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उत्तिष्ठित जाग्रत प्राप्य वरान् निबोधत
INDIAN INSTITUTE OF ENGINEERING SCIENCE AND TECHNOLOGY, SHIBPUR
भारतीय अभियांत्रिकी विज्ञान एवं प्रौद्योगिकी संस्थान, शिवपुर

वार्षिक रिपोर्ट

२०१५ – २०१६

Annual Report
2015-2016

भारतीय अभियांत्रिकी विज्ञान एवं प्रौद्योगिकी संस्थान, शिवपुर

हावड़ा - ७११ १०३

Indian Institute of Engineering Science and Technology (IIEST), Shibpur, Howrah – 711 103

An Institute of National Importance under Ministry of Human Resource Development, Government of India

ANNUAL REPORT

2015 – 2016

INDIAN INSTITUTE OF ENGINEERING SCIENCE AND TECHNOLOGY, SHIBPUR
HOWRAH – 711 103

An Institute of National Importance
under
Ministry of Human Resource Development, Government of India

From the Desk of the Director

Professor Ajoy Kumar Ray
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It is a great pleasure for me to bring out the Annual Report of our Institute for the year 2015-16. IIEST, Shibpur started its journey way back in 1856 as the second oldest Engineering Institute of the country .After contributing immensely towards producing quality manpower to the country , we have been given the status of and Institute of National Importance in 2014. I am happy to announce that this year we have been ranked twenty among the top Institutions of higher education of our country by the NIRF ranking system and it is our goal to be among the top ten within the next few years. It has been a heartening experience for me to be witness to a rejuvenated Institute where the Academic community are giving full effort to achieve excellence in the sphere of teaching, learning, creation and dissemination of knowledge.

Our Institute has always laid great stress on research activities. Along with quality teaching, the Faculty members are devoting their energy to quality research as well. In the last year, there have been 417 publications in peer reviewed journals. The doctoral programme is gaining momentum and we have at present more than 600 research scholars pursuing Ph.D programme. The Institute has also witnessed an excellent growth in the number of sponsored research projects in the recent past. At present, research projects worth about 75 Crores and consultancy projects worth about Rs. 15 crores are being pursued in different departments.

In keeping with tradition, this year too several faculty members have been lauded and have won recognition for their superior academic performance. To mention a few of them, Dr. Saptearshi Ghosh of Computer Science and Technology has won the prestigious Humboldt Fellowship to work at the Max Planck Institute, Germany; Dr. Sulata Mitra and Dr. Sipra Das Bit won the Best Paper award in IEEE Indicon; Dr. Malay Bhattacharya of IT has received the BIRD award for outstanding contributions in Bioinformatics and Functional Genomics; Prof. Swarup Kumar Ghosh of Metallurgy has won the Best Paper award at RAFTS; Prof. H. Saha of Green Energy and Sensor Systems was nominated as RAC member of NETRA and NTPC; Dr. Jhuma Ganguly of Chemistry was awarded the Young Faculty Research Award, 2015 by GAABESU; Dr. Arijit Sinha of the School of Materials science has received the Young Engineers Award from the Institution of Engineers and many other Faculty members have delivered addresses and Chaired sessions of International conferences and also edited volumes of International journals.

Substantial advancements have been made under the TEQUIP II scheme through which our Institute could procure instruments like UV-VIS spectrophotometer; Wave probe monitor, portable RF analysers etc. and 51 workshops/seminars/conferences have been arranged the previous year. Also, to promote Industry-Institute interaction, 25 interaction programmes were arranged. We are proud to announce that from this scheme the Centre of Excellence for Microstructurally designed Advanced Materials has been established in a space of about 5000 sq.ft. area.

There has been a substantive growth in the number of laboratories and other Infrastructural facilities for academic growth of the Institute. Several existing laboratories have also undergone extensive modifications .In the Department of Mechanical Engineering Thermal Power Laboratory has been equipped with Engine Emission measuring instruments , FESEM has been procured under DST-FIST programme, Single Crystal X-Ray Diffractometer has been procured in the Department of Chemistry under SAIF programme, X-Ray Fluorescence Spectromemter has been procured in the Department of Physics, new infrastructure has been developed in the School of Mechatronics and Robotics and many other developments have taken place.

The period under review has witnessed a wide range of academic events organized by various Departments that includes a number of National and International seminars and workshops. Eminent personalities like Prof. Subhendu Guha of United Solar, USA, Prof. Rolf Drechsler, University of Bremen, Prof. Stephen Fiatus, University of Newcastle and many others visited the Institute and delivered talks.

Our students have been performing extremely well both in academic as well as in extra curricular activities. To mention a few, research Scholars Soumi Bhattacharya and Anuja Roy went to Trinity College, Dublin, Ireland for research activities, Neelanjan Datta, M.Tech student presented a paper at the 4th International Water Conference at Oklahama, USA, Mousumi Mitra presented paper at International Conference at Kiyoto, Japan. Research Scholars and students of Electrical Engineering, CST, Civuil and ETC have initiated the IEEE Students Branch in the Institute.

The Institute has always been taking initiatives in social outreach programmes. The School of Community Science and Technology has been involved in a Corporate Social Responsibility scheme of the Government of India with the Garden Reach Shipbuilders and Engineers Ltd. in association with Kolkata Police for imparting Vocational training to the unemployed youth in and around the Garden Reach area of Kolkata. The Equal Opportunity Cell of the Institute has been organizing remedial coaching classes and training for examinations leading to entry into services for students belonging to reserved categories and the non creamy layer of the society. The process of strengthening the Ramanujan Central Library of the Institute continued throughout the period under review. A detailed plan was prepared for interior design, internal refurbishment, decoration etc was prepared and its execution has started. Access of full text electronic resources including ASCE journals, ASME digital library and IEL online available through INDEST-AICTE Consortium was continued. Access to JSTOR, Institute of Physics and Royal society of Chemistry journals are provided through UGC-INFONET Digital library consortium.

From the Annual report of various Departments, Schools, Centres and Administrative sections, it is clearly manifested that after being recognized as an Institute of National importance our Institute is consistently moving ahead in all activities at a very fast pace, creating real manpower and thus serving the Nation.

I would like to extend my heartiest thanks and congratulations to all Faculty members, students officers and staff of the Institute for working together harmoniously towards achieving excellence. My special thanks to the team who worked tirelessly to bring out this Annual Report.

(Ajoy Kumar Ray)
Director

Content

Introductory note with a brief history of the IIEST Shibpur

❖ Bengal Engineering College, commonly known as B.E.College started its journey as the Civil Engineering College on 12th February 1856. During this long journey, this pioneering Engineering College achieved one milestone after another. Since 1856 a number of other Departments were gradually included and have produced many reputed Engineers.

❖ There are various phases through which this institution has passed, over the last 150 yrs
❖ On January 24, 1857 the faculty of Civil Engineering was formed with the establishment of Calcutta University.
❖ On May 2, 1857 the Civil Engineering College was affiliated to the University.

❖ In November 1864 the Civil Engineering College lost its separate entity and independent existence and The Civil Engineering College become the Civil Engineering Department of the Presidency College and remained attached to it as an adjunct till 1879.

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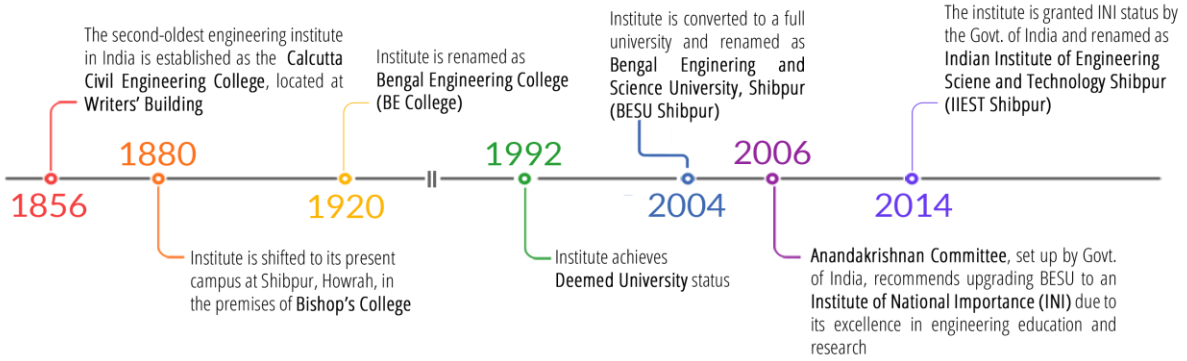
❖ In the year 1880 the College occupied the premises of the Bishop's College at Shibpur and from the 5th April 1880, the college under the name Government Engineering College, Howrah started functioning.

❖ On 18th May 1887, the name was changed to the Civil Engineering College Seebpore, gradually under went changes, namely, first Sibpur and then Shibpur.

❖ As a first step to reach the goal of including other Departments along with Civil Department the nomenclature of the college was changed from the 12th February 1920 to the Bengal Engineering College, Sibpur

❖ From March 24, 1921 in order to avoid postal delay the College was redesignated as the "Bengal Engineering College" which came to be popularly known as B.E.College.

❖ On 16.02.1993,the BE College was given the status of Deemed University and from October 1,2004 the Director was designated as the Vice-Chancellor and the Deemed University was given the status of a full fledged State University under the name Bengal Engineering and Science University, Shibpur.



IIEST Shibpur - history at a glance

Indian Institute of Engineering Science and Technology, Shibpur owes its origin to the erstwhile Bengal Engineering College, the history of which goes to the nineteenth century when industries in the sense we understand today, were practically absent. Prompted by the idea of meeting requirement of trained engineering personnel for the Public Works Department, the then council of Education, Bengal, decided to open Civil Engineering classes and a Professorship in Civil Engineering was created at Hindu College, Calcutta, in the year 1843-44. A College of Engineering was started by the name of Civil Engineering College on 24th November, 1856, in the premises of the Writers Building, Calcutta.

With the establishment of Calcutta University on January 24, 1857, the college was affiliated to this university in May 1857. The first-degree examination in Bachelors of Civil Engineering was held in 1864 in which only 2 students graduated. In 1865, the college merged with Presidency College, Calcutta and from 1865 to 1869 the college functioned as the Civil Engineering Department of Presidency College. In 1880, the college was shifted to its present campus at Shibpur, Howrah, and was christened the 'Government College, Howrah,' in the premises of Bishop's College. It started imparting training in Civil as well as Mechanical Engineering. The college became wholly residential from the year 1889.

In 1921, the name of the college was changed to 'Bengal Engineering College' (popularly known as B.E.College). During 1921-43, the various departments of the college were reorganized on the recommendation of the 'Mukherjee Committee' under the Chairmanship of Sir R.N. Mukherjee, one of the most distinguished ex-students of the college. The first batch of students in Mechanical Engineering appeared in the degree examination in 1932. The degree course in Electrical Engineering was introduced during 1935-36 and that in Metallurgical Engineering in 1939. The department of Humanities started in 1945, Applied Mechanics in 1947, and Architecture, Town and Regional Planning department in 1949.

With the end of Second World War, the necessity of further expansion and the development of the college was felt and a 'Committee for the development of Higher Engineering and Technical Education in Bengal' under the Chairmanship of the Director of Public Instruction recommended two plans - one 'Immediate' and the other 'Five Year Plan' for the college. Under the 'Immediate' plan the committee made recommendations regarding the increase of student strength from 300 to 520, an improved curriculum, better teaching staff, a greater range of degree courses and a close liaison with industry. The objective of the 'Five Year Plan' was to upgrade the college to the status of a modern and well-equipped institution with facilities for postgraduate study and research.

A new building was constructed in the year 1949 and all academic departments were moved to the new building. In 1954, postgraduate courses in Civil, Mechanical, Electrical, and Metallurgical were introduced. A postgraduate certificate course in Naval Architecture was also introduced during this period. Doctoral programs were also introduced at this time and approved by Calcutta University to enhance research activities (which started as far back as

1901) in the college. During 1954-55, an agreement was concluded by this college and the University of Wisconsin, USA, whereby six guest professors from the USA joined the college and in exchange, five teachers from the college went to the USA as Research Associate. This scheme, known as Technical Co-operation Programme of the USA, helped the college in developing laboratories, postgraduate programmes and research facilities.

The college celebrated its gala centenary function inaugurated by Dr. B.C. Roy on the 25th of December 1956 and PanditJawarlal Nehru graced concluding session on 14th January 1957. The department of Electronics & Telecommunications Engineering was sanctioned in 1956. The department of Mining Engineering started functioning in 1956. The introduction of a Teachers' Training course during 1959-60 was a noteworthy event. The college started its first Computer Centre in 1976-77 and a Microprocessor Laboratory in this centre in 1979. The 125th Anniversary of the college was celebrated in December 11, 1981, with inauguration by Sri N. Sanjiva Reddy, the then President of India.

In 1982, a new degree course in Computer Science & Technology was started and with modernization of the facilities, this department started offering the Master of Engineering courses in 1988 and Master of Computer Applications courses in 1991.
The college was selected as a participating institute under the World Bank EIDP Project and an endowment in theamount of Rs. 200,000,000 was received for upgrading the teaching facilities and laboratories in the Electronics and Computer Science Departments. An E-mail facility was offered by the DOE under this project through which the university can have install access to information super highway.

The alumni of the college have occupied or are occupying top positions in various national and international organizations. In recognition of its yeoman's service to the nation for 143 years of its existence with its well organized infrastructure, the college was elevated to the status of a "Deemed University" in 1992 by the Ministry of Human Resource Development, Government of India on the recommendation of a UGC Expert Committee. As a result, Dr. SankarDayal Sharma, the President of India, inaugurated the University in March 1993.

In 2004, B.E. College (Deemed University) was converted into a full-fledged university by an act in the West Bengal Assembly and renamed as Bengal Engineering and Science University, Shibpur. In addition to the tradition engineering disciplines, the university started M.Sc curriculum in basic sciences.

In March 2014, Bengal Engineering and Science University, Shibpur was taken over by the Government of India and converted into an Institute of National Importance through an act of parliament and renamed as Indian Institute of Engineering Science and Technology, Shibpur.
The Second Oldest Engineering College in India

The Roorkee Engineering College established in the year 1847 AD and recognized as the first Engineering College in India. The Government Engineering College, Pune established in the year 1854. The Bengal Engineering College established in the year 1856. The first batch of

degree course in Civil Engineering turned out in 1912 from Pune Engineering College whereas the first batch in Civil Engineering passed out from B.E.College, in the year 1864. Therefore, if we consider the year of establishment the B.E.College will be the third engineering college in India. However, considering the year of graduation our B.E.College stands as the 2nd oldest Engineering College in India. Please find enclosed the relevant documentary evidence from the University Website for your ready reference.

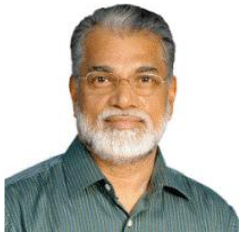
"The Govt. College of Engineering, Pune, which was established in the year 1854 is one of the oldest and premier engineering institutions in the country. Initially it started as the Poona Engineering class & Mechanical school to train subordinate officers for carrying out public work. Later the school became Poona Civil Engineering College and subsequently in the year 1911 the name was changed to the College of Engineering, Poona popularly known as COEP. The first batch of degree course in Civil Engineering turned out in 1912. Degree courses in Mechanical Engineering and Electrical Engineering were introduced in 1914 and 1932.

Roorkee College was Establish in 1847 AD as the first Engineering College in the British Empire. The College was renamed as THOMASON COLLEGE OF CIVIL ENGINEERING in 1854. It was given the status of a University by Act No. IX of 1948 of U.P., Govt. in recognition of its performance and its potential and keeping in view the needs of post-independent INDIA.Pt. JawaharLal Nehru, the first Prime Minester of India, presented the Charter in November 1949 elevating the erstwhile college to the first Engineering University of independent India."

Vision & Mission

The Vision of IIEST, Shibpur is to become one of the best Institutes in the world in providing the state-of-the art multi-disciplinary research ambience that will usher innovative world-class technologies developed towards realizing the goal of Developed India.
IIEST, Shibpur functions as an institute of higher learning and advanced research. Prime activities include creation and dissemination of knowledge; producing engineers, scientists and entrepreneurs of highest quality equipped with latest technologies and developing innovation technology solutions for the cause of the society.

Chairman of the Board of Governers of IIEST, Shibpur



Dr.Kopillil Radhakrishnan is the Chairman of the Board of Governers of IIEST, Shibpur. Dr. Radhakrishnan is an internationally acclaimed scientist and the former Chairman of the Indian Space Research Organization. When India's Mangalyaan successfully settled into Mars Orbit on September 24, 2014, the country became the first and only nation to have done so on its maiden attempt under the leadership of Dr Radhakrishnan, He also has headed several other landmark missions such as the spaceflight of an Indian cryogenic engine, the launch of the heaviest and tallest GSLV Mark II, and the successful reentry of the unmanned crew module. Dr Radhakrishnan is one of the 2014 top ten scientists chosen by the prestigious journal Nature. He was also the recipient of Padma Bhushan in 2014 for his outstanding contribution to the field of space science and technology.

Dr. Radhakrishnan was born on August 29, 1949 at Irinjalakuda, Kerala. He graduated in Electrical Engineering from Kerala University, completed his PGDM from Indian Institute of Management, Bangalore and obtained Doctorate for his thesis titled "Some Strategies for Indian Earth Observation System" from Indian Institute of Technology, Kharagpur. He is a Fellow of Indian National Academy of Science (FNASc), Fellow of Indian National Academy of Engineering (FNAE); Honorary Life Fellow of The Institution of Engineers, India; Honorary Fellow of The Institution of Electrical and Telecommunication Engineers, India; and Member of International Academy of Astronautics.

Starting his career as an Avionics Engineer in Vikram Sarabhai Space Centre, he held several decisive positions in ISRO in the domains of space launch systems, space applications and space programme management. He had commendably held the post of Director, Vikram Sarabhai Space Centre, the lead centre for launch vehicle technology in ISRO and Director, National Remote Sensing Agency. In his brief stint (2000-2005) in the Ministry of Earth Sciences, he had also been the Founder Director of Indian National Centre for Ocean Information Services (INCOIS) and the first Project Director of Indian National Tsunami Warning System. He also held several important positions at the international level including Vice Chairman of Intergovernmental Oceanographic Commission (2001-05), Founder Chairman ofIndian Ocean Global Ocean Observing System (2001-06) and Chairman of the Working Group of the Whole UN-COPUOS STSC (2008-2009).

Since October 2009, Indian Space Programme have carried the signatures of the strong leadership of Dr. Radhakrishnan with focused thrust towards (a) space applications for societal services and national imperatives; (b) creation, management and sustenance capability and capacity for space systems; (d) undertaking new and path-breaking missions (e) development of several critical technologies ; and most importantly (f) ensuring synergy of 16,000 strong ISRO Team with Indian Industry, Academia, User community and several National R&D Laboratories.

Prof. Ajoy Kumar Ray, Director, IIEST, Shibpur

Brief Resume
of
Prof. Ajoy Kumar Ray

Prof. Ajoy Kumar Ray joined Bengal Engineering and Science University, Shibpur as its Vice Chancellor with effect from 01.03.2009. He is also the first Director of Indian Institute of Engineering Science and Technology (IIEST), Shibpur with effect from 4th March, 2014. Currently he is on lien from IIT Kharagpur, where he is a Professor of Electronics and Electrical Communication Engineering and former Head, School of Medical Science and Technology at IIT Kharagpur**.**

As Vice Chancellor of BESU Shibpur, he has brought major transformation of the university, in diverse areas of academics – education, research, sponsored research and many outreach programs.

Prof. Ray had his Bachelor's degree from Bengal Engineering College, Shibpur, followed by M.Tech and Ph.D from Electronics and Electrical Communication Engineering Department of IIT Kharagpur. He joined IIT Kharagpur as a Faculty member in 1980.

He has successfully completed more than twenty research projects, sponsored by several agencies, like Defence Research & Development Organization, Department of Atomic Energy, Department of Science and Technology and so on. He has also worked on several consultancy projects of multinational and national industries. Prof. Ray was the Principal Investigator of research projects, sponsored by Intel Corporation during 1997 – 2004. During the course of this research project, Prof. Ray was the co inventor of six US patents jointly with Intel Corporation. Prof. Ray was the Chief Investigator of a number of Medical Imaging projects sponsored by Texas Instruments at the School of Medical Science and Technology at IIT Kharagpur. As a part of this project, he, along with other team members have filed six USA patents jointly with Texas Instruments.

Prof. Ray was associated with the University of Southampton as Senior Research Fellow during 1989-90 and led the research group on 'Image and Video Processing' of Avisere Inc., USA during 2004-2005.

He has co-authored about 150 research papers in International journals and International Conferences. He has authored five books published by International Publishing Houses, such as John Wiley, Tata McGraw Hill, Prentice Hall of India and Taylor and Francis Publication, including one in Chinese.

In addition, under his leadership, his group in the School of Medical Science and Technology has initiated a number of medical projects on 'Molecular Imaging' and Image Processing, Medical Instrumentation, etc. Prof. Ray is the Fellow and Member of many professional bodies and is involved with a large number of Universities in various academic bodies.

He has been associated with Nehru Museum of Science and Technology, IIT Kharagpur as Secretary and Chairman from 1991 – 2006.

His current research interest includes Medical Imaging and Image Processing, Pattern Recognition and Machine Intelligence.

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School of Material Sciences and Engineering

Prof. Nil Ratan Bandyopadjyay	nrb@matsc.iiests.ac.in

Secretary to Senate, Registrar, IIEST, Shibpur

Dr. Biman Bandyopadhyay	regis@iiests.ac.in

Name of Departments, Centers and Schools, Heads of the Departments and Professor-in-charge

Name of Departments

1.Aerospace Engineering and Applied Mechanics
2.Architecture, Town and Regional Planning
3.Chemistry
4.Civil Engineering
5.Computer Science & Technology
6.Electrical Engineering
7.Electronics & Tele Communication
8.Earth Sciences
9.Humanities and Social Sciences
10.Human Resource Management
11.Information Technology
12.Mathematics
13.Mechanical Engineering
14.Metallurgy And Materials Engineering
15.Mining Engineering
16.Physics
17.Dept. of Students' Activities

Name of the Schools

1.Purabi Das School of Information Technology (PDSIT)
2.School of Materials Science & Engineering (SMSE)
3.School of Management Sciences (SOMS)
4.School of Community Science and Technology (SOCSAT)
5.School of Disaster Mitigation Engineering (SDME)
6.School of Ecology, Infrastructure & Human Settlement Management (SEIHSM)
7.School of Mechatronics & Robotics (SM&R)
8.School of Safety & Occupational Health Engineering (SSOH)
9.School Of VLSI Technology (SOVLSIT)

The Center in the Institute

1.Computer Centre
2.Video Conferencing Facility
3.Centre of Excellence

Centre of Excellence

1. Health Care Science and Technology
2. Green Energy and Sensor Systems

TEQUIP –II

Name of the Heads of Departments

1.Aerospace Engineering and Applied Mechanics – Prof. Subhasis Bhaumik
2.Architecture, Town and Regional Planning - Prof. Swati Saha
3.Chemistry - Prof. Binay Krishna Ghorai
4.Civil Engineering - Prof. Subrata Chakraborty
5.Computer Science & Technology - Prof. Biplab Kumar Sikdar
6.Electrical Engineering - Prof. Jagadish Pal
7.Electronics & Tele Communication – Prof. Santanu Das
8.Earth Sciences – Prof. Tapas Gangopadhyay
9.Humanities and Social Sciences - Prof. Mallika Ghosh Sarbadhikary
10.Human Resource Management - Prof. Manas Kumar Sanyal
11.Information Technology - Prof. Arindam Biswas
12.Mathematics - Prof. Amit Das
13.Mechanical Engineering - Prof. Bijan Kumar Mondal
14.Metallurgy And Materials Engineering - Prof. Swarup Kumar Ghosh
15.Mining Engineering - Prof. Pratik Dutta
16.Physics - Prof. Samar Jana

Name of the Directors / Professor-in –charge of Schools

1.Purabi Das School of Information Technology - Prof. Arindam Biswas
2.School of Materials Science & Engineering - Prof. Subrata Chatterjee
3.School of Management Sciences - Prof.Prabir Kumar Paul
4.School of Community Science and Technology - Prof. Sujay Mukherjea
5.School of Disaster Mitigation Engineering - Prof. Ambarish Ghosh
6.School of Ecology, Infrastructure & Human Settlement Management –
Prof. Sudip Kumar Roy
7.School of Mechatronics & Robotics –Prof. Debjani Ganguly
8.School of Safety & Occupational Health Engineering - Prof. B.K.Bhattacharya
9.School Of VLSI Technology - Prof. Hafizur Rahman
10.Director of Research and Consultancy – Prof. Subrata Chatterjee

Heads of Centres
1.Centre of Excellence for Green Energy and Sensor Systems (CEGESS) –
Prof. Anup Mondal
2.Centre for Health Science and Technology (CHST) –
Prof. Amit Roy Chowdhury

Co-ordinator, TEQIP – II – Prof. Prasid Syam

Distinguished Professors who have joined this Institute in recent period:

1.Steel Chair Professor
Dr. (Prof.) Subir Kumar Bhattacharyya
Department : Metallurgy And Materials Engineering

2.Bijoy Ashu Chair Professor
Prof. Madhujit Mukhopadhyay
Department : Civil Engineering
Ph. No. : 033 2422 8047 (Ext. No.-371), (M)-9831171782
e-mail address : mmadhujit@yahoo.com, mmadhujit@gmail.com

3.Honorary Emeritus Scientist
Prof. Chitta Ranjan Mahata

4.Honorary Distinguished Professor
Prof. Amitabha Ghosh
Former Director, IIT Kharagpur,
Senior Scientist, Indian National Science Academy, IIEST Shibpur and Honorary Distinguished Professor, IIT Kanpur
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5.Honorary Distinguished Professor
Prof. Asok Kumar Mallik
Former Professor, IIT Kanpur

6.Metalogic Systems Emeritus Chair of the Centre of Excellence-in memory of Professor Sankar Sebak Baral
Prof. Hiranmoy Saha

7.Prof. C.R. Mahata
Honorary Emeritus Scientist, IIEST Shibpur

8.Dr. Nikhilesh Bandyopadhyay
Former HOD, Coated Product Group, Tata Steel, Jamshedpur
As Tata Steel Chair Professor, Dept. of Matellurgy and Materials Engineering, IIEST Shibpur

9.Prof. Sabyasachi Sarkar
Former Professor of Chemistry, IIT, Kanpur
As Honorary Emeritus Professor, IIEST Shibpur

10.Dr. Dipankar Chakraborty
Former Professor and HOD, Dept. of Electronic and Telecommunication Engineering, IIEST Shibpur
As Adjunct Professor, Centre for Health Care Science and Technology

11.Prof. Shankar lall Maskara
Former HOD, Dept. of E & TC, IIT, Kharagpur
As Adjunct Professor, Department of E & TC , IIEST Shibpur

12.Prof. Achintya Haldar
Professor of Civil Engineering and EM & da Vinci Fellow
University of Arizona, Tuscon, USA
As Honorary Distinguished Visiting Professor of IIEST Shibpur

13.Prof. Srikumar Mallick
Former HoD of Electrical Engineering
As Adjunct Professor of Electrical Engineering Department of IIEST Shibpur

14.Prof. U. K. Chatterjee
As Adjunct Professor, Department of Metallurgy and Materials Engineering of IIEST Shibpur

15.Prof. Jayanta Kumar Chakraborty
Former Professor of AE & AM, BESUS
As Adjunct Professor, Centre for Health Care Science and Technology

16.Dr. S. P. Gon Chaudhuri
Former Director of Institute of Cultivation of Science
As Adjunct Professor of CEGESS, IIEST Shibpur

Professor-in-Charge

1. International Relations and Alumni Affairs of the Institute : Prof. Santanu Karmakar
2. Computer Networking : Prof. Manas Hira
3. Library : Prof. Sudip Kumar Chattopadhyay
4. Furniture: Prof. Sudipta Mukhopadhyay
5. Internal Quality Assurance Cell : Professor Indra Nath Sinha

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Wardens of Hostels / Halls, IIESTS

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Pandya Hall
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Professor, Civil Engineering
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Richardson Hall
Prof. Chanchal Majumder
Assist. Professor, Civil Engineering
Mob.: 9007761448

Sen Hall
Prof. Ayan Banerjee
Associate Professor, ETC
Mob.: 9477373489

Macdonald Hall
Prof. Soumen Mitra
Assistant Professor,
Architecture (T & RP)
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Sengupta Hall
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Professor, Mechanical Engineering
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Sri S.N. Datta
Deputy Registrar and Finance Officer (Acting)
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Hostel No. 15
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Associate Professor, Mining Engineering
Mob.: 9433965705

Hostel No. 16
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Associate Professor, Mechanical Engineering
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Bhagini Nivedita Hall
Prof. Ananya Barui
Assistant Professor, Centre For Health Care I
Science & Technology (CHST)
Mob.: 9432083954

PG. Hostel
Prof. Tapendu Mandai I
Asst. Prof. Metallurgy & Materials Engineering
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Prof. Nillohit Mukherjee I
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Lt William Hall of Residence
Prof. Paromita Chattopadhyay
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Banks at IIEST, Shibpur Campus

United Bank of India
Uco Bank
State Bank of India

Achievements

NIRF revised ranking of engineering institutions - IIEST, Shibpur at 20th position.

The Indian Institute of Engineering Science and Technology (IIEST), Shibpur, has been ranked 20 in the National Institutional Ranking Framework (NIRF) assessment of engineering colleges, undertaken by the ministry of human resource development. The ministry had earlier given the institute a rank of 82, allegedly because the IIEST authorities had not submitted their data within the set deadline.

NIRF is a methodology adopted by the ministry to rank all higher education institutions in the country. The framework was approved by the ministry and launched last September.

There are separate rankings for different types of institutions, depending on their areas of operation - universities and colleges, engineering institutions, management institutions, pharmacy institutions and architecture institutions. NIRF uses several parameters for ranking purposes, such as resources, research, and stakeholder perception.

The ranked lists were published on April 4.

It is unclear exactly why the prestigious institute initially received such a poor rating, but senior university officials said it could have had something to do with the fact that the IIEST status was bestowed on the institute, changing its name and also some of its manner of functioning.

Ministry officials, however, claimed the IIEST authorities hadn't submitted their data on time.
The initial list did not even feature IIEST Shibpur. It was only after repeated requests from the IIEST authorities that the name was included in the list, but was poorly ranked, certain parameters having been marked zero, said a source. For example, the complete data on research publications was not considered, the source added. The institute was also provided a window of 24 hours to upload their data.

The new ranking was possible through the efforts of IIEST Shibpur director Ajoy Kumar Roy. "Our revised RPC (research score) is 83.07 out of 100, which will modify our research ranking to 8. However, we have the potential to excel further and will strive to be one of the top 10 in the country," the director said.
Ray pointed out that IIEST needed more funds from the ministry to enhance infrastructure and research facilities. Senior sources said the faculty members were trying their best to excel in each of their research areas. "IIEST will complete the process of selection of about 80 new teachers, who will join by the end of this year. This will further strengthen our teaching and research. I must acknowledge the great responsibilities being shared by many of our visiting and adjunct professors, many of them are undoubtedly the best in their fields," the director added.

"We are working on the process to make NIRF even better from next time. This was the first year, so there is scope to improve on our policies, which we are currently working on. Not only IIEST, but the rankings of two or three more institutes have changed or been elevated. Many institutes submitted their data late. This will not be allowed from next year," said an MHRD source.

EDU-RAND study for the best engineering colleges in India ranks IIEST, Shibpur at 13th position

Prof P.K. Paul, Dean (Administrative Affairs) receiving the award from EDU-RAND

EDU, an Indian on line news magazine on higher education collaborated with the famous RAND Corporation, a US-based not-for-profit global research house known for impartial, evidence-based policy evaluation and implementation to carry out research for ranking of the engineering colleges in India. The rankings are a result of extensive research and data collection involving around 800 colleges and included factors like employability, research productivity, faculty qualifications and fill rate. The research has placed IIEST, Shibpur in the 13th position nationally.http://pickacollege.digit.in/best-engineering-colleges for complete listing of the study.

As per this highly credible EDU-RAND study, IIEST, Shibpur stands at the top of the institutions one can seek admission through JEE (Main) and even many institutions that admit students through JEE (Advanced).However, this is not the only ranking study IIEST, Shibpur has been placed highly. Earlier too, the institute existing then as Bengal Engineering and Science University (BESU), Shibpur, consistently featured amongst the top in various other such studies carried out by Mint, Outlook, India Today, The Week, Careers 360 etc. (see Why IIEST, Shibpur link for those rankings). It should, however, be remembered that BESU, Shibpur functioned with fraction of the budget given to other technical institutions in the country for the last few decades. The indomitable spirit of students and teachers overcame all odds to consistently perform at the highest levels of teaching, learning, and research. With conversion of BESU, Shibpur to IIEST, Shibpur, an Institute of National Importance, the mood in the campus is quite upbeat where students, teachers, and researchers are aiming higher and higher to achieve desired levels of excellence.

Ranking is, however, not the only reason to attract brightest students of the country to the campus. There are myriads of other reasons to study here, which is the only institute in the country to offer exclusive dual degree B.Tech-M.Tech program in traditional and inter-disciplinary areas of science and technology. "IIEST, Shibpur is a premier Engineering Institution with glorious heritage of 159 years. Recently, we have embarked on a new journey, where we have initiated novel 5-year B.Tech-M.Tech dual degree program with emphasis on industrial training and industrial projects leading to the development of products of national importance. We encourage the students to take up multidisciplinary projects in areas of national strategic importance. I am sure that we will be a leading torchbearer in the carnival of science and technology within a short span of time. I wish each of our students indulge on creativity with enjoyment.", says Prof Ajoy K. Ray, Director of IIEST, Shibpur.

About The Campus

Main Academic Building

The main academic complex is a four-storied building covering about 22000 square meters area that accommodates most of the engineering departments, Department of Human Resources Management, Office of the Dean (Academic Affairs) and Office of Controller of Examinations.

Main building viewed from Parade Ground

First Lobby of Main Building

Science and Technology Building

The newly constructed eight-storied Science and Technology building with 14400 square metres area accommodates some of the existing engineering departments, science and management departments, and various centres and schools. Office of the Vice-Chancellor, Offices of the Deans, Registrar, and other financial and administrative offices are also located in this building. Annexes to this building are now being constructed to accommodate future departments, schools, centres and offices.

Eight-Storeyed Science & Technology Building

Above the main entrance of Science & Technology Building and Eight-Storeyed Building

Workshop Complex

The old Workshop complex where the former Bengal Engineering College was originally started in this campus is now a heritage building. Part of the workshop is housed in the adjoining building. The workshop complex is quite large, encompassing an area of about 8500 square metres. The Workshop Complex has nine engineering shops to offer trainings in different basic shop practices including Carpentry Shop, Smithy Shop, Welding and Painting Shop, Fitting Shop, Machine Shop, Foundry and Pattern Shop, Boiler Shop, Electric Shop, Automobile Shop and Project Model Shop

The main workshop complex

Road to Carpenting and Foundry Shops

Health Services

The Institute has a hospital to cater to the needs of the campus inmates with medical officers and other supporting staff. It provides 24 hours ambulance service. Besides, the hospital has an ID Ward to effectively isolate students suffering from infectious diseases such as chicken pox, mumps, measles etc. Outdoor treatment is available in two shifts: morning and afternoon except Sundays and holidays. Serious cases are generally transferred either to any city hospital or to the Students' Health Home, Kolkata, the institute having Universal Membership for the later. The institute hospital provides 24 hours ambulance service.

Banks

The Campus has branches of three banks - United Bank of India (UBI), UCO Bank, and State Bank of India (SBI) - along with associated ATM facilities.

Printing Press

The Institute has a modest printing press with necessary staff and machines. The press is utilised to print Institute news bulletins, seminars proceedings and other miscellaneous materials.

Campus Services and Management

- The Institute is provided with uninterrupted power supply from the Calcutta Electric Supply Corporation Limited.
- Water supply is provided by the Howrah Municipal Corporation. In addition, the Institute has its own captive generation plant and also water supply sources.
- There are three agencies which look after the maintenance of various services in the campus:
- The Public Works Department (Maintenance) for maintenance of all buildings and roads
- The Public Works Department (Electrical) to look after the maintenance of electrical services
- Public Health Engineering Department for maintenance of water supply and sewage disposal

Halls / Hostels of Students

The Institute, with a student population of more than 3200, has 17 hostels including two girls' hostels for UG students and one girls' hostel for PG and Research Scholars.
There are 9 multi-seated hostels for boys:

- A. C. Roy Hall (Hostel 7)
- D. Banerjee Hall (Hostel 8)
- A. K. Seal Hall (Hostel 9)
- Hostel 10
- Hostel 11
- Hostel 13 – exclusively for PG and Research Scholars
- Hostel 14
- Hostel 15
- Hostel 16

Multi seated Hostel 14

Hostel 14, with Vidyasagar Setu in the background

There are 5 single-seated halls for boys:

- Richardson Hall
- Macdonald Hall
- Sen Hall
- Sengupta Hall
- Wolfenden Hall

Richardson Hall

Macdonald Hall

There are 3 girls' hostels (single and multi-seated):

- Sister Nivedita Ladies Hostel
- Pandya Hall
- Lt. William Hall of Residence - for PG and Research Scholars

Sister Nivedita Ladies Hostel

Lt. William Hall for female PG & Research Scholars

Sports Grounds

There are two main sports grounds - named after the famous English stadiums - the Lords, and the Oval. Lords ground is for general purpose games and sports, and also serves as main venue for the Convocation Ceremony and the College Fest - REBECA. The Oval Ground is more well-maintained and is used for Physical Training, Sports Meets, and inter and intra-college Cricket and Football matches.

Lords Ground

Oval Ground

Pavilion, Oval

Shed, Oval

Basketball Court

The institute has a basketball court near the Hospital Building, opposite to Oval Ground. Basketball enthusiasts flock here in the evenings for friendly matches.

Basketball Court

A Firendly Basketball Match

Alumni Swimming Pool

The Alumni Swimming Pool is a wonderful gift from our alumni assocation, GAABESU, to the residents of the institute. It started operating from April 2013.

Swimming Pool entrance

Alumni Swimming Pool

Gymnasium

The centruy old heritage athletic club building houses the gymnasium. GAABESU, our alumni association, recently renovated the building, bought new equipments, and inaugurated the upgraded gymnasium in August 2014.

Gymnasium Entrance

Interior

Students' Amenities Centre

This is a common-room for students, just beside the Lords Ground. It serves multi purpose, and also houses the Drama Club of the institute. It was initiated with generous contribution from an alumnus of 1948 batch.

Slater Hall - Students' Centre for Creative Expressions

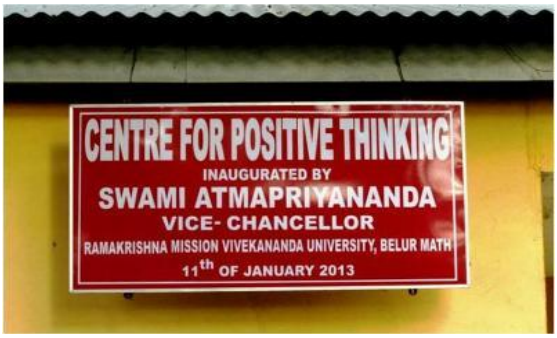
Slater Hall houses some of the clubs and societies of the institute, most notably the Music Club, the Debate Club, thr Photography Club and the Innovation Centre.

Students' Amenitites Centre

Slater Hall

Spiritual Development

The Vivekananda Youth Circle (for boys) and Sister Nivedita Study Circle (for girls) help in holistic personality development of the students. A meditation centre for students - PrasantaNeer (BABTECH Meditation Hall) – was designed, funded, and constructed in the year 2013 by an alumnus of 1974 batch.



