

# ANNUAL REPORT

2011-2012



INDIAN INSTITUTE OF TECHNOLOGY BHUBANESWAR

# ANNUAL REPORT

## 2011-2012



**INDIAN INSTITUTE OF TECHNOLOGY BHUBANESWAR**

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INDIAN INSTITUTE OF TECHNOLOGY BHUBANESWAR



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## FROM DIRECTOR'S DESK

### Infrastructure

#### Temporary Campuses

Currently, the institute is operating from a number of campuses, which include IIT Kharagpur extension Centre at Samantapuri, Toshali Plaza at Satyanagar and Workshop cum Laboratory complex near IIT Kharagpur extension Centre. IIT Bhubaneswar is also receiving adequate support from institutes viz. IMMT (CSIR) and Central Tool Room and Training Centre (CTTC) for laboratory and workshop facilities. The hostel for the first and second-year undergraduate students is situated in SBI Colony, Kesura, whereas the third and fourth year students are residing in the new A.N. Khosla Hall of Residence constructed by IIT Kharagpur at Samantapuri. Housing facilities have been provided to faculty members and staff at Kesura and New Government Colony in Gajapati Nagar.

#### Permanent campus

Of the 936 acres of land allotted at Arugul by the Government of Odisha, the institute has taken advanced possession of 598 acres. Out of total 19 KM, construction of 11 KM of boundary wall has been completed. About 8 bore wells have been sunk to facilitate construction work. IIT Bhubaneswar has also taken up tree plantation programme for its new campus. The work for land grading, road and other related construction have started and a Ground Breaking Ceremony for the same was organized on 14<sup>th</sup> August 2011. The Institute plans to move to the new campus by the end of 2013 or beginning of 2014.

### Academics

#### Academic Schools

IIT Bhubaneswar promotes a borderless academic environment. The institute has the concept of Schools, rather than Departments. The institute encourages academic staff and students to work together in an interdisciplinary environment. At present the institute has the following Schools:

- School of Basic Sciences (Physics, Chemistry, Bioscience, Mathematics)
- School of Earth Ocean and Climate Sciences
- School of Electrical Sciences (Electrical Engineering, Electronics Communication Engineering, Computer Science and Engineering, Energy, Learning Sciences, Instrumentation)
- School of Humanities, Social Sciences and Management (Economics, English, Psychology)
- School of Infrastructure (Civil Engineering, Architecture, Urban Design, Transportation Engineering)
- School of Mechanical Sciences (Mechanical, Manufacturing & Industrial Engineering, Aerospace Engineering Architecture)
- School of Mineral, Metallurgical and Materials Engineering

The Institute is running the B. Tech. programme in three core engineering branches (Civil, Electrical and Mechanical) and Ph. D. programme in Science, Engineering, Humanities and Social Sciences. The institute has taken an initiative to launch Postgraduate (Joint M. Tech. – Ph.D.) programme from 2012-13.

#### Awards and Honors

Prof. P. C. Pandey of the School of Earth, Ocean and Climate Sciences was elected Fellow of Indian Society for Mathematical Modeling and Computer Simulation. Professor V. R. Pedireddi was awarded the Bronze Medal of Chemical Research Society of India (CRSI). Dr. Akilesh Barve received the Excellent Paper

Award at ICMS 2011 & ICCPM 2001 in Singapore, 18 September 2011. Dr. S. R. Samantaray won the Samanta Chandra Sekhar Award for 2010 from Orissa Bigyan Academy for his contribution to Engineering and Technology by Oriya Scientist working in Odisha. Shri Punnag Padhy, 2<sup>nd</sup> year. Electrical Student was awarded the Kishore Vaigyanik Protsahan Yojana (KVYP) Scholarship (2<sup>nd</sup> amongst 12 scholarships on All India basis). Prof. G. Panda was awarded the Fellowship of Institute of Engineering and Technology (UK), 2012. Dr. Tara Kanta Nayak was awarded "Junior Associate of International Centre for Theoretical Physics (ICTP)" and Dr. S. Pal received the Prof. G.N. Mahapatra endowment Award from Utkal University.

### Publications

Within 3 years of existence in the city of Bhubaneswar, the faculty members have already contributed to creating new knowledge by publishing about 223 papers in National and International Journals of repute. The publication record in 2011-12 comprises of 89 research papers, 3 books/book chapters and presentation of 40 papers in various conferences in India and abroad.

### Sponsored Projects and Consultancy

The Institute has already received a number of sponsored projects from various funding agencies like DST, CSIR and DRDO and consultancy from industries worth more than Rs. 450 lakhs. Besides, the following UKIERI projects have been sanctioned:

1. Joint masters and split site Ph. D. programme: An Integrated Doctoral and Masters Programme with the University of Warwick to develop an integrated suite of postgraduate joint degree programmes.
2. Thematic Partnerships programme:
  - (a) UKIERI Thematic Partnership in Low Carbon Materials Technologies, Innovation and Application jointly with the University of Warwick.
  - (b) UKIERI Thematic Partnership to establish the School of Earth, Ocean and Climate Science at IIT Bhubaneswar and a new marine campus on the Bay of Bengal jointly with the Southampton and National Oceanography Centre and University of Massachusetts at Dartmouth

### International Collaborations

The institute has signed an MOU for faculty, research scholar student exchange programmes, and joint research projects with the University of North Texas, USA and the Warwick Manufacturing Group (WVG) of the University of Warwick UK. Dr. B. B. Rath, Associate Director of Research, Naval Research Laboratory, Washington DC USA has also been appointed as Distinguished Visiting Professor of the Institute.

### Workshop/Conferences

The Institute organized a Workshop on Electron Microscopy (WEM 2011) jointly with Electron Microscopy Society of India and the Institute of Physics Bhubaneswar from 23-24 Nov 2011. The Institute organized the 35<sup>th</sup> National System Conference, of the System Society of India from 09 - 11 December 2011. A Workshop on "Water Resources Management in India in the 21<sup>st</sup> century" was organized from 27-29 December 2011.

### Summer Internships & Placement

Our students have received support from various Universities and Industries in India and abroad for summer internships viz. the University of North Texas, Oklahoma State University, University of Massachusetts at Dartmouth, Northern Arizona University in USA, University of Warwick UK, McGill University Canada, University of Cologne, Germany, University of Padua Italy, Flanders Mechatronics Centre, Belgium, ExTechNa GmbH Switzerland, University of Zacadecas, Mexico, Tianjin University, China, Ming Chi University Taiwan and University of Technology, Malaysia.

### Events of the Institute

#### Celebrations

The 4<sup>th</sup> Institute Day was celebrated on 22<sup>nd</sup> July 2011. Hon'ble Justice U. C. Banerjee, former Supreme Court Judge, graced the occasion as the Chief Guest and planted trees in the permanent campus of the Institute to mark the occasion.

The 4<sup>th</sup> Foundation Day of the Institute was celebrated on 12<sup>th</sup> February 2012. Hon'ble Justice Markandey Katju, Chairman of the Press Council of India graced the occasion as the Chief Guest. Prof. Lord S. K. Bhattacharyya, Founder and Chairman of the WMG, the University of Warwick delivered the 1<sup>st</sup> Foundation Day Lecture.

The 2<sup>nd</sup> Research Scholar Day was celebrated on 28<sup>th</sup> February 2012. Prof. K.L.Chopra, Former Director, IIT Kharagpur inaugurated the ceremony. He also delivered the 1<sup>st</sup> National Science Day Lecture which was organized jointly by IIT Bhubaneswar and IMMT.

A socio-cultural programme was organized at the institute to observe the International Women's Day on 8<sup>th</sup> March.

#### Distinguished Visitors

During the year 2011-12, a number of distinguished personalities visited IIT Bhubaneswar and addressed our students and faculty. Notable among them were Professor Lord S. K. Bhattacharyya, Founder and Chairman of the Warwick Manufacturing Group of the University of Warwick UK, Hon'ble Justice Markandey Katju, Chairman of the Press Council of India, Padma Vibhushan Dr. Anil Kakodkar, Prof. Samir K. Brahmachari, Director General CSIR, Hon'ble Justice U. C. Banerjee, Professor Sujit Banerjee, Executive Director, Postgraduate Programs, WMG, Dr. Sailesh Naik, Secretary, Ministry of Earth Sciences, Government of India, Prof. Richard Dashwood, Academic Director, Head of Materials and Sustainability, WMG, University of Warwick, Prof. Avijit Gangopadhyay, Associate Dean, University of Massachusetts at Dartmouth, USA.

#### Student Activities

The students under the Student's Gymkhana are quite active and organize various activities each year. The socio-cultural festival (**Alma Fiesta**) and Techno-Management festival (**Wiessenaire**) were organized successfully in January 2012 with the support from many sponsors/industries. These have drawn participations from various colleges/institutions of the country. The students also participated in the inter-IIT sports meet, inter-IIT social and cultural events.



## BOARD OF GOVERNORS

<p><b>Professor P. Rama Rao</b> Chairman, Governing Council International Advanced Research Centre for Powder Metallurgy and New Material (ARPI) &amp; Former Secretary to the Government of India (Department of Science &amp; Technology) Balapur, Hyderabad</p>	Chairman
<p><b>Professor Madhusudan Chakraborty</b> Director, IIT Bhubaneswar</p>	Member
<p><b>Shri Bijay Kumar Patnaik, IAS</b> Chief Secretary &amp; Chief Development Commissioner Government of Odisha, Bhubaneswar</p>	Member
<p><b>Smt Vibha Puri Das, IAS</b> Secretary, Department of Higher Education Ministry of HRD, Government of India</p>	Member
<p><b>Shri S. K. Roongta</b> Former Chairman, Steel Authority of India Limited, New Delhi</p>	Member
<p><b>Professor Samir K. Brahmachari</b> Director General, Council of Scientific &amp; Industrial Research &amp; Secretary, Department of Scientific &amp; Industrial Research, Government of India, New Delhi</p>	Member
<p><b>Shri T. V. Mohan Das Pai</b> Chairman, MEMG International India Pvt. Ltd Bangalore</p>	Member
<p><b>Professor Subhasish Tripathy</b> Professor, School of Earth, Ocean &amp; Climate Sciences IIT Bhubaneswar</p>	Member
<p><b>Professor Sujit Roy</b> Professor, School of Basic Sciences, IIT Bhubaneswar</p>	Member
<p><b>Professor Damodar Acharya</b> Director, IIT Kharagpur</p>	Special Invitee
<p><b>Shri B.K. Ray</b> Registrar, IIT Bhubaneswar</p>	Secretary

## FINANCE COMMITTEE

<p><b>Professor P. Rama Rao</b>  Chairman, Governing Council  International Advanced Research Centre for Powder Metallurgy and New Material (ARPI)  &amp;  Former Secretary to the Government of India  (Department of Science &amp; Technology)  Balapur, Hyderabad</p>	Chairman
<p><b>Professor Madhusudan Chakraborty</b>  Director, IIT Bhubaneswar</p>	Member
<p><b>Shri Ashok Thakur, IAS</b>  Special Secretary, Department of Higher Education  Ministry of Human Resource Development  Government of India</p>	Member
<p><b>Shri A. N. Jha</b>  JS &amp; FA  Ministry of Human Resource Development  Government of India</p>	Member
<p><b>Shri T.V. Mohan Das Pai</b>  Chairman  MEMG International India Pvt. Ltd  Bangalore</p>	Member
<p><b>Professor Sujit Roy</b>  Professor, School of Basic Sciences  IIT Bhubaneswar</p>	Member
<p><b>Shri B. K. Ray</b>  Registrar, IIT Bhubaneswar</p>	Secretary

