- Padma Vibhushan Dr. Anil Kakodkar, eminent Nuclear Scientist and former Chairman of Atomic Energy Commission attended the First Annual Convocation of the Institute as Chief Guest on 31st August 2012. He delivered the Convocation Address.
- Shri R. Gopal Krishnan, Executive Director Tata Sons Limited visited IIT BBS on its 5th Foundation Day celebration on 12th February 2013 and delivered a talk.
- Professor U.R.Rao, Internationally Renowned Space Scientist, Former Chairman ISRO and Chairman of the Governing Council of the Physical Research Laboratory, Ahmedabad visited the Institute on the occasion of 3rd Research Scholar Day on 28th February 2013 and delivered a lecture on National Science Day.

INSTITUTE LECTURES

- 03.08.2012 - Smt Shobhana Radhakarishna from Ministry of Rural Development, Government of India delivered a lecture on "'Ethical Leadership and Values in Management Based on the Ideology of Mahatma Gandhi".

- 17.08.2012 - Mr. Ravi Naidu from Vivekananda Kendra Kanyakumari delivered a lecture on "3S: Students, Success & Stress"

- 07.09.2012 - Prof K. L. Chopra, Former Director, IIT Kharagpur delivered a lecture on "Nurturing Innovations and Entrepreneurship in Academic Institutions".

- 15.11.2012 - Prof. Ravi Ravindran from Ryerslon University, Canada delivered the "INAE Silver Jubilee Distinguished Lecture"

- 11.01.2013 - Prof. Debjyoti Banerjee, Mechanical Engineering Deptt, Texas A&M University, USA delivered a lecture on "Nano-devices for Enhanced Thermal Energy Storage, Cooling and Sensing".

- 28.02.2013 - Prof. U. R. Rao, Former Chairman, Indian Space Research Organization delivered the Delivered the National Science Day Lecture.

- 22.03.2013 - Shri A.K.Das, Dy. Project Director, on behalf of the Louis Berger Group of America, Monorail Project in Mumbai delivered the lecture on "Why Mass Transit System (Monorail, Metro Rail)".

STUDENT ACTIVITIES

SOCIO CULTURAL SOCIETY

15th August, Independence Day

Independence Day celebration: Music Production by Music Society including songs by Muhammad Ali, Haritha, Sravani and other Music Society members.

Dance Production by Dance Society members on tunes of patriotic songs of Bollywood movies. Literary Society gave a little introduction session which had various fun questions for the students in audience to participate. The Dramatics Society performed a street play on importance of Independence Day which was enjoyed a lot by the crowd.

24th August, Anchor Hunt

The Literary Society conducted Anchor Hunt for selecting anchors for institute events. The event was judged by Ms. Papia and Nitin George.

7th September, Dance Workshop

Dance Workshop was conducted by Dance Society in Institute Auditorium with a participation of around sixty students. The workshop involved teaching basic and simple dance to the tunes of Bollywood and Tollywood songs.

12th September, Alma Fiesta Theme Release

The theme of Alma Fiesta; Dawn of the Pirates was released in this event which also had an introductory session for 1st years bringing them more close to the socio-cultural festival of IIT Bhubaneswar; Alma Fiesta.

12th October, Kolosseum 2012

The Dance Society participated in Group dance competition at Kolosseum 2012, cultural fest of KIIT School of Management and won 2nd prize. Abhinav Jha, a member of Fine Arts Society got 1st prize for shirt painting.

18th to 22nd October, Rendezvous 2012

The Dramatics Society participated in Stage play and Street play event and won critical acclaim ahead of all the IITs that participated except IIT Kanpur. The Cinematic Society participated in Documentary competition with their famous work 'Turn the Page' and won laurels from one and all and the Third place in the competition.

9th November, Music Production

The Music Society had Music Production in Institute Auditorium with its members giving the students a wonderful evening of great music from Bollywood to Tollywood to Metal to Pop.

12th November, Diwali Celebration

On the eve of Diwali the whole area around Samantapuri Campus including auditorium was lit with diyas by the Fine Arts Society. The cultural events as part of the celebration included a Fun History quiz by Literary Society, Bollywood songs and opening prayers by Music Society, moving to the tunes were Dance Society members with a rocking performance and to add icing to the cake we had another educative Street play by Dramatics Society. The evening ended with a DJ hour in which all students of college danced and enjoyed the evening to the fullest.

13th November, Diwali

The day of Diwali for students of IIT Bhubaneswar was marked by Rangoli making Competition conducted by Fine Arts Society. In the evening the whole Debashram area was lit up by Fine Arts Society. They also made the huge 10 feet illumination which was evening's attraction.