Centre for Positive Thinking

Meditation Centre by the Bidisha Lake

Water Bodies

The campus has three large water bodies which add to its beautification. Of these, the Bidisha Lake has a connection to the River Ganges, and hence experiences the rise and fall of water level through tides.

Bidisha Lake, with the iconic Clocktower

Another view Bidisha Lake

Bidisha Lake, with the iconic Clocktower

Lake near First Gate

Institute Gates

The main gate of the institute (known as First Gate) was a gift from our alumni in the year 1956, when the institute completed a 100 years of its journey. The first gate leads to the main academic buildings, the Halls of Residence, and the Lords Ground. The second gate was reconstructed in the year 2013 to an impressive architectural structure. The new design was done by a student of Architecture Department, and the funding was from alumni of 1983 batch. The second gate leads to the hostels, ladies' hostels, Wolfenden Hall, Oval Grounds and Swimming Pool. A Third Gate is also present which opens to the Botanical Garden adjoining area, and is open for selected times of the day.

First Gate, also known as Centenary Gate

Second Gate

Netaji Bhavan

This is a building overlooking the Lords Ground, and serves multi-purpose. During festivities like Convocation, College Fests and Conferences, it can serve as reception area, as dining area or as a stage for street-theatres. In other times, it is a centre for UdyanSabpeyechhirAsar - an external body conducting children's programs in physical fitness exercise, games & sports, drawing and painting, and other cultural activities.

Way to Third Gate

Netaji Bhavan

Clocktower

The famous Turret Clock of the Clock Tower was installed in the year 1921. This iconic structure has always found its place in the logo of the institute. The clock was donated by Sir Rajendranath Mukherjee, an alumnus of 1883 batch, and chief engineer of the modern Howrah Bridge, and the Victoria Memorial.

The Clocktower, also serves as a Water Tank

Clocktower at Night

Graveyard

The instute has a graveyard adjacent to Pandya Hall and the Guest House. In here, graves dating back to 1852 and before can be found.

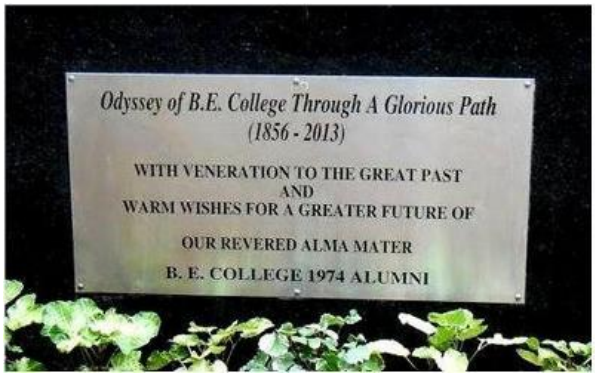
A curiously shaped tombstone

Overview of the Graveyard

Odyssery of B.E. College

This is a Gallery of Historical Events. The journey of our institute from 1856 to present day is carved in thirteen stone tablets. The 200 kg giant bell in the centre is over a century old. In 1820, it was installed in a tower beside the then Bishop's College. It is said that the renowned poet Michael Madhusudan Dutta - who stayed in Bishop's College during that time - used to wake up in the morning hearing the sound of this bell.

The stone tablet gallery



Odyssey Name Plaque

Army Barracks from World War II

These barracks, currently behind Hostel 15 and 16, were constructed to accomodate soldiers during Second World War. Later these were used as hostels from 1946 to 1954. Most of them are now used as staff quarters.

Lighthouse

Hiding from the public eye is an old lighthouse inside the campus. It is situated near the printing press.

Sign shows direction of Barracks

Lighthouse

Department of
Aerospace Engineering
&
Applied Mechanics

About the department

The department of Applied Mechanics was established as a separate major engineering department in 1947 and subsequently the Drawing Section was attached to it in late fifties. Over the years the department garnered enough human resources in the areas of fluid mechanics and structures. With effect from 2008 the department has been renamed as the Department of Aerospace Engineering and Applied Mechanics. The department runs regular postgraduate programme in engineering mechanics and started undergraduate programme in Aerospace Engineering from academic session 2010 – 11 with an intake of 30 students.

Academic Programmes:

Undergraduate Level:

Degree offered: B.E. in Aerospace Engineering

Sanctioned students intake: 30

Postgraduate Level:

Degree offered: M.E. in Engineering Mechanics

Sanctioned students intake: 54

Specializations in: Mechanics of Solid & Mechanics of Fluid.

Doctoral Level:

Degree offered:PhD (Engineering)

No. of candidates enrolled: 12

Registered: 03 in 1st year

02 in 2nd year

04 in 3rd year

03 in pre-submission stage

Awarded: One

Faculty Position:

Sanctioned faculty post : 28 Vacant Post: 13

Faculty profile (in the following table)

Name	Designation	Highest Qualification	Specialization/ Research Area	Contact No./ E-mail
Dr. K. Debnath	Professor & Head	Ph.D.	Fluid Dynamics, Hyd.	9830434409 debnath_koustuv@yahoo.com
Dr. S.K. Mukherjea	Professor	Ph.D.	FM, CFD	9831209985 mksujay@gmail.com mksujay@lycos.com skmukherjea@appmech.becs.ac.in
Dr. S. Halder	Professor	Ph.D.	Solid Mech., FEM	9830671153 salilhaldar@lycos.com
Dr. Subhasis Bhaumik	Professor	Ph.D.	Robotics, Mechatronics, Fluid Power System, CAD/CAM, Automation	9836044278 sbhaumik_besu@yahoo.co.in, subhasis@aero.iiests.ac.in
Dr. S. Majumder	Professor	Ph.D.	Solid Mechanics, Biomechanics	9433477867 majumder.santanu@gmail.com
Dr. R. Roy	Professor	Ph.D.	Earthquake Engg, Soil-structure interaction	9433154976 rroybec@yahoo.com
Dr. A. Roychowdhury	Professor	Ph.D.	Biomech., Solid Mech., FEA	9830465710 arc_98@rediffmail.com
Dr. B. Bhattacharya	Associate Professor	Ph.D.	Numerical Methods, Biomech.	9433235720 basubec@yahoo.com
Dr. N. Nandi	Associate Professor	Ph.D.	Fluid Mechanics, Flow separation, Hydraulics and hydraulic structures	9830354744 nityananda@mailcity.com
Dr. M.C. Manna	Associate Professor	Ph.D.	Vibration, Dynamics	9433228694 mcmbecdu@lycos.com

Dr. P.K. Das	Associate Professor	Ph.D.	Earthquake Engg, Struc. Dyn.	9433429156 / 7890099664 drpkdbesu@gmail.com
Dr. N. Khutia	Assistant Professor	Ph.D.	FE, Fracture Mech.	9883263316 niloy@mailcity.com niloy@aero.iiests.ac.in
Sri D. Pal	Assistant Professor	M.E.	CFD, Microfluidics, Fluid Mechanics & Thermal Engineering	9432311430 debashispal_2000@yahoo.com
Sri K. Bhowmik	Assistant Professor	M.Sc (Engg)	Solid Mechanics, FEM	9051327240 krishnendub@aero.iiests.ac.in, krishnendu.besu@gmail.com, krishnendu.iiests@gmail.com
Dr. P. Halder	Assistant Professor	PhD	CFD, High Speed Compressible Flow (Hypersonic), Magnetohydrodynamics & Aero Propulsion	9836277025/ 9434368954 pabicmeri@gmail.com / pabitrah@aero.iiests.ac.in
Dr. S. Talapatra	Visiting Professor	Ph.D.	FM, Hyd. Machines, FPE	9874145375 talapatrasuc@yahoo.in
Dr. D. Sengupta	Visiting Professor	Ph.D.	Solid Mechanics, Numerical Analysis and Fracture Mechanics.	9830212131 dsengupta2003@yahoo.com
Dr. B.N. Datta	Visiting Professor	Ph.D.	Fluid Mechanics, Hydraulic Machines and Fluid Control.	2668-9782 bndatta2004@yahoo.com
Dr. A.K. Mallick	Honorary Distinguished Visiting Professor	Ph.D.	Vibration Engineering, Mechanisms	9163323881 asokiitk@gmail.com
Dr. B.S. Mazumder	Honorary Distinguished Visiting Professor	Ph.D.	Fluid Mechanics and Heat Transfer	9831175336 bsmazumder@gmail.com
Dr. A. Ghosh	Honorary Distinguished Professor	Ph.D	Mechanics, Kinematics, Dynamics, Advanced Manufacturing, Robotics.	9433043427 amitabha@iitk.ac.in
Dr. A. Bose	Visiting Professor	Ph.D	Inertial Systems & Navigation	9477267944 amitavabose1@gmail.com

Awards and Laurels received by the faculty members: -

Dr. Rana Roy – Selected as Life member in European Association of Earthquake Engineering, Work Group 8: Irregular and Complex Structures (EAEE: WG 8), on nomination.

Research area (only mention broad titles without description in detail):

a. Analysis of structures under different loading

b. Fluid Dynamics and Turbulence, Micro Fluidics

c. Computational Fluid Dynamics, Compressible flow

d. Hydraulics and hydraulic structures.

e. Applications of Finite Element Method

f. Biomechanics, Fracture Mechaanics

g. Robotics and Mechatronics

h. Earthquake Engineering, Dynamic Soil-structure interaction.

i. Dynamics of Structures, Vibration

j. Micro and Nanoscale Transport Processes

Research facilities: (name specific equipment / picture, infrastructure etc)

i. Material Testing using UTM
ii. Implant Testing using Knee Joint Simulator
iii. Dynamic Analysis of Gait using Kistler Force Platform & Barograph
iv. Dynamic Model Testing using Shaker Table and Cyclic Loading test setup
v. Aerodynamic Model Testing using Wind Tunnel.
vi. Tilting Flume.
vii. Micro-Acoustic Doppler Velocimeter (16 MHz).
viii. Compressible Flow Bench
ix. Nozzle Pressure Distribution Measuring Setup
x. Nozzle Performance Experimental Setup.

Name of the laboratories:

1. Strength of Materials Lab	2. Fluid Mechanics & Hydraulics Lab
3. Biomechanics Lab	4. CAD Lab
5. Low Speed Aerodynamics Lab	6. Aerospace Structure Lab
7. Thermodynamics Lab	8. High Speed Aerodynamics Lab
9. Mechanical Vibration Lab	10. Stability and Control Lab

Consultancy Work:

- Design of two chimneys of 40 m and 75 m height, of DESCON Consultancy Services.

- Project on Entrepreneurship Development Cell (along with HRM Deptt.) (Sponsoring Agency – AICTE).
- Project on Centre for green TBI (Sponsoring Agency - NSTEDB, DST, Govt. of India).
- Calibration of Flow-meter (Kolkata Municipal Corporation)

Support staff position:

Sanctioned technical post:

Technical Assistant – 7 (vacant – 6)

Laboratory Assistant – 3 (vacant – 2.)

Instrument Mechanic – 1

Mechanic – 1 (vacant – 1)

Draughtsman – 1 (vacant-1)

Technical staff profile (in the following table)

Name	Designation	Highest Qualification	Contact No.	E- mail
Amalendu Sahoo	Technical Assistant I	M. E.	9432647772	Sahoo_amalendu@rediffmail.com
Arun Kr. Nandi	Laboratory Assistant	B. Sc.	9433452131	asttn.56@gmail.com

Ongoing Sponsored Research / projects: (mention area)

Sl. No.	Title of Research Project	Sponsoring Agency	Amount sanctioned Rs. in lakhs
1.	Development of Bone Condition Monitoring Technique using Ultrasonographic Sensor	DST	18
2.	Design and Development of patient specific orthopadic implant at Indian content	DST	63
3.	Turbulence in Rough Bed Free Surface Flow using Double Averaged	DST	30
4.	Development of a unified model to simulate uniaxial and multi-axial LCF and ratcheting for nuclear piping materials	DAE, BRNS	37

Details of publications of each faculty member (2015 – 16)

Journal …… 29

Conference …… **9**

1.Singh, S., Debnath, K., and Mazumder, B. (2016). "Spatially averaged turbulent flow over cubical roughness in wave-current co-existing environment." Coastal Engineering, Elsevier, 114, 77-85, ISSN: 0378-3839, DOI: 10.1016/j.coastaleng.2016.04.013 (Impact Factor = 2.7)

2.Singh S K, Debnath K and Mazumder BS (2016). "Turbulence statistics of wave-current flow over a submerged cube". Journal of waterway, Port, coastal, and Ocean Engineering (ASCE). 142(3), 04015027-1-20. ISSN: 0733-950X DOI: 10.1061/(ASCE)WW.1943-5460.0000329. [Impact factor 1.107]

3.Barman K, Debnath K and Mazumder BS (2016). "Turbulence between two inline hemispherical obstacles under wave-current interactions". Advance in Water Resources, Elsevier. 88, 32-52, Doi: 10.1016/j.advwatres.2015.12.001. [Impact factor 4.3]

4.Singh, S. K. & Debnath, K. (2016). "Combined effect of wave and current in free surface turbulent flow." Ocean Engineering, ELSEVIER, 127, 170-189, ISSN: 0029-8018, DOI: http://dx.doi.org/10.1016/j.oceaneng.2016.10.014. [Impact factor 1.4]

5.Singh, S. K., Debnath, K. & Mazumder, B. S. (2016). "Change in turbulent flow structure over rough-bed under combined wave-current motions." ISH J. Hydraul Eng., Taylor and Francis group, 22(3), 305-313, ISSN: 0971-5010 (Print) 2164-3040 (Online), DOI: 10.1080/09715010.2016.1192496.

6.Pramanik, D., Banerjee, A. and Roy, R. (2016). "Implications of Bi-directional Interaction on Seismic Fragilities of Structures, **Coupled Systems Mechanics**, **Techno Press,** 5 (2), 101-126.

7.Banerjee, A.K, Pramanik, D. and Roy, R. (2016). "Seismic Structural Fragilities: Proposals for Improved Methodology per Spectral Matching of Accelerogram", **Engineering Structures, Elsevier**, 111, 538-551.

8.Sengupta, A., Quadery, L., Sarkar, S. and Roy, R. (2016). "Influence of Bi-directional Near-fault Excitations on RC Bridge Piers", **Journal of Bridge Engineering, ASCE,** 21 (7), 04016034: 1-30.

9.Chabroborty, S. and Roy, R. (2016). "Role of Ground Motion Characteristics on Inelastic Seismic Response of Irregular Systems", **Journal of Architectural Engineering, ASCE,** 22 (1), B4015007: 1-16.

*10.*Roy, R., Ghosh, D and Bhattacharya, G. (2015). "Influence of Strong Motion Characteristics on Permanent Displacement of Slopes", **Landslides,** Springer, 13(2), 279-292.

11.Kalita, K., Shine, D. and Haldar, S. (2015). "Analysis on transverse bending of rectangular plates", Materials Today; Proceedings, 2(4), 2146-2154, 2015. ***Elsevier Science***

12. Dey, P., Haldar, S., Sengupta, D. and Sheikh, A. H. (2016). "An efficient plate element for the vibration of composite plates", Applied Mathematical Modelling, Vol. 40, Issue 9-10, 5589-5604. ***Elsevier Science.***

13.Kalita, K. and Haldar, S. (2015) "Parametric study on thick plate vibration using FSDT", Mechanics and Mechanical Engineering, Vol. 19, No. 2, 81-90.

14.Kalita, K. and Haldar, S. (2016). "Free vibration analysis of rectangular plates with central cutout", Cogent Engineering, Vol. 3, March.

15.Roy S., Das M., **Khutia N.,** Das D., Balla K V., Roy Chowdhury A., Bandopadhyay Amit,Understanding compressive deformation behavior of porous Ti using Finite Element Analysis, Materials Science and Engineering C. **Elsevier**, Vol. 64, Pages 436-443, 2016.

16.Roy S., Das M., Chakraborty P., Biswas J., Chatterjee S., **Khutia N.**, Saha S., RoyChowdhury A., Optimal selection of dental implant for different bone conditions based on the mechanical response, **Acta of Bioengineering and Biomechanics**. 2016 – Accepted for Publication.

17.**Khutia N.**, Dey P. P., Hassan T., An improved nonproportional cyclic plasticity model for multiaxial low-cycle fatigue and ratcheting responses of 304 stainless steel. Mechanics of Materials. **Elsevier**, Volume 91, Part 1, Pages 12–25, 2015.

18.Basantia S. K., Md Abu Bakkar, **Khutia N.**, Das D., Simulation of LCF Characteristics of AA6063 Al Alloy under Different Aging Conditions", Materials Today Proceedings, **Elsevier**, Volume 2, Issues 4–5, Pages 2226–2235, 2015.

19.S. Maiti, J. Roy, A. K. Mallik and J. K. Bhattacharjee (2015) – Nonlinear Dynamics of a Rotating Double Pendulum – Physics letters A.

20.Chatterjee, S., **Majumder, S.,** Roychowdhury, A., Pal, S., (2016), 'Review: Problems with use of Trans-Tibial Prosthesis', Journal of Medical Imaging and Health Informatics; Vol-6, pp-269-284.

21.Das, M., Talukdar, R G, **Bhowmik, K.,** Roy, S. and **Majumder, S.**, 'Comparison of interface stress-strain analysis of molar teeth with solid and porous dental implant', International Journal of Applied Engineering Research (IJAER); pp.10502-10506; Volume 10, Number S11 (2015).

22.Talukdar, R.G., Das, M., **Majumder, S., Roychowdhury, A.,** (2015). Optimization of Solid UHMWPE with porosity as a cervical disc implant. International Journal of Applied Engineering Research (IJAER); Volume 10, Issue S11, pp.10511-10515.

23.**Debashis Pal** and Suman Chakraborty, "Fluid flow induced by periodic temperature oscillation over a flat plate: Comparisons with the classical Stokes problems", Physics of Fluids 27, 053601 (2015).

24.ParthaSarathi Banerjee, Rururaj Pradhan, **Amit Roychowdhury,** Santanu Kumar Karmakar (2015), "Investigation Of Stresses Developed In Natural And Implanted Human Cervical Spine By Finite Element Method", Journal of Advanced Medical and Dental Sciences Research, Vol. 3, Issue 1, January-March 2015.

25.P. Dutta & **N. Nandi, '**Effect of Reynolds Number and Curvature Ratio on Single Phase Turbulent Flow in Pipe Bends**' International Journal** Mechanics and Mechanical Engineering, Vol. 19, No. 1 (2015) pp 5–16 c◯ Lodz University of Technology.

26.P. Dutta & **N. Nandi, '**Study on pressure drop characteristics of single phase turbulent flow in pipe bend for high Reynolds number' ARPN Journal of Engineering and Applied Sciences VOL. 10, NO. 5, MARCH 2015 (ISSN 1819-6608) pp 2221-2226.

27.P. Dutta, S. Saha & **N. Nandi, '**Computational study of turbulent flow in pipe bends' **International Journal of Applied Engineering Research** (ISSN 0973-4562) Volume 10, Number 11 (2015), pp10128-10133.

28.**N. Nandi,** S. C. Dutta and A. Roychowdhury, 'Change in stress distribution scenario within the earthen dams due to the effect of soil-structure interaction and hydrodynamic forces under static and seismic loading conditions.**' International Journal of Dam Engineering,** UK (2015), Vol XXVI issue 1**.**

29.P. Dutta, S. K. Saha, **N. Nandi** and N. Pal, 'Numerical study on flow separation in 90^0 pipe bend under high Reynolds number by k-ε modeling', Engineering Science and Technology, an international journal (Elsevier), 2016, pp 904-910.

CONFERENCE

1.Singh SK and Debnath K (2015). "Turbulence over rough-bed using double averaged Navier-Stokes equations". 20th International conference on Hydraulics, water Resources and River engineering, IIT Roorkee, 17-19 Dec., 2015.

2.Barman K. and Debnath K. (2015). "Turbulence flow characteristics over hemispherical obstacles in the presence of surface wave". 20th International conference on Hydraulics, water Resources and River engineering, IIT Roorkee, 17-19 Dec., 2015.

3.Mahure, K., Barman, I. and Haldar, S. (2015) "Free Vibration of Rectangular Composite Laminate Plate with Concentrated Mass At Centre by Finite Element Method", 60th. Congress of ISTAM, held on Malaviya National Institute of Technology, Rajasthan.

4.Chakrabarty A., Khutia N., Bar H. N., Dey P. P., Sivaprasad S., Effect Of Loading Variations On Damage Of SA333 C-Mn Steel, Accepted for Publication in Materials Today Proceedings, Elsevier as Proceedings of 5th International Conference on Materials Processing and Characterization (ICMPC-2016), 12th to 13th March, 2016, GRIET, Hyderabad.

5.Das B. K., Bakkar Md Abu, Khutia N., Das D. D., Low Cycle Fatigue Performance Evaluation of TMT rebar, Accepted for Publication in Materials Today Proceedings, Elsevier as Proceedings of 5th International Conference on Materials Processing and Characterization (ICMPC-2016), 12th to 13th March, 2016, GRIET, Hyderabad.

6.Dutta, P. and Nandi, N. (2016), "Computational study on the effect of bend curvature on velocity distribution from straight to a 900 pipe bend using k – ε turbulence model" international

conference on Engineering Problems and Application of Mathematics 2016 (EPAM – 2016), 11-12 June, NIT Agartala.

7. Dutta, P. and Nandi, N. (2016), "Numerical study on the effect of bend curvature on static pressure distribution from straight to a 900 pipe bend using k – ε turbulence model " 3rd international conference on applications of fluid dynamics (ICAFD) organised by department of Applied Mathematics, ISM Dhanbad, India in association with Fluid Mechanics Group, University of Botswana, Botswana, on December 19-21 (accepted for publication).

8. S. K. Saha, P. Dutta and N. Nandi, " Study on flow separation for single phase flow through 900 pipe bend", proceedings of International Conference on Current Innovation in Engineering & Technology (ICETER 2015) sponsored by international association of engineering & technology for skill development, pp 234-243, October 11, 2015, VRS & YRN college of engineering and technology, Chirala, AP.
9. P. Dutta, S. K. Saha and N. Nandi, " Computational study of turbulent flow in pipe bends' International conference emerging trends in manufacturing, engines and modeling (ICEMEM-2015), NMIMS university, Maharastra, February 2015.
10. P. Dutta, S. K. Saha and N. Nandi, "Study on Turbulent Flow Characteristics in Pipe Bends", Proceedings of 2nd International Conference on Advances in Mechanical Engineering and its Interdisciplinary Areas (ICAMEI), College of Engineering and Management, Kolaghat, WB, 2-4 January, 2015, Excel India Publication (ISBN: 978-93-84869-03-8).pp 58-64.

Seminar / Workshops / Conferences / Training programme organized by the department (2015 - 16): Two days workshop on Astrodynamics and Aerospace Materials on 10th and 11th August, 2016.

Advancements under TEQIP – Phase II:

1. Viscous Analogue Apparatus (Hele Shaw): funded by TEQIP, cost Rs. 5,98,561/- April, 2015
2. Aircraft Longitudinal Roll and Yaw Control Experimental Set up : for Aircraft Stability and Control Laboratory funded by TEQIP (Cost. Rs. 4,93,666.75/-) February, 2014
3. Quad rotor Aircraft Experimental Setup : for Aircraft Stability and Control Laboratory funded by TEQIP (Cost. Rs. 2,13,542.50/-) February, 2014
4. Emissivity Measurement Apparatus: funded by TEQIP, cost Rs. 4,59,760/- February, 2013
5. ANSYS Academic Research CFD (5 tasks) : funded by TEQIP, cost Rs. 6,69,070/- November, 2012
6. Pro Engineering: funded by TEQIP, cost Rs. 3,22,740/- November, 2012.

Visitors to your Department (Indian & Foreign):

1. Professor Arun Mishra, Chairman, Dept. of Mechanical and Aerospace Engg., McGill University, Montreal, Canada on August, 2016.
2. Professor Stephen Yue, Department of Material Sciences, McGill University, Canada on August, 2016.

Alumni Contribution to your Department: Not very specific

Training and Placement:

10 Students were placed in different industries through Training & Placement Cell of the Institute. (Exl Services, IBM, Infosys, CTS and Accenture)

New Academic / Research Initiatives

Academic Collaboration:

3rd Year students visited IIT, Kanpur on March, 2015 for training in Flight Mechanics Laboratory. Academic Collaboration is in process with McGill University, Montreal, Canada.

Department of Architecture, Town & Regional Planning,

About the Department:

Bengal Engineering College was established in 1856. Later it was conferred the status of a Deemed University in 1993 and then became a full-fledged university under UGC Act from 2006. The Department of Architecture, Town & Regional Planning was established in 1949 as a constituent department of the Bengal Engineering College, and it was the first B.Arch. Degree awarding institution in the country. PG diploma in Town Planning was also started, as a part time course from 1949 and subsequently it became a full time course in Master of Town and Regional Planning from 1976 abolishing the part-time course. Since then it has produced about one thousand Under Graduate Students and three hundred Post Graduate students.

The vision of our Department is to carry forward our legacy that aims in making a student aware of the cultural, social, historical and technological aspects of design from the micro to the global scale with the aim to enhance quality of life on individuals and communities through a sustainable and humane approach to the profession, rooted in responsible use of resources and sensitive to ethno-cultural diversity of human kind.

Our mission is to engage our students in an exemplary architectural education program that has as its backbone a diversified and comprehensive curriculum that encourages independent innovative thinking through teaching, research and service in an unprejudiced and ethical academic environment reverent to history, culture and heritage and dynamic enough to embrace the challenges of the future.

Academic Programs

Undergraduate Level

Degree offered:	Bachelor of Architecture (B.Arch)
Sanctioned student intake:	24

Post-Graduate Level

Degree offered:

Master of Urban and Regional Planning (MURP)

Sanctioned student intake:	16
Additional intake through other programs (i.e. QIP)	As per rule
Specializations in	Urban and Regional Planning

Doctoral Level

Degree offered	PhD
No. of candidates enrolled, registered and awarded	Enrolled: 6 Registered: 12 Awarded: 3

Faculty position

Sanctioned faculty post: 13Vacant post: 4

Faculty profile (in following table)

Name	**Designation**	**Highest Qualification**	**Specialisation/ Research Area**	**Contact No. E-mail**
Aditya Bandyopadhyay	Professor	Doctorate	Mathematical Models in Urban Planning, Regional Planning	bandyopadhyay.aditya@gmail.com
Souvanic Roy	Professor	Doctorate	Spatial and Environmental Planning, Alternative Technology and Green Building Techniques, Community Based Natural Resource Management	soy1roy@gmail.com
Arup Sarkar	Professor	Doctorate	GIS, Urban and Regional Planning	arupsarkar.ar@gmail.com
Swati Saha	Professor and Head	Doctorate	Urban and Regional Planning	swatisaha04@yahoo.com
Keya Mitra	Professor	Doctorate	Seismic Evaluation, Disaster Risk Mitigation and Management, Cultural heritage seismic risk mitigation, Urban Design	keyamitra@gmail.com +91 9831766596
Parthasarathi Mukhopadhyay	Associate Professor	Doctorate	Disaster Resistant Architecture, Urban Design, Technical Education, Visual Design	(+91) 98312 76459 parthasm@gmail.com
Amitava Roy	Associate Professor	Doctorate	Energy and Architecture	r.amitava@gmail.com +91 98300 07654
Subrata Kumar Paul	Assistant Professor	Doctorate	Transport Planning, Urban and Regional Planning	subrata2412@gmail.com
Soumen Mitra	Assistant Professor	Doctorate	GIS, Urban and Regional Planning	mitrasmen@yahoo.co.in

Research Area

1. Architecture and Built form.
2. Computer Aided Architecture.
3. Vernacular and Rural Architecture
4. Energy and Building.
5. Urban Design.
6. Architectural Conservation.
7. Housing and Human Settlement Planning.
8. Transportation Planning.
9. Remote Sensing and Geographical Information System.
10. Environmental Planning and Management.
11. Rural Planning and Development.
12. Regional Planning and Development.
13. Earthquake resilient Buildings and Builtform.
14. Urban Planning/ Town Planning.
15. Regional Planning.
16. Urban administration, management and finance.
17. Climate Change and Human Settlements.

Research Facilities

1. Computer facilities for Remote Sensing and GIS
2. CAD Simulation Laboratory
3. Environmental Laboratory
4. Acoustic Laboratory

Name of the laboratories

Material Museum is used for permanent display of samples of building materials for acquaintance of the students.
Construction Yard demonstrates various techniques of construction.
Computer Aided Architectural Design Laboratory is used for learning and practice of CAD for the students and Multimedia Simulation Laboratory for Research and Development.
Remote Sensing and GIS Laboratory facilitates training for the students of Town and Regional Planning in GIS, GPS and Remote Sensing technologies.

Support Staff position

Sanctioned Technical Post: 3
Technical Staff Profile (in the following table)

Name	**Designation**	**Highest Qualification**	**Contact No.**	**E-mail**
Anjana Sengupta	Technical Assistant (Gr. I)	M. E. (Civil Engg.)	+913326684561-63 (Extension 401)	anjanasenguptaa@yahoo.com,
Keya Rani Mandal	Technical Assistant (Gr. II)	I.I.A. Examination Passed (equivalent to B. Arch.)		rani_mandal@rediffmail.com
Sarbani Sarkar	Technical Assistant (Gr. II)	I.I.A. Examination Passed (equivalent to B. Arch.)		sarkar_sarbani@rediffmail.com

No. of Publications)
Journal 7
Conference5
Books / Monographs5
(List to be included)

Seminar / Workshop / Conference / Training Program organized by the Department last year

1.Faces – An Architectural Design Exercise. Design Workshop held in the Department from October 28- Nov 6, 2015 by Prof. Federico De Matteis, Department of Architecture, Sapienza University of Rome

2.A Workshop on Architecture and Structures for the UG Thesis Class of 2016 from March 18-March 29, 2016 by Professor Andrew Charleson of the Victoria University of Wellington, New Zealand

List of Publications by faculty members during 2015-2016

Journals

1. **Paul, S.K, Roy,S.,** "Tourism based heritage conservation in Murshidabad: an appraisal," Journal of Heritage Tourism [ISSN 1743-873X (Print), 1747-6631 (Online)], Routledge, Taylor and Francis, (DOI: 10.1080/1743873X 2016.1159685), March, 2016, pp. 2-16.
2. **Mukhopadhyay, P.** and Dutta, S. C. "Rapid visual screening of earthquake-susceptible buildings." Proceedings of the Institution of Civil Engineers – Municipal Engineer, ICE, Vol. 169, No. 1, 2016, pp. 1-8, Impact Factor: 0.15.
3. **Mitra, S.,** Guha Niyogi, J., Guha Niyogi, A., "Methodology for Deciding Route-Specific Appropriate Transit Modes based on Stakeholders' Utility Values: Applicability in Indian Cities", Indian Journal of Transport Management, Vol. 39, No. 2, 2015, pp.60-75.
4. **Roy, S.,** "Sustainable Slum Improvement Models: Ban Mankong in Thailand and PRODEL in Nicaragua,"TerraGreen, Issue 7(12), 2015, pp.23-28.

5. **Roy, S.,** "Significance of Pre-operational Embodied Water of Buildings in Innovative and Sustainable Design Practices", Technical Journal of The Institution of Engineers (India) Pune Local Centre, Issue 39, 2015, pp.74-78.

6. **Mukhopadhyay, P.** and Dutta, S. C. "Investigating Compressive and Cleavage Strengths of an Indian Bamboo Species." Journal of Materials in Civil Engineering, ASCE, Vol. 27, No. 9, 2015, pp. 06014029-1 – 8, Impact factor: 1.32.
7. Dutta, S. C., **Mukhopadhyay, P.** S., Saha, R. and Nayak, S. "2011 Sikkim Earthquake at Eastern Himalayas: Lessons learnt from performance of structures." Soil Dynamics and Earthquake Engineering, Elsevier, Vol. 75, 2015, pp. 121-129, Impact Factor: 1.30.

Participation in International/national conferences/seminars during 2015-2016

1. **Keya Mitra** – "Earthquake Resistant Traditional Knowledge Systems in the Sikkim Monasteries, India, in the 2011 M 6.9 Sikkim Earthquake: Lessons Learnt," In Proceedings of the International Conference on Earthquake Engineering and Post Disaster Reconstruction Planning 24 – 26 April, 2016, Bhaktapur, Nepal, April 24-26, 2016.
2. **Keya Mitra** - International Conference on "Emerging Building Materials and Construction Technologies", New Delhi, Building Materials and Technology Promotion Council, Ministry of Housing and Urban Poverty Alleviation, Government of India, March 21-22, 2016
3. **Souvanic Roy** - International Symposium on "Livable Habitat and Sustainable Infrastructure: A Key to Smart Growth" published by IIT, Kharagpur, 2016

4. **Souvanic Roy** - "Climate Vulnerability and Adaptation Experience of Megacities in Asia", Proceedings of the Asian University Network Forum on Advances in Research, published by Aichi Gakuin University, Japan, 2015

5. **Souvanic Roy** - International Symposium on "Urban Quest South Asia" published by South Asia Urban Forum, Colombo, Sri Lanka, 2015

6. **Arup Sarkar** - National Workshop on "Mission Ganga: Urban Planning Perspectives", Institute of Town Planners, India, August 8, 2015

Books and Monographs

1. **Mukhopadhyay, P.** and Dutta S. C. "Indian Cyclones and Earthquakes: Their Impact on Structures." In Encyclopedia of Natural Hazards, Taylor and Francis Group, Boca Raton, United States (accepted), 2016
2. **Mitra, K.** "The Calcutta Chronicles. From Calcutta to Kolkata". In Geropanta, V & E. Lucantoni (eds) Projects For: Kolkata The regeneration of the Hooghly riverfront. Aracneeditriceint. le SRL, Rome. ISBN: 978-88-548-8550-9.June 2015.
3. **Roy, S.,** "Architectural Design, The Bloomsbury Encyclopedia of Design", Bloomsbury Publishing (ISBN 9781472521576),2015, pages 49-56
4. **Paul, S.K.,** "Transit Oriented Development", The Bloomsbury Encyclopedia of Design, Bloomsbury Publishing (ISBN 9781472521576),2015, pages 330-331
5. **Mitra, S., Roy, S.,** Roy, S.K., Sanyal, M.K., "Land Use and Infrastructure Development Strategy for Planned Transformation of Bally-Howrah-Uluberia Planning Area, Urban Development in Howrah: Socio-Economic Perspectives", Book Chapter, PRIMUS Books Publishers, ISBN 978-93-84082-39-0, 2015, pp-304-312

Foreign visits and Invited Lectures

1. **Souvanic Roy –** Speaker at Climate Vulnerability and Adaptation Experience of Megacities in Asia, Proceedings of the Asian University Network Forum on Advances in Research, published by Aichi Gakuin University, Japan, 2015

2. **Souvanic Roy –** Speaker at International Symposium on "Urban Quest South Asia" published by South Asia Urban Forum, Colombo, Sri Lanka, 2015

3. **Keya Mitra** – One month Study and Research Programme, Department of Architecture, Sapienza University, Rome, June 2015.

Visitors to your Department (Indian & Foreign)

1.Prof. Federico De Matteis, Department of Architecture, Sapienza University of Rome

2.Prof. Andrew Charleson of the Victoria University of Wellington, New Zealand

3.Dr. Peter Scriver and Dr. Amit Srivastava, Centre for Asian and Middle Eastern Architecture, University of Adelaide

Alumni Contribution to your Department

Training and Placement

As a part of B.Arch Curriculum, students went for 6 months professional training in renowned architectural practices in India (Ahmedabad, Bengaluru, Delhi, Kolkata), and in Dubai.

Extension Activities and Societal outreach

New Academic / Research Initiatives

a) Academic Collaboration:

Department of Architecture, Sapienza University of Rome

b) Industrial Collaboration

Students' Achievements

ANDC 2015: 1 entry has been selected.

ZONASA 2015 :

2nd Position in ZONASA 2015
1st : Architectural Journalism
1st : Convention Trophy (Urban Design)
2nd : Flag Design
3rd : Reubens (Academic Sessionals)
Special Mention: Design 306.
Special Mention : Main Design 1 (Hand Drafted Design)
Special Mention : Main Design 2 (Computer Aided Design)
Informal Events:
2nd : Identatis (Logo Design)
3rd :Wah! Taj (Head Gear Design)
3rd : Metamorphosis (Model making with Wires)

NASA 2016:

FIRST POSITION (CITATION 1) in UCP Trophy (Unknown Craft's Person Trophy– Documentation of a Tribal Wall Craft of Shantiniketan, Birbhum)
Top 10 in G SEN Trophy
Top 20 in Louis I Kahn Trophy
Top 15 in Writing Architecture

TRANSPARENCE 2015:

- JURY RECOMMENDATION (Ayan Roy, Soumyodeep Das and Saisha Mattoo)

RUSSEL BUSTLE 2016:

- 1st Runners up (Ayan Roy and Saisha Mattoo)

INDIAN ARCH 2016: 29th edition of NASA annual magazine published.

Tamalee Basu: GAABESU Research Award 2015-16; ADI AWARDS, for entry 'Navayana Buddhist Meditation Centre'

GATE 2016: Eeshan Bhaduri – AIR 05
Shamik Sambit Chatterjee – AIR 13
Shagufta Pal – AIR 30

Department of Civil Engineering

About the Department

The University started its journey with the Department of Civil Engineering in 1856. Civil Engineering College, as the University was known at that time, began with ten students and two teachers in Civil Engineering with the objective of producing finest Civil Engineers in the country. Now, more than 157 years' old, Department of Civil Engineering remains the premier department of this University. During these years, the department has produced Civil Engineers who contributed immensely in shaping the pre- and post-independence India. Feeling the need of research and development, it started Master of Engineering in Civil Engineering programme in 1954. Currently it offers Master of Engineering and PhD programmes in five specializations: Environmental Engineering, Geotechnical Engineering, Structural Engineering, Highway and Traffic Engineering and Water Resources Engineering. Apart from teaching and research it is also actively engaged sponsored projects and industrial consultancy at national and international levels. At the societal level, the department has developed and successfully implemented technology solutions that helped thousands of rural people in getting pollution free water and thus living safely.

Academic Programmes

Undergraduate Level

Degree offered: B.E., Integrated Dual Degree
Students' intake: 132
Additional intake through lateralentry in 3rd Semester

Postgraduate Level (Regular)

Degree offered: MTech.
Students' intake: 39 (GATE)
Additional intake through other programmes: Nil

Specializations: Environmental Engineering, Geotechnical Engineering, Highway and Traffic Engineering, Structural Engineering and Water Resources Engineering

Doctoral & Postdoctoral Research Programme

Degree offered: Ph.D.