## BUILDING & WORKS COMMITTEE

<p><b>Professor M. Chakraborty</b> Director, IIT Bhubaneswar</p>	Chairman
<p><b>Prof. S.C. Dutta</b> Head, School of Infrastructure IIT Bhubaneswar</p>	Member
<p><b>Prof. Ganapati Panda</b> Dy. Director &amp; Head, School of Electrical Sciences IIT Bhubaneswar</p>	Member
<p><b>Shri S. R. Sethy</b> Chief Engineer, Buildings Public Works Department, Government of Orissa</p>	Member
<p><b>Shri D. S. Kapur</b> Chief Engineer (EZ-II) CPWD, Patna</p>	Member
<p><b>Shri B. K. Lenka</b> Chief Engineer CESU, Orissa</p>	Member
<p><b>Prof. G.C. Mitra</b> PIC, IIT Kharagpur Extn. Centre, Bhubaneswar</p>	Special Invitee
<p><b>Shri B. K. Ray</b> Registrar, IIT Bhubaneswar</p>	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 (Alumni Affairs, International Relations  
and Continuing Education)

Professor Swarup Kumar Mahapatra

Dean (Students' Affair)

Professor V. R. Pedireddi

Dean (Sponsored Research and Industrial Consultancy)

## Heads of the Schools

### School of Basic Sciences

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Assistant Registrar (S & P)

Shri Manas Kumar Behera

Assistant Registrar (F & A)

Shri Asit Kumar Sahu

Assistant Executive Engineer (Civil)

Shri Dharmaraja Mohanty

Assistant Executive Engineer (Electrical)

Shri N.R.Maiti

Officer-on-Special Duty (Academic Affairs)

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## School of Basic Sciences

### Head of School

Professor V.R.Pedireddi

### Faculty Members

#### Professor

##### Professor Sujit Roy

Ph. D.: IIT Kanpur, 1987

Research Areas: Organometallic Chemistry, Homogeneous catalysis, Multimetallic catalysis, C-H functionalization, Metallocenes

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##### Professor V.R.Pedireddi

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#### Assistant Professors

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##### Dr. Chandrasekhar Bhamidipati

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##### Dr. Niharika Mohapatra

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Ph. D.: IIT Guwahati, 2007

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**Visiting Faculty****Professor Vasudeva R Yerikalapudy**

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The **School of Basic Sciences** is a cluster of disciplines like Bioscience, Chemistry, Mathematics and Physics with faculty strength of 20, having expertise in contemporary fields of research. Among the new IITs established, the School of Basic Science 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 15 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. Currently one Post-Doctoral Fellow is working in Physics.

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, DBT, BRNS, 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 diffract meters (XRDs), Scanning Electron Microscope (SEM), Raman Spectrophotometer, Rheometer, NRM, PPMS, etc., are being created and new collaborations with 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 researches in various areas of Science with special focus in Biosciences, Chemistry, Mathematics, Physics and in various frontier areas of contemporary research fields. The research is being carried out to understand the chemical transformations in organometallics, supramolecular chemistry, Coordination chemistry, and organic synthetic chemistry and computation studies is directed towards synthesis and evaluation of materials of societal impact in the form of drugs, polymers, nanomaterials etc. The research work in the areas of bioscience is focused on the structure and

function of various proteins of eye lenses, leprosy, tuberculosis etc. The research in high energy physics is focused on understanding fundamental particles and their interaction, using theoretical tools such as string theory, and experimented setup in collaboration with CERN, Geneva. Active Areas include conformal field theory, pure spinor formalism of superstrings, super symmetry and Black holes. In addition the projects in the area of the plasmonics and photonics, ion-surface interactions, focus on the design and development of sensors, magneto materials, optoelectronic devices and nanomaterials towards preparation of the advanced materials for the applications and development of energy storage devices, transportation materials, etc. In the areas of interaction meromorphic functions on the planes, variational inequalities and complementary problems, queuing problems, research is being carried out by various faculty members to explore and apply for the basic understanding and development of design of telecommunication system, various IT networks related computational theorems etc. The faculty members of the School of Basic Sciences also work in interdisciplinary areas, especially in the field of material science towards generating nanomaterials for the development of devices based on the devices on the nanotechnology assembling and clustering.

### Thrust areas

- Computational Mathematics
- Chemistry and Biology
- Materials
- Organic and Organometallics
- Supra molecular Chemistry
- Condensed Matter Physics
- Optics & Plasmonics
- Nanomaterials Technology
- Bio and chemo informatics
- String theory & Non-Commutative geometry
- Black holes
- Theoretical and experimental high energy physics

### Sponsored Research Projects

Projects	Principal Investigator	Sponsoring Agency
High-Dimensional [ n x n ] Magnetic Gels by Polytopic Ligand-Directed Self Assembly	Dr. Akhilesh Singh	DST (SERB)
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
Intermolecular 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
Neutron Diffraction studies of field induced magnetic transitions in ErSi <sub>3</sub>	Dr. N.Mohapatra	UGC-DAE Consortium for Scientific Research, Mumbai
Indigenous development of miniaturized surface Plasmon resonance based fiber optic sensor	Dr. Rajan Jha	DST

### Achievements

- Prof. V.R.Pedireddi has won the Chemical Research Society of India (CRSI) medal for the year 2011-12
- Dr.S.Pal received the Prof. G.N.Mahapatra endowment Award from Utkal University.
- Dr. A.D.Banik received the Fundação para a Ciência e a Tecnologia (FCT), Portugal fellowship



### Visit Abroad

Prof. V.R.Pedireddi	XXII Congress and General Assembly of the International Union Of Crystallography at Madrid, Spain during August 22-30, 2011
Prof. V.R.Pedireddi	Presented a Paper on "Molecular recognition studies of cyanuric and trithiocyanuric acids" at Ruhr Universitat, Bochum, Germany during 26th -28th March, 2012
Dr. S. Patra	Attended The 3rd Asian biomaterials Congress "BEXCO" Busan, South Korea: Srikanta Patra, Jagotamoy Das, and Haesik Yang, September 15-17, 2011
Dr. S. Chatterjee	Attended XXVI ICPEAC, 2011, Belfast, UK, July 27-Aug 3, 2011

### Journals

- FaycalTouti, **Akhilesh Kumar Singh**, Philippe Maurin, Laurence Canaple, Olivier Beuf, Jacques Samarut, and Jens Hasserodt, "An electroneutral macrocyclic iron(II) complex that enhances MRI contrast in vivo", *Journal of Medicinal Chemistry*, 2011, 54, 4274-4278.
- Sharmila Pandey, Partha Pratim Das, **Akhilesh Kumar Singh** and Rabindranath Mukherjee, Cobalt(II), nickel(II) and copper(II) complexes of a hexadentate pyridine amide ligand. Effect of donor atom (ether vs. thioether) on coordination geometry, spin-state of cobalt and Mn(II)-Mn redox potential", *Dalton Transactions*, 2011, 40, 10758-10768.
- Nagaraj, R. H., Nahomi, R. B., Shanthakumar, S., Linetsky, M., Padmanabha, S., Pasupuleti, N., Wang, B., Santhoshkumar, P., Panda, A. K., and **Biswas, A.**, "Acetylation of alphaA-crystallin in the human lens: effects on structure and chaperone function", *BiochimBiophysActa*, 2012, 1822, 120-129
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- **S. Barik**, S. Fallat, and S. Kirkland, "On Hadamard diagonalizable graphs", *Linear Algebra and its Applications*, 2011, 435, 1885-1902
- **N. Mohapatra**, K. Mukherjee, K. K. Iyer and E. V. Sampathkumaran, "A First-order magnetic phase transition near 15 K with novel magnetic-field-induced effects in Er<sub>5</sub>Si<sub>3</sub>", *J. Phys: Condens. Matter*, 2011, 23, 496001

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- **S Chatterjee**, Akshaya K. Behera, Amarabha Banerjee, Lokesh C. Tribedi, Tapobrata Som and Pushan Ayyub, "Nanometer-scale sharpening and surface roughening of ZnO nanorods by argon ion bombardment", *Applied Surface Science*, 258 (2012) 7016.
- T Shrivastava, **Rajan Jha** and R. Das, "High-Performance bimetallic SPR sensor based on photonic crystal-waveguides", *IEEE Photonics Technology Letters*, 20(20) (2011), 1448-1450
- R. Das, **Rajan Jha** and T Shrivastava, "Channeled Bragg-plasmon-coupled waveguide", *SPIE*, 8173 (2011) 11-16
- R. Verma, B.D. Gupta and **Rajan Jha**, "Sensitivity enhancement of a surface Plasmon resonance based biomolecules sensor using graphene and silicon layers", *Sensors and Actuators B*, 160 (2011), 623-631
- **Rajan Jha**, T. Shrivastava, and R. Das, "Photonic Crystal Surface Plasmon Waveguides Sensor for High and Accurate Temperature Measurement", *SPIE*, 8351 (2012) 511-514
- S. Barik, S. Fallat and S. Kirkland, "On Hadamard diagonalizable graphs", *Linear Algebra and its applications*, 2011, 435:1885-1902

### Papers Presented at Seminars/Workshops/Conferences

- Avinash Lakma and Akhilesh Kumar Singh, "Design and Synthesis of Polytopic Ligands for High Dimensional [n<sub>xn</sub>] Magnetic Grids", 3rd Asian Conference on Coordination Chemistry, 17th - 20th October, 2011, New Delhi
- Niharika Mohapatra, K. Mukherjee, K. K. Iyer, and E. V. Sampathkumar, "Magnetoresistance Behavior And Magnetocaloric Effect In Er<sub>5</sub>Si<sub>3</sub>", DAE Solid State Physics Symposium 2011, Dec 18-24, in Press.
- K. K. Iyer, Niharika Mohapatra, and E. V. Sampathkumar, "Magnetic behavior of nano-crystalline ruthenium perovskites, CaRuO<sub>3</sub> and SrRuO<sub>3</sub>", DAE Solid State Physics Symposium 2011, Dec 18-24
- S. Chatterjee et al., "Ionization of H<sub>2</sub> and He in collision of 3 KeV electrons and the Bethe binary-encounter peak, ICPEAC, 2011, Belfast, UK, Fr042.
- Rajan Jha, Triranjita Srivastava and Ritwick Das, "Photonic Crystal Surface Plasmon Waveguide Sensors for Temperature Measurement" XXXVI OSI Symposium on Frontiers in Optics and Photonics-FOP 2011, Dec. 3-5, 2011
- Rajan Jha, Triranjita Srivastava and Ritwick Das, "Resonant mode-coupling at anti-crossing points in THz regime", XXXVI OSI Symposium on Frontiers in Optics and Photonics-FOP 2011, Dec. 3-5, 2011.
- Triranjita Srivastava, Ritwick Das and Ranjan Jha, "High Performance Bragg Plasmon Coupled Waveguide Sensor", XXXVI OSI Symposium on Frontiers in Optics and Photonics-FOP 2011, Dec. 3-5, 2011.
- S. Chatterjee et al., "Electron interference in fast ion collisions with h<sub>2</sub> and frequency parameter", International Workshop on Highly Charged Ions and Atomic Collisions (WHCI 2012), held at TIFR, Mumbai, between March 28 - 31, 2012
- Akshaya K. Behera, Amarabha Banerjee, Lokesh C. Tribedi, Shyamal Chatterjee, "Argon ion bombardment on ZnO nanorods: study of structural and optical properties", International Workshop on Highly Charged Ions and Atomic Collisions (WHCI 2012), held at TIFR, Mumbai, between March 28-31, 2012

### Invited Lectures by Faculty Members

- "Co-ordination Chemistry: a Bio-inorganic Perspective" Akhilesh Kumar Singh at the UGC-Sponsored National Level Seminar, Dumdum Motijheel College, Kolkata, March 22-24, 2012
- "The Role of Acetylation on the Structure and Chaperone Function of Human A-Crystalline" Ashis Biswas, Alok Kumar Panda and Ram H Nagaraj, Indian Institute of Technology Patna, March 3-4, 2012
- "Application of Gold Nanoparticles for the Development of Biosensor" Srikanta Patra at the "National Conference on Recent Advancement in Chemical Science: 2011" J. K. College, Purulia campus, November 18- 19th, 2011.
- "Activations of Gold Nanoparticles via NaBH<sub>4</sub> Treatment and Their Application", Srikanta Patra, Jagotamoy Das, and Haesik Yang, The 3rd Asian biomaterials Congress "BEXCO" Busan, South Korea, September 15-17, 2011
- "Application of Variational Inequalities" in Recent Advances in Science and technology, Dr.S.Pani, RAST 2012, VSSUT Burla, Sambalpur, Feb 27-28, 2012
- "Characterization of graphs and cographs with H-property", S Barik, S.Fallat and S.Kirkland, IIT Delhi, March 30, 2012
- "Spin chain magnetism and frustration in nano-particles of Ca<sub>3</sub>Co<sub>2</sub>O<sub>6</sub>", N.Mahapatra, Workshop on Electron Microscopy, IOP, Bhubaneswar, 2011, Nov 23-25.
- "Field induced magnetic transitions in Er<sub>5</sub>Si<sub>3</sub>", N. Mohapatra, Theme Meeting on Utilization of National Facility for Neutron Beam Research.
- "Young-type interference in the electron emission from H<sub>2</sub> induced by fast charges particles", S Chatterjee et al, International Workshop on highly charged ions and Atomic Collisions (WHCI 2012), TIFR Mumbai, March 28-31, 2012.
- "Microstructured fiber sensor and terahertz spectroscopy", Rajan Jha, UKIERI Workshop
- "Supramolecular Assemblies of Symmetrically Substituted Cyclic Compound", Prof. V. R. Pedireddi, CRSI 14TH National Symposium in Chemistry (CSC-14) February 3-5th, 2012.
- "Cooperative Multimetallic Catalysis in TM/Sn Regime: Synergy & Sustainability – A Win-Win Paradigm", Sujit Roy, 3rd Asian Conference on Coordination Chemistry (ACCC-3), October 17-19, 2011.