11th to 13th January, Alma Fiesta

The socio cultural fest of IIT Bhubaneswar, Alma Fiesta commenced with great pop and show. It had bands like Indian Ocean and Ganesh Talkies performing and stars like Pandit Bhajan Sapori and writer Ira Trivedi blessing the occasion and thus the fest has gained national status and is talked about in almost every kind of social media available. The members of Dance Society, Dramatics Society, Music Society and Literary Society took part in various events and won prizes.

23rd to 26th January, Spring Fest

Spring Fest, the socio cultural fest of IIT Kharagpur had students from our college visiting for various competitions. The Music Society participated in Lake Side Dreams competition and secured 5th position among the 21 teams that participated. While Athul P, member of Literary Society won in Twisted History and Crossfire bringing laurels to our college. The Cinematic Society's documentary won third prize.

SPECIAL

Cinematic society participated in the Competition organised by an organisation called Aaina and won special jury award for the same and got selected to be featured in the national film festival in Goa.

TECHNICAL SOCIETY

Entrepreneurship Cell (E – Cell)

The activities conducted during the year are as follows:

1 An online treasure hunt (E-Mania) conducted over a period of one week as a prelude for E-Week through our face book page. The event received huge response from the students of IIT-BBS.

2 Students of E-Cell had a meeting with a representative from FICCI. The discussion was centered on the role FICCI plays in helping entrepreneurs and how FICCI can possibly associate with IIT Bhubaneswar.

3 **Collaboration with NEN**

- An "Idea Pool" competition was organized for all the students of IIT-BBS. 12 entries were selected to be presented in the final round. All the 12 participants were given valuable feedback of the judges and suggestions for improving their idea.
- A NEN introduction session (3 hrs) was held for the members for E-Cell. The session introduced NEN, the role NEN plays in the current educational setup and how NEN helps student entrepreneurs and entrepreneur clubs across the country.
- An "Ideation to Business Plan" workshop was conducted for the students of IIT-BBS. The resource person was Mr. Raj Bhatt (Chief Mentor, NEN) on 7th April 2013. This was conducted in sequel to "Idea Pool" competition to help students with ideas and convert them to business plans. This workshop saw a huge turnout from the students of IITBBS.
- Also E-Cell members of IITBBS participated in various competitions held in the city like "Tata First Dot" and attended various entrepreneurial meets held in the city such as 'Villgro's - Unconventional' Entrepreneurship meet.

4 **Engineer's day Celebration**

Engineer's day was celebrated on September 15th 2012, commemorating the birthday of Sir Mokshagundam Vishveshwariah, The event started with a short introduction to the life and work of Sir Vishveshwariah, followed by a slideshow on achievements of the faculties and research scholars of IIT Bhubaneswar in the field of innovation and technology in recent years. The event ended on a high note with a quiz session on engineering marvels of India.

SPORTS SOCIETY

48th Inter IIT Sports meet

The 48th Inter IIT Sports meet was held at IIT Roorkee pitching the talents from 15 IITs against each other. The prestigious event took place from 17th-24th December 2012 keeping up the sportive spirit among all the IITs . IIT Bhubaneswar is one among the 15 IITs which took part in the meet. Being a budding Institute IIT Bhubaneswar saw a good success at the meet making its presence felt. The highlights of the meet are as follows:

March past:

IIT Bhubaneswar contingent stood 4th position amongst all IITs in March-past prooving their spirit of discipline. The DOSW of IIT Roorkee added that IIT Bhubaneswar had maintained uniformity in all aspects including shoe.

Athletics:

The contingent experienced tremendous success in athletics domain. ***For the first time IIT Bhubaneswar won Two medals in single event. Ramesh Chandra Meena won silver medal and Muhammadali M.S won bronze medal in Discus throw***. In shot put Muhammadali M.S and in discus throw Lokesh ku. Xess have qualified into finals. Track events required regular practice which assures better performance next year.

Badminton:

As like last year badminton team cleared league rounds defeating IIT Hyderabad and IIT Patna with good lead and entered Quarter Finals. In quarter finals the team gave neck to neck fight to IIT Bombay and lost. The daily practice ensures equivalent performance with older IITs.

Volleyball:

Along with badminton, Volleyball also entered quarter finals defeating IIT Mandi. The team members had a proper co-ordination amongst each other which lead to their victory. The team faced IIT Madras, the defending champions in quarter finals and lost giving a tough fight.

Table Tennis:

The team played considerably well defeating IIT Mandi in league rounds. Unfortunately lost against IIT Ropar with very narrow margin and couldn’t qualify into Quarter finals

The teams Cricket, football, basketball strived hard put up their fighting spirit but couldn't win. Being large teams they require regular practice as like other IITs which will ensure their better performance

FINANCIAL INFORMATION