No. of candidates: Enrolled: 14; Registered: 20, Submitted: 2 Awarded: 4

Faculty position: Sanctioned: 34 Vacant: 8

Faculty profile

SL No.	Name	Designation	Highest Qualification	Specialisation/ Research Area	Contact No. E-mail
01	Saibal Kumar Ghosh	Bijoy – Ashu Chair Professor	Ph.D.	Structural Engg., Conc. Tech.	2668-4561 (Extn. 659)
02	Subhamay Gangopadhyay	Visiting Professor	Ph.D.	Transportation Engineering	2668-4561 (Extn. 666)
03	Gautam Bhattacharya	Professor	Ph.D.	Geotech. & Highway Engg.	2668-4561 (Extn. 281)
04	Kalyan Kr Chattopadhyay	Professor	Ph.D.	Geotech. & Structural Engg.	2668-4561 (Extn. 660)
05	Kalyan Kumar Bhar	Professor	Ph.D.	Water Resources Engg.	2668-4561 (Extn. 674)
06	SubrataChakraborty	Professor	Ph.D.	Structural Engg.	2668-4561 (Extn. 673)
07	Anirban Gupta	Professor	Ph.D.	Environmental Engg.	2668-4561 (Extn. 675)
08	Sudip Kumar Roy	Professor & Head	Ph.D.	Transportation Engg.	2668-4561 (Extn. 666)
09	Ambarish Ghosh	Professor	Ph.D.	Geotechnical Engg.	2668-4561 (Extn. 653)
10	Chaitali Ray	Professor	Ph.D	Structural Engg.	2668-4561 (Extn. 661)
11	Aparna (Dey) Ghosh	Professor	Ph.D.	Structural Engg.	2668-4561 (Extn. 663)
12	Debabrata Mazumber	Professor	Ph.D.	Environmental Engg.	2668-4561 (Extn. 654)
13	Sugato Pal	Assoc. Professor	M.E.	Structural Engg.	2668-4561 (Extn. 714)
14	Debashis Moitra	Assoc. Professor	PhD	Geotechnical Engg.	2668-4561 (Extn. 711)
15	Pratip Bandyopadhyay	Assoc. Professor	M.E.	Environmental Engg.	2668-4561 (Extn. 657)
16	Arun Kumar Chakraborty	Assoc. Professor	MTRP	Structural Engg.	2668-4561 (Extn. 645)
17	PrasantaChakraborty	Asst. Professor	M.E.	Structural Engg.	2668-4561 (Extn. 715)
18	Ashis Kumar Bera	Asst. Professor	Ph.D.	Geotechnical Engg.	2668-4561 (Extn. 655)
19	SujataBiswas	Asst. Professor	Ph.D.	Water Resources Engg.	2668-4561 (Extn. 672)
20	Tapash Kumar Roy	Asst. Professor	Ph.D.	Geotech. & Transport. Engg.	2668-4561 (Extn. 668)
21	ChanchalMajumder	Asst. Professor	Ph.D.	Environmental Engg.	2668-4561 (Extn. 661)
22	SoumyaBhattacharjya	Asst. Professor	Ph.D.	Structural Engg.	2668-4561 (Extn. 715)
23	Sandip Chakraborty	Asst. Professor	M.E.	Transportation Engg.	2668-4561 (Extn. 672)
24	Asok Adak	Asst. Professor	Ph.D.	Environmental Engg.	2668-4561 (Extn. 658)
25	Sujit Kumar Dalui	Asst. Professor	Ph.D.	Structural Engg.	2668-4561 (Extn. 822)
26	Sneha Murmu	Asst. Professor	M.E.	Water Resources Engg.	snehabesu09@gmail.com
27	Ujjwal Saha	Asst. Professor	Ph.D.	Water Resources Engg.	ujjwalsaha1980@gmail.com
28	Pritam Saha	Asst. Professor	Ph. D.	Transportation Engg.	saha.pritam@gmail.com

Awards and laurels

- The UKIERI Project under Prof. Kalyan Kumar Bhar on "Assessment of effects of arsenic pollution on health in rural Bengal and development and implementation of sustainable technology solution" has been shortlisted by UKIERI as one of the most successful projects and selected for case study documentation.
- Dr. Goutam Bhattacharya Received the IGS-Shri R.N. Prasad Biennial Prize, 2015 by Indian Geotechnical Society for the best paper on "Slope Stability and Landslides"(Jointly with the PhD Sholar, SubhadeepMetya).
- Dr. Tapas Kumar Roy and Sri Raja Mistry received Best conference paper award 2016 in the International Conference on Applied System Innovation Organized by 'IEEE and Taiwanese Institute of Knowledge Innovation'
- Dr. SubrataChakraborty acted as Section Editor (civil Engineering) of INAE Letter, An Official Journal of the Indian National Academy of Engineering, Published by Springer.
- Dr. SubrataChakraborty nominated as Member of the Sectional Committee 1 (Civil Engineering) ofIndian National Academy of Engineeringfrom Jan 1, 2016.

Research area

Environmental Engineering

- Development of Domestic and Community-based Arsenic Removal Units and Installation at Arsenic-contaminated areas
- Testing and standardizing a low-cost domestic water filter for iron and arsenic removal
- Screening of public water sources for arsenic contamination
- Rapid assessment for fluoride contamination in West Bengal
- Development of new materials for arsenic removal
- Water treatment for surface water at village-level
- Technology for treatment of septic tank effluent
- Characterization of and energy recovery from municipal solid waste
- Environmental Impact Assessment
- Antibiotic Resistance in Waste Water

Geotechnical Engineering

- Application of stone columns as cost effective foundation system in soft soil
- Application of Jute Geotextiles in Civil Engineering
- Application of Geotube in Civil Engineering Construction
- Reliability in Geotechnical Engineering
- Analysis & Design of waste containment liner design for containment transport modeling
- Risk evaluation of pile foundation in liquefiable soil
- Study on liquefaction of soil for mutation and of mitigation strategy with special emphasis to microzonation of Kolkata
- Use of waste materials for Road Construction
- Behaviour of piles under complex loading

Structural Engineering

- Fibre Reinforced Composite Structures
- Concrete Technology (High performance concrete, Lightweight concrete, Geopolymer concrete, High-volume fly ash concrete, Self compacting concrete, Bio Concrete etc.)
- Reliability Analysis of Structures
- Structural Dynamics and Earthquake Engineering
- Computational Mechanics (FEM, BEM, SFEM)
- Structural Health Monitoring

- Corrosion of steel in concrete
- Vibration control

Transportation Engineering

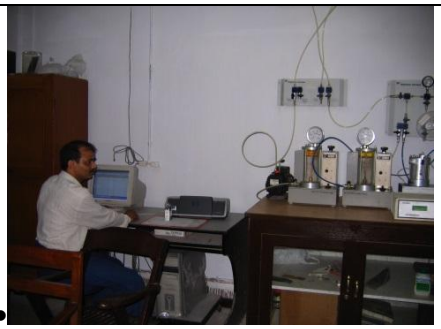
- Highway Capacity and Level of Service
- Traffic Congestion Analysis
- Alternate Pavement Material
- Public Transport SystemPlanning
- Road Safety
- Design and Management of Rural Roads
- Pavement Distresses and Maintenance Management
- Cold Mix Technology

Water Resources Engineering

- Water Resources Planning and Management
- Flood Hazard Mitigation
- Reservoir operation
- Stochastic Hydrology
- Storm Water Management
- River Hydraulics and Modeling
- Watershed Management
- Remote Sensing and GIS Applications
- Climate Change,
- Urban Hydrology

Research Facilities: (Major equipment / picture etc.)

Environmental Engineering • Atomic Absorption Spectrometer • Gas Chromatography **Geotechnical Engineering** • Pile Integrity Testing Setup • Digital Triaxial Testing Setup Seismic Down Hole Testing System	**Transportation Engineering** • Field Asphalt Content Tester • Hand-held Falling Weight Deflectometer • V Box • Digital Camera for traffic survey • Laser Distometer • Laser Speedometer
Structural Engineering • Modal Testing Set-up • Automatic Compression Testing Machine • Corrosion Analysis Instrument • NDT Facilities • Composite Testing Lab • Vibration Testing Facilities • UTMs, CTMs	**Water Resources Engineering** • Remote Sensing and GIS Setup • High-performance Computing



Digital Triaxial Testing Setup

Atomic Absorption Spectrometer

Hand Held Core Cutter

Field Asphalt Content Tester

Automatic Compression Testing Machine

GPR for concrete testing

Some Recently Created Facilities

Composite testing facilities

100kN UTM

Vibration Control Testing Facilities

CAPO Test System

SASW test set up

Laboratories

Name of the Laboratory	Purpose
1. Computational Lab	• To conduct regular laboratory classes according to undergraduate and postgraduate curricula • To provide testing facilities to outside agencies. • To undertake research work
2. Concrete Technology Lab	
3. Environmental Engineering Lab	
4. GIS Lab 5. Geotechnical Engineering Lab	
6. Geotextile Engineering Lab 7. Modeling and Simulation Lab 8. Structural Engineering Lab	
9. Structural Dynamics Lab 10. Surveying Lab	
11. Transportation Engineering Lab	
12. Water Resources Engineering Lab	

Consultancy work:

Sl. No.	Title of the work	Sponsoring agency	Period	Amount (Rs.)	PI / Consultant(s)
1.	Vetting of Design Calculation of 160 m3/h capacity Arsenic Removal Unit at NASIRKUL and , Kamalpur, Zone-I, Nadia Under PHED, Govt. of W.B	Effluent Wastewater Treatment Engineers (P) Ltd.	3 Months	2.3 lac	Prof. ChanchalMajumder
2.	Renovation, Rehabilitation and Strengthening of Old Arched Masonry Bridge over river Banka at Birhata on G. T. Road Burdwan	Burdwan Development Authority	2 months	4.8 lac	Prof. Sudip Kumar Roy, Prof. AmbarishGhosh, Prof. Tapas Kumar Roy, and Prof. Sujit Kumar Dalui
3.	Chandrapura – Bhandaridah - Phusro Railway Crossing – Kathara - Gomia Road in Jharkhand: Safety Consultant	Ram Kripal Singh Construction Pvt. Ltd. for State Highways Authority of Jharkhand	1 and ½ months	19.46 lac	Prof. Sudip Kumar Roy, Prof. SandipChakraborty
4.	Strengthening and Widening/Reconstruction of Koderma – Domchanch – Khorimahua – Jamua Road (SH 13) to two lane with paved shoulder under EPC Mode: Safety Consultant	Ram Kripal Singh Construction Pvt. Ltd. for State Highways Authority of Jharkhand	1 and ½ months	22.20 lac	Prof. Sudip Kumar Roy, Prof. SandipChakraborty
5.	Quality Control of Construction of 'URBANA' Project	Bengal NRI Complex Ltd.			
6.	Vetting of Hydraulic Design and Drawing of Storm Water Drainage System of lake Gardens Area under Borough – X of KMC followed by proposal of Drainage Pumping Station	Comtel Consultants &InfraprojectsPvt. Ltd.	1 Month (March 2016)	1.10 lac	Prof. Asok Adak Prof. Sudip Kumar Roy, Prof. SandipChakraborty
7.	Third Party consultancy for 11.5 km 1829(OD) MS pipeline from river Hooghly to New Town	Public Health Engg, Dept. Govt. of WB	April,2013-Ongoing	521.0lac	Prof. SaibalGhosh, Prof. K KChattopadhyay, Prof. S. Chakraborty and other consultants

8.	Vetting of Design and drawing for Beck Bagan Crossing, AJC Bose Road	Hooghly River Bridge Commissioners	Ongoing	6.0Lacs	Prof. SaibalGhosh
9.	Vetting of design and drawing for Nager Bazar Flyover	Hooghly River Bridge Commissioners	Ongoing	13.0 Lakhs	Prof. SaibalGhosh
10.	Proof checking of MridangaBhanga Bridge	Hooghly River Bridge Commissioners	Ongoing	12.0 lakhs	Prof. SaibalGhosh
11.	Vetting of 20 Storied Office Building of HMC with Roof Top Helipad	HMC	2015 to Ongoing	13.0 lakhs	Prof. SaibalGhosh
12.	Vetting and Third Party Consultancy for 400 Ft Viewing Tower in Howrah Belilius Park	HMC	2016 to Ongoing	24.0 lakhs	Prof. SaibalGhosh, Prof. K KChattopadhyay, Prof. S. K. Dalui
13.	Vetting of design and drawing of Unified Campus of Bose Institute at Salt Lake	Bose Institute	Ongoing	6.0 Lakhs	Prof. SaibalGhosh
14.	Proof Checking of Design and Drawing of Drainage Pumping Station at AkandaKeshari in AA-IIID New Town Kolkata	Public Health Engineering Directorate, Govt. o West Bengal	2015-Ongoing	1.50 lakhs	Prof. SaibalGhosh, Prof. SoumyaBhattacharjya
15.	Vetting of design and drawing for Akademia Tower	M/s ShibNiketan Pvt. Ltd.	Ongoing	3.0 lakh	Prof. SaibalGhosh, Prof. K KChattopadhyay,
16.	Vetting of design and drawing of building at B.R.Singh Hospital	M/s Panchdeep Construction Ltd.	Ongoing	2.0 lakh	Prof. SaibalGhosh
17.	Structural Stability checking of buildings at NabaDiganta Industrial Township	M/s NabaDiganta Industrial Township authority	Ongoing	12.0 lakh	Prof. SaibalGhosh, Prof. K KChattopadhyay, Prof. S. K. Dalui
18.	Special repair of buildings at Turf view complex Kolkata	Garrison Engineer, Alipore	2015	3.0 lakh	Prof. SaibalGhosh,Prof. SoumyaBhattacharjya, Prof. S. K. Dalui
19.	Proof checking of design and drawing of warehouse, office and dormitory building, at Agartala, Tripura	M/s RITES Ltd.	August 2015-Sept 2015	1.5 lakh	Prof. SoumyaBhattacharjya,Prof. SaibalGhosh
20.	Vetting of bearing design for bridge project	M/s Oriental Ltd.	2015	1.0 lakh	Prof. SaibalGhosh, Prof. SoumyaBhattacharjya
21.	Vetting of WB Joint Entrance Board building	M/s Bridge & Roof	2016	2.5 lakh	Prof. SaibalGhosh, Prof. SoumyaBhattacharjya
22.	Proof checking of Pipe bridge at Dhakuria	IOL	2016	1.0 lakh	Prof. SaibalGhosh, Prof. SoumyaBhattacharjya
23.	Vetting of State hut at Dhakuria	M/s Panchadeep Construction	2016-ongoing	2.5 lakh	Prof. SaibalGhosh, Prof. SoumyaBhattacharjya
24.	Vetting of Office buildings for LIC at Guwahati	LIC	2016-Ongoing	5.0 lakh	Prof. SaibalGhosh, Prof. K KChattopadhyay, Prof. S. K. Dalui
25.	Vetting of International guest house at IIT KGP	CPWD	2016-ongoing	3.0 lakhs	Prof. SaibalGhosh, Prof. K KChattopadhyay, Prof. SoumyaBhattacharjya
26.	Vetting of Design and Drawing of B+G+10 Residence for Hon''ble Minister of Govt. of West Bengal at Alipur, Kolkata	National Building Construction Corporation Ltd.	One month	3.50 lac	Prof. Tapas Kumar Roy
27.	Vetting of Design and Drawing of B+G+2 Kolkata House of Govt. of West Bengal at Alipur, Kolkata.	National Building Construction Corporation Ltd.	One month	3.50 lac	Prof. Tapas Kumar Roy

28.	Technical vetting of structural design and estimate of a new classroom building of Monya College.	Monya College, PurbaMedinipur.	One month	2.00 lac	Prof. Tapas Kumar Roy
29.	Safety Consultancy services during Development and Construction Phase of NH-34: for Project i) Barasat-Krishnagar Section from km 31.000 to 115.000 (84 km) and ii) Krishanagar- Baharampore Section from km 115.000 to 193.000 (78 kms).	National Highways Authority India	Two years	118.20 lac -	Prof. Sudip Kumar Roy, Prof. SandipChakraborty, Prof. Tapas Kumar Roy
30.	Earthquake Resistance Certificate for Shukla Devi Academy for B.Ed., Birbhum	Shukla Devi Academy for B.Ed., Birbhum	One month	0.5 lac	Prof. Aparna (Dey) Ghosh
31.	Vetting of Design and Drawing of AIRP under PHE DTE, W. Bengal	Effluent & Water Treatment Engineers Pvt. Ltd.	One month	0.5 lac	Prof. Aparna (Dey) Ghosh
32.	Vetting of structural design of State Haat	Govt. of West Bengal	Ongoing	2.5 lac	Prof. SubrataChakroborty
33.	Vetting of structural design of the proposed construction of East Bidhannagar Police Station, Police Lines, Barracks under Bidhannagar Police Commissionerate	Kolkata Police Housing &Infrastructure Development Corporation Ltd	2015-16	1.5 Lac	Prof. SubrataChakroborty
34.	Design, engineering, procurement, construction and completion of 7.4 km, 2(two) lane elevated Road between Jinjira Bazar and Batanagar on Budge Budge Trunk Road in Kolkata along with the widening of the existing 2 (two) lane road by addition of two lanes on both sides of the elevated fly – over through construction of an at grade road and construction of a 1.5 m footpath at the side of at grade roads - Proposal for Vetting of detail design of road, substructure and superstructure	M/S Larsen & Toubro Limited, Infrastructure IC	One year	50.00 lac	Prof. AmbarishGhosh
35.	Stability test of Dyke/ Embankment through the proposed Navigational Channel across Nayachara Island as a Long Term Measures of KoPT	WAPCOS Ltd.	One year	5.50 lac	Prof. AmbarishGhosh
36.	Consultancy services for Project Preparation of Package III: Mogra-Kampa-Barojaguli in the Hooghly and Nadia District of West Bengal, India including Major Bridge over River Saraswati, ROB at Bansberia, Elevated Corridor at Junction of Barrackpore Expressway, Interchange at Kampa Junction and State of Art Extradosed Cable Stayed Bridge (over	RITES LIMITED	One year	4.50 lac	Prof. AmbarishGhosh

	river Ganges-Hooghly)				
37.	Independent Assessment of effect of vibration, emanating from installation of Sheet Piles using a vibro-sinker at 2 Judge Court Road, Alipore,	M/S ShapoorjiPallonji and Company Private Limited	One year	1.67 lac	Prof. AmbarishGhosh
38.	Soil Investigation for the Proposed Construction of Youth Hostel (Biswa Bangla Yuba Abas), at 4/1 Moore Avenue, Tollygunge, Kolkata	Kolkata Division, Social Sector, P. W. Dte., Govt. of West Bengal	One year	3.20 lac	Prof. AmbarishGhosh
39.	Soil Investigation for the Proposed Construction of three storied office building of SPF Tollygunge, two storied Group C staff quarters, three nos. four storied Group D staff quarters and single storied change room.	Kolkata Division, Social Sector, P. W. Dte., Govt. of West Bengal	One year	1.48 lac	Prof. AmbarishGhosh
40.	Soil Investigation for the Proposed Construction of Govt. Polytechnic at Behala, Kolkata	Kolkata Division, Social Sector, P. W. Dte., Govt. of West Bengal	One year	3.05 lac	Prof. AmbarishGhosh
41.	Soil Investigation for the Proposed Construction of an English Medium School of SourindraVidyapith, Behala, Kolkata	Kolkata Division, Social Sector, P. W. Dte., Govt. of West Bengal	One year	1.45 lac	Prof. AmbarishGhosh
42.	Strengthening and Widening to 2 lane/2-lane with paved shoulder configuration of Ghatakpukur – Malancha – Sarberia Section of Kolkata Basanti Road (Section of SH-3) in West Bengal	ADHUNIK INFRASTRUCTURE (P) LTD.	One year	2.20 lac	Prof. AmbarishGhosh
43.	Construction of Subway at Shalimar Railway Station	IRCON INTERNATIONAL LIMITED	One year	0.98 lac	Prof. AmbarishGhosh
44.	Consultancy for Non-Destructive Test for Reserve Bank of India Staff/ officers' Quarters at Singhi park, Kolkata	Reserve Bank of India (Govt. of India)	06 Month	4.18 lac	Prof. Arun Kr. Chakraborty
45.	Investigation of Structural elements of the dilapidated KMC labour quarter at 89B, Narkeldanga Main Road (Block-B), W-31, B-III, Kolkata	The Kolkata Municipal Corporation	03 Month	2.50 lac	Prof. Arun Kr. Chakraborty
46.V	Vetting for Structural Design & Drawings for Eastern Railway-Construction of High Shed with Crane gantry arrangement & other allied works in connection with new central periodic overhauling depot for Track Machines at Kanchrapara	AKMB-Rawatsons (JV)	03 Month	1.00 lac	Prof. Arun Kr. Chakraborty

Support staff position:

Sanctioned technical post: 13

Technical staff profile (in the following table)

Name	Designation	Highest Qualification	Contact No./ E-mail
ShriTinkariPatra	Superintendent (Tech)	B.Sc. DCE	2668-4561(Extn.769)
Shri Dipak Kumar Roy	Superintendent (Tech)	B.Sc. DCE	2668-4561(Extn.283)
Shri Ranjan Kumar Biswas	Superintendent (Tech)	B.Sc. DCE	2668-4561(Extn.283)
Shri Swapan Kumar Roy	Lab. Asst.	B.Sc.	2668-4561(Extn.254)
ShriIndranath Chakraborty	Jr. Superintendent	DCE	2668-4561(Extn.665)
Shri Sajal Kumar Chakraborty	Tech. Asst. I	B.Sc. (Hons.)	2668-4561(Extn.283)
Mrs. Amrita Bandyopadhyay	Tech. Asst. I	B.Sc. (Hons.), MCA	2668-4561(Extn.677)
Shri Amar Tarafder	Tech. Asst. II	DCE	2668-4561(Extn.282)
ShriMohini Mohan Debsharma	Tech. Asst. II	DCE	2668-4561(Extn.282)
Md. ShafiulAlam (in Lien)	Tech. Asst. II	B.E. (C.E.)	2668-4561(Extn.761)
ShriSwarupShovan Mukherjee	Tech. Asst. II	DCE	2668-4561(Extn.282)

Sponsored Research (Ongoing):

Sl. No.	**Title of the work**	**Sponsoring agency**	**Period**	**Amount (Rs.)**	**PI / Co-PI(s)**
1	Identification of Spatial Dispersion Pattern of Dredge Materials in a Coastal River Reach from Radioactive Tracer Experiments and Hydrodynamic Modeling	BRNS, BARC, Mumbai	2013-2017	3455197/-	Kalyan Kumar Bhar
2	Water, Sanitation and Hygiene Education Programme in School.	Water For People, USA	Oct 2015 -Sept 2016	20,44,400.00	Anirban Gupta
3	Demonstration of Child Friendly Group Hand Washing Facilities in schools	UNICEF	Aug 2015 – Aug 2016	24,44,210.00	Anirban Gupta
4	Passive Control of Seismically Excited Short Period Structures by the Compliant Liquid Column damper	DST-SERB	3.5 yrs (July 2012 – Jan 2016)	Rs. 29.5 lakhs	PI: Aparna (Dey) Ghosh Co-PI: SubrataChakraborty
5	Seismic Vulnerability Assessment of Existing Building to Supplement Rehabilitation practices	DST, Govt. of India, TSD Programme	Ongoing	63.44	SubrataChakraborty

	with special emphasis to North Eastern Region				
6	Near surface Geophysical and Geotechnical Investigation for Site-specific Earthquake Hazard and Slope Stability studies in and around Gangtok via-a-via its Vulnerability and Risk Implications (VIS)	Ministry of Earth Science	Ongoing	37.62	AmbarishGhosh

Industry Institution Interaction

No. of publications:
Journal Publication: 51
Conference Publication: 40

List of Publications

Journals

1. Sondipon N Thakur, Chaitali Roy and SubrataChakraborty, 'A new efficient higher order shear deformation theory for doubly curved laminated composite shell, *ActaMechanica, Online avaialble*DOI 10.1007/s00707-016-1693-3 IF1.694 Citation: Nil SCI.
2. *SwarupGhoshand SubrataChakraborty*, Analytical Seismic Fragility Analysis of RC Building Frame in The North Eastern India, Sc*ientiaIranica in Press IF 1.025 SCI*
3. Papiya D. Mondal, Aparna (D.) Ghosh and SubrataChakraborty, Performances of various base isolation systems in mitigation of structural vibration due to underground blast induced ground motion, *IJSSD*, In Press IF 0.537 SCI
4. Bijan K. Roy, SubrataChakraborty and Sudib K. Mishra Seismic vibration control of bridges with excessive isolator Displacement, *Earthquakes & Structures, 10(6), 2016, 1451-1465*, IF0.693 Scopus
5. SomdattaGoswami and SubrataChakraborty, Reliability Analysis of structures by iterative improved response surface method, *Structural Safety*, 60, 2016, 56-66. IF 2.039 SCI
6. Sudib K. Mishra, SouravGur, Koushik Roy, SubrataChakraborty, Response of Bridges Isolated by Shape-Memory-Alloy-Rubber-Bearing subjected to Random Earthquakes, ASCE Bridge Engg. 21(3), 2016 DOI: 10.1061/(ASCE) BE.1943-5592.0000837. IF 1.065 SCI
7. Sandip Kumar Saha, VasantMatsagar and SubrataChakraborty, uncertainty quantification and seismic fragility of base-isolated liquid storage tanks using response surface models, *Probabilistic Engineering Mechanics*,43, (2016) 20-35. IF 1.736 SCI
8. SubrataChakraborty and Rama Debbarma, Robust design of tuned liquid column damper in seismic vibration control of system characterized by uncertain bounded parameters, *Structure and Infrastructure Engg*, 12(5), 592–602, 2016. IF1.202 SCI
9. SaibalGhosh, S Bhattacharjya, S Chakraborty, Behaviours of short fiber reinforced composite under shear, *ICE Construction Materials*. 168(6), 2015, 267-275. http://dx.doi.org/10.1680/coma.14.00018.
10. Suprateek Roy, Sudib K. Mishra, SubrataChakraborty, Performance of Alternative Wavelet Basis for Feature Based Damage Detection in Structures, In Press, *IntJ. of Life Cycle Reliability & Safety Engg. 1(4), 2015, 29-37.* Sumanta Das, SouravGur, Sudib K. 11
11. Mishra and SubrataChakraborty, Optimal performance of Base Isolated building considering limitation on excessive isolator displacement, *Structure and Infrastructure Engineering*, 11(7), 2015, 904-917. IF1.202 SCI
12. Bijan Kumar Roy, SubrataChakraborty, Robust Optimum Design of Base Isolation System in Seismic Vibration Control of Structures under Random System Parameters, *Structural Safety*, 55 (2015) 49–59. IF 2.039 SCI
13. Rama Debbarma, SubrataChakraborty, Robust optimum design of liquid column vibration absorber in seismic vibration control of structures characterized by random parameters, *Struct. Engg Mechanics. 53(6) (2015) 1127-1141 IF 0.927 SCI*

14. Das Sumanta, GurSourav, Mishra Sudib K. and ChakrabortySubrata, "Optimal performance of Base Isolated building considering limitation on excessive isolator displacement", Structure and Infrastructure Engineering, Vol. 11, No. 7, 2015, pp 904-917, Impact Factor: 1.454, Citation: Nil (SCI)
15. Kar, R. and Dalui, S. K., "Wind interference effect on an octagonal plan shaped tall building due to square plan shaped tall buildings", Int. J. Adv. Struct. Engg. (Springer), Vol. 8, No. 1, March, 2016, pp- 73-86, DOI: 10.1007/s40091-016-0115-z
16. Accepted on 18th July, 2016◊(2) Paul, R. and Dalui, S. K., "Wind Effects on 'Z' Plan Shaped Tall Building: A Case Study", Int. J. Adv. Struct. Engg. (Springer),
17. S. Karmakar and Roy T. K., "Effect of Waste Plastic and Waste Tires Ash on Mechanical Behavior of Bitumen", Journal of Materials in Civil Engineering, 2016, Vol.28, No. 6, pp. 040160061-9, Impact Factor: 1.296, Citation: Nil (SCI)
18. Mistry, R., Roy, T.K, "Effect of using fly ash as alternative filler in hot mix asphalt",Perspectives in Science, 2016, (http://dx.doi.org/10.1016/j.pisc.2016.04.061) (Scopus).
19. Metya S. and Bhattacharya G., "Probabilistic Stability Analysis of the Bois Brule Levee Considering the Effect of Spatial Variability of Soil Properties Based on a New Discretization Model", Indian Geotechnical Journal (ISSN: 0971-9555), Springer, India, Volume 46, Issue 2, 2016, pp 152-163, Impact Factor: Nil, Citation: Nil, Indexed in Scopus.
20. Roy R, Ghosh D, and Bhattacharya G., "Influence of Strong Motion Characteristics on Permanent Displacement of Slopes", Journal of the International Consortium on Landslides, Springer, Vol. 13, No. 2, 2016, pp. 281-292., Impact Factor: 3.049, Citation: 02, (SCI)
21. Metya S. and Bhattacharya G., "Reliability Analysis of Earth Slopes Considering Spatial Variability", Geotechnical and Geological Engineering - An International Journal (ISSN: 0960-3182), Springer, Netherlands, Volume 34, Issue 1, 2016, Pages 103-123, Impact Factor: Nil, Citation: Nil, Indexed in Scopus and E-SCI
22. Metya S., Bhattacharya G., and Chowdhury R., "Reliability Analysis of Slopes in Strain-Softening Soils", Journal of Innovative Infrastructure Solutions (Accepted with minor revisions).
23. Metya S., and Bhattacharya G., "Reliability Analysis of Earth Slopes Based on a New Discretization Model for Spatial Variability", Engineering Geology, Elsevier, (In preparation).
24. Bhattacharya G., Chowdhury R., and Metya S., "Residual Factor as a Variable in Slope Reliability Analysis", Bulletin of Engineering Geology and the Environment, Springer, (In preparation).
25. UjjwalSaha, "Duirnal Rainfall Variation of Bangalore HAL Airport", IJIRSET, Vol-4, 2015, pp 79-85, Impact Factor: NIL, Citation: NIL
26. Chandra Rupa, UjjwalSaha and P.P. Mujumdar, "Model and Parameter uncertainty in IDF relationship under climate change', Advances in Water Resources, Vol 79, 2015, pp127-139, Impact Factor 3.417, Citation: 1 (SCI)
27. N.S.Dlamini, M.K.Rowshon, UjjwalSaha, A. Fikri, SH Lai and MSF Mohd, "Developing and calibrating a stochastic rainfall generator model for simulating daily rainfall by markov chain approach", JurnalTeknologi, Vol 76, no. 15, 2015, pp 13-19, Impact Factor 0.146, Citation: NIL
28. N.S.Dlamini, M.K.Rowshon, UjjwalSaha, A. Fikri, SH Lai and J. Zubaidi, "Simulation of future daily rainfall scenario using stocgastic rainfall generator for a rice-growing scheme in Malaysia", Asian journal of applied science, Vol 3, no. 5, 2015, pp 492-512, Impact Factor 0.2, Citation: NIL
29. BhattacharjyaSoumya, ChakrabortiSubhasis and Das Subhashis "Robust optimization of reinforced concrete folded plate and shell roof structure incorporating parameter uncertainty", Structural Engineering and Mechanics, Vol. 56, No. 5, 2015, pp 707-726, Impact factor: 1.021, Citation: Nil (SCI).
30. Das, T., and Bhattacharjya, S., "Efficient Moving Least Squares Approach in Probabilistic Robust Structural Optimization", National conference on "Relevance of Dr. B. R. Ambedkar for Inclusive Development in India, Visva-Bharati, West Bengal, India, April, 2016 (Paper ID 24)
31. Sarkar, M., and Bhattacharjya, S. "Robust Design Optimization of a Stacker Reclaimer Structure Incorporating Parameter Uncertainty", Proceedings of 7th All India Inter College Academic Meet 2016, FOSET, Kolkata, W.B., March, 2016,
32. NS, Ajeesh Kumar, and Bhattacharjya, S. "Robust Design Optimization of a Multi-storied concrete building in efficient Metamodelling and Simulation Framework Incorporating Parameter Uncertainty," 6th All India Inter Engineering College Meet 2015, April, 2015, West Bengal, India,
33. Sit Moumita, Ray Chaitali, BiswasDhiraj and MandalBibekananda, "Stress distribution in the hollow stiffened hybrid laminated composite panels in ship structures under sinusoidal loading", International Journal of maritime Engineering, RINA Transactions, vol 158, part A2, 2016, pp. A107-A116, Impact factor: 0.361, Citation: 0. SCI

34. Nath Thakur Sandipan and Ray Chaitali, "The effect of thickness coordinate to radius ratio on free vibration of moderately thick and deep doubly curved cross-ply laminated shell". Archive of Applied Mechanics (Springer), June 2016, Volume 86, Issue 6,pp 1119-1132, Impact factor: 1.11, Citation: 0. SCI
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36. SandipanNath Thakur and Chaitali Ray, "The effect of thickness coordinate to radius ratio on free vibration of moderately thick and deep doubly curved cross-ply laminated shell". Archive of Applied Mechanics (Springer) (in press), 2015. Impact factor: 1.11, Citation: 0. SCI
37. SandipanNathThakur, Chaitali Ray, Chakraborty, A new efficient higher-order shear deformation theory for a doubly curved laminated composite shell, ACTA MECHANICA, DOI 10.1007/s00707-016-1693-3, Impact factor 1.694, SCI
38. Murmu,S. and Biswas,S. "Application of Fuzzy logic and Neural Network in Crop Classification: A Review", Aquatic Procedia, Elsevier (Scopus-indexed),4(2015), pp 1203-1210.
39. Hasim, S., Bhar, K. K., "Generation of Monthly Inflows using Log-Normal Model", Jr. Basic and App. Eng. Res., Vol. 3, No. 3, 2016, pp. 223-228.
40. Bakshi, S., Bhar, K. K., "Modeling Stage-Discharge Relationship in a Tidal River using Artificial Neural Network Models", Jr. Basic and App. Eng. Res., Vol. 3, No. 3, 2016, pp. 229-233.
41. Saha, P., Roy, N., Mukherjee, D., Sarkar, A.K., "Application of Principal Component Analysis for Outlier Detection in Heterogeneous Traffic Data", *Procedia Computer Science, Elsevier,* vol. 83, 2016, pp. 107 - 114. doi: 10.1016/j.procs.2016.04.105. Citation: Scopus.
42. Saha, P., Roy, N., Sarkar, A.K., Pal. M., "Assessment of Level-of-Service of Two-Lane Highways with Heterogeneous Traffic", *Transportmetrica A: Transport Science, Taylor & Francis,* 2016, (Under review). Impact factor: 1.477, citation: Science Citation Index Expanded; Scopus; Social Sciences Citation Index.
43. Saha, P., Roy, R., Sarkar, A.K., Pal. M., "Preferred Time Headway of Drivers on Two-Lane Highways with Heterogeneous Traffic", *Transportation Letters: The International Journal of Transportation Research,* 2016, (Under review). Impact factor: 0.594, citation: Science Citation Index Expanded; Scopus
44. Saha, P., Roy, N., Sarkar, A.K., Pal. M., "Evaluation of Limiting Speed of Slower Vehicles: A Major Variable Causing Platoon on Two-Lane Highways", *Journal of The Institution of Engineers (India)-Series A, Springer,* 2016, (Under review).
45. Mukherjee, D., Saha, P., "Pedestrian fatalities on roads: a diagnosis of future research needs", *KSCE Journal of Civil Engineering, Springer*, 2016, (Under review), Impact factor: 0.600, citation: Science Citation Index Expanded; Scopus.
46. Mukherjee D., Das, S., Saha, P., Roy, S.K., "Analysis of Pedestrian Movements on Sidewalks: a case study in Kolkata, India", *Iranian Journal of Science and Technology, Transactions of Civil Engineering, Springer,* 2016, (Under review), Impact factor: 0.403, citation: Science Citation Index Expanded; Scopus.
47. Roy, N., Basu, S., Saha, P., Sarkar, A.K., "Effect of Safety in Performance Assessment of Two-lane Roads: A Review of Recent Research and Future Research Needs", *Transportation Research Record,* 2016, (Under review), Impact factor: 0.556, citation: Science Citation Index; Scopus.
48. Roy, R., Saha, P., Sarkar, A.K., "An Investigation of Headway Distribution Models on Two-Lane Roads with Mixed Traffic", *Transportation Research Record,* 2016, (Under review), Impact factor: 0.556, citation: Science Citation Index; Scopus.
49. Saha, P., Sarkar, A. K. & Pal, M., "Evaluation of speed-flow characteristics on two-lane highways with mixed traffic", *Transport, Taylor & Francis,* 2015, DOI: 10.3846/16484142.2015.1004369. Impact factor: 0.553, Citation: Science Citation Index Expanded; Scopus.
50. Saha, P., Sarkar, A. K. & Pal, M., "Evaluation of Performance Measures of Two-Lane highways under Heterogeneous Traffic", *Pertanika Journal of Science & Technology*, vol. 23, no. 2, 2015, pp. 223 - 239. Impact factor: 0.011, Citation: Scopus
51. Adak, A., Mangalgiri, K. and Blaney, L. "UV irradiation and UV-H_2O_2 advanced oxidation of the roxarsone and nitarsoneorganoarsenicals." Water Research, Vol. 70, 2015, pp. 74-85, Impact Factor: 5.53, Citation: 12. (SCI, Scopus).

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1.SwarupGhoshShyamalGhoshandSubrataChakrabortyGeneration of Seismic Hazard Curve and Synthetic Ground Motion for the North Eastern Region of India for Performance Based Seismic Risk Assessment, *The 6th Asia-Pacific Symposium on Structural Reliability and Its Applications, May 28-30, 2016, Shanghai, China*

2.SoumyaBhattacharjyaandSubrataChakraborty, Robust Design Optimization of Structures under Stochastic Earthquake incorporating Parameter Uncertainty, *The 6th Asia-Pacific Symposium on Structural Reliability and Its Applications, May 28-30, 2016, Shanghai, China*

3.International Workshop on Civil Engineering and Architecture, IWCEA-2015, 12th -13th September, 2015, Scientific Cooperation, Titanic Business Europe, Istanbul, Turkey,

4.Roy, T.K., "Effect of Tyre Rubber Ash on Bituminous Mixes Used for Roadway Pavement", The Eighth international conference on environmental science and technology, Houston, Texas, USA, 2016. (compendium of papers: ID-670)

5.Karmakar S., Majhi D. and Roy T. K., "Performance Evaluation of Polypropylene Waste Modified Bitumen in Bituminous Mix by Ultrasonic Pulse Velocity Method", International Conference on Recent Trends in Engineering and Materials Science (ICEMS), Jaipur, 2016, (compendium of papers: ID- 1-IC-1653)

6.Majhi D., Karmakar S. and Roy T. K., "Reliability of Ultrasonic Pulse Velocity Method for Determining Dynamic Modulus of Asphalt Mixtures", International Conference on Recent Trends in Engineering and Materials Science (ICEMS), Jaipur, 2016, (compendium of papers: ID- 1-IC-1587)

7.Mistry, R., Roy, T.K, "The Effect of Using Rice Husk Ash as Filler on Moisture Susceptibility of Asphalt Mix", IEEE International Conference on Applied System Innovation (ICASI), Okinawa, Japan, 2016, (compendium of papers: ID-0480).

8.Mistry, R., Roy, T.K, "Assessment of black rice husk ash as mineral filler in hot mix asphalt", 3rd Conference of the Transportation Research Group of India (3rd CTRG), Kolkata, 2015, (compendium of papers: ID-516).

9.Karmakar S. and Roy T. K., "Study on Conventional Properties Enhancement of Bitumen by adding Milk Pouch", 3rd Conference of the Transportation Research Group of India (3rd CTRG), Kolkata, 2015, (compendium of papers: ID- 467)

10.The Eighth international conference on environmental science and technology, Houston, Texas, USA, 2016

11.Poddar N., Metya S., Barman A.K., and Bhattacharya G., "Deterministic and Probabilistic Stability Analysis of Earth Slopes during Rapid Drawdown", Proceedings of 50th Indian Geotechnical Conference (IGC 2015), at College of Engineering, Pune, India, December 17 – 19, 2015 (Paper ID – 62 under Subtheme 9).

12.Metya S., Bhattacharya G., and Chowdhury R., "Reliability Analysis of Strain-Softening Slopes using the First Order Reliability Method (FORM)", Geo-China 2016, at Shandong University, China, July 25-27, 2016, pp. 100-107, GSP 257 (ASCE).

13.Metya S., Bhattacharya G., and Chowdhury R., "A New Discretization Model to Include the Effect of Spatial Variability in the Reliability Analysis of Earth Slopes", Geo-Chicago 2016, at Sheraton Hotel & Towers, Chicago, USA, August 14-18, 2016 (Accepted).