## School of Earth, Ocean and Climate Sciences

### Head of School

Professor Subhasish Tripathy

### Faculty Members

#### Professors

##### Professor Subhasish Tripathy

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Research Areas: *Environmental Geochemistry, Waste Utilization*

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#### Emeritus Professors

##### Professor Prem Chand Pandey

Ph. D.: Allahabad University, 1972

Research Areas: *Satellite Oceanography, Atmospheric Sciences, Polar Research, Climate Change Science, Remote Sensing, Disaster Management, Education & Research Management and establishment of R&D institutions*

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Realizing the increasing importance of the Earth, Ocean and Climate, and their mutual Interactions, the **School of Earth, Ocean and Climate Sciences** at IIT Bhubaneswar is a recent addition. The School will also have a marine campus named as "Innovation Center for Climate Change (IC3)" between Puri - Konark.

At present the School of Earth, Ocean and Climate Sciences at IIT Bhubaneswar is offering M. Tech. courses in Applied Geosciences and Climate Science and Technology. Apart from having highly motivated faculty members with vast experience in the field of Environmental Geochemistry, Waste Utilization, Hydro-geochemistry, Soil and Water Contamination, Environmental Impact Assessment, Tropical Cyclone Modeling, Cloud microphysics, Hydrology, Oceanography, Atmospheric Sciences, Climate Science and Polar research etc., the School also invites experts from other premier academic institutes (e.g. University of Ontario, Canada, University of Massachusetts Dartmouth) and industry to provide students the first-hand experience about the latest development in the field.

Apart from the institutional facilities such as well-equipped central library, central instrumental facility and computer laboratory etc. the School plans to have its own library. On the analytical front the School is in process of establishing a modern geochemistry laboratory and a clean laboratory with instruments including ICP-MS, XRF, Ion Chromatograph, Microwave Digestion System, UV-Spectrophotometer etc. It is also establishing a Seismology laboratory, Engineering laboratory, Petrology laboratory and Remote Sensing laboratory equipped with the modern instruments such as Ground Penetrating Radar System, Multi-Channel Exploration Seismograph etc. The School is also acquiring the High Performance Computing System to help students to run various models related to earth and its atmosphere.

The School has set up collaboration with the University of Massachusetts Dartmouth, USA and University of Southampton, U.K. A UKIERI project has been awarded jointly to the School of Earth, Ocean and Climate Sciences and the National Oceanography Centre at University of Southampton. The School is in process of setting up collaborations with Woods Hole Oceanographic Institution and the Scripps Institute of Oceanography, USA.

#### Research Activities

The major R & D activities of the School includes monitoring, prediction and providing mitigation solutions for natural disasters with sound and precise observational network of meteorological,

oceanographic, geological and geophysical instruments combined with data-assimilative modeling in a multi-institutional framework and use of Information and Communication Technology (ICT), thereby becoming a hub of such activities on the east coast of India with an international presence.

The School has established collaboration with University of Massachusetts Dartmouth, USA and University of Southampton, U.K. A UKIERI project has been awarded jointly to the School of Earth, Ocean and Climate Sciences at IITBBS and the National Oceanography Centre at University of Southampton. Faculty member from the U.K. counterpart have already visited the School and discussed the modus operandi for the project.

### Thrust Areas

Climate Modeling, Tropical Cyclone Modeling and Cloud Physics, Numerical Weather Prediction, Climate Change and its Effects, Biological Oceanography, Application of the Space Technology for the Study of the Earth System Science, Sustainable Development, Soil-Water Interactions, Waste Utilization, Pollution Pathways.

### Journals

- Sahoo P. K., **Tripathy S.**, Equeenuddin S. M., Panigrahi M. K.; Geochemical Characteristics of Coal Mine Discharge vis-à-vis Behavior of Rare Earth Elements at Jaintia Hill Coalfield, North-eastern India. *Journal of Geochemical Exploration*. 112: 235-243; 2012.
- Dash M. K., **Pandey P. C.**, Vyas N.K. and John Turner; Variability in the ENSO induced southern hemispheric circulation and Antarctic Sea Ice Extent; *International Journal of Climatology*; DOI:10.1002/joc.3456; 2012.

### Papers Presented at Seminars/Workshops/Conferences

Prof. P. C. Pandey, Chaired the session and Prof. S. Tripathy was the Panelist in "Workshop of Physical Processes in the Bay of Bengal and Monsoon Intra-Seasonal Oscillation" held at IISc Bangalore during 5-7 March 2012.

### Seminars/Workshops/Conferences Organized by the Schools

Workshop on "Indian Water Management in 21st Century (IWM-2011)" during 27th – 29th December 2011, jointly organized with School of infrastructure.

## School of Electrical Sciences

### Head of School

Prof. Ganapati Panda

### Faculty Members

#### Professors

##### Professor Ganapati Panda

**Ph. D.:** IIT Kharagpur, 1981  
**Research Areas:** Digital Signal Processing  
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##### Professor S.C.De Sarkar

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#### Assistant Professors

##### Dr. Arun Ghosh

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##### Dr. Chandrasekhar Narayan Bhende

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##### Dr. Debalina Ghosh

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##### Dr. Prasant Kumar Sahu

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##### Dr. Subhansu Ranjan Samantaray

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#### Visiting Faculty

##### Dr. S.Sundarajan

**Ph. D.:** University of Illinois, USA, 1989  
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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 endeavor 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

### 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. S. R. Samantaray has been awarded the Samanta Chandra Sekhar Award by Orissa Bigyana Academy, Dept. of Science and Technology, Govt. of Orissa.

## Visits Abroad

Prof. G. Panda	University of Sheffield; Collaborative Research, December 2011, UK.
Prof. G. Panda	University of Edinburgh; Collaborative Research, December 2011, UK.
Prof. G. Panda	Attended the International Research Conference on Management, Engineering and Technology; R. Majhi, G. Panda, T. Rahul; Bangkok, Thailand, March 2012.
Dr. S. R. Samantaray	IEEE ISTG-2012; S.R. Samantaray, I. Kamwa, G. Joos; Washington DC, USA, 22-24 January 2012
Dr. C. N. Bhende	Attended the International Conference on Power & Energy Systems and Applications, C. N. Bhende and S. G. Malla, Nov. 2011, Pittsburgh, USA.

## Journals

- N.K. Rout, D.P. Das and **G. Panda**, "Particle swarm optimization based active noise control algorithm without secondary path identification", IEEE Transactions on Instrumentation and Measurement, 61(2), pp.: 554-563, 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.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 Multiobjective Problems using Cat Swarm Optimization", Expert Systems with Applications, 39(3), pp.: 2956-2964, 2012.
- H. Pal Thethi, Babita Majhi, **G. Panda**, "Efficient System Identification using a Low Complexity Nonlinear Network with Differential Evolution and its variant based Training Schemes", International Journal of Computer Applications, 31(8), pp.: 38-46, 2011
- N. V. George and **G. Panda**, "A robust evolutionary feedforward 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 Multiobjective Evolutionary Algorithms and Fuzzy Decision Making", Ad Hoc Networks, 10(6), pp.: 1134-1145, 2012.
- **S. R. Samantaray**, I. Kamwa, G. Joos, "Decision tree based fault detection and classification in distance relaying", International Journal of Engineering Intelligent Systems, 19(3), 2011.
- **S. R. Samantaray**, P. K. Dash, "Decision tree based discrimination between inrush currents and internal faults in Power Transformer", International Journal of Electrical Power and Energy Systems, 33(4), pp.: 1043-1048, 2011.



- A. Samui, **S.R. Samantaray**, "Assessment of RO CPAD relay for islanding detection in distributed generation", IEEE Transactions on Smart grid, 2(2), pp.: 391-398, 2011.
- **S. R. Samantaray**, A.Samui, B. Chittibabu, "Time-frequency transform based islanding detection in distributed generation", IET Renewable Power Generation, 5(6), pp.: 431-438, 2011.
- B. Chittibabu, **S. R. Samantaray**, "Implementation of smart battery charger with low power pv energy system using synchronous buck converter", Journal of Low Power Electronics, 8, pp.: 1-10, 2012.
- A. Samui, S. Singh, T. Ghose, **S. R. Samantaray**, "A direct approach to optimal feeder routing for radial distribution system", IEEE Transactions on Power Delivery, 27(1), pp.: 253-260, 2012.
- I. Kamwa, **S. R. Samantaray**, G. Joos, "On the accuracy vs transparency trade-off of data-mining models for fast-response pmu-based catastrophe predictors", IEEE Transactions on Smart Grid, 3(1), pp.: 152-161, 2012.
- **S. R. Samantaray**, R. K. Dubey, B. ChittiBabu, "A novel time-frequency transform based spectral energy function for fault detection during power swing", Electric Power Components and Systems, 3(1), pp.: 152-161, 2012.
- **C. N. Bhende**, S. Mishra, S. G. Malla, "Permanent magnet synchronous generator based stand-alone wind energy supply system", IEEE Transactions on Sustainable Energy, 2(4), pp.: 361- 373, 2011.
- S. Chattopadhyay, D. K. Pratihari, **S. C. De Sarkar**, "A Comparative Study of Fuzzy C-Means Algorithm and Entropy-based Fuzzy Clustering Algorithms", Computing and Informatics, 30, pp:701-720, 2011.

### Papers Presented at Seminars/Workshops/Conferences

- 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.
- 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.
- A. Acharyya, A. Losalka, P. Gupta, G. Panda, "Development of an Automated Examination Seating Arrangement Generation System Using Music Inspired Harmony Search Algorithm", SocProS-2011, 20-22 December 2011, Roorkee, India.
- V.Baghel, G. Panda, L.Mansinha, K.F.Tiampo, S.R.Valluri, "Enhancement of the frequency resolution of the S-transform using the Fourier transform", IEEE ICEAS-2011, 28-30th December 2011, Bhubaneswar, India.
- N.V. George, G. Panda, "Development of low complexity evolutionary computing based nonlinear active noise control systems", IEEE ICEAS-2011, 28-30th December 2011, Bhubaneswar, India.
- V.Baghel, S.J. Nanda, G. Panda, "New GOPSO and its application to robust identification", IEEE CEAS-2011, 28-30th December 2011, Bhubaneswar, India.
- S. Mishra, G. Panda, B.Biswal, "Use of multiple change detection in pattern recognition using Relevant Vector Machine and moving sum average filter", IEEE ICEAS-2011, 28-30th December 2011, Bhubaneswar, India.
- S.R.Samantaray, I. Kamwa, G. Joos, "Differential Energy based Microgrid Protection against Fault conditions", 2012 IEEE PES Innovative Smart Grid Technologies Conferences, 16-18 January 2012, Washington DC, USA.

- L. Tripathy, S. R. Samantaray, "Differential Energy based Relaying for Thyristor Controlled Series Compensated line", IEEE ICEAS-2011, 28-30th December 2011, Bhubaneswar, India.
- S.R. Samantaray, R. Dubey, B.Chittibabu, "Spectral Energy function for Fault Detection during Power Swing", IEEE ICEAS-2011, 28-30th December 2011, Bhubaneswar, India.
- A. Samui, S. R. Samantaray, "Assessment of P-V Droop Characteristics in Islanding Detection with Frequency-Dependent ZIP-Exponential Static Load", IEEE ICEAS-2011, 28-30th December 2011, Bhubaneswar, India.
- R.Dubey, S. R. Samantaray, B.Chittibabu, "A Novel Technique for Asymmetrical Fault Detection in DFIG based Wind-Farm using Wavelet Transform Based Energy Function", IEEE ICAER 2011, 9th - 11th December, 2011, IIT Bombay, India.
- B. Patnaik, P.K.Sahu, "Ultra High Bit-Rate DWDM System Design and Simulation for Future Optical Network", NSC-2011, IIT Bhubaneswar.
- C. N. Bhende, S. G. Malla, "A Stand-Alone Wind Energy System with Battery Storage", International Conference on Power & Energy Systems and Applications, 7-9 Nov. 2011, Pittsburgh, USA.

### Invited Lectures by Faculty Members

- "Multiobjective optimization" by Prof. G. Panda at the University of Sheffield, UK (December 2011).
- "Distributed signal processing in sensor networks" by Prof. G. Panda at the University of Edinburgh, UK (December 2011).
- "Engineering applications of soft computing" by Prof. G. Panda at the Indian Institute of Space Science and Technology, Thiruvananthapuram (December 2011).
- "Application of evolutionary computing algorithms to Management" at IRCMET-2012, Bangkok (March 2012).

### Seminars/Workshops/Conferences Organized by the Schools

- 35<sup>th</sup> National Systems Conference, 09 to 11 December 2011.

## School of Humanities, Social Sciences and Management

### Head of School

Dr. Dukhabandhu Sahoo

### Faculty Members

#### Assistant Professors

##### Dr. Amrita Satapathy

Ph. D.: Utkal University, 2009  
 Research Areas: Commonwealth Studies, Indian Diaspora Literature, Travel Writings, Autobiographies and Memoirs  
 Phone: +91-674-2576 157  
 Email: asatapathy@iitbbs.ac.in

##### Dr. Anamitra Basu

Ph. D.: IIT Kharagpur, 2007  
 Research Areas: Clinical Psychology: Cognitive Neuroscience, Cognitive Psychology, Hemispheric Lateralization, Personality, Neurolinguistics  
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##### Dr. Asmita Shukla

Ph. D.: IIT Kanpur, 2008  
 Research Areas: Clinical Psychology, Consumer Behavior, Cyber psychology Marketing, Psychology of Personality, Research methodology  
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##### Dr. Dukhabandhu Sahoo

Ph. D.: ISEC Bangalore, 2007  
 Research Areas: Open Macroeconomics, Environmental and Natural Resource Economics, Social Sector, Public Policies and Applied Econometrics  
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##### Dr. Naresh Chandra Sahu

Ph. D.: IIT Kanpur, 2008  
 Research Areas: Environmental Economics and Natural Resources Management, Water and Energy, Finance, and Rural Economics  
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##### Dr. Punyashree Panda

Ph. D.: Berhampur University, 2008  
 Research Areas: Postcolonial Literature, American Literature, Canadian Literature, Indian Writing in English, ELT, Cross-cultural Communication, Business Communication  
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### Visiting Faculty

#### Professor Subhendu Kumar Mund

Ph.D.: Utkal University, 1996  
 Research Areas: Indian English Literature, Oriya Literature and Cultural Studies  
 Phone: +91-674-2576 154  
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**The School of Humanities, Social Sciences and Management** 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.

### New Acquisitions (Equipment)

- Workstation
- Camcorder

### Sponsored Research Projects

Projects	Principal Investigator	Sponsoring Agency
SWM in Bhubaneswar City	Dr. Dukhabandhu Sahoo	ICCSR, New Delhi
Impact of JFM	Dr. N.C.Sahu	ICCSR, New Delhi

### Visits Abroad

Dr. Anamitra Basu	Cognition, Conduct & Communication-CCC 2011 conference, University of Lodz, Poland, 2011, 6-8 October, 2011
Dr. Amrita Satapathy	Presented paper titled 'The Fictional Representation of England in Postcolonial Autobiographies' at the <i>Literary London 2011 on Representations of London in Literature: An Interdisciplinary Conference</i> organized by the University of Northampton, Kingston University, London, and the Institute of English Studies, University of London, UK from 20 – 22 July, 2011.
Dr. Punyashree Panda	Presented a Paper titled "In Search of the Self: The Pangs of Identity in Salman Rushdie's <i>Midnight's Children</i> " in the International Conference on "Sites of Memory, Anamnesis and Representation of Identity (SMARI 2011)" at Paris IV Sorbonne University, Paris, France held from 21-23 September 2011
Dr. Dukhabandhu Sahoo	A Cross-Industry Efficiency Analysis and Contribution of the Information and Technology Sector to Indian Economic Growth CPR South6, 2011, Dec 9-10, 2011. CPR South6, Bangkok, 2011.

## Journals

- **Shukla, A.**, Sharma, N. K. and Swami, S. Website Characteristics and Website Satisfaction: Role of Computer Self-Efficacy, *International Journal of Information Systems Management Research and Development*, Vol. 2 (1), 1-16; 2012
- Basantia, T. K., Panda, B. N. and **Sahoo, D.** Multi-Dimensional Activity based Integrated Approach: A Strategy for Cognitive Development of the Learners at the Elementary Stage *US-China Education Review* 2012, B 1, 68-81
- **Sahoo, D.** Performance of the Indian Economy and the Global Financial Crisis, *Journal of Social Sciences & Management*, 2011, 01, No. 05, 81-96
- **Sahoo, D.** Relevance of  $\beta$  and  $\sigma$  Convergence: An Empirical Study of Indian Federation, *Journal of Economics & Business* 2011, 01, No. 04, 148-161\
- **Panda, P.** "Review of Black Swan by Eileen Harrison and Carolyn Landon." *Transnational Literature* 4.1(2011).
- **Panda, P.** and Sulagna Mohanty S. "The Parody of the Sacred: A Study of the Characters in the Great Indian Novel by ShashiTharoor." *International Journal of Business, Humanities and Technology* 1.2 (2011): 162-166.

## Papers Presented at Seminars/Workshops/Conferences

- Basu A., 'A study on bilingualism and multilingualism', *Cognition, Conduct & Communication-CCC* 2011 conference, University of Lodz, Poland, 2011,, 6-8 October, 2011, proc. *Cognition, Conduct & Communication CCC*, 2011, Page 12- 13, chair of Pragmatics, University of Lodz.
- Shukla A. and Parija S. *Life in Cyberspace: A Conceptual Framework*. 99th Indian Science Congress, Bhubaneswar, January 3-7, 2012.
- D. Sahoo *A Cross-Industry Efficiency Analysis and Contribution of the Information and Technology Sector to Indian Economic Growth CPR South6*, 2011, Dec 9-10, 2011. *CPR South6*, 2011, 1-9.
- Mishra, D. & N.C. Sahu (2012), "Pattern of Public Expenditure and Scope for Infrastructure Development in Odisha after Liberalization" 1- 3rd March, 48th Annual Conference of the Indian Econometric Society, Pondicherry University.
- P. Panda Presented a Paper titled "In Search of the Self: The Pangs of Identity in Salman Rushdie's *Midnight's Children*" in the International Conference on "Sites of Memory, Anamnesis and Representation of Identity (SMARI 2011)" at Paris IV Sorbonne University, Paris, France held from 21-23 September 2011.
- A. Satapathy Presented paper titled 'The Fictional Representation of England in Postcolonial Autobiographies' at the Literary London 2011 on Representations of London in Literature: An Interdisciplinary Conference organized by the University of Northampton, Kingston University, London, and the Institute of English Studies, University of London, UK from 20-22 July, 2011.

**Book Published**

Name of the Author(s)	Title	Publisher	Year
Dr. Amrita Satapathy	Shifting Images: England in Indian Writing in English	Lambert Academic Publishing, Germany	June, 2011. ISBN978-3-8443-3041-0
Dr. Punyashree Panda	Contemporary Native Fiction of the U.S. and Canada: A Postcolonial Study.	Bäuu Press, USA.	2011. ISBN978-0-9820467-9-1

**Invited Lectures by Faculty Members**

- Dr.Naresh Chandra Sahu was invited as Resource Person by UGC Academic Staff College, Utkal University VaniVihar, Bhubaneswar to deliver a set of lectures for the UGC Sponsored Refreshers Course in Economic and Human Development held from 21-11-2011 to 11-12-2011.
- Dr.Punyashree Panda was invited as Resource Person for the UNICEF-IGNOU Workshop on ELT from 6-10 November 2011 at Regional Centre, IGNOU, Koraput, Odisha.
- Dr.Dukhabandhu Sahoo was invited as Resource Person by UGC Academic Staff College, Utkal University VaniVihar, Bhubaneswar to deliver a set of lectures for the UGC Sponsored Refreshers Course in Economic and Human Development held from 21-11-2011 to 11-12-2011.

**Seminars/Workshops/Conferences Organized by the Schools**

- Workshop on "Teaching English Redefined: Latest Approaches for the English Language Classroom" held from 19-20 November 2011 at Indian Institute of Technology, Bhubaneswar.
- 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

### Faculty Members

#### Professor

##### Professor Sekhar Chandra Dutta

Ph. D.: IIT Kanpur, 1996  
 Research areas: Structural Engineering, Structural dynamics and Earthquake Engineering, Seismic behavior of Asymmetric structures, Elevated Dams, Earthen Dams, Dynamic soil structure interaction, Effect of cyclone, Disaster mitigation.  
 Phone: +91-674-2302 914  
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#### Assistant Professors

##### Dr. Arindam Sarkar

Ph. D.: IIT Kharagpur, 2006  
 Research areas: Fluvial Hydraulics, Mathematical Flow Modeling  
 Phone: +91-674-2303562  
 Email: asarkar@iitbbs.ac.in

##### Dr. Debasis Basu

Ph. D.: IIT Kharagpur, 2008  
 Research Areas: Traffic Engineering and Transportation System Planning  
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##### Dr. Dinakar Pasla

Ph. D.: IIT Madras, 2005  
 Research areas: Concrete Technology  
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 Email: pdinakar@iitbbs.ac.in

##### Dr. Hanumantha Rao Bendadi

Ph. D.: IIT Bombay, 2009  
 Research Areas: Geotechnical Engineering and Environmental Geomechanics  
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##### Dr. ParthaPratimDey

Ph. D.: IIT Roorkee, 2006  
 Research Areas: Traffic Flow Modeling  
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##### Dr. Puspendu Bhunia

Ph. D.: IIT Kharagpur, 2008  
 Research Areas: Wastewater Treatment  
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##### Dr. Rajesh Roshan Dash

Ph. D.: IIT Roorkee, 2008  
 Research areas: Water and Wastewater Treatment  
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 Email: rrdash@iitbbs.ac.in

##### Dr. Sumanta Haldar

Ph. D.: IISc Bangalore, 2008  
 Research areas: Geotechnical risk and reliability, soil- structure interaction and energy geotechnology  
 Phone: +91-674-2303561  
 Email: sumanta@iitbbs.ac.in