*14.*Bhattacharjya, S., and Chakraborty S., "Robust Design Optimization of Structures under Stochastic Earthquake incorporating Parameter Uncertainty,"6th Asian-Pacific Symposium on Structural Reliability and its Applications (APSSRA6),28-30 May 2016, Shanghai, China, ed:H.W. Huang, J. Li, J. Zhang & J.B. Chen (editors*)*

15.Das, S., Mukherjee, D., Saha, P. & Roy, S. K., "Characteristics of Pedestrian Traffic on Sidewalks: a case study in Kolkata Metropolis", 3rd Conference of the Transportation Research Group of India (3rd CTRG), Kolkata, 2015, (compendium of papers: ID-626)

16.Vaylure, S., Kehimkar, I, Das, S. Whittier, D. B. and Gupta, A., Richhariya, A. "Mobile Apps for Climate Change: A Case Study of Mobile Learning Through Citizen Science in Secondary Schools of Urban India", MIT LINC 2016 Conference, Boston, USA.

17.Lodh, R. and Biswas, S. "Application of Remote Sensing and GIS in Erosion Hazard Modeling of a Catchment", Proceedings of International Conference on Advances in Civil and Environmental Engineering, Pulau Pinang, Malaysia, 28^{th}-30^{th} July,2015, pp B-79-B90.

18.Sinha, B., Medda, S., and Bhar, K. K., "Selection of suitable stochastic model for generating monthly streamflows of Konar Reservoir", HYDRO 2015 International, 20th International Conference on Hydraulics, Water Resources and River Engineering, IIT Roorkee, India, 17-19 December, 2015

19.Bakshi, S., Bhar, K. K., "A Semi-Coupled Model for Simulation of River Morphodynamics", HYDRO 2015 International, 20th International Conference on Hydraulics, Water Resources and River Engineering, IIT Roorkee, India, 17-19 December, 2015.

20.Hasim, S., Bhar, K. K., "Two Parameter Log Normal Models for Generating Monthly Streamflow in DVC Reservoir System", HYDRO 2015 International, 20th International Conference on Hydraulics, Water Resources and River Engineering, IIT Roorkee, India, 17-19 December, 2015.

*21.*Mukherjee, D., Saha, P., "Pedestrian fatalities on roads: a diagnosis of future research needs", *96th Annual Meeting of the Transportation Research Board (TRB), Transportation Research Board of the National Academics, Washington, D.C.,* 2017. (Under review).

22.Saha, P., Roy, N., Mukherjee, D. & Sarkar, A. K., "Application of Principal Component Analysis for Outlier Detection in Heterogeneous Traffic Data", *7th International Conference on Ambient Systems, Networks and Technologies,* 2016 *(ANT 2016) in Madrid, Spain.*

23.Basu, A., Benarjee, S., Basu, S., Saha, P.,"A critical review of regression models for analysinghighway crash data", *12th International Conference on Transportation Planning and Implementation Methodologies for Developing Countries*, 2016, (TPMDC) in IIT Bombay (Accepted).

24.Mukherjee D., Das, S., Saha, P.& Roy, S.K., "Evaluation of pedestrian Speeds on Sidewalks: A Comparitive Study at the Commercial Hubs in the Twin Cities of Kolkata and Howrah", *12th International Conference on Transportation Planning and Implementation Methodologies for Developing Countries*, 2016, (TPMDC) in IIT Bombay (Accepted).

25.Roy, R., Roy, N., Saha, P.&Sarkar, A. K., "Analysis of Time Headways under Heavy Traffic Flow Conditions on Two-lane Roads: Case Study from North-East India", *12th International Conference on Transportation Planning and Implementation Methodologies for Developing Countries*, 2016, (TPMDC) in IIT Bombay(Accepted).

26.Saha, P., Roy, N., Talukdar, H. &Sarkar, A. K., "Level of Service Criteria on Two-Lane Roads with Mixed Traffic: An Application of Kappa Statistic in the Assessment of Cluster Algorithms' Agreement", *12th International Conference on Transportation Planning and Implementation Methodologies for Developing Countries*, 2016, (TPMDC) in IIT Bombay (Accepted).

27.Roy, N., Roy, R., Saha, P., Sarkar, A. K., "Modelling of vehicular speeds on Two-Lane Roads under Heavy Traffic Flow Condition", *Proc. National Conf. on Engineering problems and Application of Mathematics (EPAM-2016), NIT Agartala,* 2016

28.Mukherjee, D., Das, S., Saha, P. "Walking speeds on Sidewalks: A comparison of Recreation and Residedential Zones in Kolkata", *Proc. National Conf. on Engineering problems and Application of Mathematics (EPAM-2016), NIT Agartala,* 2016.

29.De, D., Ray, S. & Saha, P., "Analysis of pedestrian Movement at Intersection: A case study in Kolkata Metropoils", *Proc. National Conf. on Engineering problems and Application of Mathematics (EPAM-2016), NIT Agartala,* 2016

30.Basu, S. & Saha, P., "A comparison of poisson and negative binomial regression in accident data analysis", *Research Scholars' Colloquium (RSC)-2016, IIEST Shibpur*, 2016. (Accepted).

31.Roy, R. & Saha, P., "Exponential Distribution of Headways: A Misnomer on Two-Lane Roads with Heterogeneous Traffic", *Research Scholars' Colloquium (RSC)-2016, IIEST Shibpur*, 2016. (Accepted).

32.Kolay, P. K., Talukdar, H. & Saha, P., "LOS assessment of two-lane roads with mixed traffic: What really matters to analysts?", *Research Scholars' Colloquium (RSC)-2016, IIEST Shibpur*, 2016. (Accepted).

33.Saha, P., Sarkar, A. K. & Pal, M., "Assessment of Level-of-Service of Two-Lane Highways with Heterogeneous Traffic", *94th Annual Meeting of the Transportation Research Board (TRB), Transportation Research Board of the National Academics, Washington, D.C.*, 2015. (compendium of papers: ID-15-2723)

34.Roy, R., Saha, P. & Sarkar, A. K., "Time Headway Modeling of Mixed Traffic on Two-Lane Highways", *3rd Conference of the Transportation Research Group of India (3rd CTRG), Kolkata*, 2015. (compendium of papers: ID-563)

35.Das, S., Mukherjee, D., Saha, P. & Roy, S. K., "Characteristics of Pedestrian Traffic on Sidewalks: a case study in Kolkata Metropolis", *3rd Conference of the Transportation Research Group of India (3rd CTRG), Kolkata*, 2015, (compendium of papers: ID-626)

36.Saha, P., Sarkar, A. K. & Pal, M., "Preferred Time Headway of Drivers on Two-Lane Highways with Heterogeneous Traffic", *Proc. National Conf. on Recent Advances in Traffic Engineering SVNIT Surat*, 2015. (compendium of papers: ID-182)

37.Mondal, B., Das, I., Adak, A. and Datta, P. "Complete degradation of the cationic surfactant by UV based advanced oxidation process", Recycle 2016, Guwahati, April 2016.

38.Mondal, B., Das, I., Koner, S. and Adak, A. "Degradation of 2,4-dichlorophenoxy acetic acid by advance oxidation process", Recycle 2016, Guwahati, April 2016.

39.Koner, S., Pal, A. and Adak, A. "Surfactant removal by metal oxides and adsolubilization of organics in exhausted materials", 8th International Conference on Environmental Science and Technology, Houston, USA, June, 2016.

40.Chakraborty, R., Ghosh, A. and Adak, A., "Electrokinetic remediation of chromium contaminated soil." Indian Geotechnical Conference 2015, Pune, December, 2015.

Books and Book Chapters

1.P. Samui, S. Chakraborty and D. Kim (Eds.)***Modeling and Simulation Techniques in Structural Engineering,*** IGI Global, Hershey PA, USA, ISBN13: 9781522505884| ISBN10: 1522505881| EISBN13: 9781522505891|DOI: 10.4018/978-1-5225-0588-4

National/International Journals Reviewed by the Faculty Members:

- Journal of Environmental Chemical Engineering
- Journal of Environmental Management
- Mathematical Problems in Engineering, Hindawi Publishing Corporation (SCI Journal)
- Transportation Letters: The International Journal of Transportation Research, Taylor and Francis (SCI Journal)
- Journal of Traffic and Transportation Engineering (English Edition), Elsevier
- The conference on Transportation Planning and Implementation Methodologies for Developing Countries (TPMDC), IIT Bombay
- Recent Advances in Traffic Engineering-2015 (RATE 2015), Sardar Vallabhbhai National Institute of Technology Surat
- Transportation Systems Engineering & Management, organised by Centre for Transportation Research, Department of Civil Engineering, National Institute of Technology Calicut
- Journal of Environmental Management, Elsevier
- Reviewed an article on "Variation of Parameters Method with an Auxiliary Parameter for Initial Value Problems'" in Ain Shams Engineering Journal
- Reviewed an article on "A Structural Reliability-Based Sensitivity Analysis Method Using PSO: Relative Convergence Rate," in Journal of Zhejiang University-SCIENCE A, China
- Reviewed an article on " Cyclicbehaviour of cantilever RC columns with steel fibre reinforced concrete at plastic hinge regions," in in Journal of The Institution of Engineers (India): Series A.
- Reviewed an article on" Stress analysis method for the large excavation of a river-crossing oil pipeline," for 4th International Conference on Civi Engineering and Urban Planning (CEUP2015),to be held in Beijing, China
- Presently re-reviewing an article on "Optimized Design Of Shallow Foundation Using Multiobjective Optimization Algorithm, in Journal of The Institution of Engineers (India): Series A.
- ASCE Journal of Geomechanics
- Springer-Indian Geotechnical Journal
- Springer-Institution of Engineers (India) Journal of Civil Engineering
- Journal of Structural Engineering, ASCE
- Engineering Structures (Elsevier)
- Earthquake Engineering and Engineering Vibration (Springer)
- Computers and Structures (ElsvSc)
- J of Computational Physics (ElsvSc)
- Mathematics and Computer in Simulation(ElsvSc)
- J of Sound and Vibration(ElsvSc)
- Probabilistic Engineering Mechanics(ElsvSc)
- ASCE J. of Engg Mechanics
- ScientiaIranica
- Earthquake Enggg and Engg Vibration (Springer)
- Inverse Prob in Engg (T&F)
- Earthqauke and Struct (Techno Press)
- Computer and Concrete (Techno Press)

Seminar / Workshops / Conferences / Training programme organized by the department

Sl. No.	Title	Period / Duration	Collaborator / Sponsorer	No. of participant	Name of the Co-ordinator(s)	Remarks
1	Short Term Training Programme on "Introduction to Structural Engineering"	Two weeks November 30th,2015-January 3rd, 2016 (online activities), Jan 4-9, 2016 (physical interaction)	IIT Kharagpur, Sponsored by MHRD, Govt. Of India and ISTE, IIEST Shibpur,	7	Dr. SoumyaBhattachajya	under National Mission on Education through ICT programme

2	Green Building: Urban Habitats for India	10th April 2015	Corporate Monitor	100	Sri S. Majumdar Prof UjjwalSaha	
3.	Short Term Training Programme on "Environmental Studies"	Two weeks June 2nd ,2015- June 10th, 2016 (online activities), Jan 4-9, 2016 (physical interaction)	IIT Bombay, Sponsored by MHRD, Govt. Of India and ISTE, IIEST Shibpur,	**7**	Dr. Asok Adak	under National Mission on Education through ICT programme
4	Biannual Workshop on 'Development of Indo-HCM Manual"	7th& 8th August 2015	Central Road Research Institute, New Delhi	**50**	Dr. Sudip Kumar Roy and Prof. SandipChakraborty	
5	Workshop on "Cold Mix Technology"	9th October 2016	Central Road Research Institute, New Delhi and Bitchem	**40**	Dr. Sudip Kumar Roy and Prof. Tapas Kumar Roy	

Technology Developed and Innovation

- Application of functionalized carbon nanocomposite for removal of dissolve organic matter (DOM) from drinking water.

- Development of model for treatment of pond water to make it suitable in rural areas.

- Indirect photolysis of organoarsenical feed additives - mechanism of transformation.

- Recovery of phosphorus from poultry litter by acid wash followed by lime precipitation method.

- Degradation of herbicide using UV/H_2O_2 and examining the effects of water quality on the degradation process.

- Cationic and anionic surfactant removal by advanced oxidation process and observe the biodegradability of the transformed product.

- Manufacturing of nanofiber membrane using electrospun technology.

- In relation to the sediment transport problems in estuaries, radiotracer experiments were performed in sea near Hooghly and hydrodynamic models were developed.

- An innovative design of modular handwashing basins for schools has been developed and installed.

- Utilization of Rice husk ash as alternative and effective filler material for the design mix of binder course in flexible pavements.
- Utilization of mixed waste plastic for making polymer modified bitumen
- Development of Highway Capacity and Level of Service for Multi-Lane Highways

Foreign visits and Invited Lectures

Sl. No.	Place of visit including country name	Duration	Purpose
1	UPM, Malaysia	25th June to 5th July, 2015	research collaborator for 'Weather Generator development under climate change impacts (WGen-Climate): Putra Grant GP-IBT/2013/9406300'
2	Scientific Cooperation, Titanic Business Europe, Istanbul, Turkey	12th -13th September, 2015	International Workshop on Civil Engineering and Architecture, IWCEA-2015

Invited Lectures

- Dr. Sudip Kumar Roy Delivered Lecture on a short term training programme on "Analysis and Design of Flexible Pavements" during 24-28 Aug. 2015 organized by National Institute of Technical Teachers' Training and Research, Kolkata.
- Dr. T. K. Roy Delivered Lecture on a short term training programme on "Analysis and Design of Flexible Pavements" during 24-28 Aug. 2015 organized by National Institute of Technical Teachers' Training and Research, Kolkata.

Visitors to your Department (Indian & Foreign)

- Professor Kumares C. Sinha, the Edgar B. and Hedwig M. Olson Distinguished Professor of Civil Engineering at Purdue University has kindly consented to deliver a lecture on: Transportation Engineering Education in 21st Century, on, the 21st December 2015
- Professor B. B. Pandey, Emeritus Professor, Indian Institute of Technology, Kharagpur, delivered the Siddhananda Memorial Lecture on Long Life Pavements for Roads and Highways on 23 November 2015

Alumni Contribution to your Department

The strong alumni community of this department has extended cooperation and help in development of the department in various ways.

Training and Placement

Extension Activities and Societal outreach

- Arsenic removal units installed in remote villages and school of district Nadia, which are Serving more than 1000 families and 2500 school children
- Participated in one-hour talk-show on "Flood Disaster Management" on 30.06.2015 aired by Doordarshan Kendra, Kolkata for generating awareness among community.
- Installed five arsenic and iron removal filters in 5 schools and gender-sensitive appropriate sanitation facilities in 9 schools in North 24 Parganasdistrict catering to 11000 students.
- Conducted hygiene awareness camps in 10 schools.

- Installed an innovative design of group hand washing facility in 32 schools in Malda and South 24 Parganas districts.
- Dr. Goutam Bhattacharya have been Nominated as President, Vivekananda Youth Circle, IIEST, Shibpur

New Academic / Research Initiatives

Academic Collaboration

- Research Collaboration with University Putra, Malysia and Dr. UjjwalSaha for the research project 'Weather Generator development under climate change impacts (WGen-Climate): Putra Grant GP-IBT/2013/9406300'
- Research and book publication collaboration with Professor Robin Chowdhury, Professor Emeritus, University of Wollongong, Australia and Dr. Goutam Bhattacharya
- Collaborative work with Dept. of Mechanical Engineering, IIT Kanpur.

Industrial Collaboration

- A MOU has been signed with Bitchem for promotion of joint research and studies in the field of Bituminous road material

Others

Student Achievement

Ph D Scholar, SubhadeepMetya, has received the prestigious Newton-Bhabha PhD Placement award 2015 from the British Council (United Kingdom) and the Department of Science and Technology (DST), Govt. of India for a collaborative research project with the Zienkiewicz Centre for Computational Engineering (ZCCE), Swansea University, UK.

Department of Chemistry

The Department

The more than hundred years old department has a glorious past. The Department, besides engaging itself in undergraduate teaching has a heritage of conducting research in various fields. A well-known Physical Chemist, Professor Barodananada Chatterjee, was the Head of the Department of Chemistry & Metallurgy and the first Vice-Principal (Academic) of the College. Under his direct supervision and through his encouragement, faculty members and several research students made significant contributions in soil chemistry, corrosion, chemical exploration of medicinal plants and a way of coal and petroleum products.

At present the faculty members are involved in research in the frontier areas of Chemistry and Chemical Physics, which include Coordination & Bioinorganic Chemistry, Carbohydrate Chemistry, Electrochemistry & Corrosion Science, Fuel Cell Technology, Molecular Recognition & Supramolecular Chemistry, Structural Chemistry, Catalysis, Synthetic Organic & Organometallic Chemistry, Thin Film Semiconductor, Solar Photo-voltaic & Photo-electrochemical Cells, Non-linear Optical Phenomena: Modeling & Computation, Non-equilibrium Statistical Mechanics, Relativistic & non-relativistic Electronic Structure Theory. The two year (four semesters) M. Sc. Course in Chemistry offered by the department is designed to satisfy the needs of academia and industries. The department is endowed with a number of research projects sponsored by various funding agencies. The department has also been selected for MHRD special grant and DST-FIST and UGC-SAP programmes. About sixty seven research students under the Ph.D. program are currently working in the various fields of chemical sciences.

Academic Programmes

(a)**Under graduate level**: UG/B.Tech course at the 1st and 2nd Sem (All student admitted to this Institute except B.Arch course)

(b)**Post graduate level**:

- **Degree offered: M.Sc.** (Two-year Four Semesters)
- **Sanctioned students' Intake: 30**
- **Additional intake through other programmes (i.e. QIP):** Nil
- **Specializations:**

  Organic Chemistry/ Inorganic Chemistry/ Physical Chemistry

(c)Doctoral & Post Doctoral Research Programme

- Degree offered: **Ph.D. (Science)**
- No of Candidates enrolled: **11**
- No. of Candidates registered: **11**
- No. of Candidates awarded: **08**
- No. of Post Doctoral candidates **: 04**

Faculty Profile

Sanctioned Faculty Post: **15** Vacant Post: **02**

Name (date of joining)	**Designation**	**Highest Qualification (Date of award) (NET)**	**Specialization/ Research Area**	**Contact No. E.mail**
Dr. S. P. Goswami (01-07-1997)	Professor	Ph.D. (June 1983)	Molecular Recognition and Supramolecular Chemistry	+91-9433301414 spgoswamical@yahoo.com
Dr. (Mrs.) J. Dutta (01-09-1995)	Professor	Ph.D. (Jan. 1982)	Electrochemical Nanoscience, Fuel Cells, Solar Cells	+91-9830029798 jayati_datta@rediffmail.com
Dr. B. Adhikary (01-09-1995)	Professor	Ph.D. (August, 1988)	Nanomaterials and Co-ordination Chemistry	+91-33 25385701 adhikarybibhu@yahoo.com
Dr. A. Mondal (20-08-1996)	Professor	Ph.D. (Feb, 1985)	Thin film semiconductors, solar cells, gas sensors and photocatalysis	+91-9681420714 anupmondal2000@yahoo.co.in
Dr. S. K. Chattopadhyay (03-07-1989)	Professor	Ph.D. (June 1988) (NET)	Coordination Chemistry, Bioinorganic Chemistry	+91-9874339079 shyamalchattopadhyay@gmail.com
Dr. P. K. Nandi (10-07-1995)	Professor	Ph.D. (26-08-1994) (NET)	NonLinear Optics: Modeling and Computation	+91-9432177021 Nandi_pk@yahoo.co.in
Dr. B. K. Ghorai (18-05-1995)	Professor & Head	Ph.D. (09.01.1995) (NET)	Synthetic Organic, Organometallic and Materials chemistry	+91-9433843142 bkghorai@yahoo.co.in
Dr. Sudip Kr. Chattopadhyay (22-07-2004)	Professor	Ph.D. (21-03-2001) (NET)	Theoretical Molecular Sciences	+91-9433144725 sudip_chattopadhyay@rediffmail.com
Dr. Ajit Kumar Mahapatra (27.06.2008)	Professor	Ph.D. (Feb, 2001) (NET)	Design, Synthesis and Recognition of Bio-active Molecules	+91-9434508013 akmahapatra@chem.iiests.ac.in
Dr. (Mrs.) J. Ganguly (02-04-2003)	Assistant Professor	Ph.D. (10-12-2003) (NET)	Carbohydrate Chemistry	+91-9674152990 dasgangulyjhuma@gmail.com
Dr. C. Bhattacharya (23-06-2006)	Assistant Professor	Ph.D. (13-02-2006) (NET)	Photoelectrochemical Solar Cells, Conducting Polymers, Corrosion Science	+91-9433639041 Cbhattacharya.besus@gmail.com

Dr. P. Biswas (30-09-2008)	Assistant Professor	Ph.D. (July 2007) (NET)	Coordination and Bioinorganic Chemistry, catalysis, nanomaterials	+91-8420248676 pb.besu.chem@gmail.com
Dr. N.D. Paul (02-01-2014)	Assistant Professor	Ph.D. (27-05-2012) (NET)	Homogeneous catalysis and bio-inspired coordination chemistry	+91-8902431148 ndpaul@gmail.com
Dr. Mrinal Bera (15-10-2014)	UGC Assist Professor	Ph.D (August, 2008) (NET)	Synthetic Organic Chemistry	+91-9932152526 mrinalkbera@yahoo.com
Dr. Debabani Ganguly (21-05-2014)	Ramalingaswami Fellow	Ph.D (Oct. 2008) (NET)	Computational Chemistry	+91-8017942890 gangulydebabani@gmail.com

Awards and Laurels received by the faculty members:

✓Dr. Jhuma Ganguly, **recipient of Young Faculty Research Award (GAABES USA)-2015.**

✓**Young Scientist Award,** Oral Presentation, Enhancement of DSSC properties by the incorporation of CdTe onto TiO_2 matrix, S. Bhattachraya, A. Pal, J. Datta, **Indian chemical Society,** National Symposium on Recent Adnances in Chemistry & Industry**, Kolkata, July 31, 2015**

✓**Young Scientist Award,** Poster Presentation, Multimetallic Pt and Non-Pt alloyed Anode catalysts for Direct Ethanol Fuel Cell, A. De, A. Mondal, J. Datta, **Indian chemical Society,** National Symposium on Recent Adnances in Chemistry & Industry**, Kolkata, July 31, 2015**

✓Chattopadhyay and coworkers have also contributed one invited Advanced Review Article in "***Wiley Interdisciplinary Reviews: Computational Molecular Science***" (2015)**.**

✓Dr. Mrinal Kanti Bera received a Equipment Subsidy from **Alexander von Humboldt Foundation, Germany**

✓Prof. J.Dutta received **Prof. P.K. Bose memorial Award-2014**, Endowment Lecture, Formulation of Non Pt metal nano-composites with transition metal & metal oxides: Smart catalytic performances for Direct Ethanol Fuel Cell, **The Indian Chemical Society, JECRC, Jaipur, December 2015**

Research Areas :

- Coordination, Bioinorganic & Biophysical Chemistry
- Molecular Recognition, Supramolecular Chemistry & Organic Synthesis
- Organometallic and Materials Chemistry
- Electrochemistry, Non-conventional Energy, Fuel Cell, Corrosion Science.
- Thin Film Semiconductors, Solar Photo-voltaic, Conducting Polymers & Photo-electrochemical Solar Cells
- Theoretical and Computational Chemistry, Theoretical Molecular Sciences
- Glycobiology
- Nano Science, Spectroscopies and X-ray Crystallography
- Homogeneous & Heterogeneous Catalysis
- Synthetic methodology, natural product synthesis and organocatalysis
- Computational biophysical chemistry

Research Facilities

- UV-Visible Spectrophotometer
- IR Spectrometer
- Spectrofluorimeter
- Optical Microscope with image analyzer
- TG-DTA-cum-DSC System
- Analytical cum Preparative HPLC with Mass Detector
- Vacuum Coating Unit
- Electrochemical Quartz Crystal Microbalance System
- Semiconductor Characterization System
- PAR Versastat-II Potentiostat and electrochemistry system
- Precision L-C-R Meter
- Gas Chromatograph
- BET Surface Area & Pore Volume Analyzer

Name of the laboratories:

1. Coordination & Bioinorganic Chemistry
2. Glycobiology
3. Electrochemical Nano Science, Fuel Cell and Solar Cells.
4. Molecular Recognition & Organic Synthesis
5. Synthetic Organic and Organometallic Chemistry
6. Thin Film Semiconductors & Solar cells
7. Theoretical and Computational Chemistry
8. Theoretical Molecular Sciences
9. Conducting Polymers & Photoelectrochemical Solar Cell
10. Nano Imaging and Artificial photo synthesis

Supporting Staff

Sanctioned technical Post: **09** Vacant: **02**

Staff profile:

Name	**Designation**	**Highest Qualification**	**Contact No.**
S. Munshi	Technical Assistant- II	M.Sc. (Chemistry)	9432307325
R. Halder	Technical Assistant – II	B.Sc. (2 years)	9547215236
B. Das	Store Helper	Madhyamik	9674774122
J. Ali	Sr. Peon	Madhyamik	9733930005
J. Roy	Helper 1	Class-VIII	9231897280
A. Ganguly	UD clerk	BA (Hons) in English (C.U.), 1986	9836271911

Ongoing Sponsored Research / projects: (mention area)

Ongoing (Prop value) in Lakhs	**Sponsoring agencies**
75	**CSIR**
422.23	**DST**
131	**DST-SERB**
30.58	**MNRE**
20.18	**DST (W.B.)**
134	**DBT**
47.67	**BRNS_DAE**
13.27	**Humboldt Foundation, Germany**

Industry – Institute Interaction:

- Dyesol Ltd., Australia

Details of publications of each faculty member (2015 – 16):

Journal papers :**110**

Conference : **26**

Books / Monograms:**02**

(List to be included)

Patents / Invention Disclosure / Technology Transfer / Copyright: Nil

Please see Annexure I for detailed list of publications

Seminar / Workshops / Conferences / Training programme organized by the department (2015 - 16):

- Recent Trends in Chemical Sciences [A Symposium in Commemoration of the 154th Birth Anniversary of Acharya Prafulla Chandra Ray] held on 5th August, 2015 at Department of Chemistry, IIEST Shibpur Cosponsored by M/s Thermo Fischer Scientific India Pvt. Ltd.

Foreign visits and Invited Lectures:

Foreign visits

- Postdoctoral Fellow at Department of Chemistry and Geochemistry, Colorado school of Mines, CO, USA. Worked with Prof. Ryan M. Richards
- Prof. S.P. Goswami visited Ohio State University and Princeton University.

Invited Lectures

- **Prof. P. K. Nandi,** *"Frontiers in Chemistry-2016"* during March 7-8, 2016 organized by Department of Chemistry, University of North Bengal, Darjeeling 734013, West Bengal.
- **Prof. A.K. Mahapatra,** Indian Chemical Society, JECRC University, Jaipur, Rjasthan, Dec 28-30, 2015
- **Prof. A.K. Mahapatra,** 22nd Conference of NMRS, IIT, Kharagpur, Feb 18-21, 2016
- **Dr. Chinmoy Bhattacharyao entitled "Semiconductor photocatalysis for solar driven water splitting process: An Application of Scanning Electrochemical Microscopy (SECM) in rapid screening of dopants & cocatalysts"** ***at National Convention of Electrochemists (NCE-19),*** **Organized by:** Society for Advancement of Electrochemical Science and Technology (SAEST) & CSIR-Central Electrochemical Research Institute (CSIR-CECRI), Karaikudi, held on **28th - 29th March 2016, at NIT, Tiruchirappalli**
- **Dr. Jhuma Ganguly entitled 'Sweet World: Characterization and Application" on 6th February, 2016,** ***Organized by: Burdwan University, National Seminar on "Design, synthesis, interactions, chemical and biochemical activities of different functional molecules"***
- **Prof. S.P. Goswami** at Indian Chemical Society at Calcutta University (P. C. Roy memorial lecture)-2015
- **Prof. J.Dutta,** at National conference on Recent trends in functional materials in relation to nanomaterials and nanotechnology (RTFMNN), Dept. Chemistry, St.

Paul's Cathedral Mission College, Kolkata and Indian Chemical Society, Kolkata, Feb, 4-5, 2016

- **Prof. J.Dutta,** Invited Speaker and Chairperson, International Photovoltaic Solar Energy Conference (SOLAR ASIA -2015), **Dept. Phys., Savitribai Phule Pune University, India, 30th July-1st Aug., 2015**
- **Debabani Ganguly**, *International seminar on Exploring the Modern Approach in Biological Science: From Genome to Organism*, Nov 25-27, 2015, Department of Zoology, Sidho-Kanho-Birsha University, Purulia, WB, India, Multi-Scale Modeling of Intrinsically Disordered Proteins.

Visitors to your Department (Indian & Foreign):

1. Prof. Tapas Kar, Research Assistant Professor, Computational/Theoretical Chemistry, Utah State University, USA
2. Prof. Amit Basak, Department of Chemistry, IIT, Kharagpur.
3. Prof. Deb Sankar Ray, IACS, Jadavpur, Kolkata
4. Dr. Goutam Saha, Chem Biotech, Salt lake, Kolkata

Training and Placement: 10

Extension Activities and Societal outreach:

New Academic / Research Initiatives

Academic Collaboration: National and International

1.Dr. Nikhil R. Jana, Centre for Advanced Materials, Indian Association for the Cultivation of Science, Kolkata
2.Dr. Somobrata acharya, Centre for Advanced Materials, Indian Association for the Cultivation of Science, Kolkata
3.Dr. Partha P. Parui, Department of Chemistry, Jadavpur University, Kolkata
4.Prof. Ryan M. Richards and Dr. Brian J. Trewyn, Department of Chemistry and Geochemistry, Colorado school of Mines, CO, USA
5.Dept. of Chemistry, University of Calcutta, Department of Chemistry
6.The Chinese University of Hong Kong, People's Republic of China
7.School of Chemistry, The University of Nottingham, University Park, England, UK.
8.ISOF-CNR, Bologna BO, ITALY
9.Department of Organic Chemistry, University of Murcia, Campus de Espinardo, 30100 Murcia, Spain
10.Departament de Química, Universitat de les IllesBalears, Crta. De Valldemossa km 7.5, 07122 Palma, Baleares, Spain.
11.Dr. BiswaChoudhuryPranab, Scientist,University of California , San Diego,
12.Prof. S.Lahiri, SINP,
13.Dr. Debmalya Ray, DRDO, Kanpur
14.(Prof. UrmiChatterjee, University of Calcutta
15.Dr. Ashis Kumar Satpati, BARC, Mumbai,
16.Dr. S. Kumar, Central Electrochemical Research Institute (CECRI-CSIR), Karaikudi,
17.Dr. Surojit Pande, BITS, Pilani

18.Prof. Samir Kumar Pal, *Department of Chemical, Biological and Macromolecular Sciences, S. N. Bose National Centre for Basic Sciences, Kolkata*
19.Professor Yauhen A. Straltsou**,** Head of Electrochemistry Department, Department of Chemistry, Belarusian State University (BSU), Minsk, BELARUS,
20.Prof. Anatoly I. Kulak**,** Deputy Director of the Institute of General and Inorganic Chemistry, Belarusian National Academy of Sciences (IGIC NASB); Head of the Electrochemistry and Photochemistry Department, Institute of General and Inorganic Chemistry (IGIC NASB), Minsk, BELARUS.
21.Paula Brandão, *Departamento de Química,CICECO-Instituto de Materiais de Aveiro,Universidade de Aveiro, 3810-193 Aveiro, Portugal*
22.Bas de Bruin, Homogeneous Catalysis Group, van 't Hoff Institute for Molecular Sciences, University of Amsterdam, Science Park 904, 1098 XHAmsterdam, The Netherlands
23.Dr. Parimal Paul (CSIR-Central Salt & Marine Chemicals Research Institute,
24.GijubhaiBadhekaMarg, Bhavnagar, Gujarat-364002, INDIA
25.Professor H. K. Fun of University of Malaysia
26.BIT, Mesra, Ranchi, Jharkhand, India
27.CSIR-CGCRI, Kolkata, India
28.School of Materials Science, University of New South Wales, Sydney, Australia.
29.IIT, Guwahati, India
30.Saha Institute of Nuclear Physics, Kolkata, India
31.Centre for Renewable Energy, Northeastern University, Boston, USA.
32.Department of Chemistry, Presidency College, Kolkata, India

Industrial Collaboration

- Dyesol Ltd., Australia

Annexure I

List of Publications (2015 - 2016)

1.A. Ghosh, M. Mitra, D. Banerjee, **A. Mondal**, "Facile electrochemical deposition of Cu_7Te_4 thin films with visible-light driven photocatalytic activity and thermoelectric performance" ***RSC Adv.*** **2016**, *6*, 22803-22811.

2.A. Ghosh, C. Kulsi, D. Banerjee, **A. Mondal**, "Galvanic synthesis of $Cu_{2-X}Se$ thin films and their photocatalytic and thermoelectric properties" ***Applied Surface Science*** **2016**, *369*, 525-534.

3.A. Ghosh, **A. Mondal**, "Fabrication of stable, efficient and recyclable p-CuO/n-ZnO thin film heterojunction for visible light driven photocatalytic degradation of organic dyes" ***Materials Letters*** **2016,** *164*, 221-224.

4.G. Mondal, M. Acharjya, A. Santra, P. Bera, S. Jana, N. C. Pramanik, **A. Mondal,** P. Bera, "A new pyrazolyl dithioate function in the precursor for the shape controlled growth of CdS nanocrystals: optical and photocatalytic activities" ***New J. Chem.*** **2015**, *39*, 9487-9496.

5.S. Jana, P. Mondal, S. Tripathi, **A. Mondal**, B. Chakraborty, "Electrochemical synthesis of FeS_2 thin film: An effective material for peroxide sensing and terephthalic acid degradation", ***J. Alloys and Compounds,*** **2015,** *646*, 893-899.

6.G. Mondal, S. Jana, A. Santra, M. Acharjya, P. Bera, D. Chattopadhyay, **A. Mondal**, P. Bera, "Single-source mediated facile electrosynthesis of p-Cu_2S thin films on TCO (SnO_2:F) with enhanced photocatalytic activities", ***RSC Adv.,*** **2015,** *5*, 52235-52242.

7.S. Shyamal, P. Hajra, H. Mandal, A. Bera, D. Sariket, A.K. Satpati, S. Kundu and **C. Bhattacharya** "Benign role of Bi on an electrodeposited Cu_2O semiconductor towards photo-assisted H_2 generation from water" ***J. Mater. Chem. A,*** **2016**, *4*, 9244–9252.

8.H. Mandal, S. Shyamal, P. Hajra, A. Bera, D. Sariket, S. Kundu and **C. Bhattacharya** "Development of ternary iron vanadium oxide semiconductors for applications in photoelectrochemical water oxidation" ***RSC Adv.,*** **2016,** *6*, 4992–4999

9.P. Hajra, S. Shyamal, A. Bera, H. Mandal, D. Sariket, M. Kundu, S. Pande, **C. Bhattacharya, "**Optimization of Triton-X 100 surfactant in the development of Bismuth Oxide thin film semiconductor for improved photoelectrochemical water oxidation behavior" ***Electrochimica Acta,*** **2015,** *185*, 229–235.

10.S. Shyamal, P. Hajra, H. Mandal, J. K. Singh, A.K. Satpati, S. Pande, and **C. Bhattacharya,** "Effect of substrates on the photoelectrochemical reduction of water over cathodically electrodeposited p-Type Cu_2O Thin Films" ***ACS Appl. Mater. Interfaces,*** **2015**, *7*, 18344−18352.

11.A. B. Ghosh, N. Saha, A. Sarkar, A. K. Dutta, P. Biswas, K. Nag, **B. Adhikary**, " Morphological tuning of Eu_2O_2S nanoparticles, manifestation of peroxidase-like activity and use in glucose assay " ***New J. Chem***, **2016**, *40*, 1595-1604.

12.A. B. Ghosh, N. Saha, A. Sarkar, D. N. Srivastava, P. Paul, **B. Adhikary**, " Solvent assisted and solvent free orientation of growth of nanoscaled lanthanide sulfides: tuning of morphology and manifestation of photocatalytic behavior " ***RSC Adv***, **2015**, *5*, 102818-102827.

13.N. Saha, A. Sarkar, A. B. Ghosh, A. K. Dutta, G. R. Bhadu, P. Paul, **B. Adhikary**, " Highly active spherical amorphous MoS_2: facile synthesis and application in photocatalytic degradation of rose bengal dye and hydrogenation of nitroarenes " ***RSC Adv***, **2015**, *5*, 88848-88856.

14.A. Sarkar, A. B. Ghosh, N. Saha, A. K. Dutta, D. N. Srivastava, P. Paul, **B. Adhikary**, " Morphological tuning of Eu_2O_2S nanoparticles, manifestation of peroxidase-like activity and use in glucose assay " ***Catal. Sci. Technol***, **2015**, *5*, 4055-4063.

15.A Mondal, **B Adhikary**, D Mukherjee, " Room-temperature synthesis of air stable cobalt nanoparticles and their use as catalyst for methyl orange dye degradation " ***Colloids. Surf., A***, **2015**, *482*, 845-857.

16.A. Sarkar, A. B. Ghosh, N. Saha, D. N. Srivastava, P. Paul, **B. Adhikary**, " Enhanced photocatalytic performance of morphologically tuned Bi2S3 NPs in the degradation of organic pollutants under visible light irradiation " ***Colloid and Interface Science,*** **DOI:** 10.1016/j.jcis.2016.08.023

17.A. Jana, P. Hazra, M. Hazra, **J. Datta**, "Sequential electro-deposition of Bi2S3/CdS films as co-sensitizer photoanodes for liquid junction solar cell", ***Material Chemistry and Chemistry*** **2016,** doi:10.1016/j.matchemphys.2016.08.016

18.B. N. Mongal, S. Naskar, A. Pal, S. Bhattachraraya, T.K. Mondal, **J. Datta**, S. Naskar, "Ruthenium complexes of substituted terpyridine and pyridyl-quinoline based ligands with ancillary ligands: Synthesis, characterization, electrochemical study and DFT calculation", ***Chemistry Select*** **2016**, *1*, 3276 – 3287.

19.S. Bhattacharya, A. Pal, A. Jana, **J. Datta**, "Synthesis and characterization of CdS nanoparticles decorated TiO_2 matrix for an efficient N3 based dye sensitized solar cell (DSSC)", ***Journal of Materials Science: Materials in Electronics*** **2016**, DOI: 10.1007/s10854-016-5298-3

20.B. N. Mongal, S. Bhattacharya, S. Sengupta, T. K. Mandal, **J. Datta**, S. Naskar, "A novel ruthenium sensitizer with –OMe substituted phenyl-terpyridine ligand for dye sensitized solar cells", ***Solar Energy*** **2016**, *134*, 107-118.

21.P. Hazra, A. Jana, **J. Datta**, "Voltammetric deposition of BiCdTe composite films with improved functional properties for photo-electrochemical cells", ***RSC-New Journal of Chemistry*** **2016**, *40*, 3094-3103.

22.B.N. Mongal, A. Pal, T.K. Mandal, **J. Datta**, S. Naskar, "Synthesis, characterisation, electrochemical study and photovoltaic measurements of a new terpyridine and pyridine-quinoline based mixed chelate ruthenium dye" ***Polyhedron*** **2015**, *102*, 615-626.

23.A. Datta, A. Mondal, **J. Datta**, "Tuning of Platinum nano-particles by Au coverage in their binary alloy for direct ethanol fuel cell: Controlled synthesis, electrode kinetics and mechanistic interpretation", ***J. Power Source*** **2015,** *283*, 104-114.

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Computer Science and Technoligy

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To be recognized globally for excellence in academic programs and innovative, applied and socially relevant research

MISSION

To provide the students with a firm foundation of both the theory and practice of Computer Science and Technology through a comprehensive undergraduate and post-graduate curricula, and to strengthen creativity, nurture innovation, and develop the ability to carry out research and solve real - world problems.

The Department of Computer Science and Technology (CST), established in 1982, is the 2nd youngest of the ten Engineering departments in the institution. The CST department, since its inception, has maintained a steady growth in every sphere of its activities and played an important role in bringing a vibrant and forward looking academic environment within the University. It is a premier department offering high quality undergraduate and postgraduate engineering courses as well as providing an excellent infrastructure and facilities for advanced research and consultancy.

The importance of introducing a separate discipline on Computer Science and Technology was felt back in mid 70s. To serve the growing need of manpower with specialization in Computer Design and Applications a proposal to start the new discipline was submitted to MHRD and the approval was obtained in 1981. The new department started functioning from within the Electrical Engineering department and admitted the first batch of Bachelor of Engineering (BE) students in July 1982 and a separate CST department came into existence in August 1984. In January 1988 Master of Computer Application (MCA) course was introduced; the first in Eastern region. The full time Master of Engineering (ME) course in Computer Science and Technology started from July 1992. The department conferred its first PhD degree in January 1999.

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Academic Programmes

Undergraduate Level

Degree offered: 5-yr. Dual Degree BTech-MTech
Sanctioned students' intake: 92

Post Graduate Level

Degree offered : **Master of Technology (MTech)**
Sanctioned students' intake **: 16 (GATE*)***
Specializations in : Computer Science and Engineering

Doctoral & Post Doctoral Research Programme

Degree offered: **PhD (Engineering)**

No of Candidates enrolled: 04
No. of Candidates registered: 16
No. of Candidates awarded: 06

Faculty Position

Sanctioned faculty post **22** Vacant Post **3**

Faculty profile

Name	Academic Qualifications	Designations & Date of Joining	Research Publications	Specialisation / Research Area	E - mail
Biplab Kumar Sikdar	PhD(BESU) 2003 M.Tech (CU) 1990 B.Tech (CU) 1988 BSc(Phys) (CU) 1985	Professor & HOD Joined: 02-09-1997	Journal: 20 Book:1 Conf: 80	Cellular Automata	biplab@cs.iiests.ac.in
Abhik Mukherjee	PhD (BECDU) 2003 ME (JU) 1994 BE (JU) 1991	Associate Professor Joined: 29-01-2000	Journal: 18 Conf: 15	Real Time Systems	abhik@cs.iiests.ac.in
Amit Kumar Das	PhD (BECDU) 1998 ME (CU) 1982 BE (CU) 1979	Professor Joined:25-08-1985	Journal: 12 Conf: 35	Image Processing	amit@cs.iiests.ac.in
Apurba Sarkar	M.Tech (IIT Guwahati) 2003 B.Tech (CU) 2001	Assistant Professor Joined:12-08-2003	Journal: 1 Conf: 6	Digital Geometry, combinatorial Geometry, Computational Geometry, Image & shape Analysis	sarkar@cs.iiests.ac.in
Ashish Kumar Layek	ME (BESU) 2001 BE (BESU) 1999	Assistant Professor Joined:07-11-2013	Conf: 1	Wireless Telecommunication and Networking	ashish@cs.iiests.ac.in
Asit Kumar Das	PhD (BESU) 2011 M.Tech (CU) 2002 B.Tech (CU) 1996 BSc (Maths)(CU)1993	Associate Professor Joined: 09-01-2006	Journal: 10 Book:1 Conf: 24	Data Mining, Pattern Recognition	akdas@iiests.ac.in
Jaya Sil	PhD (JU) 1996 ME(JU) 1986 BE (CU) 1984	Professor Joined: 15-11-2003	Journals: 30 Conf: 120	Machine Learning, Image Processing	js@cs.iiests.ac.in
Malay Kule	M.Tech (CU) 2005 B.Tech (CU) 2003 BSc (Phys)(CU) 2000	Assistant professor Joined: 08-10-2013	Conf: 6	Defect Tolerance & Testing of Nanoscale Circuits	malay@cs.iiests.ac.in
ManasHira	M.Tech(IITKGP) 1991 B.Tech(IIT KGP) 1989	Associate Professor Joined: 30-12-1994	Journal: 1	Theoretical Computer Science	manas@cs.iiests.ac.in
Samit Biswas	PhD (IIEST) 2016 M.Tech. (KU) 2006 B.E.(BU) 2004	Assistant Professor Joined:05-09-2013	Journal: 4 Conf: 10	Digital Image Processing and Analysis	samit@cs.iiests.ac.in

Saptarshi Ghosh	PhD (IIT KGP) 2013 M.Tech. (IITKGP)2007 B.E. (BESU) 2005	Assistant Professor Joined: 25-07-2007	Journals: 8 Conf: 22	Information Retrieval, Machine Learning.	sghosh@cs.iiests.ac.in
Sekhar Mondal	PhD (BESU) 2007 M.Tech. (CU) 1993 B.Tech (CU) 1991	Associate Professor Joined: 01-03-2000	Book Ch: 1 Journal: 5 Conf: 30	Image Processing and pattern Recognition	sekhar@cs.iiests.ac.in
Sipra DasBit	Ph.D (JU) 1997 M.E.(JU) 1986 B.E.(CU) 1984	Professor Joined: 23-02-1988	Journal: 16 Book:2 Book Ch:1 LNCS: 6, Conf: 42	Mobile Computing, Wireless Sensor Network, Delay Tolerant Network	sb@cs.iiests.ac.in
Somnath Pal	M.E. (CU) 1983 B.E. (CU) 1981	Associate Professor Joined: 31-07-1986	Journal:08 Conf: 14 Book Ch: 1		sp@cs.iiests.ac.in
Sulata Mitra	PhD (BESU) 2005 M.Tech. (Ranchi Univ)1996 B.E.(CU)1986	Professor Joined: 01-02-2000	Journal: 13 Book/Book ch: 5, Conf: 43	Mobile computing, QoS issues in cellular network, Ad-hoc network, Multihomed mobile network	sulata@cs.iiests.ac.in
Surajeet Ghosh	M.E. (WBUT) 2005 B.Tech. (KU) 2002	Assistant Professor Joined:11-09-2013	Journal: 1 Conf: 9	Computer Architecture	surajeet@cs.iiests.ac.in
Susanta Chakroborty	PhD (CU) M.Tech (CU) 1985 B.Tech (CU) 1983	Professor Joined:17-11-2005	Journal:18 Conf: 44 Book/Ch:3	Bio-chip, Quantum Computing, Video Image Processing, Big-data application	sc@cs.iiests.ac.in
Tamal Pal	ME (BESU) 2011 B.Tech (GCETTB)2007	Assistant Professor Joined:09-09-2013	Conf: 2	Image Processing, Wireless Multi-media Sensor Network	tamal@cs.iiests.ac.in
Uma Bhattacharya	PhD (CU) 1995 ME (JU) 1983 B.Tech (CU) 1979	Professor Joined:20-07-1987	Journals: 7 Book ch: 3 LNCS: 3, Conf: 30	Mobile Network	ub@cs.iiests.ac.in

Awards and Laurels received by the faculty members

Amit Kumar Das	**Patent Awarded** – Method and Apparatus for Image Retrieval – (US Patent Number: US 2003/0198387 A1) – Inventors: Tinku Acharya, Bhabotash Chanda, Amit Kumar Das, Sanjoy Kumar Saha Oct 23, 2003.
Sekhar Mandal	Winning team of the Page Segmentation Competition, In 9th International Conference on Document Analysis and Recognition, Curitiba, September, 2007.
Abhik Mukherjee	Special Mention as one among best five papers in EAIT-2014 Session Chair of ICINCO-2014, September 2014 at Technology University, Vienna, Austria
Jaya Sil	INSA Scientist Exchange Programme. Best project award in Outreach area for the project on : "Remote Health: A Framework for Health care Services using Mobile and Sensor-Cloud Technologies" [Sponsoring Authority: Information Technology Research Academy (ITRA)].
Saptarshi Ghosh	Humboldt Postdoctoral Fellowship in July 2014. Dr. Ghosh carried out research under this fellowship at the Max Planck Institute for Software Systems in Saarbrücken, Germany, in the areas of Social Computing and Data Mining, during October 2014 – September 2015. Max Planck-India Mobility Grant, for visiting the Max Planck Institute for Software Systems, Germany to continue collaborative research (November 2015)
Sipra DasBit	Best Paper Award in Wireless Vitae, 2011; One of the Best Paper Awards in IEEE INDICON, 2015
Sulata Mitra	Best paper award in IEEE INDICON 2015
Surajeet Ghosh	Best Paper Award at the 2013 IEEE International Conference on Computational Intelligence and Computing Research (ICCIC), December 2013.
Susanta Chakraborty	NSA-JSPS fellowship and worked with *Professor H. Fujiwara of Nara Institute of Science and Technology, Japan.* Invited German Gov Fellowship from *Institute of Computer Science, University of Potsdam, Germany and* worked with Professor Michael Gossel. Invited from University Michigan, Advanced Computer Architecture Lab, deptt of Electrical Engineering and Computer Science and worked with Professor John P. Hays, Shannon Professor of Engineering Science in the area of Quantum circuit. Program Chair, IEEE WRTLT-2015 International Symposium Nov, 2015 at IIT Bombay. Publicity Co-Chair and Program Committee member Twenty-fifth Asian test Symposium, November, India, 2015. Publicity Chair & Program Committee member of 4th, 5th and 6th IEEE International workshop on Reliability Aware system Design and Test (RASDAT), January, India, 2013, 2014 and 2015.

Research areas

The current research areas of the Department are as follows:

I. VLSI Design and Testing for Sub-micron Technology
II. Theory and Applications of Cellular Automata in Diverse Fields
III. Information System for Control and Management Applications
IV. Mobile Computing
V. Testing and synthesis of Quantum circuit, Reversible Circuit, Nano-Circuit and Digital Micro fluidic
Bio-Chip
VI. Broadband Computing
VII. Image Processing including Document Image Processing and Content Based Image Retrieval
VIII. Soft computing
IX. Computational geometry
X. Data mining and Big Data Analytic
XI. Wireless sensor network

Research facilities (name specific equipment / picture, infrastructure etc)

Equipments

Cluster and Distributed Computing Platform	HPC (High Performance Computing) Server - IBM P Series 8 CPU Server IBM eServer Blade Center with 12 Blade servers (running Linux, Unix, Windows OS) 3 High-End Workstations - 1 SGI Prism, 2 IBM Intelli Stations
PCs	About 150 high-end Desktop PCs (dual-core / quad-core)
Printers	Multiple networked printing stations
P/C with Robot Interface	Parallax Boe –Bot Robot Kit , Hex- Crawler Kit, Robot Arm
Wireless Explore Kit (WEK)	IEEE 802.15.4 Standard
Labview (Software)	National Instrument/ NI-DAQMX for Windows Vista, Vista X64 Edition, XP/2000.Also includes: Labview Signal Express
Microcontroller platforms	KEIL-based (sufficient number)
Function Generators	Yokogawa/ FC-300(15MHZ), Synthesized Function Generator (sufficient number)
Digital Signal Oscilloscopes (DSO)	Yokogawa/ DL-9505L 5GS/S 500MHZ (sufficient number)
FPGA / CPLD platform	Xilinx and Altera based
DSP platforms	Texas Instruments-based
Programmable Logic Controller platform	Siemens-based
8085 / 8086 based SDKs	Sufficient number
Workbench for hardware circuit design	Sufficient number

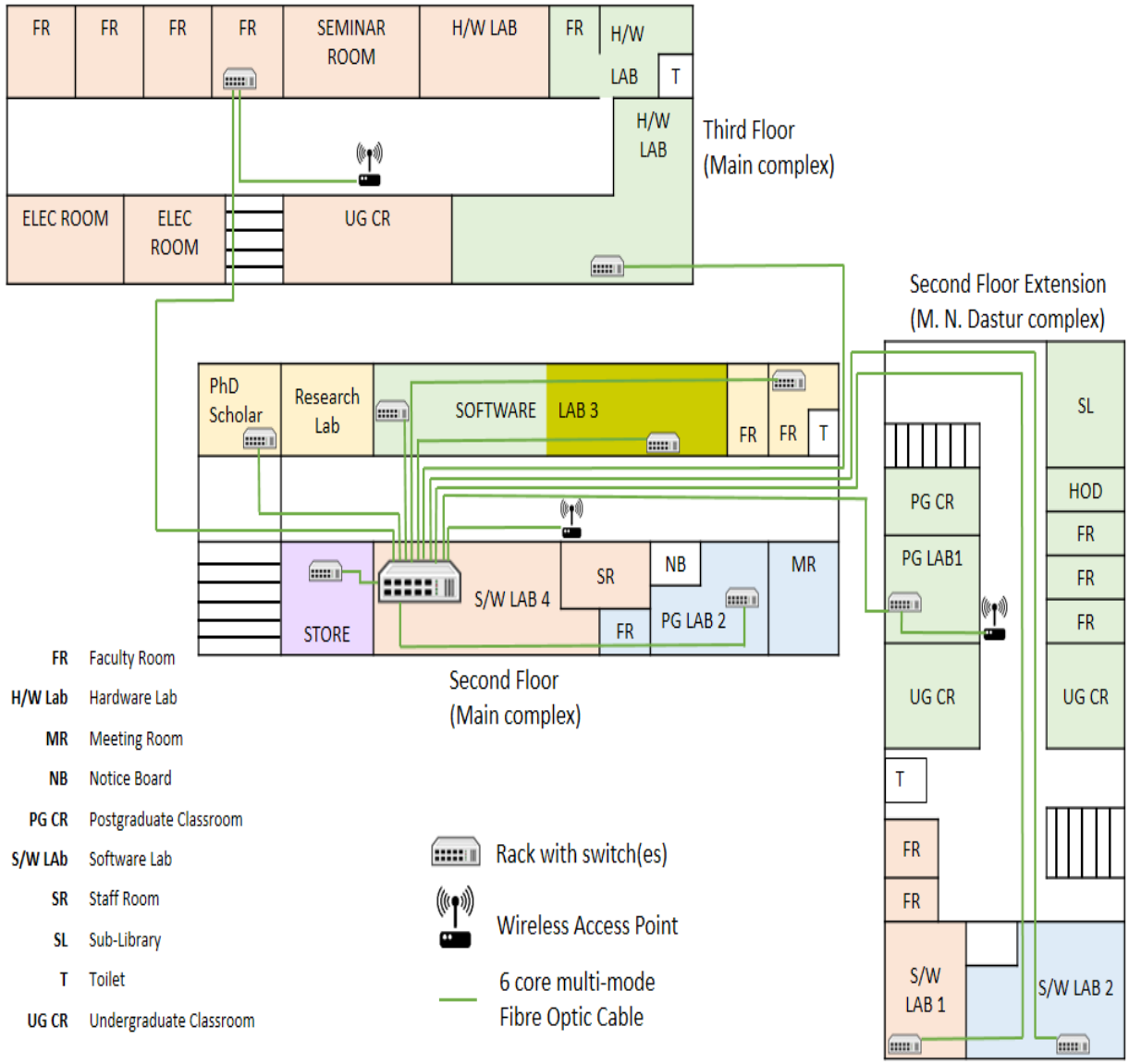
Network

The Department has 24-hour Internet access through Gigabit Ethernet backbone (Internet connection through NIC under National Knowledge Network). The entire department is covered under WiFi network created by multiple access points

Departmental sub-library

In addition to the Central Library of the Institute, the Department has a small but well-stocked library containing more than 1200 text and reference books.

Departmental LAN



Detailed facilities in the laboratories

Undergraduate

Software Laboratories	Hardware Laboratories
Resources: • **PCs**: 175 • **Servers** : 20 • **OS** : Linux, Windows, Unix • **Software**: Oracle 10g, matlab, VLSI etc. **Supporting the following courses:** **i)**Data Structure **ii)**Object Oriented Technology **iii)**Discrete Structures **iv)**Operating Systems **v)**Algorithm **vi)**Analysis, Design & Management of Information Systems **vii)**Database Management System **viii)**Computer Networks **ix)**Systems Programming **x)**Computer Graphics **xi)**Compiler Design **xii)**Symbolic Logic & Artificial Intelligence **xiii)**Software Engineering **xiv)**VLSI Design **xv)**Electronic Design & Automation	Digital Circuit Experimentation Kit, Microprocessor S/W Development Kits, Embedded System Design Kits, Programmable Logic Controller, PCs, GPS Receiver Unit, RFID Reader. **Supporting the following courses:** **i)**Digital Logic **ii)**Computer Organization **iii)**Microprocessor Based System Design **iv)**Embedded System **v)**Computer Control of Industrial Process **vi)**Digital Systems Design

Post-graduate and Research

The Department has four research laboratories that are specifically used by postgraduate students, research scholars and faculty members. These laboratories are equipped with 2 servers and 20 PCs. additionally; the postgraduate students and research scholars working in hardware-related areas also utilize the Hardware laboratory.

Consultancy Work

Name of PI / Co-PIs	Title	Funding Agency	Total Quantum Support	Status
Manas Hira	Implementation of information system for Howrah municipal corporation (consultancy)	Howrah Municipal Corporation	8 Lakhs	Ongoing

Support Staff Position

Technical staff profile

Name	Designation	Highest Qualification	E- mail
Bimal Prasad Jana	Supdt. Tech. (teaching)	LEE	bjana@cs.iiests.ac.in
Susanta Kumar Chakravorty	Supdt. Tech. (teaching)	DEE	schak@cs.iiests.ac.in
Pradip Kumar Roy	Tech. Asst. – Grade I	DEE	pkr@cs.iiests.ac.in
Sumitra Bagchi	Tech. Asst. – Grade I	MCA, BSc (Physics)	bagchi@cs.iiests.ac.in
Sarbani Barari	Tech. Asst. – Grade II	Diploma in Electronics & Telecommunication Engineering, BSc	sarbani@cs.iiests.ac.in
Sujata Misra	Tech. Asst. – Grade II	Diploma in Computer Science & Technology, BSc	sujata@cs.iiests.ac.in
Rumeli Bose	Tech. Asst. – Grade II	M.Tech	rumeli@cs.iiests.ac.in

Sanctioned non-technical post: Not known

Non-technical staff profile

Name	Designation
Judhistir Mandal	Senior Assistant
Jahar Pal	Senior Peon
Rama Roy	Senior Peon
Bijon Sarkar	Helper Gr. – III

Recently Completed and Ongoing Sponsored Research / projects

The following table lists some of the recently completed or continuing R&D projects undertaken by the faculty members of the Department.

Name of PI / Co-PIs	Title	Funding Agency	Total Quantum Support	Status
Abhik Mukherjee	Alignment and Ejection studies of Precision Guided Missiles	DRDO (RCI)	8 Lakhs	Completed
Abhik Mukherjee	Guidance, Control &Target Tracking strategies for a Precision Guided Missile	DRDO (RCI)	8 Lakhs	Completed
Abhik Mukherjee	Conceptual Design of NGC loop for PGM	DRDO(RCI)	10 Lakhs	Completed
Amit Kumar Das	Strategic Air Guidance	ADA, Bangalore	8.5 Lakhs	Completed
Amit Kumar Das	Content Based Image Retrieval (E-document)	Institute Sponsored	15 Lakh	Ongoing
Biplab Kumar Sikdar	Sponsored Cellular Automata Research Projects	Intel, Fujitsu	22 Lakhs	Completed
Jaya Sil	Remote Health: A Framework for Healthcare Services using Mobile and Sensor-Cloud Technology	ITRA, Media Labs Asia, and DEITY	40.16 Lakhs	Sanctioned: 2013 (ongoing)
Sekhar Mandal	De-noising MEMS Vibrating Gyro Using Wavelet Transform	DRDO	9 Lakhs	Completed
Sipra Das Bit, Saptarshi Ghosh	Post-Disaster Situation Analysis and Resource Management Using Delay-Tolerant Peer-to-Peer Wireless Networks	ITRA, Media Labs Asia, and DEITY	58.66 Lakhs	Sanctioned: 2013 (ongoing)

Details of publications of each Faculty Member in (2015-16)

Abhik Mukherjee

Conference

Rajrup Ghosh, Dipanjan Ghosh , Sreemoyee Roy and Abhik Mukherjee; *Exploring the Self Similar Properties for Monitoring of Air Quality Information;* ICAPR-2015.

Amit Kumar Das

Journals

Sayan Mandal; Samit Biswas; Amit Kumar Das; Bhabatosh Chanda; *Map image bina- rization and stitching using extraction of regions,* Journal of Theoretical and Applied Computer Science, Vol 9(1):2840, 2015.

Paramita De, Sekhar, Mandal, Partha Bhowmick, Amit K Das; ASKME: Adaptive Sampling with Knowledge Driven Vectorization of Mechanical Engineering Drawings, International Journal on Document Analysis and Recognition, , Volume 19, pp 11–29, 2015.

Conferences

Samit Biswas, Sekhar Mandal and Amit Kumar Das, *Representation and Reconstruction of Map Regions*, 13th International Conference on Document Analysis and Recognition (ICDAR 2015), September 23-26, 2015, Nancy, France pp - 516-520.

Sekhar Mandal, Paramita De, Amit Kumar Das and Bhabatosh Chanda; Detection of Electrical Circuit Elements from Documents Images, Document Recognition and Retrieval XXI, Proc. of SPIE-IS&T Electronic Imaging, Vol. 9402, 94020O © 2015 SPIE-IS&T, Page – 94020O-1 - 94020O-11.

Jana, P.; Majumdar, A.; Layek, A.K.; Mandal, S.; Das, A. K., "Automated segmentation and classification of chemical and other equations from document images", 2015 Eighth International Conference on Advances in Pattern Recognition (ICAPR), pp. 1-7, 2015.

Sekhar Mandal, Sugata Das and Amit Kumar Das; Binarization of Stone Inscripted Documents, IEEE International Conference on Computer Graphics, Vision and Information Security, 2015.

Sekhar Mandal, Sugata Das and Amit Kumar Das; Binarization of Degraded Handwritten Documents based on Morphological Contrast intensification, Third International Conference on Image Information Processing, 2015.

Apurba Sarkar

Journals

Sarkar, A., A. Biswas, P. Bhowmick, M. Dutt, and B. B. Bhattacharya, A linear-time algorithm to compute the triangular hull of a digital object, Discrete Applied Mathematics, Elsevier, 2016.

Conferences

Sarkar, A., A. Biswas, M. Dutt, and A. Bhattacharya (2016). Finding Largest Rectangle inside a Digital Object. In: 6th International Workshop on Computational Topology in Image Context: CTIC 2016, Marseille, France. Vol. 9667. Springer-Verlag. Lecture Notes in Computer Science (LNCS), pp.170-179.

Sarkar, A, A Biswas, S Mondal, and M Dutt, Finding Shortest Triangular Path in a Digital Object, 19th IAPR International Conference on Discrete Geometry for Computer Imagery, 2016.

Sarkar, A, A Biswas, M Dutt, and A Bhattacharya, *Generation of Random Digital Curves using Combinatorial Techniques,* In: Conference on Algorithms and Discrete Applied Mathematics (CALDAM). Springer, pp. 286–297, 2015.

Sarkar, A, A Biswas, M Dutt, and A Bhattacharya, *Generation of Random Triangular Digital Curves Using Combinatorial Techniques*, In: 6th International Conference on Pettern Recognition and Machine
In-telligence (PReMI). Springer, pp. 136–145, 2015.

Sarkar, A and M Dutt, *Construction of Sandwich Cover of Digital Objects. In Seventeenth International Workshop on Combinatorial Image Analysis*, IWCIA. Springer, pp. 172–184, 2015.

Sarkar, A and A Kar, *Construction of Hexagonal Covers of Digital Objects Using Combinatorial Technique*, In: Seventeenth International Workshop on Combinatorial Image Analysis. RPS, 2015.

Ashish Kumar Layek

Conferences

Jana, P.; Majumdar, A.; Layek, A.K.; Mandal, S.; Das, A. K., "Automated segmentation and classification of chemical and other equations from document images", 2015 Eighth International Conference on Advances in Pattern Recognition (ICAPR), pp. 1-7, 2015.

Biplab K Sikdar

Journal

Mousimi Saha, Mamata Dalui and Biplab K Sikdar:- A Cellular Automata Based Highly Accurate Memory Test Hardware Realizing March C−; Microelectronics Journal , 52: 91-103, 2016.

B. Sen, Y. Sahu, R. Mukherjee, R. K Nath and B. K. Sikdar, "On the Reliability of Majority Logic in Qunatum-dot Cellular Automata", Microelectronics Journal, volume 47, pp 7 – 18, January 2016.

B. Sen, M. Dutta, R. Mukherjee, R. Nath, A. Sinha, and B. Sikdar,"Towards the design of hybrid qca tiles targeting high fault tolerance," Journal of Computational Electronics, issue 2, pp. 429-445, January, 2016.

B. Sen, A. Nag, A. Dey and B. K. Sikdar,"Towards the hierarchical design of multilayer QCA logic circuit", Journal of Computational Science, Elsevier, volume 11, pp 233 – 244, 2015.

Bibhash Sen, Mrinal Goswami, Subhra Mazumdar and Biplab K Sikdar, "Towards Modular Design of Reliable QCA Logic Circuit using Multiplexer", Computers and electrical Engineering Journal, Elsevier, Vol 45, pp 42-54, July, 2015.

Conferences

B Sen, R. mukherjee, Y Sahu, R. k Nath and Biplab k Sikdar, "Towards designing reliable universal QCA architecture in the presence of cell deposition defect", 29th International conference of VLSI design, January 4-8, 2016, Kokata, India.

Rajdeep Kumar Nath, Bibhash Sen, Rachit Daga, Nilesh Chakraborty, Harsh Tibrewal, Biplab K Sikdar. "Fault masking in Quantum-dot cellular automata using prohibitive logic circuit" In 19th International Symposium on VLSI Design and Test (VDAT), 2015, Ahmedabad, India, pages 1-5, 26-29 June 2015.

Mausumi Saha and Biplab K. Sikdar:- A Cellular Automata Based Fault Tolerant Approach in Designing Test Hardware for L1 Cache Module; ISVLSI 2015, pp 497-502, 2015.

Mausumi Saha, Navneet Kumar Gautam and Biplab K. Sikdar:- A fault tolerant test hardware for L1 cache module in tile CMPs architecture; In 19th International Symposium on VLSI Design and Test (VDAT), 2015, Ahmedabad, India, pages 1-6, 26-29 June 2015.

Mausumi Saha, Shubhra and Biplab K. Sikdar:-An efficient method for testing of L1 cache module in tiled CMPs architecture at low cost; VLSI Systems, Architecture, Technology and Applications (VLSI-SATA), 2015.

Bidesh Chakraborty, Bhanu Pratap Singh, M. Chinnapureddy, Mamata Dalui, Biplab K Sikdar. Design of Coherence Verification Unit for Heterogeneous CMPs, 19th International Symposium on VLSI Design and Test (VDAT), 2015, Ahmedabad, India.

Jaya Sil

Journals

Indrajit De and Jaya Sil, No-reference image quality assessment using interval type 2 fuzzy sets, Applied Soft Computing 30 (2015) 441–453.

Nanda Dulal Jana and Jaya Sil, Levy distributed parameter control in differential evolution for numerical optimization, Springer Natural Computing, pp 1-14, 2015.

Pratyay Konar , Jaya Sil , Paramita Chattopadhyay, Knowledge extraction using data mining for multi-class fault diagnosis of induction motor, Neurocomputing 166 (2015), pp 14–25.

Jaya Sil, and Zenefa Rahaman, Optimizing Large Search Space using DE Based Q-learning Algorithm, American Academic & Scholarly Research Journal Vol. 7, No. 5, July 2015.

Conferences

Jaya Sil and Jaydeep Sen, A generalized probabilistic approach for managing inconsistency to improve classifier accuracy, Pages: 69 - 74, DOI: 10.1109/DIPDMWC.2016.7529366

Indrani Bhattacharya, Jaya Sil, Query Classification using LDA Topic Model and Sparse Representation Based Classifier. CODS: 24:1-24:2, 2016.

Jaya Sil, Indrani Bhattacharya, Patient classification based on expanded query using 5-gram collocation and binary tree. DSAA: 1-10, 2915.

Suparna Biswas, Jaya Sil, An Efficient Expression Recognition Method using Contourlet Transform. PerMin,167-174, 2015.,

Atrayee Majumder, Srija Chowdhury, Jaya Sil, Gabor Filter Based Face Recognition Using Non-frontal Face Images. WCI, 419-425, 2015

Malay Kule

Conferences
Malay Kule, Hafizur Rahaman, Bhargab B. Bhattacharya, Reliable Logic Design with Defective Nano-Crossbar Architecture, 2016 IEEE International Conference on Distributed Computing, VLSI, Electrical Circuits, and Robotics (DISCOVER), NITK, Surathkal, India, 13-14, August, 2016.
Malay Kule, Habibur Rahaman, Defect Tolerant Approach For Function Mapping in Nano Crossbar Using Evolutionary Algorithms, Third International Conference on Microelectronics, Circuits and Systems, Kolkata, India, pp. 5-9, July 09-10, 2016.

Malay Kule, Hafizur Rahaman, Bhargab B. Bhattacharya, On Finding a Defect-Free Component in Nanoscale Crossbar Circuits, Fourth International Conference on Eco-friendly Computing and Communication Systems , NIT Kurukshetra, India, Elsevier Procedia Computer Science, Volume 70, pp. 421–427, 2015.

Samit Biswas

Journals

Sayan Mandal; Samit Biswas; Amit Kumar Das; Bhabatosh Chanda; *Map image bina- rization and stitching using extraction of regions*, Journal of Theoretical and Applied Computer Science, Vol 9(1):28-40, 2015.
Conferences

Samit Biswas, Sekhar Mandal and Amit Kumar Das, *Representation and Reconstruction of Map Regions*, 13th International Conference on Document Analysis and Recognition (ICDAR 2015), September 23-26, 2015, Nancy, France pp - 516-520.
Tamali Banerjee, Samit Biswas, Hand-drawn Line Removal from Bangla Printed Document Images, 2015 IEEE CGVIS, Bhubaneswar, pp. 116-121, 2015.

Saptarshi Ghosh

Journals
C. Freitas, F. Benevenuto, A. Veloso, S. Ghosh. An Empirical Study of Socialbot Infiltration Strategies in the Twitter Social Network, Social Network Analysis and Mining, Springer, 2016 (in press).

M. B. Zafar, P. Bhattacharya, N. Ganguly, K. P. Gummadi, S. Ghosh, Sampling Content from Online Social Networks: Comparing Random vs. Expert Sampling of the Twitter Stream, ACM Transactions on the Web (TWEB), vol. 9, issue 3, pp. 12:1 - 12:33, June 2015.

Conferences

Koustav Rudra, Ashish Sharma, Niloy Ganguly, S. Ghosh. Characterizing Communal Microblogs during Disaster Events, IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), San Francisco, USA, August 2016.

M. Mondal, J. Messias, S. Ghosh, K. P. Gummadi, A. Kate. Forgetting in Social Media: Understanding and Controlling Longitudinal Exposure of Socially Shared Data, USENIX Symposium on Usable Privacy and Security (SOUPS), Denver, USA, June 2016.

M. Basu, S. Bandyopadhyay, S. Ghosh. Post Disaster Situation Awareness and Decision Support through Interactive Crowdsourcing, Humanitarian Technology: Science, Systems and Global Impact (HumTech), Boston, USA, June 2016.

A. Chakraborty, S. Ghosh, N. Ganguly, K. P. Gummadi. Dissemination Biases of Social Media Channels: On The Topical Coverage of Socially Shared News, AAAI International Conference on Web and Social Media (ICWSM), Cologne, Germany, May 2016.

M. B. Zafar, P. Bhattacharya, N. Ganguly, S. Ghosh, K. P. Gummadi. On the Wisdom of Experts vs. Crowds: Discovering Trustworthy Topical News in Microblogs, ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW), San Francisco, USA, February 2016.

K. Rudra, S. Ghosh, N. Ganguly, P. Goyal, S. Ghosh, Extracting Situational Information from Microblogs during Disaster Events: A Classification-Summarization Approach, ACM International Conference on Information and Knowledge Management (CIKM), Melbourne, Australia, October 2015.

S. Dutta, S. Ghatak, M. Roy, S. Ghosh, A. K. Das, A graph based clustering technique for tweet summarization , IEEE International Conference on Reliability, Infocom Technologies and Optimization (ICRITO), New Delhi, India, pp. 1--6, September 2015.

C. Freitas, F. Benevenuto, S. Ghosh, A. Veloso, Reverse Engineering Socialbot Infiltration Strategies in Twitter, IEEE/ACM International Conference on Advances in Social Networks Analysis (ASONAM), Paris, France, August 2015.

J. Kulshrestha, M. B. Zafar, L. E. Noboa, K. P. Gummadi, S. Ghosh, Characterizing Information Diets of Social Media Users, AAAI International Conference on Web and Social Media (ICWSM), Oxford, UK, May 2015.

K. Rudra, A. Chakraborty, M. Sethi, S. Das, N. Ganguly, S. Ghosh, #FewThingsAboutIdioms: Understanding Idioms and its Users in the Twitter Online Social Network, Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD), Ho Chi Minh City, Vietnam, May 2015.

A. Sen, K. Rudra, S. Ghosh, Extracting Situational Awareness from Microblogs during Disaster Events, Social Networking Workshop in conjunction with International Conference on Communication Systems & Networks (COMSNETS), Bangalore, India, January 2015.

Sekhar Mondal

Journals

Paramita De, Sekhar, Mandal, Partha Bhowmick, Amit K Das; ASKME: Adaptive Sampling with Knowledge Driven Vectorization of Mechanical Engineering Drawings, International Journal on Document Analysis and Recognition, , Volume 19, pp 11–29, 2015.

Paramita De, Sekhar Mandal, Partha Bhowmick; Hierarchical Vectorization of Electrical Drawings in Document Images by Connectivity Analysis of Symbols and Supercomponents, Accepted in International Journal on Pattern Recognition and Image Analysis, 2016.

Conferences

Sekhar Mandal, Paramita De, Partha Bhowmick and Bhabatosh Chanda; Topological Simplification of Electrical Circuits by Super-component Analysis, 13th International Conference on Document Analysis and Recognition (ICDAR 2015), pp. 211-215, 2015.
Samit Biswas, Sekhar Mandal and Amit Kumar Das, *Representation and Reconstruction of Map Regions*, 13th International Conference on Document Analysis and Recognition (ICDAR 2015), September 23-26, 2015, Nancy, France pp - 516-520.

Sekhar Mandal, Paramita De, Amit Kumar Das and Bhabatosh Chanda; Detection of Electrical Circuit Elements from Documents Images, Document Recognition and Retrieval XXI, Proc. of SPIE-IS&T Electronic Imaging, Vol. 9402, 94020O © 2015 SPIE-IS&T, Page – 94020O-1 - 94020O-11

Jana, P.; Majumdar, A.; Layek, A.K.; Mandal, S.; Das, A. K., "Automated segmentation and classification of chemical and other equations from document images", 2015 Eighth International Conference on Advances in Pattern Recognition (ICAPR), pp. 1-7, 2015.

Sekhar Mandal, Sugata Das and Amit Kumar Das; Binarization of Stone Inscripted Documents, IEEE International Conference on Computer Graphics, Vision and Information Security, 2015.

Sekhar Mandal, Sugata Das and Amit Kumar Das; Binarization of Degraded Handwritten Documents based on Morphological Contrast intensification, Third International Conference on Image Information Processing, 2015.
Sekhar Mandal, Ramanath Datta, Paramita De and Bhabatosh Chanda; Detection and Identification of Logic Gates from Document Images using Mathematical Morphology, Fifth National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics, 2015.
Sipra DasBit

Journals

Arpan Sen, Tanusree Chatterjee and Sipra DasBit, □ LoWaNA: Low-overhead Watermark Based Node Authentication in WSN□ , Wireless Networks, Springer, January 2016.

Rajib Banerjee, Shibashis Chatterjee and Sipra DasBit, An Energy Saving Audio Compression Scheme for WMSN using Spatio-temporal Partial DWT, Journal of Computer and Electrical Engineering, Elsevier Science, vol 48, pp 389-404, 2015.

Subir Halder and Sipra DasBit, Design of an Archimedes' Spiral based Node Deployment Scheme Targeting Enhancement of Network Lifetime in Wireless Sensor Networks, Journal of Network and Computer Applications, Elsevier Science, vol 47, pp 147-167, January, 2015.

Amrita Ghosal and Sipra DasBit, A Lightweight Security Scheme for Query Processing in Clustered Wireless Sensor Networks, Journal of Computer and Electrical Engineering, Elsevier Science, vol 41, pp 240-255, January 2015.

Conferences

N. Das, A. Roy and S. DasBit, ′ LionBEAR: A Location Based Energy Aware Routing Scheme in DTNs′, Int. Conf. DIPDMWC, IEEE Xplore, pp 75-80, July 2016.

S. Basu, S.Roy, S. DasBit, S. Bandyopadhyay, 'A Human Mobility Based Knowledge Sharing Approach for Post Disaster Need Assessment using DTN', ICDCN, Singapore, January 2016.

A. Das, N. Mallik, S. Bandyopadhyay, S. DasBit , Interactive Information Crowdsourcing for Disaster Management Using SMS and Twitter: A Research Prototype , Workshop CASPer at IEEE PerCom, Sydney, 2016.

S. Bhattacharjee, S. Basu, S. Roy, S. DasBit, Best-effort Delivery of Emergency Messages in Post-disaster Scenario with Content-based Filtering and Priority-enhanced PRoPHET over DTN, IEEE COMSNET, January, 2016.

T. Pal and S.DasBit, A new CFA based image compression technique for energy-starved wireless multimedia sensor network, IEEE INDICON, Dec, 2015.

S. Basu, S.Roy, S. DasBit, S. Bandyopadhyay, A Human Mobility Based Knowledge Sharing Approach for Post Disaster Need Assessment using DTN, ICDCN, Singapore, January 2016.

T. Pal, S. Bandyopadhyay, S.DasBit, Energy-saving image transmission over WMSN using block size reduction technique, IEEE iNIS , Dec, 2015.

R.Banerjee and S. DasBit, Low-Overhead Image Compression in WMSN for Post Disaster Situation Analysis, IEEE ANTS, December, 2015.

A. Roy Chowdhury and S. DasBit, LMAC: A Lightweight Message Authentication Code for Wireless Sensor Network, IEEE GLOBECOM, IEEE Xplore, San Diego, USA, December 2015.

T. Chatterjee, P. Banerjee and S. DasBit, LoENA: Low-overhead Encryption based Node Authentication in WSN, ICACCI, IEEE Xplore, pp 2126-2132, 2015.

A. Roy, T. Acharya and S. DasBit, Energy-Aware Social-Based Multicast in Delay-Tolerant Networks , Workshop at IEEE VTC, pp 1-6, 2015.

Sulata Mitra

Books and Book chapters

S. Mitra and A. Mondal, "Secure Inter-Vehicle Communication - A Need for Evolution of VANET Towards IoV", Chapter of the book "IoT: Connectivity Frameworks of Smart Devices", published by Springer, March 2016.

Journals

S. Mitra and A. Roy, “Communication Void Free Routing Protocol in Wireless Sensor Network", Wireless Personal Communication, Springer , vol. 82, no. 4, pp. 2567-2581, 2015.

Conferences

A. Mondal and S. Mitra, "TDHA: A Timestamp Defined Hash Algorithm for Message Authentication in VANET", International Conference on Computational Modelling and Security (CMS), 2016.

B. Bhabani, A. Mondal and S. Mitra, "A Demand Based Unicast Data Dissemination Scheme in VANET", IEEE India Conference (INDICON), proceedings published in IEEE Xplore, 2015.