##### Dr. Suresh Ranjan Dash

Ph. D.: University of Oxford, 2011  
 Research Areas: Earthquake Engineering, Seismic Analysis, Design and Retrofitting of Buildings and bridges, Soil Dynamics and Geo-mechanics, pile-Soil Interaction in liquefiable soils, Seismic Analysis and Design of buried pipelines  
 Phone: +91-674- 2306 359  
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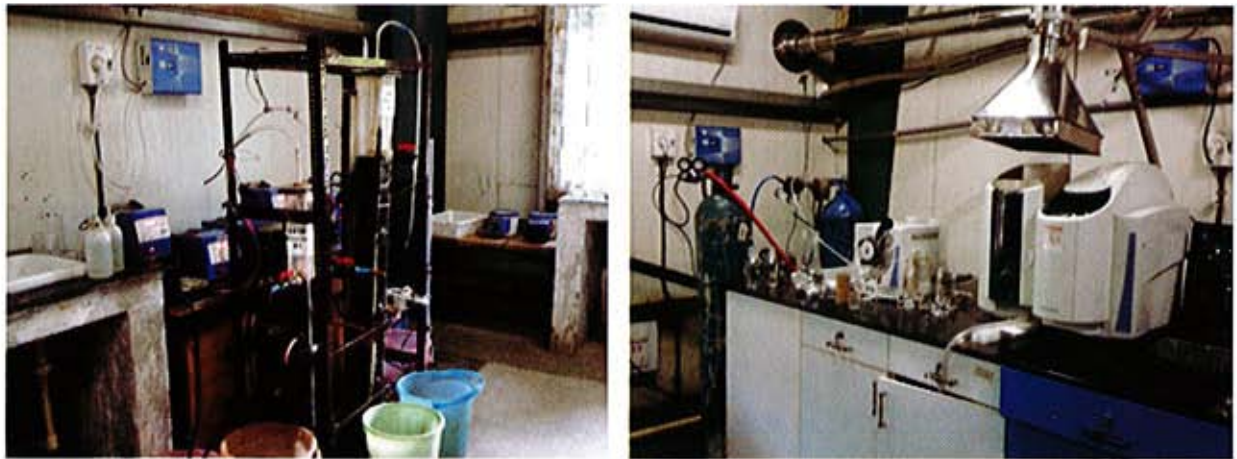
##### Dr. Umesh Chandra Sahoo

Ph. D.: IIT Kharagpur, 2009  
 Research Areas: Traffic Flow Modeling  
 Phone: +91-674-2306 375  
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At the backdrop of worldwide infrastructural escalation, **School of Infrastructure** 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. and Ph. D. programme 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

School of infrastructure aims to have an academic space for interaction between all disciplines of engineering related to Infrastructural development, namely, Civil Engineering, Architecture, Urban and Town Planning, Traffic and Transportation Engineering. The School has established seven state-of-the-art laboratories to cater the needs of UG and PG students as well as Sponsored Research and Consultancy works related to Civil Engineering. The School has eleven faculty members and they continue to strive loftier by exploring new frontiers of knowledge, imparting the latest technical knowledge to the students and conducting high quality of research. The faculty also renders technical advice on live engineering problems to various Government and Private Sector companies.



### Thrust Areas

- Concrete Technology
- Earthquake Engineering
- Traffic Flow Modeling
- Travel Demand Modeling
- Travel Behaviour Analysis
- Transportation System Planning and Policy Address
- Energy Geotechnology
- Soil-Structure Interaction
- Fluvial Hydraulics
- Waste Water Engineering
- Water Resources Engineering
- Unsaturated soils behaviour

### New Acquisitions (Equipment)

- Ultrasonic synthesis reactor (in-line flow mode)

### Sponsored Research Projects

Projects	Principal Investigator	Sponsoring Agency
Hydraulics of submerged structures subject to shallow submergence	Dr. Arindam Sarkar	DST
Characterization of granular lateritic soils for mechanistic design of pavements	Dr. U.C.Sahoo	DST Fast Track



### Consultancy Project

Title	Name of the Investigator (s)	Sponsors
Proposed Residential Quarters at HAL, Sunabeda, Koraput, Odisha.	Prof. S.C.Dutta, Dr. S.Haldar, Dr. A.Sarkar, Dr. D.Pasla, Dr. P.P.Dey, Dr.P.Bhunia, Dr.R.R.Dash	HAL, Sunabeda, Koraput, Odisha
Technical Scrutiny of Road Proposals under PMGSY for states of Jharkhand and Odisha	Dr. U.C.Sahoo	NRRDA, New Delhi
Proof checking of design of river bed pile foundations for location no. 10, 12 and 15 of 220 KV transmission line from Bidanasi Grid substation to Cuttack Grid substation.	Dr. D.Pasla & Dr. S.Haldar	Orissa Power Transmission Corporation Limited (OPTCL)
Proof checking of design of pile foundations for location no. 16A and 24 of 220 KV transmission line tower from Bidanasi (Cuttack) near the bank of Kathajodi to Nuapada (Cuttack), in the spill zone	Dr. D.Pasla & Dr. S.Haldar	Orissa Power Transmission Corporation Limited (OPTCL)
Design of chimney and pad foundations for OPTCL 220KV Budhipadar to Burla DC Transmission line towers, Orissa	Dr. D.Pasla & Dr. S.Haldar	Hindalco Industries Ltd
Design of rock socketed pile foundations for 220 Kv transmission line towers between Kantapali to Hindalco in the Mahanadi River	Dr. D.Pasla & Dr. S.Haldar	Hindalco Industries Ltd

### Visits Abroad

Prof. Sekhar Chandra Dutta	Fulbright Nehru Senior Research Fellowship Programme administered by US Department of States, for pursuing research in Dept. of Civil and Environmental Engineering, University of California, Davis, USA, Dec., 2010 to July, 2011.
Prof. Sekhar Chandra Dutta	9th CUEE and 4th ACEE Joint Conference, Tokyo Institute of Technology, Tokyo, Japan, March 6-8 2012.
Dr. Suresh R Dash	9th CUEE and 4th ACEE Joint Conference, Tokyo Institute of Technology, Tokyo, Japan, March 6-8 2012.
Dr. Sumanta Haldar	Geo-Congress 2012: State of the Art and Practice in Geotechnical Engineering, Oakland, California, USA, March 25-29, 2012.
Dr. Puspendu Bhunia	2012 1st Journal Conference on Environmental Science and Development (JCESD 2012 1st), Bangkok, Thailand, April 7-8 2012.
Dr. Arindam Sarkar	7th IAHR Symposium on River, Coastal and Estuarine Morphodynamics, RCEM 2011, Beijing, China, Sept. 6-8, 2011.

## Journals

- Mukhopadhyay, P. and **Dutta, S.C.** Strongest cyclone of the new millennium in the Bay of Bengal: Strategy of RVS for non-engineered structures. *Natural Hazards Review, ASCE*, doi:10.1061/(ASCE)NH.1527-6996.0000057 (May 26, 2011).
- Roy, R. and **Dutta, S.C.** Seismic Demand of Low-rise Multistory Systems with General Asymmetry. *Journal of Engineering Mechanics*, doi:10.1061/(ASCE)EM.1943-7889.0000303 (July 22, 2011).
- Nayak, S., **Dutta, S.C.** and Dinakar, P. Dynamic characteristics of masonry walls. *The IUP Journal of Structural Engineering*. 2012, 5(1), 33-53.
- **Haldar, S.** and Sivakumar Babu, G.L. (2012). Response of vertically loaded pile in clay: A probabilistic study. *Geotechnical and Geological Engineering: An International Journal*, Vol. 30, Issue 1, pp. 187-196.
- **Hanumantha Rao, B.**, Sridhar, V., Rakesh, R.R., Singh, D.N., Narayan, P.K., and Wattal, P.K., (2012). Lysimetric studies for modeling radioactive contaminant transport in soils, *Int. J. of Environment and Waste Management*, 2012.
- **Partha Pratim Dey** and Pallab Biswas (2011). Acceleration of queue leaders at signalized intersections" *Indian Highways*, 39(12), Indian Roads Congress, New Delhi, December, 49-54, 2011.
- **Dinakar, P.** Predicting the life of reinforced concrete experimentally using polarization and accelerated corrosion cracking techniques, *International Journal of 3R's*, 2011, 2(2), 236-240.
- **Dinakar, P.** Remediation of slump loss of self-compacting concrete by overdosing technique, *ICI Journal*, 2012, 12(4), 37-41

## Papers Presented at Seminars/Workshops/Conferences

- Nayak, S., Kumar, V., Jindal, M., Dutta, S.C. and Dinakar, P., Prediction of lateral strength of masonry walls, 9thCUEE and 4th ACEE, 2012, March 6-8, Tokyo, Japan, Paper ID: 07-141.
- Dutta, S.C., Raj, A. and Shrivastava, N. Effect of bi-directional interaction on seismic behaviour of asymmetric structures, 9thCUEE and 4th ACEE, 2012, March 6-8, Tokyo, Japan, Paper ID: 07-143.
- Saha, R., Tayal, S.L., Kumar, Sekhar Chandra Dutta and Sumanta Haldar, Effect of non-linear behaviour of soil on seismic response of soil pile, 9thCUEE and 4th ACEE, 2012, March 6-8, Tokyo, Japan, Paper ID: 07-145.
- Dash, S.R. and Bhattacharya, S. "Study of Showa Bridge Pile Failure Using A New P-Y Curve Model for Liquefied Soils", Joint Conference Proceedings of 9th International Conference on Urban Earthquake Engineering (7CUEE) & 4th Asia Conference on Earthquake Engineering (4ACEE) March 6-8, 2012, Tokyo Institute of Technology, Tokyo, Japan.
- Haldar, S. and Basu, D. (2012). Response of strip foundation on spatially random elastic foundation under variable column loads. *Proceedings of Geo-Congress 2012: State of the art and practice in Geotechnical Engineering (GSP225)*, Oakland, California, pp. 2806-2815.
- Sarkar, A. (2011). "Simulation of turbulent flow in submerged jumps on smooth and rough beds." 7th IAHR Symposium on River, Coastal and Estuarine Morphodynamics, RCEM 2011, Beijing, pp. 879-889.
- Dinakar, P. "Mechanical properties of ultra-high performance self-compacting concrete containing silica fume and steel fibers", 9th International symposium on High Performance Concrete, August 9-11, 2011.
- Dinakar, P. "Design of fly ash based self-compacting concrete" 9th International symposium on High Performance Concrete, August 9-11, 2011.
- Dinakar, P. "Overcoming the slump loss of fresh self-compacting concrete by overdosing technique for different transportation times" International Conference on Structural Engineering Construction and Management, December 15-17, Kandy, Sri Lanka, 2011.

**Book Published**

Name of the Author(s)	Title	Publisher	Year
Dutta, S.C. and Mukhopadhyay, P.	Improving Earthquake and Cyclone Resistance of Structures: Guidelines for the Indian Subcontinent	TERI, New Delhi	June, 2011. ISBN978-3-8443-3041-0

**Invited Lectures by Faculty Members**

- Professor Sekhar Chandra Dutta delivered a series of invited lectures in a short term course organized by BESU on seismic design of structures sponsored by Dept. of Disaster Mitigation, Govt. of West Bengal during 19th – 20th January, 2012.
- Dr.Puspendu Bhunia delivered a lecture at Public Health Engineering Department, Bhubaneswar, Odisha

**Seminars/Workshops/Conferences Organized by the Schools**

- Workshop on Indian Water Management (IWM) in 21st Century, Dec 27-29 2011.
- Access for All, 3rd September 2011.

## School of Mechanical Sciences

### Head of School

Dr. Swarup Kumar Mahapatra

### Faculty Members

#### Associate Professor

##### Dr. Swarup Kumar Mahapatra

Ph. D.: Jadavpur University, 2000  
 Research Areas: Radiation Modeling,  
 Conjugate Heat Transfer, Bio-Heat Transfer  
 Phone: +91-674-2306 272  
 Email: swarup@iitbbs.ac.in

#### Assistant Professors

##### Dr. Akhilesh Barve

Ph. D.: IIT Delhi, 2009  
 Research Areas: Supply Chain Management,  
 Logistics, Quality Control, Industrial Engineering  
 Phone: +91-674-2306 277  
 Email: akhilesh@iitbbs.ac.in

##### Dr. Arun Kumar Pradhan

Ph. D.: IIT Kharagpur, 2008  
 Research Areas: Composite Materials,  
 Smart Composite Structures,  
 Solid Mechanics, Fracture Mechanics  
 Phone: +91-674-2306 276  
 Email: akpradhan@iitbbs.ac.in

##### Dr. Mihir Kumar Das

Ph. D.: IIT Roorkee, 2006  
 Research Areas: Boiling Heat Transfer  
 Phone: +91-674-2306 275  
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##### Dr. Mihir Kumar Pandit

Ph. D.: IIT Kharagpur, 2009  
 Research Areas: Composite Materials,  
 Sandwich Structures, Finite Element Analysis,  
 Probabilistic Mechanics, Deterministic and  
 Random Vibration, Smart Composites  
 Phone: +91-674-2306 274  
 Email: mihir@iitbbs.ac.in

##### Dr. Prasenjit Rath

Ph. D.: Nanyang Technological University,  
 Singapore, 2007  
 Research Areas: Transport Phenomena  
 in Material Processing, Ultrafast  
 Radiation Heat Transfer  
 Phone: +91-674-2306 273  
 Email: prath@iitbbs.ac.in

##### Dr. Satyanarayan Panigrahi

Ph. D.: IISc Bangalore, 2007  
 Research Areas: Industrial Noise Control,  
 Technical Acoustics, Automotive Noise control  
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 Email: psatyan@iitbbs.ac.in

##### Dr. Satish Dhandole

Ph. D.: IIT Delhi, 2009  
 Research Areas: Dynamic Design,  
 Vibration and Acoustics  
 Phone: +91-674-2306 286  
 Email: satish@iitbbs.ac.in

##### Dr. Sathyanarayana Ayyalasomayajula

Ph. D.: Cornell University, NY, USA, 2007  
 Research Areas: Fluid Turbulence, Experimental  
 and Computational Fluid Mechanics and High  
 Performance Computing  
 Phone: +91-674-2306 285  
 Email: sathya@iitbbs.ac.in

### Visiting Faculty

#### Dr. R. Dashwood

Professor of Engineering Materials, Head of Materials  
 and Sustainability, Academic Director, WMG,  
 International Manufacturing Centre,  
 University of Warwick, UK  
 Research Areas: Physical and Chemical Metallurgy,  
 Low Carbon Vehicle Technology, Composite Metal,  
 TiB reinforced Titanium Alloys  
 Email: r.dashwood@warwick.ac.uk

### Adjunct Faculty

#### Dr. Amitav Rath

CEO at policy Research International,  
 Ottawa, Canada  
 Research Areas: Operations Research  
 Email: amitavrath@iitbbs.ac.in

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. and Ph. D. Programme.

The School is equipped with state of the art equipment/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

Tissue Tumor detection and subsequent treatment using ultrafast laser, Thermo-Acoustic Refrigeration, Electronic Cooling using Phase Change Material, Impact Response of Sandwich Panels, Smart Materials and Structures, Delamination studies in Composite Materials, Green Supply Chain Management, Thixo-forming of in-situ Metal Matrix Composites, Plasma Processing, Ultrafast Laser Material Processing, Modeling and Simulation of Artificial Knee Implants/Joints, Active Noise Control, Radiation Modeling, Boiling Heat Transfer, Computational Fluid Dynamics, Experimental Fluid Mechanics, etc.

### Thrust Areas

- Computer-Aided Design and Manufacturing
- Rapid Prototyping
- Robotics and Controls
- Turbo-machinery
- IC Engines
- Multi-Phase flow
- Nano-mechanics
- Material Science
- Bio-Mechanics
- Green Supply Chain Management
- Industrial Engineering
- Operations Management
- Computational Fluid Dynamics
- Vibration & Acoustics.
- Composite Materials
- Sandwich Structures
- Smart Materials and Structures
- Fracture Mechanics

### New Acquisitions (Equipment)

- Torsion Testing Machine and Rotary Bend Fatigue Testing Machine (Strength of Materials Laboratory)
- TIG, MIG Welding Machine (Workshop)
- Extended Heat Transfer Unit, Unsteady State Heat Transfer Unit, Combined Free, Forced Convection and Radiation Heat Transfer Unit, Linear Heat Conduction Unit, Radial Heat Conduction Unit, Radiation Heat Conduction Unit, Concentric Tube Heat Exchanger Unit, Fuel Cell Training Unit, Transparent DI Engine, Axial Flow Gas Turbine Unit, Flame propagation and stability Unit, Refrigeration and Heat pump Unit with cycle inversion valve (Thermo-Fluid Laboratory I & II)

### Sponsored Research Projects

Project	Principal Investigator	Sponsoring Agency
Simulation of Conjugate Heat Transfer Phenomena in Ultra short Laser Tissue Interaction	Dr. Swarup Kumar Mahapatra and Dr. P. Rath	DST, India
Improved Crack and Delamination Growth Resistance Technology Development for Isotropic and FRP Composite Structural Components	Dr. Arun Kumar Pradhan	DST, India
Impact Response and damage analysis of sandwich composite structures	Dr. Mihir Kumar Pandit	DST, India
Low Carbon Materials Technologies, Innovation and Application	Prof. M Chakraborty, Dr. M. K. Pandit, Dr. A. K. Pradhan and Dr. A. Mandal	UKIERI

### Consultancy Projects

Title	Name of the Investigator (s)	Sponsors
Design Modification of a Maize Sheller	Dr. A. K. Pradhan, Dr. M. K. Pandit and Dr. A. Mandal	Department of Agriculture and Food Processing (O), Odisha, India
Design of weighbridge for 60 Ton and 100 Ton capacity with a movable floor crane	Dr. S. N. Panigrahi	DS Systems, Bhubaneswar, Odisha, India

### Achievements

Dr. Akhilesh Barve received the excellent paper award in conference ICIMS 2011, Singapore, 16-18 September, 2011 on paper titled "Challenges to Environmental Management Practices in Indian Mining Industries".

### Visits Abroad

Dr. Swarup Kumar Mahapatra	Visited University of Leeds, UK during 30 Aug-01 Sep, 2011 to attend The Twelfth UK National Heat Transfer Conference
Dr. Prasenjit Rath	Visited University of Leeds, UK during 30 Aug-01 Sep, 2011 to attend The Twelfth UK National Heat Transfer Conference
Dr. Akhilesh Barve	Attended the International Conference on Innovation, Management and Services at Singapore during 16-18 September 2011

### Journals

- K. Muduli and **A. Barve**, "Role of Green Issues of Mining Supply Chain on Sustainable Development", (2011), Vol.2, No.6, pp.484-489.
- **P. Rath** and S. K. Mahapatra, "New Formulation of Radiative Flux in Ultra-short Time scale with its implications", AIAA Journal of Thermophysics and Heat Transfer, Vol.26, no.2, pp.294-299, 2012.

- B. N. Padhi, **P. Rath**, S. K. Mahapatra and A.K.Satapathy, "Short Pulse Collimated Radiation with Diffusely Reflecting Boundaries", Heat Transfer Research, Vol.42, No.3, 2011.
- S.K.Jena and **S. K. Mahapatra**, "Numerical Modeling of Interaction between Surface Radiation and Natural Convection of Atmospheric Aerosol in Presence of Transverse Magnetic Field", Journal of Applied Mathematical Modeling, 10.1016/j.apm.2012.02.052.
- **S. K. Mahapatra**, B.K.Dandapat & A.Sarkar, " Radiation transfer in participating medium interacting with variable property natural convection subjected to collimated/diffused irradiation at boundary-critical appraisal", Journal of Heat Transfer Asean Research, Volume, 41, Issue 2, March 2012, pp.164-178.
- **S. K. Mahapatra**, S. R. Samantaray & A Sarkar, "Role of Prandtl Number in the Interaction Phenomena of Surface Radiation With an Opposing Mixed Convection Within a Differential Heated Cavity", Journal of Heat Transfer Asean Research, DOI:10.1002/htj.2100,2012.

### Papers Presented at Seminars/Workshops/Conferences

- S. K. Jena & S. K. Mahapatra, "Effect of Lid Velocity on heat transfer Characteristics of magnetic convection in presence of surface radiation", UKHTC, 30-Aug-01-Sep, 2011.
- B. N. Padhi, P. Rath, S. K. Mahapatra and A.K. Satapathy, "Radiative Heat Transfer in a participating Medium Bounded by diffusely Reflecting Boundaries with short-pulsed Collimated Irradiation", 7<sup>th</sup> International Conf. On Computational Heat & Mass Transfer", July-18-22, 2011, Istanbul, Turkey.
- B. N. Padhi, P. Rath, S. K. Mahapatra and A.K. Satapathy, "Short pulsed Collimated radiation in a participating medium bounded by diffusely Reflecting Boundaries", 3<sup>rd</sup> International Conference On Mechanical and electrical technology, Dalian, China, Aug 26-27, 2011.
- S. P. Kar and P. Rath, "A Numerical Model for Laser Pulse Heating and Phase Change in Metals" UKHTC, 30-Aug-01-Sep, 2011.
- A.Barve and K. Muduli, "Challenges to Environmental Management Practices in Indian Mining Industries", Proceeding of International Conference on Innovation, Management and Service ICIMS 2011, Singapore, 16-18 September 2011.

## School of Minerals, Metallurgical and Material Engineering

### Head of School

Professor Sujit Roy

### Faculty Members

#### Professors

##### Professor Madhusudan Chakraborty

Ph. D.: IIT Kharagpur, 1978

Research Areas: Solidification Processing, Scanning, Electron Microscopy, Metal Matrix Composites, Ti-Based Alloy

Phone: +91-674-2301 292

Email: director@iitbbs.ac.in

##### Professor Sujit Roy

Ph. D.: IIT Kanpur, 1987

Research Areas: Organometallic Chemistry, Homogeneous catalysis, Multimetallic catalysis, C-H functionalization, Metallocenes

Phone: +91-674-2576 056

Email: sroychem@iitbbs.ac.in

#### Assistant Professors

##### Dr. Animesh Mandal

Ph. D.: IIT Kharagpur, 2007

Research Areas: Alloy development for automotive applications, In-situ Metal Matrix Composites, Semi-solid processing, Structure-property correlation

Phone: +91-674-2306 278

Email: animesh@iitbbs.ac.in

##### Dr. Chirantan Ghosh

Ph. D.: IISc Bangalore, 2010

Research Areas: Diffusion in solids

Email: chirantan@iitbbs.ac.in

##### 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.

Email: kisorsahu@iitbbs.ac.in

##### Dr. Partha Sarathi De

Ph. D.: Missouri S&T, 2010

Research Areas: Structure-Property-Processing correlations in metals, High cycle fatigue and fracture in metals, Friction stir welding /processing

Email: parthasarathi.de@iitbbs.ac.in

The **School of Minerals, Metallurgical and Materials Engineering (SMMME)** is a unique initiative in the science and technology education and research scenario of India. It is one of the only Schools where minerals, metals and materials have come into a collaborative existence in the interest of the nation. The School with faculties from a diverse background of minerals, metals and ceramics is gearing up to achieve this goal. Currently, the focus of the School is multi-directional with an emphasis on both research and education.



The School collaborates with the Institute of Minerals and Materials Technology (IMMT) located in Bhubaneswar. Further, collaborative research and academic ventures with universities both in Europe and USA are also in the pipeline. An additional fillip to the School has come through the private endowment of Rs 30 million vested by MGM group of industries for a chaired professorship reflecting the faith conferred on the abilities of the SMMME team. The School is focusing in setting up a vibrant minerals, metals and materials research facility and to begin Masters and Bachelors program very soon.