A. Mondal and S. Mitra, "Secure Data Dissemination in VANET - A Pull Based Approach", IEEE Communication, Networks and Satellite (COMNETSAT), proceedings published in IEEE Xplore, 2015.

B. Bhabani and S. Mitra, "Efficient Bandwidth Utilization during Message Dissemination among Authentic Vehicles in VANET", International Conference on Advances in Computing, Communications and Informatics (ICACCI), proceedings published in IEEE Xplore, pp. 935-941, 2015.

S. Mitra, “Cooperative Revocation of Misbehaving Vehicles from VANET”, Information Systems Design and Intelligent Applications, proceedings published by Springer Series of Advances in Intelligent Systems and Computing (AISC), 2015.

A. Mondal and S.Mitra, “Detection and Revocation of Misbehaving Vehicles from VANET”, International Conference on Communication and Computer Engineering (2014), Lecture notes in Electrical Engineering, vol.315, Chapter 72, pp. 767-778, 2015.

Surajeet Ghosh

Journals

S. Saha Ray, K. Das and S. Ghosh, A RAM-Based MAC Table with Two-Tier Security at Layer 2, IETE Journal of Research, 2015.

Conferences

S. Saha Ray, S. Ghosh and B. Sardar, SRAM Based Longest Prefix Matching Approach for Multigigabit IP Processing, IEEE ANTS 2015, 15-18 Dec. 2015.

S. Ghosh, S. Mandal and S. Saha Ray, A Scalable High-Throughput Pipeline Architecture for DNA Sequence Alignment, IEEE TENCON 2015, 1-4 Nov. 2015.

Susanta Chakroborty

Books

S. Bhattacharyya, P.Dutta and S. Chakraborty "Hybrid Soft Computing Approaches" International Publication by Springer Germany, 2015.

Book Chapters

Hrishikesh Bhaumik, Siddhartha Bhattacharyya, Mausumi Das Nath and SusantaChakraborty,"Hybrid Soft Computing Approaches to Content based Video Retrieval: A Brief Review" Journal of Applied Soft Computing, 2016.

Sarit Chakraborty, Chandan Das, Susanta Chakraborty and Partha P Dasgupta, "A Novel Two Phase Routing Technique in Digital Microfluidic Biochip" Journal of IET Computers & Digital Techniques, U.K, 2016.

Conferences

H. Bhaumik, S. Bhattacharyya and S. Chakraborty, "Redundancy Elimination in Video Summarization" in Image Feature Detectors Foundations, Innovations, and Applications, pp. 173-202, Springer Verlag, 2016.

Kamarujjaman, MausumiMaitra and SusantaChakraborty, "An Unsupervised Modified Spatial Fuzzy C-mean Method for Segmentation of Brain MR Image"*5th International Conference on Advances in Computing, Communications and Informatics*, Jaipur, India, Sep. 21-24, 2016.

Bikromadittya Mondal ,and Susanta Chakraborty "An Efficient Reversible Cryptographic Circuit Design" *20th VLSI Design and Test Symposium (VDAT-2016)*, IIT Guwahati, May, 2016

Sarit Chakraborty, Chandan Das, Susanta Chakraborty, "A Novel mixing Technique for low cost sample preparation in Digital Microfluidic Biochip" Proceeding of the 6nthInternational conference on Reliability Aware System Design and Test. (RASDAT) January, Kolkata, 2016.

Bikromadittya Mondal, Pradyut Sarkar, and Susanta Chakraborty "A Novel Design of reversible Crypographic Circuit" Proceeding of the 6nthInternational conference on Reliability Aware System Design and Test. (RASDAT) January, Kolkata, 2016.

Debajyoti Bera, Subhamoy Maitra, Sparsa Roychowdhury, Susanta Chakraborty,"Diagnosis of single faults in quantum circuits", arXiv:1512.05051 [quant-ph], 16 Dec 2015.

Hrishikesh Bhaumik, Siddhartha Bhattacharyya, Mausumi Das Nath and Susanta Chakraborty "Real-Time Storyboard Generation in Videos Using a Probability Distribution based Threshold" In Proc. of

Fifth IEEE International Conference on Communication Systems and Network Technologies (CSNT), pp. 425-431., April , 2015.

Sarit Chakraborty, Chandan Das, Susanta Chakraborty and Partha P Dasgupta "A Novel Two Phase Heuristic Routing Technique in Digital Microfluidic Biochip" Proceedings of the 19th International symposium on VLSI Design and Test (VDAT),pp., Ahmedabad, June, 2015.

Biswanath Chakraborty, Siddhartha Bhattacharyya, Susanta Chakraborty, "An Unsupervised Approach to Video Shot Boundary Detection Using Fuzzy Membership Correlation Measure", *Fifth International Conference on Communication Systems and Network Technologies*, pp. 1136-1141, 2015.

Hrishikesh Bhaumik, Siddhartha Bhattacharyya, Manideepa Chakraborty and Susanta Chakraborty, "Dissolve Detection in Videos Using an Ensemble Approach," In Proceedings of Fourth IEEE International Conference on Advances in Computing, Communications and Informatics (ICACCI 2015) pp. 1461-1467, August, 2015.

Bikromadittya Mondal Pradyut Sarkar, and Susanta Chakraborty, "A Improved synthesis of reversible Circuit" Proceedings of the 24th Asian Test symposium and 16th IEEE workshop on RTL and High level Testing, pp.57-62, November, IEEE CS Press, IIT, Bombay, 2015.

Tapan Chowdhury, Sanjit Kumar Setua, Susanta Chakraborty "A Novel Rules Optimizer with Feature Selection using Rough-Entropy-Coverage Partitioning based Reduct", 3rd International Conference on Computer, Communication, Control and Information Technology (C3IT), India, February, 2015.

Tamal Pal

Conferences

T. Pal and S.DasBit, A new CFA based image compression technique for energy-starved wireless multimedia sensor network, IEEE INDICON, Dec, 2015.
T. Pal, S. Bandyopadhyay, S.DasBit, Energy-saving image transmission over WMSN using block size reduction technique, IEEE iNIS , Dec, 2015.
Uma Bhattacharya

Journals

Abantika Chowdhury, Abhijit Sharma, Uma Bhattacharya, Overview of Location management in PCS network: A survey, ICACNI, KIIT University, Bhuvaneswar, Orissa, 23-25 June, 2015, February 2015.

Abhishek Bandyopadhyay , Debdutto Chakraborty , Uma Bhattacharya and Monish Chatterjee, On Improving Static Routing and Wavelength Assignment in WDM All-Optical Mesh Networks, ICACNI 2015.

Patents / Invention Disclosure / Technology Transfer / Copyright

Title: Thought Concentration Controlled Dexterous prosthetic arm for Handicapped.
The Patent Office Journal, Kolkata, India,.
Application No - 201631017174, Publication Number: 26/2016
Publication Date: 26 - 06 - 2016.

Name of the Inventors: Biswarup Neogi, Samit Biswas, Bipasha Chakrabarti, Abhijit Das, Sudipta Paul, Sudipta Ghosh, Debasish Kundu, Swati Barui,

Seminar / Workshops / Conferences / Training programme organized by the department (2015-16)

Organized IEEE Workshop on Distributed Systems for Coordinate Disaster Management (CORDIM) in collaboration with IIM, Calcutta, January, 2016.

Advancements under TEQIP – Phase II

A chunk of Teachers Received National/International Travel Grant to attend conferences.

Foreign visits and Invited Lectures (2015-16)

Faculty	Topic	Programme / University / Institute	Year
Abhik Mukherjee	Control Systems and Systems Biology	WBSU, Barasat	2015
Apurba Sarkar		To attend and present research paper at PReMI, 2015; Warsaw University of Technology, Warsaw, Poland. To attend and present a research paper at DGCI 2016 held at Nantes, France. To attend and present a research paper at CTIC 2016 held at Marsille, France.	2015
Saptarshi Ghosh	Post-doctoral research	Max Planck Institute for Software Systems, Saarbruecken, Germany	2014-2015
Saptarshi Ghosh	Visit for collaborative research on online social media	Max Planck Institute for Software Systems, Saarbruecken, Germany	2016
Saptarshi Ghosh	Invited talk on “Characterizing information production and consumption in online social media”	Department of CSE, IIT Kharagpur	2015
Saptarshi Ghosh	Invited talk on “Dealing with Disasters: Role of Engineering and Technology”	National Seminar on Role of Technical Education and Professional Societies to Make in India, organized by the Council of Engineering and Technology (India)	2015
Saptarshi Ghosh	Tutorial on "Utilising Online Social Media for Disaster Management"	IEEE Workshop on Distributed Systems for Coordinated Disaster Management (CORDIM), at IIM Kolkata	2016
Surajeet Ghosh		To attend and present a research paper at IEEE Tencon, Macao (SAR), China	2015

Susanta Chakraborty	Quamtum Computing & Nano-electronice	22nd West Bengal State Science & Technology Congress, North Beng. Univ.	2015
	Synthesis, fault diagnosis & redundancy in reversible circuit	4th IEEE workshop on Reliability Aware System Design and Test (RASDAT)	2015
Sipra DasBit	Post Disaster Situation Analysis using Delay Tolerant Network in the context of developing countries	To deliver tutorial in IEEE Region 10 Symposium (TENSYMP) held in Bali, Indonesia	2016
Jaya Sil	Content based Image Retrieval	Invited Talk in 3rd IEEE International Conf. On RAIT 2016, ISM Dhanbad, India	2016
Jaya Sil	Bioinformatics and gene expression data analysis	College of Engineering and Management Kolaghat, West Bengal	2016
Jaya Sil	A generalized probabilistic approach for managing inconsistency to improve classifier accuracy	The Third International Conference on Digital Information Processing, Data Mining, and Wireless Communications (DIPDMWC2016), Russia	2016
Jaya Sil	Optimizing Large Search Space using DE Based Q-learning Algorithm	International conference ARCBEST 2015, London	2015
Sulata Mitra	Secure Data Dissemination in VANET - A Pull Based Approach	International Conference, Communication, Networks and Satellite (IEEE COMNETSAT), Indonesia	2015

Visitors to the Department (Indian & Foreign) (2015-16)

1.Prof. Mansoor Alam
Professor, Chair & Graduate Director EE and CS
University of Toledo
May 9, 2015, to deliver lecture on Cloud Computing

2.Prof. Ravi Sundaram
Professor, College of Computer and Information
Northeastern University
July 2, 2015, to deliver lecturer on Multiplex networks: a generative model and algorithmic complexity

3.Dr. Probal Sengupta
Director, Alumnus Software
Kolkata
August 5, 2015, to deliver lecture on Importance of small scale embedded systems in industry

4.Mr. Somenath Mukhopadhyay
Software Designer and Developer
September 30, 2015, to deliver lecture on Android feature, Android Architecture, Android Application Building Block and Android Development Environment .

Extension Activities and Societal outreach

Computer Engineers' Society of Bengal Engineering College plays the host to most of the activities that are conducted round the year by the CST department, be it academic, cultural, sports or college festivals.

Reading Group in the Department

A Reading Group has been started in our Department, under COENSOBEC from December 2015. As of now, it has been decided that the group will meet every Wednesday at 3.30 pm in the 3rd floor Seminar Room of our department. Dr. Saptarshi Ghosh has agreed to be the faculty-in-charge for the Reading Group..

Now, Students are delivering talks in regular basis. Prof. J. Sil has delivered a talk on topics related to Rough Set Theory / Fuzzy Logic on 27th January, 2016 as the first faculty member to speak in the reading group.

New Academic / Research Initiatives

Academic Collaboration

Dr. Saptarshi Ghosh has joined the Forum for Information Retrieval Evaluation, which organizes the FIRE conference annually. The next conference will be at ISI Kolkata, in December 2016. In collaboration with researchers from ISI Kolkata, Dr. Saptarshi Ghosh is organizing the track "Information Extraction from Microblogs Posted during Disasters" at the FIRE 2016 conference (link to the conference website: http://fire.irsi.res.in/fire/2016/home)

Department of Electrical Engineering

Name of the Department

The Department of Electrical Engineering is one of the oldest in this 'ancient-new' University. Started in 1912, undergraduate degree course was introduced in this department from 1935-36 and postgraduate course from 1955. The first Ph.D. was produced by this department in 1959. The number of Ph.D.s awarded from this department has now been grown to 29 out of which 24 had been in last 10 years. From 1989, the Ministry of Human Resource Development declared this department as one of the QIP Centres for Post Graduate Studies and Research.

The faculty and other staff members of the department are committed to imparting excellent education at par with national / international seats of learning. An extraordinary pool of talents exists in fields as diverse as Electrical Machines, Power Systems, Control Systems, Power Electronics and Instrumentation. Research activities in the department are on a climbing ramp. The department has been included in the 'National Mission on Power Electronics Technology' (NaMPET), a project launched by DIT, MCIT, Govt. of India. In this programme, it shares the limelight with three IITs, IISc. and Anna University. Under NaMPET the department has received a grant of approximately Rs. 2 crores to spearhead research on Power Electronics. The department was chosen to carry out research under the SAP-DRS scheme of UGC in the area of smart control and instrumentation systems at a total project cost of almost Rs. 52 lakhs. The department has also executed the DST-FIST project under which a grant of Rs. 1.5 crores had been received. It has also received its share of about Rs. 1.2 crores under the TEQIP scheme. Other research activities include condition monitoring of electrical equipment, application of soft computing tools to electrical machine and power system related problems, design of robust controllers for defense applications, biomedical instrumentation, analytical instrumentation, power quality studies, embedded technology etc.

Academic Programmes:

Undergraduate Level

Degree offered **62**

Sanctioned students' intake **60**

Additional intake through lateral entry in 3rd Semester **6**

Post Graduate Level

Degree offered **21**

Sanctioned students' intake **24**

Additional intake through other program (i.e. QIP) **1**

Specializations in i) Power System

ii) Control System

iii) Power Electronics

iv) Electrical M/Cs and Drives

Doctoral & Post Doctoral Research Programme

Degree offered: PhD (Engineering / Science / Humanities & Management Science) :

No of Candidates enrolled : **10**

No. of Candidates registered : **2**

No. of Candidates awarded : 4

Faculty Position:

Sanctioned faculty post …**28**……. Vacant Post ……**24…**……

Faculty profile

Sr. No.	Name	Desig-nation	Highest Qualific ation	Specialisation / Research Area	Contact no.	E-mail id
1.	S. Mallik	**Adjunct Professor**	M.E.E.	Electrical Machines	94331 68523	srikumar_mallik@hotmail.com
2.	B. Basak	Professor	Ph.D.	Electrical Machines, Power Electronics & Drives	94331 39874	biswarup_basak@yahoo.com bbasak@ee.iiests.ac.in
3.	A. Chakrabarti	Professor	Ph. D.	Power Systems, Networks	98302 02924	a_chakraborti55@yahoo.com
4.	D. Sarkar	Professor	Ph. D.	Electrical Machines, electromagnetic Fields	94332 41826	debasissrkr@yahoo.co.in
5.	G. Bandyopadhyay	Professor	Ph. D.	PowerSystems, Computer Applications	8902795379	gautamkabi@hotmail.com
6.	J. Pal	Professor & HOD	Ph. D.	PowerSystems, Computer Applications & Expert Systems	94331 83992	jagadish_pal@hotmail.com
7.	A. Sutradhar	Professor	Ph. D.	Instrumentation, Digital systems	94771 23351	asee1@rediffmail.com
8.	P. Syam	Professor	Ph. D.	Power Electronics and **Drives**	98368 93676	prasidsyam@yahoo.co.uk, ps@ee.iiests.ac.in prasidsyam@gmail.com
9.	A.K. Maitra	Professor **(on re-employed)**	Ph. D.	Power Systems, Power System Protection	94770 02145	ashokmaitra@gmail.com
10.	C.K. Chanda	Professor	Ph. D.	Power System, Electrical Machines	94332 69567	ckc_math@yahoo.com
11.	A. Rouf	Professor	M.Tech.	Electrical Machines,	94330 98388	rauf_a@hotmail.com

				Non-Conventional Energy		
12.	M. Sengupta	Professor	Ph. D.	Electromagnetic Electrical Machines and Drives	033 26685869	mainak.sengupta@gmail.com
13.	D. Roy	Professor	Ph. D.	Electrical Machines & Drives	98364 84873	dbr_roy@yahoo.co.in
14.	Aparajita Sengupta	Professor	Ph. D.	Control Systems	98747 47610	sgaparajita@gmail.com
15.	K.Das(Bhattacharya)	Professor	Ph. D.	Microprocessor & PowerSystem Protection	93393 00765	poopoolee50@hotmail.com
16.	D. Ganguly	Asso. Professor	M.E.E.	Power Electronics & Drives, Microprocessor Applications	98303 06490	ganguly.debjani@gmail.com djg@ee.iiests.ac.in
17.	A. Barman	Asso. Professor	M.E.E.	Measurement, Illumination, Computer Programming and Simulation/ Open Source Software	94324 93108	amalburman@yahoo.com, ab@ee.iiests.ac.in
18.	A.B. Choudhury	Asso. Professor	Ph. D.	Power Systems	94331 69967	ab_choudhury@yahoo.com
19.	Anindita Sengupta	Asso. Professor	Ph. D.	Instrumentation,Control Systems	94320 83954	aninsen2002@yahoo.com
20.	A. De	Asstt. Professor	Ph. D.	High Voltage Engineering., Power Systems	94332 69572	abhinandan.de@gmail.com ade@ee.iiests.ac.in
21.	K. Mukherjee	Asstt. Professor	Ph. D.	Power Electronics / Electrical Machine Drives, Distributed Generation, Power Quality	98746 93920	kaushikk_mukh@rediffmail.com,
24.	P. Chattopadhyay	Asstt. Professor	Ph. D.	Power System, Condition Monitoring	92316 64811	pc@ee.iiests.ac.in paramita_chattopadhyay@yahoo.com
25.	S. Parui	Asstt. Professor	Ph. D.	Electrical Machines & Drives, Power Systems	94332 51764	sp_74107@yahoo.com sparui@ee.iiests.ac.in
26.	Bhaskaran Barman	Asstt. Professor	M.E.	Power Electronics &Machine Drives	94345 28673	barman_bec@rediffmail.com
27.	S. Dalapati	Asstt. Professor	Ph. D.	Power Electronics and Drives; DSP/Microcontroller based Applications	80175 16567	suvarundalapati@yahoo.co.in

Research area:

Sr. No.	Name	Desig nation	Specialisation	Broad Research Area
1.	S. Mallik	**Adjunct Professor**	Electrical Machines	
2.	B. Basak	Professor	Electrical Machines, Power Electronics & Drives	Drives, Energy
3.	A. Chakrabarti	Professor	Power Systems, Networks	
4.	D. Sarkar	Professor	Electrical Machines, electromagnetic Fields	
5.	G. Bandyopadhyay	Professor	PowerSystems, Computer Applications	(i)Use of Power Electronic Converters to Power System, (ii)Power Quality and (iii) Use of Distributed computing in P.S. problems
6.	J. Pal	Professor & HOD	PowerSystems, Computer Applications & Expert Systems	
7.	A. Sutradhar	Professor	Instrumentation, Digital systems	
8.	P. Syam	Professor	Power Electronics and Drives	Converter Topology, AC to AC power converter, Power Quality, Vector Control Drive
9.	A.K. Maitra (reemployed)	Professor	Power Systems, Power System Protection	
10.	C.K. Chanda	Professor	Power System, Electrical Machines	
11.	A. Rouf	Professor	Electrical Machines, Non-Conventional Energy	
12.	M. Sengupta	Professor	Electromagnetic Electrical Machines and Drives	
13.	D. Roy	Professor	Electrical Machines & Drives	
14.	Aparajita Sengupta	Professor	Control Systems	Stabilisation and Control of Uncertain Nonlinear and Time Delay Systems using Linear Matrix Inequalities AND application to physical systems.

15.	K.Das (Bhattacharya)	Professor	Microprocessor & PowerSystem Protection, Illumination Engineering, DigitalSignal Processing and Embedded Systems	Power System Optimisation, Protection; Smart Grid Controls for Increased Efficiency of Distribution Networks Solar PV Energy Measurement and Instrumentation; Integration of Solar PV Distributed Generation into Conventional Electric and Smart Networks,
16.	D. Ganguly	Asso. Professor	Power Electronics & Drives, icroprocessor Applications	Use of PLDs in efficient control of electric drives Power Quality estimation and improvement using digital platforms
17.	A. Barman	Asso. Professor	Measurement, Illumination, Computer Programming and Simulation/ Open Source Software	
18.	A.B. Choudhury	Asso. Professor	Power Systems	
19.	Anindita Sengupta	Asso. Professor	Instrumentation, Control Systems	1.signal Processing 2.Real time control 3. Textile Instrumentation.
20.	A. De	Asstt. Professor	High Voltage Engg., Power Systems	1.Power System Operation, Monitoring & Control 2.Power System Optimization 3.Applications of AI
21.	K. Mukherjee	Asstt. Professor	Power Electronics / Electrical Machine Drives, Distributed Generation, Power Quality	
24.	P. Chattopadhyay	Asstt. Professor	Power System, Condition Monitoring	i)Machine learning based smart monitoring ii)Nano-material applications in Power Sector iii)Thermal Image Processing
25.	S. Parui	Asstt. Professor	Electrical Machines & Drives, Power Systems	Nonlinear Phenomena in Power Electronic Circuits
26.	Bhaskaran Barman	Asstt. Professor	Power Electronics & Machine Drives	
27.	S. Dalapati	Asstt. Professor	Power Electronics and Drives; DSP/Microcontroller based Applications	(a)Power Electronics (b)Machine Drives (c)Microcontroller-based applications (d)Linear control systems applications

Research facilities:

Sl. No.	Name/ particulars of the Equipment	Picture	Year of Purchase	Cost/ Funding	Remarks
	Impedance Analyzer 120 MHz		2016	22 Lakhs/ CPRI Project	Research
	Automatic Tan-delta Resistivity Measuring test set		2016	8.6 Lakhs/ CPRI Project	Research
	Automatic Break down Strength Measuring Test set		2016	6.8 Lakhs/ CPRI Project	Research
	Hardware-in-loop R&D controller (dSPACE)		2015	6.53 lakhs TEQIP	Research

Name of the laboratories:

Sl. No.	Name of the Laboratory	Area	Used by no of Students		UG/PG/Research
			Odd Sem	Even Sem	
1.	Basic Electrical Engg. Laboratory	Basic Electrical Engg.	90	90	
2.	Protective Relaying	Power System Protection		60 +	UG and Research
3.	Energy Lab	Power	Forthcoming (dual degree elective lab)		Forthcoming lab in dual degree program. UG, PG project students are working now
4.	Drives Laboratory	Drives	nil	60	UG
5.	Control Systems Lab	Control Systems	Expected 80+	Expected 80+	
6.	Smart Control Laboratory	Control Systems – Simulation and applications	Research Scholars – 2; PG – 1 UG -3		For research purpose and UG/PG project work
7.	Instrumentation Laboratory	Instrumentation	80		UG and Research.

Consultancy Work:

Sl. No.	Name of Faculty	Year of sanction	Sanctioning Authority	Sanctioned Amount (Rs. Lakh)	Institute overhead (Rs. Lakh)	Dept. Infrastructure from Institute O/H (Rs. Lakh)	As capacity
1.	A.K.Maitra & J.PAL	2015-16	Haldia Development Authority	68.13437	0.18	NIL	P.I.
2.	A.K.Maitra & J.PAL	2015-16	Haldia Development Authority	76.30367	0.18313	NIL	P.I.
3.	A.K.Maitra & J.PAL	2015-16	Haldia Development Authority	177.5843	0.4262	NIL	P.I.
4.	A.K.Maitra & J.PAL	2015-16	Haldia Development Authority	83.96429	0.20151	NIL	P.I.

Support staff position:

Name	Designation	Highest Qualification	Contact No.	e-mail id
B. Dey	Superintendent Assistant	L.E.E.	98747 18826	bddey@rediffmail.com
Biplab Mukherjee	Jr. Superintendent	MBA	7059388840	biplab.becs@gmail.com
R. Maity	Technical Assistant (Grade I)	B.Sc., D.E.E	94331 04331	ra_ktim@hotmail.com
R. Bandyopadhyay	Technical Assistant (Grade II)	D.E.E, B.E.E	94324 04489	rajib_nh@sify.com
P. K. Das	Technical Assistant (Grade II)	D.E.E	94 338 43324	pradipkdaselec@ rediffmail.com
A. Pal	Technical Assistant (Grade II)	D.E.E, B.E.E	94331 55457	amit_raju_pal@sify.com
P. S. Baruri	Technical Assistant (Grade II)	D.E.E	91439 17487	mr.dekacom@rediffmail.com
B. Santra	Sr. Mechanic Gr.- II	JDE & NCVT (Govt. of India)	98748 04896	Bablu_Santra@yahoo.com
Sukumar Paul	Record Supplier		9748140957	

Lakshman Hansda	Senior Peon	Madhyamik	9836255012	
Sandip Paramanick	Junior Peon	Higher Secondary	9433273348	sandippramanick@yahoo.com
Subhasis Das	Office Assistant	M.Sc.(Geography)	9674249503	subhasisdas2016@gmail.com
Tuhin Dey	Technical Assistant	D.E.E	9563852568	tuhindey78@gmail.com
Pritthis Banarjee	Technical Assistant	D.E.E	8697336594	pritthisb@gmail.com
Santu Das	Group-D	Passed VIII	9874634733	NIL

Ongoing Sponsored Research / projects: (mention area)

Sl. No.	Title & Broad area	Project Investigator	Year of Sanction	Sponsoring Agency	Total Amount (Lakhs of Rupees)
1	*Development of Nano-structured Transformer Oil nono-fluids for Improvement of Thermal and Insulating Properties*	Dr. P. Chattopadhyay	December 2014	CPRI, Bangalore, Ministry of Power, Govt. of India	79 lakhs
2	National Mission on Power Electronics Technology (NaMPET) : Phase II	Prof. M. Sengupta	2012	Dept. of IT, Govt. of India	93 lakhs
3	Embedded Systems in Instrumentation and Control. Control and Instrumentation	Co ordinator Prof. A. Sutradhar Deputy Co-ordinator: Prof. A. Sengupta	2011	UGC-SAP DRS-I	51.25

Industry – Institute Interaction

Refresher Course for CESC Junior Engineers held twice a year from 2014.

Details of publications of each faculty member

Journal:

1.S. Sen, S. Chanda, S. Sengupta, A. De, "Demand response governed swarm intelligent grid scheduling framework for social welfare", International Journal of Electrical Power and Energy Systems (Elsevier), (ISSN 0142-0615), Volume 78, June 2016, Pages 783–792, Impact Factor: 3.432

2.D. Sarkar, A. De, C. K. Chanda and S. Goswami, "Kruskal's Maximal Spanning Tree Algorithm for Optimizing Distribution Network Topology to Improve Voltage Stability", Electric Power Components & Systems Journal, Taylor & Francis Publication (ISSN 1532-5008), Vol.43, Issue 17, Aug 2015, pp. 1921-1930, Impact Factor: 0.66

3.S. Chanda and A. De, "Optimal stabilization of social welfare under small variation of operating condition with bifurcation analysis", Journal of The Institute of Engineers, India (series B), Springer Publication, July 2015, pp.1-12

4.Chaity Sarkar and Aparajita Sengupta, "LMI based LSVF Control of a Class of Nonlinear Systems with Parametric Uncertainty: An Application to an Inverted Pendulum System". International Journal of Control, Impact Factor 1.654, (accepted for publication).

5.Anindita Sengupta, S Sengupta, S Debnath "Fabric bending behaviour testing instrument for technical textiles" Measurement, ELSEVIER, ISSN 0263-2241, 2016, vol 87, pp.205-215.Impact Factor 1.742.

6.Anindita Sengupta, S Roy, S Sengupta "Development of a low cost yarn parameterisation unit by image processing" Measurement, ELSEVIER, ISSN 0263-2241, 2015, vol 59, pp.96-109.Impact Factor 1.742.

7.Anindita Sengupta, U Mondal, A Roy "Repetitive controller: an advanced servomechanism for periodic reference input" Journal of Dynamics and Control , Springer. 2015,1-10

Conference:

1. M. M. Bhunia, S. Das, S. Das, K. K. Chattopadhyay, P. Chattopadhyay, +" 16th IEEE International Conference on Environment and Electrical Engineering (IEEE EEEIC16), Florence, June 7-10, 2016. (Accepted)
2. P. S. Panigrahy, S. Mitra, P. Konar and P. Chattopadhyay, "FPGA friendly fault detection technique for drive fed induction motor," 2016 2nd International Conference on Control, Instrumentation, Energy & Communication (CIEC), Kolkata, 2016, pp. 299-303.
3. T. Dutta, J. Sil and P. Chottopadhyay, "Condition monitoring of electrical equipment using thermal image processing," 2016 IEEE First International Conference on Control, Measurement and Instrumentation (CMI), Kolkata, 2016, pp. 311-315..
4. P. S. Panigrahy, P. Konar and P. Chattopadhyay, "Application of data mining in fault diagnosis of induction motor," 2016 IEEE First International Conference on Control, Measurement and Instrumentation (CMI), Kolkata, 2016, pp. 274-278.
5. P. Konar, P. S. Panigrahy, P. Chattopadhyay, "Tri-Axial Vibration Analysis using Data Mining for Multi class Fault Diagnosis in Induction Motor" Mining Intelligence and Knowledge Exploration (MIKE 2015), December 9-11, 2015, pp 553 - 562.
6. S. Mondal and P. Chattapadhyay, "Fuzzy Vs. neuro-fuzzy: Implementation on the reconfigurable FPGA system," 2015 International Conference on Energy, Power and Environment: Towards Sustainable Growth (ICEPE), Shillong, 2015, pp. 1-5.
7. S. Chanda and A. De, "An Intelligent Energy Management System to Optimise Demand Response in Smart Micro Grids", Proceedings of the 2nd International Conference on Control, Instrumentation, energy and Communication, 2016 (CIEC16), IEEE conference, University College of Science and Technology, Jan. 28-30, 2016, Kolkata, India
8. S.Parui and B. Basak, Nonlinear Phenomena in Permanent Magnet Brushless DC Motor Drive, Michael Faraday IET International Summit-2015, 12-13 September, 2015, published in CD.

9.D. Ganguly, S. Sen and P. Syam, 'Real time Prony Analysis for detection of Harmonics and Interharmonics in a Power Electronic Converter', Michael Faraday IET International Summit-2015, 12-13 September, 2015, Kolkata

10.A Maity,K. Mukherjee,P. Syam," Design Methodology, Control and Performance of a Three-Phase Grid-Tie PV Inverter under Maximum Power Point Tracking", CD Proceedings of 2nd IEEE International Conference on Control, Instrumentation, Energy and Communications(CIEC), India, 2016

11.A. Basak, K. Mukherjee,P. Syam," Effect of Matrix Converter on the Speed Control Scheme of a Grid Connected Doubly-Fed Induction Generator System", CD Proceedings of 2nd IEEE International Conference on Control, Instrumentation, Energy and Communications(CIEC), India, 2016

12.T. Dey, K. Mukherjee,P. Syam," Dynamic Adjustments of the D-Q axes Reference Voltage Limits during FluxWeakening and MTPA Control of an IPMSM Drive for an EV Application", CD Proceedings of 2nd IEEE International Conference on Control, Instrumentation, Energy and Communications(CIEC), India, 2016

13.A Maity,K. Mukherjee,P. Syam," Design, Modelling and Software Implementation of a Current-Perturbed Maximum Power Point Tracking Control in a DC-DC Boost Converter for Grid-Connected Solar Photovoltaic Applications", CD Proceedings of IEEE First International Conference on Control, Measurement and Instrumentation (CMI), India, 2016

14.A Basak, ,K. Mukherjee,P. Syam," Speed Control of a Grid Connected Doubly-Fed Induction Generator System for Maximum Power Point Tracking with Improved Power Factor Employing Matrix Converter as a Slip Power Exchanger", CD Proceedings of IEEE First International Conference on Control, Measurement and Instrumentation (CMI), India, 2016.

15.Sarkar Chaity and A. Sengupta, " LMI Based Robust LSVF Stabilization of A Class of Nonlinear Systems", Proceedings of the 34th Chinese Control Conference, July 28-30, 2015, Hangjhou, China.

16.Sarkar Chaity and A. Sengupta, "Stabilization and Tracking of Uncertain Nonlinear Systems with Unobservable Dynamics and Time Delay", Proceedings of Michael Faraday IET International Summit, Sepember 12-13, 2015, Kolkata, India, Vol. 2, pp- 52-58.

17.De Souradip and A. Sengupta, "Stabilization of Time Delay Systems with Lipschitz Nonlinearities 2015, Kolkata, India, Vol. 2, pp- 500-504.

18.Arunima Mukherjee and Aparajita Sengupta, "Robust Stabilisation and Output Tracking of Lipschitz nonlinear systems, Proceedings of the 12th IEEE International Conference, INDICON-2015, (978-1-4673-6540-6/15/$31.00 c 2015 IEEE), paper ID-1570170835.

19.Arunima Mukherjee and Aparajita Sengupta, "Input Tracking of Lipschitz nonlinear systems using Input-State-Stability approach", Proceedings of the 2nd international conference on control, instrumentation, energy and communication, CIEC-16, Paper ID-57.

20.Rimi Paul, Anindita Sengupta, "Performance study of multi resolution PI controller for third order system", 8-10 Jan, 2016, Proceedings of IEEE First International Conference on Control, Measurement and Instrumentation (CMI-16) DOI:101109/CMI.2016.7413742, pp. 215-218.

21.Rimi Paul, Anindita Sengupta, "Selection of best wavelet for discrete wavelet transform based PID controller connected with liquid level system and its performances analysis," 28-30 May

2015, Proceedings of IEEE International Conference on Industrial Instrumentation and Control (ICIC), 2015, DOI: 101109/IIC.2015.7150591,pp. 55 – 59.

22.Shouvik Chakraborty, Sachidananda Sen, Ashoke Sutradhar, Anindita Sengupta, " Estimation of tire-road friction coefficient and frictional force for Active Vehicle safety system" Proceedings of IEEE International Conference on Industrial Instrumentation and Control (ICIC), 2015, DOI:10.1109/IIC.2015.7150827 pp. 674 – 679.

23.U Mondal, Anindita Sengupta, A Basu, S Bose, U Saha, " Finite dimensional robust repetitive controller for tracking periodic reference input", 5-7 Mar, 2015 Proceedings of IEEE International Conference on Electrical, Computer and Communication Technologies (ICECCT).

24.A Dhar, Anindita Sengupta, "Sliding Mode Control Algorithm with Adaptive Gain and Implementation on Inverted Pendulum System" 12-13 Sept, 2015 Proceedings of IET International Summit: MFIIS-2015 pp. 8-13.

25.A Dhar, Anindita Sengupta, " Sliding Mode Control Algorithm and its Implementation with Coupled Tank System", 12 Jun - 13 Jun, 2015, Proceedings of IEEE International Conference on Energy, Power and Environment(ICEPE 2015).

26.Arnab Sen, Anindita Sengupta, " Parameter Selection Strategy for Robust Sliding Mode Controller and its implementation in real time system" Proceedings of 1st IEEE International Conference on Power Electronics, Intelligent control and Energy systems, ICPEICES, pp.3404-3409.

Books / Monograms:

1. GATE book on Electrical Engineering; Dr. C.K.Chanda, Dr. Sumit banerjee & Dr. A. Chakrabarti in PHI.(2016)

Seminar / Workshops / Conferences / Training programme organized by the department (2015 - 16)

Sl. No	Name of Seminar / Workshop / Conference	Name of the Coordinator / Organizer	Date and duration	Sponsored by
1.	Training Course for Junior Engineers of Calcutta Electric Supply Corporation (CESC) Ltd	Dr. A. De and Dr. D. Sarkar	17.12.2015 – 23.12.2015 (6 days)	CESC
2.	Training Course for Junior Engineers of Calcutta Electric Supply Corporation (CESC) Ltd	Prof. A.Rouf and Prof. A Barman	19.02.2016 – 25.02.2016 (6 days)	CESC
3.	A Workshop on "Open Source Software (LINUX) Deployment and Virtual Machines"	A. Barman and A. Rouf	29-31 July 2016	TEQIP-II

Advancements under TEQIP – Phase II (2015 – 2016)

DS1104 R&D Controller Board (dSPACE) for Real Time Interfacing, 6.53 lakhs.

Foreign visits and Invited Lectures (2015 - 2016)

Sl No.	Name of the faculty	Institute visited	Duration and date of the visit	Purpose of visit with details / Details of the lecture delivered
1.	Dr. A. De	Environment & Sustainability Institute, University of Exeter, Penryn, Cornwall, UK	June 2-13, 2016	Collaborative research study visit which included an invited talk on "Applications of ANN in Power Systems"
2.	Dr. C.K. Chanda	Environment & Sustainability Institute, University of Exeter, Penryn, Cornwall, UK	June 2-13, 2016	Collaborative research study visit which included an invited talk on "Applications of ANN in Power Systems"

Visitors to your Department (Indian/Foreign) (2015 - 2016)

Sl. No.	Name of Visitor	Designation	Institute	Foreign/Indian	Purpose of visit
1.	Dr. S.N. Singh	Professor	IIT, Kanpur	Indian	Talk on "Smart Grid" Co-ordinated by Dr. C.K. Chanda

Training and Placement

Sl. No.	Where training/Placement Undertaken	Salary/Fellowship	On campus/ Off campus	Went for Higher study
1	CTS,Wipro	-	On campus	9 nos
2	Infosys,MNDastur	-	On campus	
3	TataSteel,Cognigent etc.	--	On campus	
4	CESC	-	On campus	
5	Coal India,Deloite	-	On campus	
6	PriceWater House and Cooper	-	On campus	

New Academic/Research Initiative

a) Academic collaboration

b) Industrial Collaboration

Sl. No.	Whether Academic/ Research/ Industrial	Name of Institute	Nodal Person if any	Foreign/ Indian	Purpose of collaboration	Faculty involved
1.	Research /Industrial (MoU signed)	ICAR-NIRJAFT and M/s Tech(Style) India	Prof. Kalyan Bhar, Dean(R&D),IIEST, Shibpur	Indian	Commercialisation, manufacturing and sale of i)A Yarn Characterisation Unit and ii)Computerised fabric bending behaviour tester	Dr. Anindita Sengupta
2.	Research /Industrial (MoU signed)	ICAR-NIRJAFT and M/s Joy Ma Tara Enterprise	Prof. Kalyan Bhar, Dean(R&D),IIEST, Shibpur	Indian	Commercialisation, manufacturing and sale of Computerised fabric bending behaviour tester	Dr. Anindita Sengupta

Department of Electronics & Telecommunication Engineering

About the department

The Department of Electronics and Telecommunication Engineering started its journey in July, 1965 after its nucleation from the Department of Physics & Telecommunication from the erstwhile Bengal Engineering College. The first batch of Graduates and Post Graduates passed out in 1971 and 1974, respectively. The Department offers Bachelor of Engineering (B.E.) course in Electronics & Telecommunication Engineering for duration of 4 years (8 Semesters). 5-year Dual degree (Integrated B.Tech. and M.Tech.) program has started to be offered since 2014 onwards. Master of Technology (M.Tech.) programs of 4 semester duration (2 years) are offered for three specializations, viz. Digital Systems & Instrumentation, Microwave Communication, and Communication & Signal Processing. The department also runs Ph.D. program in Electronics and Telecommunication Engineering in various fields.

Considerable effort has been put forward during the last couple of years towards setting up new undergraduate and postgraduate laboratories and augmenting the facilities in the existing laboratories. The department does a commendable performance in the research and development works. A high number of research projects worth a few crores are being carried out during the current year with the assistance of various funding agencies leading to high volume quality publications in international / national journals and conferences.

Academic Programmes:

Undergraduate Level

Degree offered Bachelor of Engineering (B.E.)

Sanctioned students' intake40

Integrated Undergraduate and Postgraduate Level

Degree offeredDual degree B.Tech. & M.Tech.

Sanctioned students' intake62

Post Graduate Level

Degree offered Master of Technology (M.Tech.)

Sanctioned students' intake8 + 8 + 18 = 34

Additional intake through other programmes (i.e. QIP)

Specializations ina) Digital Systems and Instrumentation

b) Microwave Communication

c) Communication and Signal Processing

Doctoral & Post Doctoral Research Programme

Degree offered: Ph.D. (Engineering)

No of Candidates enrolled 14

No. of Candidates registered08

No. of Candidates awarded05

Faculty position :

Sanctioned faculty post : 18 Vacant Post : 6

Faculty profile

Name	Designation	Highest Quali-fication	Specialization / Research Area	Contact No. & E-mail
Dr. Sekhar Ranjan Bhadra Chaudhuri	Professor	Ph. D.	Design & Dev. of Small Antenna, Network & Information Security, Digital System Design	9831043113 prof.srbc@gmail.com prof_srbc@yahoo.com
Dr..Baidynath Ray	Professor	Ph.D.	Signal Processing, Image Processing and VLSI design and testing	9433311639 bnr@telecom.becs.ac.in
Dr. Arabinda Roy	Associate Professor	Ph.D.	Microprocessor based system, Signal Processing, Power Electronics	9434313049 arabinda@telecom.becs.ac.in oruroy@yahoo.co.in
Dr. Monojit Mitra	Professor	Ph.D.	Fabrication of Microwave Device Like IMPATT, its Characterization and System development	9830010945 monojit_m1@yahoo.co.in
Dr. Santanu Das	Professor	Ph.D.	Planar circuits, & antennas, metamaterial, RFID	9433131451 santanumdas@yahoo.com santanumdas@gmail.com
Dr. Susanta Kumar Parui	Associate Professor	Ph.D.	Microstrip and CPW based Printed Circuits and antennas, Frequency selective surfaces (FSS), Electro-magnetic bandgap structures (EBG), Defected ground structures (DGS)	9433769850 arkapv@yahoo.com
Dr. Ayan Banerjee	Associate Professor	Ph.D.	VLSI Architectures Design for Communication & Biomedical Engineering, DSP architecture design using CORDIC	9477373489 ayanb12@gmail.com
Dr. Chirasree Roychoudhury	Assistant Professor	Ph.D.	Electrical biosensors with electronic interface, electrical studies of biological cells	9830847300 chirasreepram@yahoo.com
Dr. Tamaghna Acharya	Assistant Professor	Ph.D.	Wireless Communication and Networks, Dynamic spectrum access and software defined radio networks, Green communications	9434230490 tamaghna_acharya@yahoo.com

Name	Designation	Highest Quali-fication	Specialization / Research Area	Contact No. & E-mail
Dr. Partha Bhattacharyya	Assistant Professor	Ph.D.	Nanomaterial based Chemical Sensors, MEMS based Sensors and Its Signal Processing, Low Power VLSI Design	9836131103 pb_etc-besu@yahoo.com
Dr. Debasis Mitra	Assistant Professor	Ph.D.	Applied Electromagnetics and Antenna Engineering	9007418685 debasisiit@gmail.com , debasis.mitra@telecom.becs.ac.in
Prof. Ankita Pramanik	Assistant Professor	M.E.	Error Control Coding, Image Processing, GPS, MIMO, STBC	8902392864 pramanikankita@gmail.com
Dr. Mihir Kumar Mahata	Assistant Professor	Ph.D.	III-V heterostructure semiconductor devices.	9830972552 mihir.mahata@gmail.com
Prof. Suranjana Banerjee	Assistant Professor	M.Tech.	High frequency devices, optical communication	8697563932 banerjeesuranjana08@gmail.com

Awards and Laurels received by the faculty members :

1)Dr. Partha Bhattacharyya

- **Visvesvaraya Young Faculty Research Fellowship-2016** by Ministry of Communication and Information Technology (DeitY), Govt. of India.
- **Post Doctoral research and Initiation of International Collaboration** under INDO-GERMAN bilateral exchange program-**2015** supported by INSA-DFG (Indian National Science Academy-Deutsche Forschungsgemeinschaft) in the Institute of Micro and Nanomaterials (InstitutfürMikro- und Nanomaterialien), Ulm University, Germany (June-August, 2015) (Host: Prof. Hans Jörg Fecht, Chaired Professor and Director, Institute of Micro and Nanomaterials).
- Supervisor of thethesis awarded as **"Innovative Doctoral Thesis Award-2015"** by **Indian National Academy of Engineering (INAE):** Name of the scholar: Dr. ArnabHazra, Title of the thesis: "*Development of p and n Type TiO_2 Nanostructure Based Devices for Alcohol Sensing*".
- **Best poster paper Award** for the paper "ZnO nanoflowers and Ni/Pd nanoparticles hybrid junctions as a highly selective methanol sensor" authored byDebanjanAcharyya, **Partha Bhattacharyya**, **Young Scientist Colloquium-2015**, Organized by Materials Research Society of India (Kolkata chapter), 11th September, 2015, CSIR- Central Glass and Ceramic Research Institute , Kolkata, India.

2)Dr. Chirasree Roychoudhury

- Young Scientist Award**, Institute of Smart Materials Structures and Systems, 2015.**

3)Dr. Debasis Mitra

- **Visvesvaraya Young Faculty Research Fellowship-2016** by Ministry of Communication and Information Technology (DeitY), Govt. of India.

Research Areas:

1.Microwaves and Antennas

- Planar circuits and antennas
- Microwave avalanche devices
- IMPATT amplifiers and oscillators
- Meta-materials and its applications
- Phased array antennas
- Electromagnetic band-gap materials
- Surface integrated waveguides (SIW)
- RFID and its applications

2.Microelectronics, Devices and VLSI

- Biosensors
- MEMS based pressure and conductivity sensors
- Nanostructured semiconducting metal oxides for sensor applications
- Chemical sensors
- MEMS based gas sensors and its CMOS integration
- VLSI design and testing
- VLSI based signal processing
- VLSI Architectures for Communication and Biomedical Engineering

3.Communication and Signal Processing

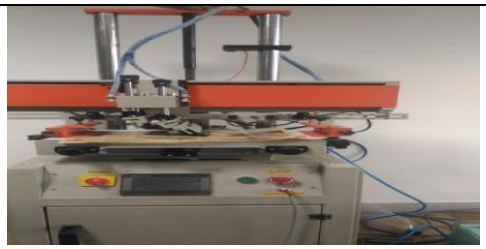
- Wireless Ad-hoc and sensor networks
- Cognitive Radio networks
- Hardware efficient FIR filter design
- Space-time coding for wireless communication
- DSP algorithms
- Design of CDMA spreading codes
- Medical imaging
- Sensor signal processing
- CORDIC based DSP architectures

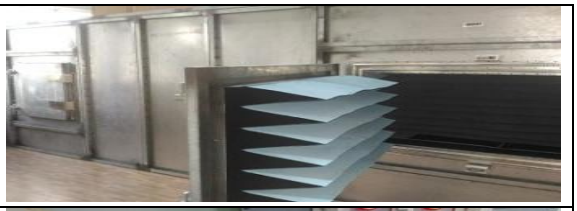
Research Facilities:

Areas	Equipments / Set up	Design Softwares / Tools
Microwaves and Antennas	•**Vector Network Analyser (10 MHz – 20 GHz)** •**Vector Network Analyser (10 MHz – 6 GHz)** •**Signal Generator (10 KHz – 20 GHz)** •**Power Meter (DC – 26 GHz)** •**PCB fabrication set up by photolithograpy** •**Prototype fabrication by milling process** •**Radiation characteristics measurement by shielded chamber** •**Screen printing system** •**Satellite trainer kit** •**Radar trainer kit**	•**IE3D** •**HFSS** •**CST studio** •**FDTD** •**Empire**
Microelectronics, Devices and VLSI	•**E-Beam Evaporation System** •**Mass Flow controller & Mass flow Meter** •**Spin Coating Unit** •**Dip Coating Unit** •**Laminar Flow Clean Bench** •**Millipore water purification system** •**Gas line manifold** •**Temperature Controlled annealing Furnace (1050°C)** •**Portable Ph meter, range 1-14 ph** •**Temperature Controlled Oven (upto 300°C)** •**Gas sensor measurement set up** •**Impedance analyzer** •**PICO-Ammeter** •**CO_2 Incubator** •**Electric cell substrate impedance sensor** •**High speed refrigerated centrifuge** •**pH meter** •**Temperature controlled annealing furnace** •**UV – VIS spectrometer**	•**T-spice** •**Comsol** •**Coventorware** •**Intellisuite** •**Supreme**
Communication and Signal Processing	•**Spectrum analyzer (9 kHz – 3.0 GHz)** •**Vector signal generator (10 KHz – 3 GHz)** •**Arbitrary function generator** •**DSO (500 MHz)**	•**MATLab**

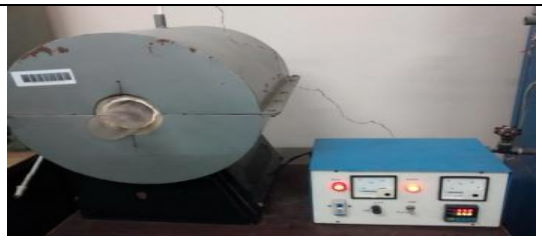
Photographs of Equipments

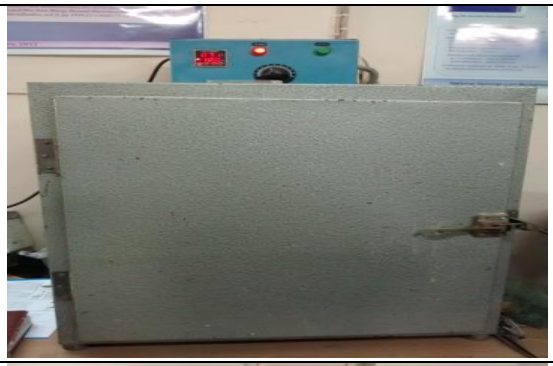
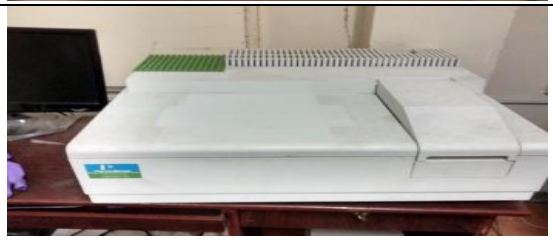
Signal Generator (20GHz)	
Network analyzer	
VNA Master	
Power meter	
Quick circuit prototyping	

Screen printing system	
Satellite trainer kit	
Rader trainer kit	

Anechoic chamber	
Dip Coating unit	
E-Beam Evaporation System	
Gas sensor measurement set up	
Gas sensor	
Impedance analyzer	
Millipore water purification system	
Temperature Controlled Oven	

Photographs of PICO-Ammeter	
Arbitrary wave generator	
CO_2 Incubator	
Electric cell substrate impedance sensor	
High speed refrigerated centrifuge	
Pico Ammeter	
Laminar flow clean bench	
pH meter	

Temperature controlled annealing furnace	

Temperature controlled Oven (up to 300^0 C)	
UV – VIS spectrometer	
Vector Signal Generator	
Arbitrary Function Generator	
DSO (500MHz)	

Name of the Laboratories :

Basic Electronics Lab	Advanced Microprocessors Lab
Network Theory Lab	Waveguides and Antenna Lab
Electronic Devices Lab	Wireless Communication and Networking Lab
Analog Electronics Lab	Digital Image Processing & Computer Vision Lab
Analog Communication Systems Lab	Microwave and Radar Engineering Lab
Digital Electronics Lab	VLSI Design Lab
Microelectronics Lab	Opto-Electronics & Optical Communication Lab
Digital Communication Lab	Thin film/Sensors Lab
Integrated Circuits and Systems Lab	RF and Microwave measurement Lab
Microprocessors and Microcontrollers Lab	Audio & Video Engineering Lab
Electronic Instrumentation and Measurements Lab	Nano-thin films & solid state gas sensor devices
Digital Signal Processing Lab	Semiconductor device/sensor characterization lab.

Consultancy Work :

Dr. Chirasree Roychoudhury

Advisor to a start up venture "Capacloud Trading Solutions Pvt. Ltd" in the project Development of Green Walls using Sensor Array.

Support staff position :

Sanctioned technical post : 10Vacant : 4
Technical staff profile

Name	Designation	Highest Qualification	Contact No.	E-mail
Mr. Rajat Mukherjee	Technical Asst.	Diploma in Electrical Engg.	9432367342	mukherjeera.2009@rediffmail.com
Mr. Brindaban Patta	Jr. Technical Asst.	Diploma in Electronics Engg.	9830970287	brindaban_patta@yahoo.co.in
Smt. Indrani Santra	Jr. Technical Asst	Diploma in Electronics Engg.	9434223985	indrani.santra08@gmail.com
Mr. Biswajit Samanta	Jr. Technical Asst	Diploma in Electronics Engg.	9002322109	biswajit_samanta21@rediffmail.com
Mr. Pradip Mistry	Jr. Technical Asst	Diploma in Electronics Engg.	9432269081	pradip.mistry75@gmail.com
Mr. Dibyendu Pal	Sr. Mechanic	H.S.	9831342357	paul.dibendu@rediffmail.com
Suvankar Bose (Contractual)	Technical Support Staff	Diploma in Electronics Engg.	9432353671	suvankar1@yahoo.co.in
Mouli Das (Contractual)	Technical Support Staff	Diploma in Electronics Engg.	9433900278	mouli.mouli2008@gmail.com
Ratna Ghosh (Contractual)	Technical Assistant	AMIE in Electronics & Telecommunication	9051952993	ratna_vlsi@yahoo.co.in

Ongoing Sponsored Research / projects :

Name of Project	PI	Sponsoring agency	Prof value in Rs. Lakh	Duration
Nanostructured Immunosensor Array for Rapid, Portable and Sensitive Food Toxin Detection	C.RoyChaudhuri	DST, SERB	18	2013-16
Multiple Wireless Sensor System for Monitoring Health Status of Elderly People — Prototype Development and field testing	Chirasree RoyChaudhuri	DST-SEED	23	2 years
Efficacy of silicon microchannel cytosensor platform for electrical profiling of multiple mammalian cells	C.RoyChaudhuri	DST, SERB	54.6	2012-15
Development of Metal-Insulator-Metal based Volatile Organic Compound Sensor for Monitoring of Ripeness of Orange	Dr. Partha Bhattacharyya	INSA	15	2013-16
Development of Graphene derivative and semiconducting oxide nanotubes /nanorods based hybrid Electronic Sensor System for efficient monitoring of quality of fruits	Dr. Partha Bhattacharyya	DeitY, MCIT GoI	37	2016-21
Center of Excellence for "Microstructurally Designed Advanced Materials Development"	Dr. Partha Bhattacharyya	AICTE,	500	2012-16
Formulation and fabrication of composite Titania matrix with surface Plasmon and quantum dots for use in dye synthesized solar cell and sensor system	Dr. Partha Bhattacharya	DST	176	2016-18
Studies on Retro-directive –Array For Space Applications	Dr. S.R. Bhadra Chaudhuri	ISRO	17.46	2013-15
Design and Development Of Substrate Integrated Wave-guide (SIW) based RF circuits and compo-nents Using Meta-materials in Ku-band Application	Dr. Susanta Kumar Parui	DST-SERC	31	2011-15
Development of Microstrip Phased Array Antenna System for Eliminating Scan Blindness by Using Defected Ground Structures	Dr. Susanta Kumar Parui	CSIR	20	2012-15
Design and development of printed antennas on paper substrates for RFID applications	Dr. Santanu Das	AICTE	15	2013-16
Efficiency Improvement of Wireless Power Transfer using Metamaterials structure implementation	Dr. Debasis Mitra	DeitY, Govt. of India.	37	2016-21
TOTAL			**944.06**	

Details of publications of each faculty member :

Journal – 59
Conference – 35
Books/Monograms – 5

List of publications – **Annexure I**

Patents / Invention Disclosure / Technology Transfer / Copyright :

- Partha Bhattacharyya, DebanjanAcharyya, A process for fabrication of hybrid junction of reduced graphene oxide nanoribbon and TiO2 nanotube array (TNTA) based gas sensor system, Indian Patent application no. 201631015735 (Filed on 05.05.2016).

- Partha Bhattacharyya, ArnabHazra, A process for fabricating an undoped transition metal oxide (TMO) based p-n homojunction diode with high rectification efficiency, Indian Patent application no. 581/KOL/2015(Filed on 27.05.2015).

- Non-invasive wireless sensor system for monitoring of elderly people staying alone, C.RoyChaudhuri, N.Samanta, A.Chanda, Indian patent filed, June 2015.

- N.Samanta, A.K.Chanda, C.RoyChaudhuri, Non-invasive camera less wireless sensor system for monitoring of elderly people staying alone, filed for Indian Patent, 647/KOL/2015.

Seminar / Workshops / Conferences / Training programme organized by the department

Date	**Title of Workshop/Seminar/Lecture etc.**	**Organizing chair / Convener**	**Speaker**	**Participanats**
16.03.16	A lecture on "Can synthetic biology program a cell like an engineer programs a device?"	Dr. S.Das & ETCE Society	Dr. Sangram Bag, Associate Professor Dept. of Biophysics & Structural Genomics, Saha Institute of Nuclear Physics, Kolkata	UG, PG students, Research scholars, Faculties of all the departments
27.01.16	A lecture on Radio Astronomy	Dr. S.Das	Dr. Nipanjan Patra Post-Doc Fellow, Univerlsty of California	UG, PG students, Research scholars, Faculties
27.01.16	A lecture on "Secure Communication Via a Wireless Energy Harvesting Untrusted Relay"	Dr. S.Das & Dr. T. Acharya	Prof. Adrish Banerjee, Dept of EE, IIT Kanpur	UG, PG students, Research scholars, Faculties
13.01.16	A lecture on Radio	Dr. S.Das	Dr. Nipanjana	UG, PG

Date	Title of Workshop/Seminar/Lecture etc.	Organizing chair / Convener	Speaker	Participanats
	Astronomy		Patra	students, Research scholars, Faculties
05-10 Jan. 2015	Workshope on "Advances in Microwave and Antenna Engineering (AMAE 2015)"	Dr. S. Das, Dr. S.K. Parui	From IIT KGP, DRDO Bangalore, IIT Guwahati, J.U. Kolkata, NIT Durgapur, Radio Physics Kolkata , Syracuse University, USA	Faculties from different Educ-tional Institution & Research scholars

Technology Developed / Innovations :

- A solid state portable electrical biosensors for bacteria/toxin detection with electronic readout
- Packaged multiple wireless sensor modules for health monitoring of elderly people- *technology transferred to Amateur World* for medium scale manufacturing
- A process for configuring insolation - intelligent bipv systems.
- Design and development of a unique ultrasensitive impedance biosensing platform based on array of nano-structured silicon oxide pores.
- The developed prototype under one of the DST sponsored project "Healthy and Safe Home based on Wireless Sensor System for Elderly People" has been selected for commercialization through National Health Systems Resource Centre (NHSRC), Ministry of Health & Family Welfare.

Advancements under TEQIP – Phase II :

- Faculties, research scholars, students of the department participated in international and national conferences / workshops / seminars / short term courses. This participation is supported by TEQIP-Phase II by extending necessary financial assistance. Participation in these events has been very beneficial for improving pedagogical and research skills, and enriching knowledge in the same and different domains.
- The department is equipped with high-end softwares to augment the facilities in the existing laboratories.
- Fellowship is received from TEQIP-Phase II for quite a few deserving students for pursuing Ph.D. program leading to high volume of research publications.
- The financial assistance from TEQIP-Phase II has helped the department to organize workshops / seminars / lecture series etc. This has enriched the students, faculties, technical staffs with the knowledge of advancement of technology in diversified areas besides the regular course curriculum.
- TEQIP-II has given financial support to PG and UG students for bearing some expenses to carry out project work and Research scholar for procuring components and consumables.

Foreign visits and Invited Lectures :

(i)Dr. S. R. Bhadra Chaudhuri - Attended International Conference in electromagnetic for Advanced Applications at Torino, Italy, for research paper presentation

(ii) Dr. Partha Bhattacharyya -

Dr. Partha Bhattacharyya attended Post Doctoral research and Initiation of International Collaboration under INDO-GERMAN bilateral exchange program-**2015** supported by INSA-DFG (Indian National Science Academy-Deutsche Forschungsgemeinschaft) in the Institute of Micro and Nanomaterials (InstitutfürMikro- und Nanomaterialien), Ulm University, Germany (June-August, 2015).

Dr. Partha Bhattacharyya attended Research Scholar Development Program, Department of Electronic Science, University of Calcutta, 30th March, 2016.

(iii) Dr. Debasis Mitra - Torino, Italy, September 7-11, 2015 for presenting paper.

(iv) Dr. Chirasree RoyChaudhuri - Visited Montreal, Canada for chairing a session and presenting a paper in 11th International Conference on Emerging Biosensors and Biotechnology, Canada, 2015.

Visitors to your Department (Indian & Foreign) :

- Dr. Nipanjan Patra, Post-Doc Fellow, University of California
- Dr. Sangram Bag, Associate Professor, Dept. of Biophysics & Structural Genomics, Saha Institute of Nuclear Physics, Kolkata
- Prof. Adrish Banerjee, Dept of EE, IIT Kanpur
- Dr. B.K. Sarkar - Consultant, Kalpan Chawla Space Technology Centre, ISRO Chair Professor (Rtd), IIT Kharagpur

Alumni Contribution to your Department :

Many alumni have visited the department on various occasions and suggested the followings for the development of the department.

(i) Modernization of class rooms with audio visual facilitates

(ii) Big size modern seminar room

(iii) Augmentation of existing laboratories with enough equipment

(iv) Adequate space for extension of laboratories to cater to the high number of student intake.

Training and Placement :

The students fared very well in campus interviews. 95% students got job opportunity in various reputed core and IT industries. Finally a few of them chose to pursue masters' degree in premier institutes like IIT and two went to premier institutes in USA for higher studies, MS leading to Ph.D. with full financial assistance.

The training department of the institute arranges for summer vocational training for 3rd year students. Some of the students take part in the said training program on their own initiative at the industries of their choice. In this case, the department of ETCE gives all kinds of necessary supports. Recently there has been a trend for the students of all years to participate in the training during the study break, viz. during summer vacation and winter recess. Department of ETCE extends its hand to provide all sorts of support.

Extension Activities and Societal outreach :

Dr. S. R. Bhadra Chaudhuri

Member : Academic Council, Government College of Engineering and Ceramic Technology, An Autonomous Institution under the Higher Education Department, Govt. of West Bengal.
Member: Academic Council/Auditing, Narula Institute of Technology, Agarpara, Kolkata, JIS group of Institution, Kolkata.
External Examiner : a) Ph.D Thesis: Jadavpur University, Kalyani University., b) M.Tech/ M.S. Thesis : Jadavpur University, NIT, Rourkela, Techno India University. c) B.Tech / B.E.: Final year Grand Viva-Voce/Project: Jadavpur University, College of Engineering and Management, Kolaghat, West Bengal.

Dr. Chirasree Roychoudhury
Initiated a project on " Soil Moisture Measurement System with Digital Display" for rural areas in collaboaration with NGO, Lok Kalyan Parishad.

New Academic / Research Initiatives

Academic Collaboration

Collaborative research project is going on in association with the following institutes

- Kalpana Chawla Space Research Centre, IIT-Kharagpur – collaborator in studies on Retro-directive –Array For Space Applications (RAA)
- Prof. Hans JörgFecht, Institute of Micro and Nanomaterials, Ulm University, Germany
- Prof. Anita Lloyd Spetz, Div. of Applied Physics, Linköping University, Linköping, Sweden
- Prof. Mon Shu Ho, Department of Physics, National Chung Hsing University, Taiwan
- Prof. DhrubesBiswas, Department of Electronics & Electrical Communication Engineering, IIT, Kharagpur, India
- Prof. Raj Kumar Gupta, Department of Physics, BITS, Pilani, India
- Dr. JamilAkhtar, , CEERI, Pilani, India
- Prof. AnupDandapat, Dept. of Electronics and Communications, NIT Meghalaya, India
- Prof. Subir Kr. Sarkar, Dept. of Electronics and Telecomm. Engg., Jadavpur University, India
- Prof. Chandan Kr. Sarkar, Dept. of Electronics and Telecomm. Engg., Jadavpur University, India

Industrial Collaboration –

Dr. Chirasree Roychoudhury - Capacloud Trading Solutions Private Limited.

Others

Books/Monograms :

1.L.Sujatha, C.RoyChaudhuri, E.Bhattacharya,"Application of Porous Silicon in MEMS and Sensor Technology", Materials and Failures in MEMS and NEMS, (121–172), Scrivener Publishing LLC, 2015

2.C.RoyChaudhuri, N.Das, "Porous Silicon Electrochemical Biosensors: Performance and Commercial Aspects", to be published in Handbook of Porous Silicon, edited by Leigh Canham, Springer, 2016.

3.Book Chapter: P. Bhattacharyya, B. Bhowmik, A.Hazra, P.P. Chattopadhyay, Potentiality of semiconducting metal oxide nanoforms as solid state vapor sensors, in the book 'Sensing Technology: Current Status and Future Trends IV', Edited by Alex Mason, Subhas Chandra Mukhopadhyay, P. Krishanthi Jayasundera, Springer, UK (2015).

4.Book Chapter: P. Bhattacharyya, K. Dutta, P.P. Chattopadhyay, Electrochemically Derived Oxide Nanoform based Gas Sensor Devices: Challenges and Prospects with MEMS Integration, in the book 'Advanced Mechatronics and MEMS Devices II', Edited by Dan Zhang, Bin Wei, Springer, New York (2016).

5.Sirshendu Hore, Tanmay Bhattacharya, Nilanjan Dey, Aboul Ella Hassanien, Ayan Banerjee and S.R. Bhadra Chaudhuri, "A Real Time Dactylology Based Feature Extractrion for Selective Image Encryption and Artificial Neural Network" in the book entitled "Image Feature Detectors and Descriptors", published by Springer International Publishing Switzerland, 2016.

ANNEXURE - I

Paper Published

International and National Journals

Dr. S.R. Bhadra Chaudhuri :

1. Abhishek Sarkhel, Debasis Mitra, Sekhar Ranjan Bhadra Chaudhuri. "A compact negative index metamaterial with multiband capability", Applied Physics - 'A", SPRINGER ,Volume-122, Issue 4, April 2016,ISSN: 0947-8396 (Print) 1432-0630(Online), p.p. 470 - 479,Impact Factor - 1.7, citations - 0.
2. Jeet Ghosh, Sandip Ghosal, Debasis Mitra and Sekhar Ranjan Bhadra Chaudhuri," Mutual Coupling Reduction Between Closely Placed Microstrip Patch Antenna Using MeanderLine Resonator" - Progress in Electromagnetics Research Letters (PIER- 'L') ,-Vol. 59, pp. 115 - 122, April, 2016, Impact Factor - 0.35, citations- 0.
3. Debasis Mitra, B. Ghosh, A. Sarkhel and Sekhar Ranjan Bhadra Chaudhuri, "Miniaturized Ring Slot Antenna with Enhanced Radiation Characteristics using Metamaterial", IEEE Transactions on Antennas & Propagation., Vol. 64, no. 1, pp. 300-305, January, 2016. Impact Factor - 2.1, citation – 0
4. Swarup Das, Debasis Mitra, Sekhar Ranjan Bhadra Chaudhuri, "Design of UWB Planar Monopole Antennas with Etched Spiral Slot on the Patch for Multiple Band Notched Characteristics", International Journal of Microwave Science and Technology, HINDWAI Publishing, Special Issue - September, 2015. citation – 0.
5. Tapas Mondal, S. Samanta, Rowdra Ghatak and Sekhar Ranjan Bhadra Chaudhuri, "A Novel Hexagonal Wideband Circularly Polarized Stacked Patch Microstrip Antenna,"-- Microwave and Optical Technology Letters, 2015, Vol. 57, No. 11, November 2015, p.p. 2548 - 2554. Impact Factor – 0.57 citation – 0.
6. Abhishek Sarkhel, Debasis Mitra, Sandip Paul and Sekhar Ranjan Bhadra Chaudhuri, "A Compact Meta-atom for Dual Band Negative Permittivity Metamaterial", Microwave and Optical Technology Letters, Vol. 57, No. 5, pp. 1152–1156, May,2015. Impact Factor – 0.57. citation - 0.
7. Tapas Mondal, Taniya Roy, Rowdra Ghatak and Sekhar Ranjan Bhadra Chaudhuri, "Novel Adaptive Blind Spot Detector Using Square Modified Cantor Fractal Microstrip Antenna Array", Microwave and Optical Technology Letters (MOTL), WILEY, Vol. 57, No. 5, pp. 1067—1072, April, 2015. Impact Factor - 0.57, citation – 1.

Dr. Tamaghna Acharya :

Sl no.	Title of Paper(s)	Name of the Co-Author(s)	Name of the Journal(s)	Page(s)	Volume & Year
5.	Route selection for interference minimization to primary users in cognitive radio ad hoc networks: A cross layer approach	S. Basak	Physical Communication SCI impact factor :0.802	118-132	vol. 19, June 2016
4.	On optimal fuzzy c-means clustering for energy efficient cooperative spectrum sensing in cognitive radio networks	S.P. Maity, S. Chatterjee	Elsevier Digital Signal Processing SCI impact factor, 2014:1.256	104-115	vol. 49, Feb. 2016
3.	Joint Power Allocation and Routing in Outage Constrained Cognitive Radio Ad Hoc Networks	S. Basak	Mobile Networks and Applications, *Special issue on Green Communications and Networking*, Springer, SCI impact factor, 2014: 1.045	636-648	vol. 20, no. 5 Oct. 2015
2.	On Optimal threshold selection in cooperative spectrum sensing for cognitive radio networks- An energy detection approach in using Fuzzy entropy maximization	S. Chatterjee, S.P. Maity	*Wireless Personal Communications, Special issue on* Recent Advances in Mobile and Wireless Networks, *Springer. SCI impact factor, 2014: 0.653*	1605-1625	vol. 84, no. 3 Oct. 2015
1.	Outage minimized joint power and channel allocation in multihop cognitive radio networks: A lifetime centric approach	S.P. Maity, S. Mandal	Wireless Personal Communications, Springer SCI impact factor, 2014: 0.653	2519-2537	vol. 83, no. 4 Aug. 2015

Dr. Chirasree Roy Chaudhuri :

1.J.Basu, C.RoyChaudhuri, " Attomolar Sensitivity of FET Biosensor Based on Smooth and Reliable Graphene Nanogrids", IEEE Trans. on Electron Device Letters, vol.37, no.4, pp.492-495, 2016.

2.**K.K.Mistry, K.Layek, T.N.Chell, C.R.Chaudhuri, H.Saha "Design and development of an amperometric immunosensor based on screen-printed electrodes", Analytical Methods (Royal Society of Chemistry),vol. 8, no.15, pp. 3096-3101, 2016.**

3.N.Samanta, C.RoyChaudhuri, "Nanocrystalline Silicon Oxide Impedance Immunosensors for Sub-femtomolar Mycotoxin Estimation in Corn Samples by Incremental Fuzzy Approach", IEEE Sensors, vol.16, no.4,pp.1079-1078, 2016.

4.**H.Ghosh, D.Kundu, C.RoyChaudhuri, "Design Issues for Performance Enhancement in Nanostructured Silicon Oxide Biosensors: Modeling the Frequency Response" IEEE Transactions on Electron Devices, vol.63, p.3241,2016**

5.D.Mondal, R.Bose, C.RoyChaudhuri, "Real Time Monitoring of Wound Healing on Nano-patterned Substrates: Non-invasive Impedance Spectroscopy Technique", IEEE Transactions on Nanotechnology, 2016, 0.1109/TNANO.2016.2581212

6.B.Mondal, J.Das, C.RoyChaudhuri, N.Mukherjee, H.Saha, "Enhanced sensing properties of ZnO-SnO2 based composite type gas sensor, Eur. Phys. J. Appl. Phys.(EDP Sciences), vol. 73,p.10301 (2016).

7.H. Ghosh, C. RoyChaudhuri, "Pore Geometry Optimization of Nanocrystalline Silicon Oxide Impedance Biosensor", accepted in IEEE Sensors Journal, 2016.

8.J.Basu and C.Roychaudhuri, "Graphene Nanogrids FET Immunosensor: Signal To Noise Ratio Enhancement", accepted in Sensors, 2016.

9. N.Das, C.RoyChaudhuri, "Reliability Study of Nanoporous Silicon Oxide Impedance Biosensor for Virus Detection: Influence of Surface Roughness", IEEE Transactions on Devices and Materials Reliability, vol.15, no.3,pp. 402-409, 2015,.

10.**D.Mondal, D.Pal and C. RoyChaudhuri," Real Time Sensing of Epithelial Cell-Cell and Cell-Substrate Interactions by Impedance Spectroscopy on Porous Substrates", Journal of Applied Physics (American Institute of Physics), vol. 118, no.4, pp. 044701-14, 2015.**

11.C.RoyChaudhuri, "A Review on Porous Silicon Based Electrochemical Biosensors: Beyond Surface Area Enhancement Factor", Sensors and Actuators B(Elsevier), vol.210, pp.310-323, 2015.

12.H.Ghosh, C.RoyChaudhuri, "Noise Spectroscopy As an Efficient Tool For Impedance Based Sub-Femtomolar Toxin Detection In Complex Mixture Using Nanoporous Silicon Oxide", Biosensors and Bioelectronics(Elsevier), vol.67, pp.757-762, 2015.

13.J.Basu, S.Datta, C.RoyChaudhuri, "A graphene field effect capacitive Immunosensor for sub-femtomolar food toxin detection", Biosensors and Bioelectronics (Elsevier),vol.68, pp.544-549, 2015 (published online in Times of India, 6th April, 2015)

14.S.Ghosh, R.Bhattacharyya, H.Saha, C.R Chaudhuri, N.Mukherjee, "Functionalized ZnO/ZnO2 n–N straddling heterostructure achieved by oxygen plasma bombardment for highly selective methane sensing", Phys. Chem. Chem. Phys (Royal Society of Chemistry), vol.17, no.41,pp. 27777—27788, 2015.

15.**N.Das, J.Basu, C.RoyChaudhuri, "Graphene coated nanoporous silicon immunosensor for food toxin detection", International Journal of Advances in Engineering Sciences and Applied Mathematics(Springer),vol.7, pp.204-209, 2015.**

16.**B Mondal, MS Meetei, J Das, CR Chaudhuri, H Saha, "Quantitative recognition of flammable and toxic gases with artificial neural network using metal oxide gas sensors in embedded platform", Engineering Science and Technology, an International Journal (Elsevier), vol. 18, no.2, pp.229-234, 2015.**

17.K.K.Mistry, T.S.Deephy, C.RoyChaudhuri, H.Saha , "Electrochemical characterization of some commercial screen printed Electrodes in Different redox Substrates", Current Science (Indian Academy of Sciences), vol.109, no.8, pp.1427-1436,2015.

Dr. Partha Bhattacharyya :

1.DebanjanAcharyya , Partha Bhattacharyya, Highly Efficient Room Temperature Gas Sensor based on TiO2 Nanotubes-Reduced Graphene Oxide Hybrid Device, IEEE Electron Device Letters, vol. 37, No. 5, pp. 656-6593 (2016) (Impact Factor: 2.754).

2.K. Dutta, N. Banerjee, H. Mishra, P. Bhattacharyya, Performance Improvement of Pd/ZnO-NR/Si MIS Gas Sensor Device in Capacitive Mode: Correlation with Equivalent Circuit Elements, IEEE Transactions on Electron Devices, vol. 63, No. 3, pp. 1266-1273 (2016) (Impact Factor: 2.472).

3.D. Acharyya, P. Bhattacharyya, Alcohol Sensing Performance of ZnO Hexagonal Nanotubes at Low Temperatures: A Qualitative Understanding, Sensors and Actuators B, vol. 228, pp. 373-386 (2016) (Impact Factor: 4.097).

4.K. Dutta, A. Hazra, P. Bhattacharyya, Ti/TiO2 Nanotube Array/Ti Capacitive Device for Non-polar Aromatic Hydrocarbon Detection, IEEE Transactions on Device and Materials Reliability, vol. 16, No.2, pp. 235-242 (2016) (Impact Factor: 1.89).

5.D. Acharyya, K.Y. Huang, P.P. Chattopadhyay, M. S. Ho, H- J. Fecht, P. Bhattacharyya, Hybrid 3D Structures of ZnO Nanoflowers and PdO Nanoparticles as a Highly Selective Methanol Sensor, Analyst, vol. 141, No. 10, pp.2977-2989 (2016) (Impact Factor: 4.107).

6.B. Bhowmik, V. Manjuladevi, R.K.Gupta, P. Bhattacharyya, Highly Selective Low Temperature Acetone Sensor based on Hierarchical 3-D TiO2 Nanoflowers, IEEE Sensors Journal, vol. 16,No. 10, pp. 3488-3495 (2016) (Impact Factor: 1.762).

7.Partha Bhattacharyya, BasantaBhowmik, Hans J. Fecht, Operating Temperature, Repeatability and Selectivity of TiO2 Nanotube based Acetone Sensor: Influence of Pd and Ni Nanoparticle Modifications, IEEE Transactions on Device and Materials Reliability, vol. 15,No. 3, pp. 376-383, (2015) (Impact Factor: 1.89).

8.B. Bhowmik, P. Bhattacharyya, Highly Stable Low Temperature Alcohol Sensor Based on Hydrothermally Grown Tetragonal Titania Nanorods, RSC Advances (Royal Society of Chemistry) vol. 5, pp. 82159-82168, (2015) (Impact Factor: 3.84).

9.A. Hazra, P. P. Chattopadhyay, P. Bhattacharyya, Hybrid Fabrication of Highly Rectifying p-n Homojunction based on Nanostructured TiO2, IEEE Electron Device Letters, vol. 36,No. 5, pp. 505-507, (2015) (Impact Factor: 2.754).

10.A. Hazra, P. Bhattacharyya, Role of Junction Geometry in Determining the Rectification Performance of Nanostructured TiO2 based p-n Junctions, IEEE Transactions on Electron Devices, vol. 62,No. 6, pp. 1984-1990, (2015) (Impact Factor: 2.472).

11.A. Hazra, , B. Bhowmik, K. Dutta, P. P. Chattopadhyay, P. Bhattacharyya, Stoichiometry, Length and Wall Thickness Optimization of TiO2 Nanotube Array for Efficient Alcohol Sensing, ACS Applied Materials and Interfaces, vol. 7, pp. 9336-9348, (2015) (Impact Factor: 6.723).

12.B. Bhowmik, Hans J Fecht, P. Bhattacharyya, Vertical Mode Gas Sensing Performance of TiO2 Nanotube Array by Tuning of Surface Area and Carrier Transport Length, IEEE Sensors Journal, vol. 15,No. 10, pp. 5919-5926, (Impact Factor: 1.762).

13.K. DuttaP. P. Chattopadhyay, Chia-Wei Lu, Mon-Shu Ho, P. Bhattacharyya, A Highly Sensitive BTX Sensor based on Electrochemically Derived Wall Connected TiO2 Nanotubes, Applied Surface Science, vol. 354, pp. 353-361, (Impact Factor: 2.711).

14.D. Acharyya, P. Bhattacharyya, An efficient BTX sensor based on ZnO nanoflowers grown by CBD method, Solid State Electronics, vol. 106, pp. 18-26, (2015) (Impact Factor: 1.504).

15.A. Hazra, P. Bhattacharyya, Pd/ TiO2 NT/Ti Metal-Insulator-Metal Devices as a Reliable Detector of Degradation of Potato, Sensor Letters , vol. 13, pp. 1-7, (2015) (Impact Factor: 1.587).