### Thrust Areas

- Minerals and Metals Processing
- Physical Metallurgy
- Materials Modeling

### Visit Abroad

<b>Professor M. Chakraborty</b>	Visited the Warwick Manufacturing Group, University of Warwick UK as Visiting Professor from 16 May - 17 June 2011
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### Journals

- K.K. Ajith Kumar, U.T.S. Pillai, B.C. Pai and **M. Chakraborty**, Tribological Behavior of Mg- Mg<sub>2</sub>Si In-situ Composite, *Materials Science Forum* Vol. 710 (2012) pp. 401-406
- K.K. Ajith Kumar, K. Raghukanadan, U.T.S. Pillai, B.C. Pai and **M. Chakraborty**, Processing and Microstructure of Magnesium in-situ composite with Titanium and Boron based Reinforcement, *Materials Science Forum* Vol. 710 (2012) pp. 389-394
- Siddhalingeshwar I. G., M. A. Herbert, **M. Chakraborty**, R. Mitra, Effect of mushy state rolling on age-hardening and tensile behavior of Al-4.5Cu alloy and in situ Al-4.5Cu-5TiB<sub>2</sub> composite, *Materials Science and Engineering, A*, 528, 1787-1798, 2011
- P. Majumdar, S.B. Singh and **M. Chakraborty**, The Influence of Heat Treatment and Role of Boron on Sliding Wear Behaviour of  $\beta$ -Type Ti-35Nb-5.7Ta-7.2Zr Alloy in Dry Condition and in Simulated Body Fluids, *Journal of the Mechanical Behavior of Biomedical Materials*, 4, 2011, 284-297
- P. Majumdar, S.B. Singh, S. Dhara and **M. Chakraborty**, Influence of in situ TiB Reinforcements and Role of Heat Treatment on Mechanical Properties and Biocompatibility of  $\beta$  Ti-alloy, *Journal of the Mechanical Behavior of Biomedical Materials*, DOI: 10.1016/j.jmbbm.2012.02.014; Impact Factor: 3.297
- P. Majumdar, S.B. Singh, U.K. Chatterjee and **M. Chakraborty**, Effect of Heat Treatment and Boron Addition on Corrosion Behaviour of Ti-35Nb-7.2Zr-5.7Ta (wt.%)  $\beta$  Titanium Alloy in Simulated Body Fluid, *Corrosion*, 67, 2011, 085001;
- B. GeethaPriyadarshini, ShampaAich, **M.Chakraborty**, An Investigation on Phase Formations and Microstructures of Ni-rich Ni-Ti Shape Memory Alloy Thin Films, *Metallurgical and Materials Transactions A*, 42A, 3284, 2011

## Central Library

The Central Library of IIT Bhubaneswar is one of the important central facilities of the institute aiming to augment very many types of reading materials to meet the academic and research needs of its user community. Keeping its practice of collection and building of good Text Books and Reference Books, it has also subscribed to some of the important e-databases for supporting the academician's literature need for research work. Since the year 2010, it has automated the library information management system by acquiring VTLS (Visionary Technology in Library Solutions) and a high capacity Computer Server from SUN Microsystems (Model: FIRE X4270) having 1200G.B Hard Disk with 12 GB RAM and RHEL-64 as O.S. All the routine library activities, such as Acquisition, Circulation are being computerized; this helps maintaining transparency in providing updated information to our user community as well as to others through OPAC (Online Public Access Catalogue). Situated at Toshali Bhawan, the Central Library is well stocked with books, references, journals and other reading materials both in the reserved as well as in the non-reserved sections. There is a separate air conditioned reading room as well. It has started a small digital resource web access facility with 10 personal computers with provision for Internet access. It is also looking for developing a smart library system by adopting RFID (Radio Frequency Identification) Technology. This will empower the user community with the freedom of self service of book loan transaction from Central Library using automated RFID check-out/check-in stations, thus reducing their waiting time at the circulation counter.



### Library Collection to date:

- Books available: 5515 Nos.
- Journal and Magazines: 14 Nos.
- Daily Newspapers: 12 Nos.
- E-database (Off-line CD Version of Cambridge Structural Database): 02 user license
- Online IP Authenticated e-databases:
  - IEL (5 user license)-Full Text Journals
  - ASCE- Full Text Journals ASME- Full Text Journals
  - OSA – Full Text Journals
  - Science Direct – Full Text Journals
  - SIAM – Full Text Journals
  - SCOPUS – Bibliographic database with Abstract
  - SciFinder Scholar (single user license) - Bibliographic database with Abstract

### Services Offered:

- Fully automated library information management
- OPAC (Online Public Access Catalogue) with Patron's book loan status check
- Reserve Collection development for student's in-house (library) reading
- New Arrival Book display for users
- Soft copy printing facilities
- Digital library- web access for academic information and literature search facilities

### New Services expected soon:

- Development of Smart Library adopting RFID Technology
- Expansion of E-resources subscription

## Career Development Cell

### Students Placement for 2011-12

Out of 93 students in the final year, 91 have been placed so far. Few of our students got 200% placements. The companies who have offered placement to our students are:

Caterpillar India, TCS (R&D Division), Infosys, Deloitte (USA), Flipkart, Tata Motors, Tata Consulting Engineers, Altair Engineering, 3DPLM, Samsung R&D, Headstrong Services, United Health Group, Cognizant, Larson & Tubro, Bank of India, HCL, AFFINE Analytics, DRDO, Persistent, Kalinga Soft and Consulting Engineering Services.

### Summer Internship of Students

For summer internship students have been visiting various industries as well as universities abroad viz., University of Warwick, University of Massachusetts Dartmouth, Ohio University, Imperial College London, etc.



## ACADEMIC INFORMATION

### Programme Offered:

School of Basic Sciences: Ph. D.

School of Earth, Ocean and Climate Sciences: Ph. D.

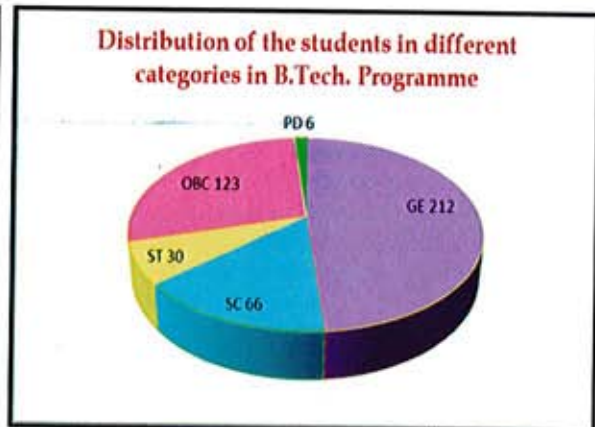
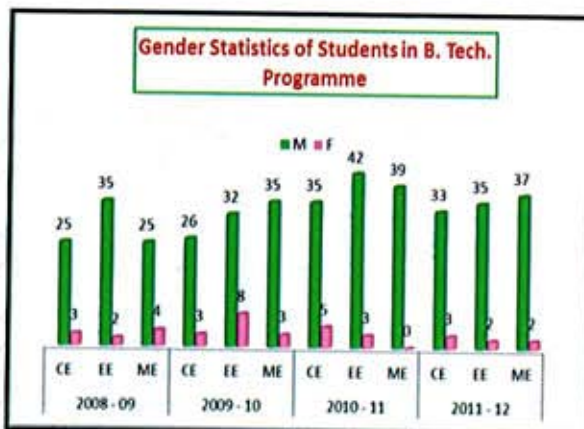
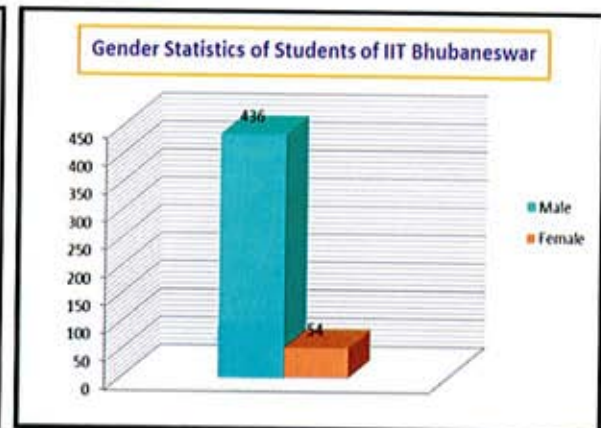
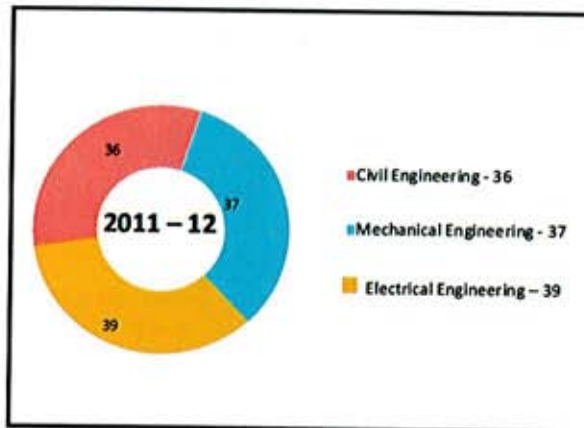
School of Electrical Sciences: B. Tech. in Electrical Engineering and Ph. D.

School of Humanities, Social Sciences and Management: Ph. D.

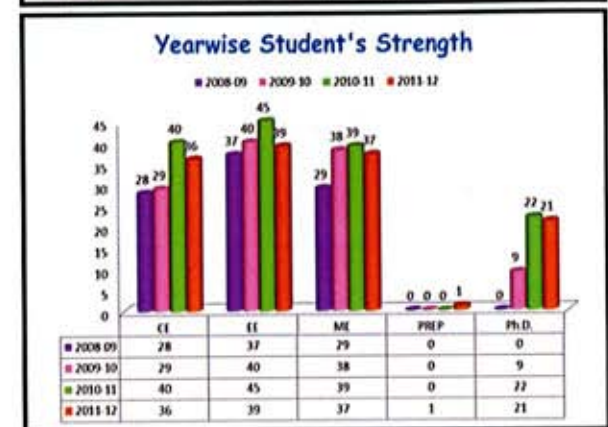
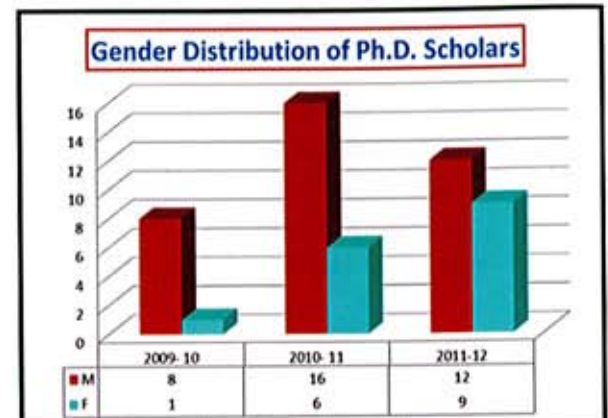
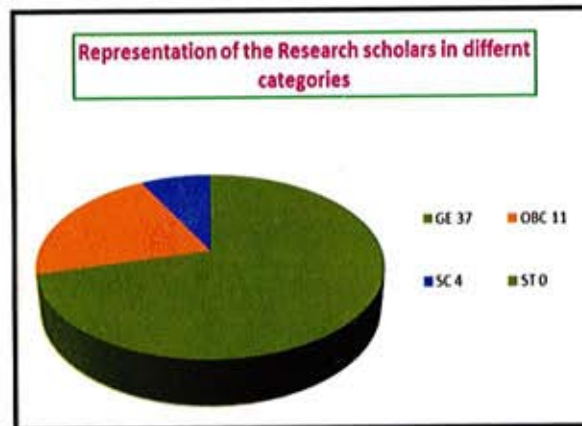
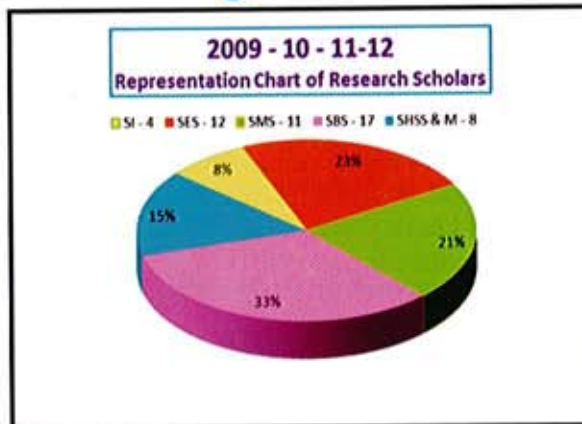
School of Infrastructure: B. Tech. in Civil Engineering and Ph. D.

School of Mechanical Sciences: B. Tech. in Mechanical Engineering and Ph. D.

### Graphical Representation of different Academic Programmes up to 2011-12 Student Admitted in B. Tech. Programme 2011-12



## Ph. D. Programme



## Scholarship

During 2011-12, 111 students have been awarded the 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/-. 39 other students have been awarded tuition fee waiver.

Name of Scholarship	2011-12 (Batch)	2010-11 (Batch)	2009-10 (Batch)	2008-09 (Batch)
MCM Scholarship 2011-12	28	32	27	24
MCM Scholarship 2011-12 (Free Studentship)	11	13	11	04
CSSS for Top Class Education (SC Students)	05	05	08	01
Financial and other assistance for ST students	00	04	00	00
NCERT				01
Post Matriculation	01			
Scholarship (MECON Ltd.)			01	
RajashreeShahu Maharaj Merit Scholarship to 100 SC Students for H.E. in the renowned educational Institution in the country		02		
District Welfare (Bihar)	01			

Western Scholarship		01		
State Bank Scholarship	01	01		01
Railway Scholarship				01
Prime Minister Scholarship	01			
CWC- Merit Scholarship				01
MP Scholarship			01	
KVPY Scholarship		01		
NEEPCO Scholarship		01		
NTSE Scholarship			01	01
BSNL Scholarship		01		
<b>TOTAL</b>	<b>48</b>	<b>61</b>	<b>49</b>	<b>34</b>

## VISITORS

Professor Samir K. Brahmachari, Director General, Council of Scientific & Industrial Research (CSIR) and Member, Board of Governors (BOG), IIT Bhubaneswar visited IIT Bhubaneswar on 16 April 2011.

Professor Sujit Banerji, Executive Director, Postgraduate Programs, Warwick Manufacturing Group, (WMG) University of Warwick visited the Institute from 23-25 November 2011 to discuss and further the budding partnership with possible student internships, future collaborations through study programmes and projects.

Dr. Sailesh Naik, Secretary, Ministry of Earth Sciences, Government of India, visited the Institute on 2nd January 2012. He discussed with the Director and the faculty of School of Earth, Ocean and Climate Sciences regarding the School and the proposed Innovation Centre for Climate Change on the coastline of the Bay of Bengal.

Honourable Justice Markanday Katju, Chairman, Press Council of India visited IIT Bhubaneswar on its 4th Foundation Day on 12 February 2012. He gave a comprehensive talk on India and its cultural foundations and put forward some interesting theories on the elusive idea of "Indian-ness".

Lord S. Kumar Bhattacharya, Director, Warwick Manufacturing Group visited the campus on the occasion of Institute Foundation Day and delivered a lecture. In his address, he said that an IIT in Odisha is appropriate because "here in the City of temples, you are creating a temple to Innovations". He emphasized that innovation and research should be taken up by IIT Bhubaneswar to meet the practical challenges of the world around us.

Padma Vibhushan Dr. Anil Kakodkar, eminent Nuclear Scientist and former Chairman of Atomic Energy Commission visited IIT Bhubaneswar on 27 March 2012. He talked of the importance of IITs as autonomous educational systems, and elaborated on the fact that financial and academic autonomy coupled with accountability can provide the right environment for bright minds to flourish.

## INVITED LECTURES

Name of the Speaker	Topic	Date
<b>Professor Ram H. Nagaraj</b> Carl F. Asseff, M.D. Professor of Ophthalmology, Department of Ophthalmology and Visual Sciences, Case Western Reserve University School of Medicine, Cleveland, OH, USA	Small Heat Shock Proteins: Cellular Gatekeepers against protein damage and apoptosis	30.03.2011
<b>Mr. Vishal Khosla</b> Manager, CETR Inc., USA	Trends in Characterizing Mechanical, Tribological and Surface topography of coatings, surfaces, thin film etc.	12.07.2011
<b>Professor Sukalyan Sengupta</b> Professor and Chairperson, Department of Civil and Environmental Engineering, University of Massachusetts Dartmouth, MA, USA	Water Sustainability in India: Some Technologies to Enable Water Reuse	11.08.2011
<b>Prof. B. S. Murty</b> , FASM, FNAE, FASc, FNAsc Department of Metallurgical and Materials Engineering, Indian Institute of Technology Madras,	Excitements and Challenges in Nanoscience and Nanotechnology	14.10.2011
<b>Professor Manas K Mandal</b> Director, Defense Institute of Psychological Research, New Delhi & President, National Academy of Psychology, India	Cerebral Asymmetry & Technology	14.10.2011
<b>Professor RudraPratap</b> Professor, Department of Mechanical Engineering, IISc Bangalore	Future Academic Prospects	5.12.2011
<b>Professor Abhijit Bhattacharyya</b> , Director, Smart Materials and MEMS Laboratory, And Associate Dean, The Donaghey College of Engineering and Information Technology, University of Arkansas at Little Rock	Graduate Education and Research	04.01.2012
<b>Professor C. Ravi Ravindran</b> Centre for Near-net-shape Processing of Materials, Ryerson University, Toronto	Light Alloy Processing Revolutionizing the Automotive Industry	05.01.2012
<b>Dr. Steven Maggs</b> Project Director, Warwick Formula Student, WMG, University of Warwick, UK	World's first Racing: Sustainable Motorsports, a novel Vehicle for Public Engagement and Industrial Collaboration	15.02.2012
<b>Professor HemaSharada</b> Director, South Asia Relations, University of Western Australia	Higher Study / Internship opportunity in Australia	15.03.2012
<b>Professor Ashok Srinivasan</b> Florida State University	Emerging Trends in High Performance Computing	21.03.2012 & 24.03.2012

## STUDENT ACTIVITIES



### Students Gymkhana "GREEN" Election

The elections for the Student's Gymkhana were held on 11 April 2011, to elect student representatives for various student activities for the year 2011-12. The election was a shining example of the 'Go Green' initiatives undertaken by IIT Bhubaneswar. Students of the Institute created a paperless, no-cost process for the election by adapting select features of Google® forms, iGoogle® and MATLAB®. The entire process was completed within 90 minutes ensuring transparency, accuracy and efficiency.

### The 1081p 2.x Workshop

IEEE IIT Bhubaneswar student branch organized 1081p 2.0 and 2.1, a hands-on workshop series on introductory 3D modeling using Solid Works. The program's theme was 'Seeing is Believing?'. Over 100 students took part in the event. The workshop was followed by a design contest aimed at assessing the designing/modeling skills that the students have been able to absorb in the course of the workshop.

### INDEPENDENCE DAY

IIT Bhubaneswar celebrated the 64th Independence Day with a multitude of activities. The Institute witnessed unison of salutes as the Director Professor Madhusudan Chakraborty hoisted the tricolor in presence of its students, faculty and staff. Later in his address to the gathering he focused on the importance of the contribution of young engineers to the masses and the need for world-class institutions for the progress of the nation.

### Centre for Entrepreneurship

TIE My Story Session: 'My Story' was an inspiring event, held on 19 August 2011, where successful entrepreneurs from various domains shared the experiences of their entrepreneurial journey. TIE Bhubaneswar chapter in collaboration with CENTRE for Entrepreneurship, IIT Bhubaneswar organized it at IIT Bhubaneswar, where accomplished entrepreneurs like Mr. J. K. Mohanty, CMD, Hotel Swosti (P) Ltd., and Mr. M. K. Gupta, MD, Gupta Power and Infrastructure Ltd., inspired the students with their brilliant talks.

### SYNC LAYER:

The student musical rock band- Sync Layer, made their debut on 12 November 2011 at RabindraMandap, Bhubaneswar during the event UNPLUGGED, a rock band competition. The band stood 4th in the competition and received a huge positive response from the audience.

### Aghaaz: A prelude to Alma Fiesta

Displaying their skills at organizing and management, the students of the Institute prepared Aghaaz- a prelude to Alma Fiesta 2012 on 6 November 2011. The promotional events were conducted by the students and involved a number of activities including chilly eating competition, paper dance etc. With a multitude of audience transfixed to the unfolding prelude, team Alma Fiesta cheered at its success in giving the Mega-event a grand head start.

### NATIONAL EDUCATION DAY CELEBRATION

IIT Bhubaneswar devoted all its love and respect to the greatness of Maulana AbulKalam Azad by proudly celebrating the National Education Day on 11 Sep 2011. Speaking on the occasion, Prof. G. Panda deliberated on the life Maulana Azad and the importance of teachers like him in the society. A debate competition was organized for the occasion and the best were appreciated for their efforts..

### TEACHER'S DAY CELEBRATION

IIT Bhubaneswar celebrated Teacher's Day on September 5 2011 with full enthusiasm. The Director Prof. M. Chakraborty began the day with a welcoming speech meant to show gratitude and love for the teaching community for their noble work. A series of interactive events and quizzes set the tone of the day.

## DIWALI

The festival of lights was celebrated with great fervor throughout the day. In the morning, the students of the Fine Arts group organized Rangoli-making competition in the campus which saw a full spectrum of colors, vividly depicting various social and cultural themes. In addition, there were a series of miscellaneous events like dance and music programs which complemented the celebratory mood. In the evening, the Society, along with other students of the Institute presented an awe-inspiring vertical illumination of Lord Ram. The students presented a play on the theme 'Say No to Crackers'.

## Inter IIT Sports meet 2012

IIT Kharagpur was the host IIT for the 47th INTER IIT Sports Meet. The meet was held from 12-19 December 2011. IIT Bhubaneswar with the smallest contingent took part in various events such as badminton, football, table tennis, volleyball, basketball and athletics for boys and badminton for girls. IIT Bhubaneswar started its winning spree by winning the girls' badminton match against IIT Rajasthan (2-0). The Girls' badminton team performed superbly in their group stage matches. They were the first team from IIT Bhubaneswar to qualify for the quarter-final for the first time in three years. Next it was the turn of the boy's badminton team who also qualified for the quarter final. In Table tennis, the boys performed excellently and defeated their opponents from IIT Patna for first time in last three years. Athletics team also put up their best effort and went on to qualify the heat level competitions. In discuss throw Lokesh Kumar Xess ranked 7th in the final round of the competition with a throw of 27.12 m. The exhibition of sportsmanship by the Basketball, Volleyball and Football teams were also laudable. The meet showed high level of competition by the IITians, and fostered the spirit of brotherhood and sportsmanship.

## ALMA FIESTA

Alma Fiesta, the annual Socio-Cultural festival of Indian Institute of Technology, Bhubaneswar began on 13 January 2012 with an enthralling recital by the noted Odissi dancer Sujata Mohapatra under the chairmanship of Dr. D. Pasla. The performance was followed the representation of the Indian culture by the budding talents of Asha Kiran. Alma Fiesta recognizes its social responsibility towards the society and this year, the case of the Olive Ridley turtles was brought into the limelight.

## WISSENAIRE 2012

The students of IIT Bhubaneswar celebrated the Techno-Management fest Wisseinaire from 20-22 January 2012. The theme of the fest was 'Indigenous - India Genius', and it projected the importance of strong Indigenous research as the key to scientific glory for the country. To test the extremes of human intelligence, team Wisseinaire conducted technical, coding, quizzing, business, robotic and designing events. The fest also included a number of workshops and guest lectures by the czars of industry, academia and corporate world.