Dr. Debasis Mitra :

1. Debasis Mitra, A. Sarkhel, O. Kundu, and S. R. Bhadra Chaudhuri, “Design of compact and high directive slot antennas using grounded metamaterial slab”, IEEE Antennas & Wireless Propagation Letters, Vol. 14, 2015.
2. Abhishek Sarkhel, Debasis Mitra, S. Paul and S. R. Bhadra Chaudhuri, “A compact metaatom for dual band negative permittivity metamaterial ” ,WILEY Microwave and Optical Technology Letters, Vol 57, Issue 5, May2015.
3. Swarup Das, Debasis Mitra, Sekhar Ranjan Bhadra Chaudhuri, “Design of UWB Planar Monopole Antennas with Etched Spiral Slot on the Patch for Multiple Band Notched Characteristics”, International Journal of Microwave Science and Technology, HINDWAI Publishing, Special Issue - September, 2015.

4. Debasis Mitra, B. Ghosh, A. Sarkhel and Sekhar Ranjan Bhadra Chaudhuri, "Miniaturized Ring Slot Antenna with Enhanced Radiation Characteristics using Metamaterial", IEEE Transactions on Antennas & Propagation., Vol. 64, NO. 1, p.p. 300-305, January, 2016.
5. Jeet Ghosh, Sandip Ghosal, Debasis Mitra, and Sekhar Ranjan Bhadra Chaudhuri, "Mutual Coupling Reduction between Closely Placed Microstrip Patch Antenna Using Meander Line Resonator", Progress In Electromagnetics Research Letters, Vol. 59, pp.115-122, April 2016.

Dr. Mihir Kumar Mahata :

1.Mihir Kumar Mahata, Saptarsi Ghosh, Subhashis Das, and Dhrubes Biswas, "Universal Band Gap Determination Model for Doped Semiconductor Materials", *ECS Solid State Letters,* 4 (12) P98-P101 (2015).
2.Rahul Kumar, P. Mukhopadhyay, A. Bag, S. Kr. Jana, A. Chakraborty, S. Das, M. Kr. Mahata, D. Biswas, "Comparison of different pathways in metamorphic graded buffers onGaAs substrate: Indium incorporation with surface roughness", Applied Surface Science Vol. 324, pp. 304–309, (2015).
3.Ankush Bag, Rahul Kumar, Partha Mukhopadhyay, Mihir K. Mahata, Apurba Chakraborty, Spatarsi Ghosh, Sanjay K. Jana, Dhrubes Biswas, " Evolution and Analysis of Nitride Surface and Interfaces by Statistical Techniques: A Correlation with RHEED through Kinetic Roughening", Electron. Mater. Lett., Vol. 11, No. 4 (2015), pp. 707-716 (DOI: 10.1007/s13391-015-5129-3).
4.Sanjay Kr. Jana, Saptarsi Ghosh, Syed Mukulika Dinara, Mihir Mahata, Soumen Das, and Dhrubes Biswas, "Structural, optical, and transport properties of AlGaN/GaN and AlGaN/InGaN heterostructure on sapphire grown by plasma assisted molecular beam epitaxy", Journal of Vacuum Science & Technology B 33, 041206 (2015); doi: 10.1116/1.4926968.
5.Saptarsi Ghosh, Syed M. Dinara, Mihir Mahata, Subhashis Das, Partha Mukhopadhyay, Sanjay Kumar Jana and Dhrubes Biswas, "On the different origins of electrical parameter degradation in reverse-bias stressed AlGaN/GaN HEMTs",Phys. Status Solidi A,1-5 (2016).

Prof. Suranjana Banerjee :

1.Suranjana Banerjee and Monojit Mitra," Large Signal and noise properties of heterojunction $Al_xGa_{1-x}As$/GaAs DDR IMPATTs", *Journal of Semiconductors,* China, Vol.37, No. 6: 064002-1-064008-8 , 2016.
2.Suranjana Banerjee and Monojit Mitra," Prospect of 3C-SiC/Si DDR IMPATTs as High Efficiency and Low Noise mm-wave and THz Sources", communicated in IETE , Journal of Research, Taylor & Francis, 2016.
3.Suranjana Banerjee, Aritra Acharyya, and Monojit Mitra," Large signal and Noise Properties of Heterojuncton DDR IMPATTs Based on 3C-SiC/Si at mm-wave frequencies", accepted for publication in *International Journal of Microwave and Wireless Technologies,* 2016.
4.Suranjana Banerjee, and Monojit Mitra, "Heterojunction DDR THz IMPATT Diodes Based on $Al_xGa_{1-x}N$~GaN Material System, *Journal of Semiconductors*, China, Vol. 36, No.6 : pp. 064002-1-064008-8, 2015.

Dr. S.Das :

1.Tapan Mondal and Santanu Das, "Design of a CPW-fed UWB printed antenna with dual notch band using mushroom structure," *International Journal of Microwave and Wireless Technologies,* Vol xx, No x, pp.1-8, September 2015. ISSN: Print: 1759-0787. Cambridge Univ Press, Impact Factor: 0.348

International and National Conferences papers

Dr. S.R. Bhadra Chaudhuri:

1. Krishnendu Bera and Sekhar Ranjan Bhadra Chaudhuri , " Polarization-insensitive Planar Negative Index Metamaterials using Crossed S-shaped Resonator", IEEE International Conference on Wireless Communication, Signal Processing and Networking (WISPNET)", 2016, Chennai, India, March, 23-25, 2016. Citation 0.--- available in IEEE Xplore.
2. M.Das, D.Mukherjee, and S.R.Bhadra Chaudhuri, "An approach to study the performance of photovoltaic water pumping system using supercapacitor," International Conference on Recent Trends in Engineering and Materials Science (ICEMS), Jaipur National University, Jaipur, India
3. Govind Tanwar and Sekhar Ranjan Bhadra Chaudhuri , " A Novel Approach to Remove Random-valued Impulse Noise from digital Images", 22nd National Conference on Communications"(NCC), IIT- Guwahati, Assam, India, March, 04-06, 2016.----available in IEEE Xplore.
4. Jeet Ghosh, Debasis Mitra, Sekhar Ranjan Bhadra Chaudhuri, "Circularly Polarized Hexagonal Slot Antenna For Broadband Application" IEEE-AEMC-2015, December-2015, Guwahati, India. Citations:0. ------- available in IEEE Xplore.
5. Gopinath Samanta, Dhrubajyoti Bhattacharya, Debasis Mitra, Sekhar Ranjan Bhadra Chaudhuri," Miniaturized CPW-Fed Slot Antenna Using Reactive Impedance Substrate" IEEE-AEMC-2015, December-2015, Guwahati, India, Citations:0. ------- available in IEEE Xplore.
6. Abhishek Sarkhel and Sekhar Ranjan Bhadra Chaudhuri" Design of Miniaturized PIFA with Magnetic Resonator Metamaterial Loading" IEEE-AEMC-2015, December-2015, Guwahati, India, Citation: 0. ------- available in IEEE Xplore.
7. Abhishek Sarkhel and Sekhar Ranjan Bhadra Chaudhuri ,"Design of a Compact Triple-Band Metamaterial Absorber with Wide Angle of Incidence using Connected Resonator Topology", International Conference in Electromagnetics for Advanced Applications, September 7-11, 2015, Torino, Italy. Citations:0. ------- available in IEEE Xplore
8. Debasis Mitra, Dhruba Das, and Sekhar Ranjan Bhadra Chaudhuri, "Miniaturization of Meandered Line Slot Antenna", International Conference on Antenna Propagation for Wireless Communication, September 7-11, 2015, Torino, Italy. Citations:0. ------- available in IEEE Xplore.

Dr. Tamaghna Acharya:

1.	Trade-off on Spectrum-Energy Efficiency in Cooperative Cognitive Radio Networks	Subhankar Chatterjee, Santi P. Maity	IEEE International Conference on Signal Processing and Communications (SPCOM), 2016		June 2016
2.	Outage Analysis in Cooperative Cognitive Radio Networks with Simultaneous Wireless Information and Power Transfer	Sanjay Kumar Yadav	IEEE International Conference on Signal Processing and Communications (SPCOM), 2016		June 2016
3.	On optimal sensing time and power allocation for energy efficient cooperative cognitive radio networks	S Chatterjee, SP Maity.	IEEE International Conference on Advanced Networks and Telecommuncations Systems (ANTS), 2015	1-6	Dec. 2015
4.	Energy-Aware Social-Based Multicast in Delay-Tolerant Networks	A Roy, S. DasBit	IEEE 81st Vehicular Technology Conference (VTC Spring), 2015	1-5	May 2015

Dr. Chirasree Roy Chaudhuri:

Sl.No	Title of Paper	Authors	Name of the Conference	Page(s)	Year
1	Impedance Based Nanocrystalline Silicon Oxide Immunosensor Electronic Tongue for Ultrasensitive and Low Cost Multiple Food Toxin Detection	H. Ghosh, R. Das, C. RoyChaudhuri	IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Taipei, Taiwan	NA	2016
2	Nanostructured Silicon Oxide Immunosensor Integrated with Noise Spectroscopy Electroni cs for POC Diagnostics	N.Das, N.samanta, C.RoyChaudhuri	29th International Conference on VLSI Design and 2016 15th International Conference on Embedded Systems	367-372	2016
3	Ultrasensitive Hepatitis B Virus Detection in Blood Using Nanostructured Porous Silicon Oxide: Towards POC Diagnostics	N. Das, N. Samanta, L. Pandey, C.RoyChaudhuri	11th International Conference on Emerging Biosensors and Biotechnology, Canada	659-662	2015
4	Detection of Multiple Toxins in Food Samples using Nanocrystalline Silicon Oxide Immunosensor Array: A Cost Effective Approach	H.Ghosh, C.RoyChaudhuri	7th International Workshop on Biosensors for Food Safety and Environmental Monitoring, Morocco	31	2015
5	Surface Charge Modulated Ionic Conductance of Closed Solid State Nanopore Biosensors	H. Ghosh, C.RoyChauudhuri	COMSOL Conference India, Pune, India,	NA	2015

Dr. Partha Bhattacharyya :

1.Capacitive Mode Methanol Sensing by ZnO Nanorods Based Devices, N. Banerjee, K. Dutta, H. Mishra, P. Bhattacharyya, International Conference on Nanotechnology and Biosensors-2015 (ICNB2015), Amsterdam, Netherlands, December 15-16, 2015.

2.KoushikDutta, ParthaProtimChattopadhyay, and ParthaBhattacharyya,Titania nanotube based benzene, toluene and xylene sensors: Effect of nanotube wall thickness variation, Young Scientist Colloquium-2015, Organized by Materials Research Society of India (Kolkata chapter), CSIR-CGCRI Kolkata,11th Sept 2015.

3.DebanjanAcharyya and Partha Bhattacharyya, ZnO nanoflowers and Ni/Pd nanoparticles hybrid junctions as a highly selective methanol sensor, Young Scientist Colloquium-2015, Organized by Materials Research Society of India (Kolkata chapter), CSIR-CGCRI Kolkata,11th Sept 2015.

4.BasantaBhowmik, and Partha Bhattacharyya, Development of Efficient Acetone Sensor based on 0-D, 1-D, 2-D and 3-D Nanostructures of TiO2,Young Scientist Colloquium-2015, Organized by Materials Research Society of India (Kolkata chapter), CSIR-CGCRI Kolkata,11th Sept 2015.

5.1D and 3D nanostructures of TiO2 as gas sensing element: A comparative study, B. Bhowmik, P.P. Chattopadhyay, H. JörgFecht and P. Bhattacharyya, 4th Nano Today Conference-2015, Dubai, December 06-10, 2015.

6.Low temperature ethanol sensing performance of hydrothermally grown TiO2 nanoflowers in resistive mode, S. Ghosal, B. Bhowmik and P. Bhattacharyya, 4th Nano Today Conference-2015, Dubai, December 06-10, 2015.

7.n-TiO2/p-Si Heterojunction Devices as a Potential Ethanol Sensor, B. Bhowmik, K. Dutta and P. Bhattacharyya, Conference on Computers and Devices for Communication (CODEC), Kolkata, India, December 16-18th, 2015.

8.Titania Nanotube based Xylene Sensor; Influence of Anodization Voltage, K. Dutta, B. Bhowmik, P. P. Chattopadhyay and P. Bhattacharyya, Conference on Computers and Devices for Communication (CODEC), Kolkata, India, December 16-18th, 2015.

Dr. Debasis Mitra :

1.Debasis Mitra, Dhruba Das, S. R. Bhadra Chaudhuri, "Miniaturization of Meander Line Slot Antenna", IEEE APWC,Torino, Italy, September 7-11, 2015.

Prof. Ankita Pramanik :

1. Soham Bhattacharjee, Saikat Kundu Chowdhury, Shrayan Das and Ankita Pramanik, "DPCM Block-based Compresssed Sensing With Frequency Domain Filtering and Lempel-Ziv-Welch Compression,", IEEE International Conference on Advances in Computing, Communications and Informatics, pp. 1244-1249, Sep. 2015
2. Abhishek Kashyap, Ankita Pramanik, Santi P. Maity, "On Block Compressed Sensing far end reconstruction using OFDM," Proceedings of Third International Conference on Image Information Processing (ICIIP), Waknaghat, pp. 162-167, Dec. 2015.
3. Ankita Pramanik, Abhishek Kashyap, Santi P. Maity, "Study on Sampling Matrices for far-end image reconstruction by Block Compressed Sensing," Proceedings of the First IEEE International Women in Engineering (WIE) Conference on Electrical and Computer Engineering, Dhaka, pp. 346-349, Dec. 2015.

4.Ankita Pramanik, Santi P. Maity, "DPCM-Quantized Block-Based Compressed Sensing of images using Robbins Monro approach," Proceedings of the First IEEE International Women in

Engineering (WIE) Conference on Electrical and Computer Engineering, Dhaka, pp. 18-21, Dec. 2015.

5.Ankita Pramanik, Santi P. Maity, "CS Reconstruction in MIMO Channel using Square Complex Orthogonal STB Codes," IEEE(EDS) Sponsored 4th International Conference on Computing, Communication and Sensor Network, Kolkata, Dec. 2015 (Extended version to appear in Journal of Microsystem Technologies)

6.Ankita Pramanik, Santi P. Maity, "On CS Reconstruction Images using LDPC Code over Radio Mobile channel," Proceedings IEEE Global Wireless Summit – Wireless Vitae, Hyderabad, Dec. 2015

7.Debamita Kumar, Ankita Pramanik, Sudeshna Sil Kar, Santi P. Maity, "Retinal Blood Vessel Segmentation Using Matched Filter and Laplacian of Gaussian," accepted for publication in SPCOMM 2016, IISc Bangalore, June 2016.

Dr. S Das :

1.T.Mandal, G.Sen, Sk N. Islam, S.Das, "Design of a Co-planar Waveguide Fed Monopole Antenna for Bluetooth and UWB Applications with Triple Notch Band Characteristics," *6th International Conference on Computers and Devices for Communication* (CODEC), 2015

2.Amartya Banerjee, Somdotta Roychoudhury, Gobinda Sen, Santanu Das, "CPW-Fed Band-Notched UWB Slot Antenna on HP Photo-Paper Substrate for Low-Cost RFID Applications," *IEEE 3rd International Conference On Electronics And Communication Systems* (ICECS 2016), pp.1010-1014, Feb.25-26, 2016, Coimbatore, Tamilnadu

Department of Human Resource Management

Activities of the Department :

The Department has its current activities in the following areas:

- Job Placements of students of the university though Campus and Off-campus selection processes.
- Internship of students at various industries and research institutes.
- Vacational / Summer Training of the students.
- Grooming up (Personality/Soft-Skill/ Performance Effectiveness) Programme for the Students.
- Remedial Training for students.
- Facilitation for other options: Preparatory programme for competitive examinations and other educational options abroad.
- Industry Interaction Programme / Academic collaborations.
- Entrepreneurship Development .
- Innovation & IPR awareness and facilitation.
- Research & Consultancy.
- Offering Ph.D. Programme.
- Career Counseling.

Academic Programmes:

This predominantly is a service department catering to all UG, PG and Ph.D students; it also offers Ph.D Programme under Faculty of Social and Management Sciences. Currently there are five (5) registered Ph.D. Scholars in this department working in the arena of Entrepreneurship and IPR. Proposals have also been submitted to concerned authority of the Institute to offer Elective courses on Entrepreneurship and / or IPR for the engineering students.

Faculty position: Sanctioned faculty post: 1 (One),

Faculty Profile:

Name	Designation	Highest Qualification	Specialisation / Research Area	Contact No. E-mail
M. K. Sanyal	Professor	Ph.D	•Entrepreneurship •IPR •Environmental Planning	9831352950 hodhrm@becs.ac.in

Support staff position

- Mr. Malay Garai
- Mr. Ram Sundar Yadav
- Mr. Tushar Mitra
- Mr. Sudarshan Mahato
- Mr. Sudipto Das

Publications

Manas kr. Sanyal et. al. "Realising prospects of Commercialization of Traditional Knowledge Based Innovation to cater to the growing needs of Health-Care sector in India". Conference Edited Volume, National Conference on Governance of Traditional Knowledge and Contemporary Innovations, IIT, Roorkee, March 13 & 14, 2015

Consultancy Activities

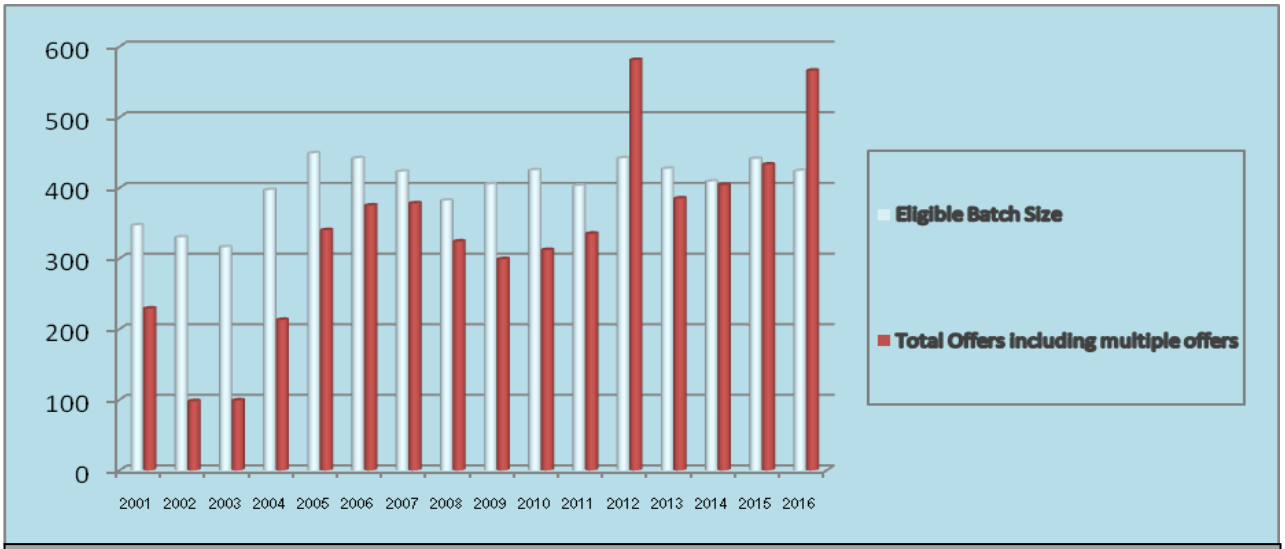
Project Name : Preparation of DPR for Strengthening & Widening of Dankuni- Mogra-STKK Link Road-SH6-Kalyani Junction Package: SH13 Package:3
Sanctioning Authority: RITES Limited
Year of Sanction: 2015

Project Name : Preparation of DPR for Strengthening & Widening of Dankuni- Mogra-STKK Link Road-SH6-Kalyani Junction Package- 1.: Dankuni- Chandannagar SH13
Sanctioning Authority: RITES Limited
Year of Sanction: 2013

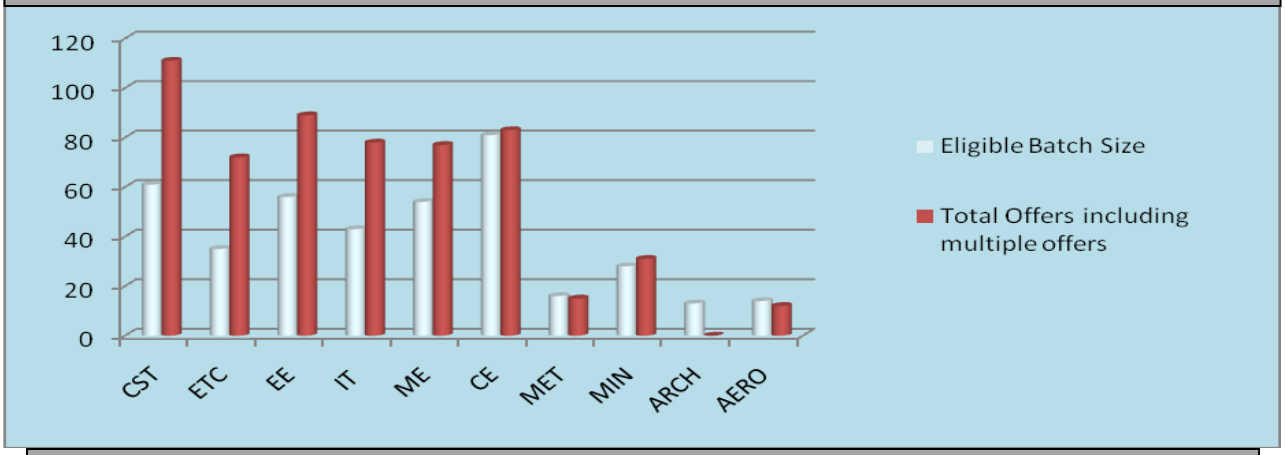
Participation of HRM Department Faculty Member in Academic and Corporate Activities

- Mentoring Students entrepreneurship Projects
- Offered Course on IPR for M.Sc. Students at Kolkata University as Guest Faculty.
- Served as Member of CII Eastern Region Innovation Task Force
- Participation in Training and Placement Meets organised by various industries.
- Participated in DST sponsored National Training Programme on Entrepreneurship Development and Management for Scientists and Technologists at EDI Ahmedabad.

Recent Placement Statistics
IIEST-Shibpur : Year-wise Eligible Batch Size vs. Total Offers made through On/Off-Campus Process for UG placement.



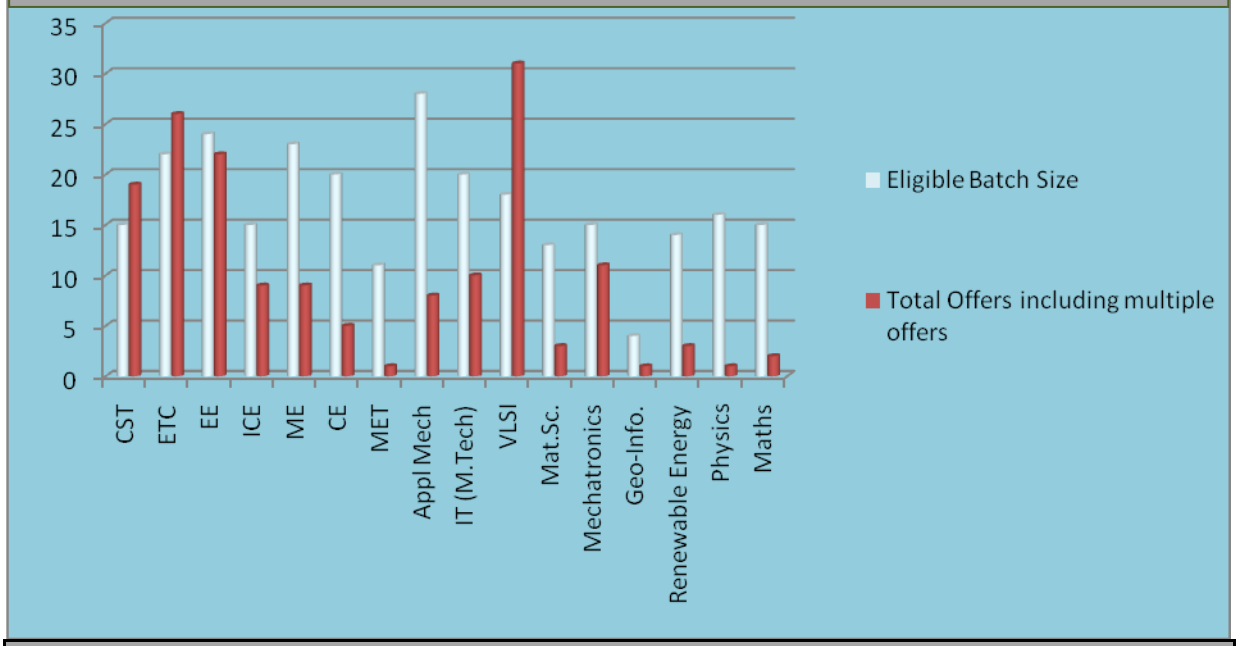
IIEST-Shibpur : Year-wise Eligible Batch Size vs. Total Offers made through On/Off-Campus Process for UG placement



IIEST-Shibpur : Placement Statistics of UG students of 2016 passout batch

Department	CST	ETC	EE	IT	ME	CE	MET	MIN	ARCH	AERO	Total
Official Batch Size	63	37	60	46	58	88	16	28	13	15	424
Interested / Eligible Batch Size	61	35	56	43	54	81	16	28	13	14	401
No. Of selection proceses held	29	29	33	25	46	21	19	13	1	11	
Total No.of Offers for UG	111	72	89	78	77	83	15	31	0	12	566

IIEST-Shibpur : Year-wise Eligible Batch Size vs. Total Offers made through On/Off-Campus Process for PG placement.



IIEST-Shibpur : Placement Statistics of PG students of 2016 passout batch

Department	CST	ETC	EE	ICE	ME	CE	MET	Aerospace	IT (M.Tech)	VLSI	Mat.Sc.	Mechatronics	Bio-Informatics	Renewable	Physics	Maths	Chemistry	Total
Eligible Batch Size	15	22	24	15	23	20	11	28	20	18	13	15	4	14	16	15	22	295
selection proceses held	10	13	10	11	10	9	4	11	12	17	9	12	5	5	1	5	3	
No.of Offers for PG	19	26	22	9	9	5	1	8	10	31	3	11	1	3	1	2	5	166

Our Recruiters over recent years

COMPANIES VISITING IIESTS DURING RECENT YEARS FOR ON / OFF-CAMPUS RECRUITMENT PROCESS

S. No	Name of the visiting Company	2010	2011	2012	2013	2014	2015	2016
1	A.M.W.		■					
2	Aakash Institute						■	■
3	ABB Ltd.				■	■		
4	Accelaries Business Solutions P.Ltd.		■	■	■	■		
5	Accenture India		■	■		■	■	■
6	Adhunik Power	■						
7	ADP India.		■					
8	Afcons Infrastructure Ltd.		■	■	■			
9	Alfatek Systems				■	■		
10	Aircon							■
11	Airovent							■
12	Alstom Ltd.				■			
13	Alstom Projects			■				
14	Amazon			■		■	■	
15	Anshin Software	■	■					
16	Ashiana	■						
17	Atos			■				
18	Babtech Consultants			■				
19	Balmer Lawrie	■		■		■		
20	Bengal Emta	■						
21	BHEL	■						
22	Blue Star		■		■	■	■	■
23	BOC India	■	■	■	■			
24	Bridge&Roof Co.Ltd.						■	
25	Britania Industries					■		■
26	Broad Ridge		■					
27	C.E.Testing		■	■				
28	Cadence					■		
29	Capgemini		■	■	■			
30	CapitalVia						■	
31	CES		■	■				
32	CESC	■	■	■	■	■	■	■
33	Coal India Ltd.	■	■	■				■
34	Coffee-day Beverages						■	
35	Cosmic Circuits		■	■				
36	CTS		■	■	■	■	■	■
37	Cybage							■
38	Cuprum Bagrodia							■
39	Cummins				■			
40	Daikin							■
41	DCPL	■	■	■	■	■		
42	Deloittee		■	■	■	■	■	■
43	DemagCranes&Comp.	■						
44	Direct-I						■	■
45	Dolsera		■					

S.No	Name of the visiting Company	2010	2011	2012	2013	2014	2015	2016
46	D X Corr							■
47	DVC			■	■			
48	Digital Dynamic		■	■	■	■	■	■
49	Egis India		■					
50	Electro Steel Castings						■	
51	Elegant Marine Services							■
52	E-Tutoring							■
53	Energy Inratech		■					
54	Ericsson India			■	■	■		
55	Essab India	■	■					
56	Essar	■						
57	Essel Mining		■					
58	EXL Infotel				■			
59	EXL Service					■	■	
60	Fi-Tek						■	■
61	Flur Daniel					■		
62	Foster Wheeler				■	■	■	
63	Foster Wheeler Bengal			■				■
64	Gontermann-Peipers		■		■			
65	Google					■		
66	GRSE		■	■				
67	Haldia Petrochemicals	■	■	■		■	■	■
68	Hiland Group					■		
69	Himadri Chemicals		■					
70	Hindalco		■					
71	Hindalco,Mumbai	■						
72	Hindustan Motors.				■	■		
73	Hindusthan National Glass	■	■					
74	HSBC			■	■		■	
75	Hyundai						■	■
76	IBM	■	■	■	■	■	■	■
77	IES Academy		■					
78	Indian Army		■	■	■			
79	Indian Navy			■		■		
80	Infinity Infotech Parks			■				
81	Infosys Technologies	■		■		■	■	■
82	Inoplexus							■
83	Infoway							■
84	I F B Agro Ltd.							■
85	Interra Software	■	■					
86	Interview Street					■		
87	Indian Oil Corporation	■	■	■	■			
88	ITC Infotech.		■					
89	ITD Cementation	■	■		■		■	■
90	Jaibalaji Group	■	■					
91	JCAPCPL						■	

Besides, Final Placements, many students, pre-dominantly from Pre-final Year also had the opportunity for Vacational Training or Summer Internship Programme in reputed industrial / academic institutions - some of them also leading to Pre-Placement Offers.

Glimpses of Activities organized by HRM Department

Mentorship and Counseling Session for students on Innovation and Entrepreneurship			Special Counselling and Remedial Training Programme for deficient students
Open Idea Competition, as a part of Observance of WORLD IP DAY - 2015			Grooming Session for Students
Students' interactive session on Issues Related with Entrepreneurship			CTS – Post Engagement Session
TCS- Student Felicitation			Participation in CII conference on "Financing Innovations- Supporting Smart Ideas"
Collaboration with IIMC- Innovation Park			Participation in Bengal Global Business Summit '2016
Participation in 8th Global IP Convention (GIPC)			Workshop on "Cycle of Development
Invited Lecture on "Driving India's growth through Student and Youth ntrepreneurship" at E-Summit at Calcutta Business School (CBS)			Observance of WORLD IP (Intellectual Property) DAY -2016

Department of Information Technology

About the department

The Department of Information Technology started its journey in the year 2000. It is one of the youngest departments of this 159 years old Institute. The department has produced excellent IT engineers who are serving in different reputed organizations and pursuing higher studies at Institutes of Excellence in India and abroad. The department provides state-of-the-art computational facilities for the students. The strength of the department has been in its diverse areas of research in which it has a remarkable contribution.

Academic Programmes:

Undergraduate Level

Degree offered: B.E. in Information Technology

Sanctioned students' intake: 82

Additional intake through lateral entry in 3rd Semester: 6

Post Graduate Level

Degree offered: M.E. in Information Technology

Sanctioned students' intake: 18

Additional intake through other programmes (i.e. QIP): NIL

Specializations in: Information and Communication Technology

Doctoral & Post Doctoral Research Programme

Degree offered: PhD (Engineering / Science / Humanities & Management Science): PhD in Information Technology

No of Candidates enrolled: 8

No. of Candidates registered: 7

No. of Candidates awarded: 3

Faculty Position:

Sanctioned faculty post …13……. Vacant Post …2……

Faculty profile (in the following table)

Name	Designation	Highest Qualification	Specialisation / Research Area	Contact No. E - mail
Dr. Hafizur Rahaman	Professor	Ph.D	➢Design & Test of VLSI Circuits ➢Network-On-Chip ➢SOC Testing ➢Design & Testing of Cryptographic Hardware ➢Design & Testing of Micro fluidic Bio Chip	rahaman_ h@it.iiests.ac.in
Dr. Santi Prasad Maity	Professor	Ph.D	➢Digital Image Watermarking ➢Wavelets for image de-noising, watermarking, Access control and Error concealment ➢Optimized spread Spectrum watermarking ➢VLSI for watermarking ➢PAPR reduction in multicarrier communication ➢Wireless Channel Estimation ➢Multiuser Detection in MC-CDMA ➢Optical Computing	santipmaity@it.iiests.ac.in
Dr. Arindam Biswas	Associate Professor	Ph.D	➢Digital Geometry ➢Image Processing and Pattern Recognition ➢Medical Image Analysis	abiswas@it.iiests.ac.in barindam@gmail.com Extn. no. 260
Dr. Sukanta Das	Assistant Professor	Ph.D	➢Cellular Automata ➢Distributed Computing	sukanta@it.iiests.ac.in Extn. no. 847
Dr. Tuhina Samanta	Assistant Professor	Ph.D	➢Design of algorithms for VLSI inter connect design	t_samanta@it.iiests.ac.in

			➢Developing of algorithm for Physical design of Digital Micro-fluidic Biochip	
Dr. Prasun Ghosal	Assistant Professor	Ph.D	➢Optimization of Architectural and Layout Level Design of 3D Nanoscale Systems with major thrust on a) Performance Centric, Power Aware Design of Network-on-Chips(NoC) and b) Performance Centric Layout Design of 3D Integrated Circuits ➢Post Silicon Nanoscale Technologies and Computing	p_ghosal@it.iiests.ac.in
Dr. Indrajit Banerjee	Assistant Professor	Ph.D	➢Wireless ad-hoc Sensor Network	ibanerjee@it.iiests.ac.in
Mr. Surajit Kr. Roy	Assistant Professor	M.Tech	➢VLSI Testing ➢3D IC Testing	suraroy@gmail.com
Dr. Chandan Giri	Assistant Professor	Ph.D	➢VLSI digital Circuit Testing ➢System-On-Chip Testing ➢Network-On-Chip Testing	chandangiri@gmail.com
Mr. Shyamalendu Kandar	Assistant Professor	M.Tech.	➢Secret Sharing ➢Visual Cryptography	shyamalendk@it.iiests.ac.in
Dr. Malay Bhattacharyya	Assistant Professor	Ph.D	➢Crowdsourcing ➢Big Data Analysis ➢Computational Biology	malaybhattacharyya@it.iiests.ac.in Extn. no. 847

Awards and Laurels received by the faculty members: -

Name	Award Received	Given by	Year
Hafizur Rahaman	DST-DAAD research fellowship (with Prof. Rolf Drechsler, Professor and Director, Computer Architecture Group, University of Bremen, Germany).	*Indo-German (DST-DAAD) Bilateral Cooperation*	2013-2015
Dr. Prasun Ghosal	Post Doctoral fellowship award in University of North Texas, USA, under Raman Post Doctoral Fellowship grant,	University Grant Commission, New Delhi	June 2013- 2014.
	Vice Chair, Executive Committee of IEEE computer Society (IEEE CS) Technical Committee on VLSI(TCVLSI)	ELSEVIER	2014
	Awarded Outstanding Reviewer status by ELSEVIER	ELSEVIER	2014
	Best Paper Award with a cash prize from IEEE Computer Society and Best presentation award in Soft Computing Section in International Conference on Advances in Electrical Engineering (ICAEE)		2014
Dr. Tuhina Samanta	Post Doctoral fellowship award in University of Central Florida, Orlando, under Raman Post Doctoral Fellowship	University Grant Commission, New Delhi,	July 2014- June 2015
Dr. Malay Bhattacharya	Bioclues Innovation, Research and Development (BIRD) Award	Bioclues Organization	2015
	Sir Visvesvaraya Young Faculty Research Fellow 2015-16	DeitY, Government of India	2015-16

Research area (only mention broad titles without description in detail) :

Below we mention the selected areas of research contributions in made by the department.

A. Systems Architecture and Design of Computer
Architecture, Design,
Testing,
Verification,
Algorithms and
VLSI CAD

B. Theory and Applications of Cellular Automata in
Distributed Computing,
Pattern Recognition,
Traffic Modeling and
VLSI design & Test

C. Digital Image Watermarking and Signal Processing
LBM and Additive watermarking using signal processing tools
High Payload Spread Spectrum watermarking using Wavelets
QIM watermarking for Access control and Error Concealment
Optimized Spread Spectrum watermarking
VLSI architecture for watermarking

D. Digital Geometry and Image Analysis
Shape Analysis
3D Image Analysis
Face Recognition
Document Image Analysis

E. Wireless and Mobile Communication, Sensor Network
PAPR reduction in Multicarrier System
Multiuser Detection in MC-CDMA
Channel estimation
Optimized system design
Efficient Routing protocol
Energy efficient WSN Management

F. Nanoscale Computing and system Design
Optimization of Architectural and Layout Level Design of 3D Nanoscale Systems
with major thrust on
Performance-centric, Power Aware Design of networks-on-Chips (NoC) and
Performance
Centric Layout Design of 3D Integrated Circuits
Post Silicon Nanoscale Technologies and Computing
Memristive Technology, Modeling, and Simulation
DNA Computing

G. Information Management and Analytics
Crowdsourcing
Big Data Analysis
Computational Molecular Biology

Research facilities: (name specific equipment / picture, infrastructure etc)

Computing Facilities:

Model	Specification	Nos.
A. MAIL SERVER & FILE SERVER	X Series 236 @ server (IBM) Intel Single Xeon DP Processor @ 3.2 GHz EM 64T	2
B. SUN SERVER	SUN FIRE V215 SERVER PROCESSOR 2X ULTRA SPARC 111	1
C. ORACLE SERVER	Single or Dual Intel® Xeon® 3.0 GHz processors or Single or Dual Intel® Xeon® 3.2 GHz processors (dependent on model)	1
D. HP XW 4600Workstation	Intel Dual Core 3 GHZ	2
	I3 RAM 4GB Hard Disk 1TB	20
E. HP COMPAQ DX 7200 MICROTOWER & DELL OPTIPLEX 780 Desktop	INTEL P-IV HT 3 GHZ & CORE DUO 2.80 GHZ 2GB DDR2 RAM	180
F. HP Compaq dx7400 MICROTOWER	INTEL CORE 2 DUO 1.60 GHZ 1 GB DDR2 RAM	
G. HP COMPAQ DX 7200 MICROTOWER	INTEL P-IV HT 3 GHZ	

- Wireless Sensor network research facility have various type of sensors and microcontroller board.

ii) Software:

- Windows 98 (SE)
- Red Hat Linux 703 professional
- Norton systems works
- Personal oracle 8015 (Win 98 compatible)
- Visual studio .Net professional (Single user)
- MS office XP (Prof)
- Macromedia flash
- ADOBE Photoshop CS2 version 9 educational paper license
- ADOBE Photoshop CS2 version 9 Edu media kit on CD
- Windows 2000 (OEM Pack)
- Win 2000 server plus (Academic editions) Client license
- Oracle 10G database std-I edition on linux
- McAfee Active Virus Scan P:1 Gold (101 user)
- Adobe Acrobat Professional 9
- Extra Cyber Emulator
- Matlab R2008a (Client Server) (30 user)
- Simulink (5 user)
- Signal Processing Toolbox(5 user)
- ATS for oracle std-I for 1 year
- Media for oracle in CD
- Internet developer suite on windows XP OS
- Sound forge (latest version) Edu full box on CD
- Rational Rose
- Microsoft windows XP prof. Upgrade OLP NL-AE
- Microsoft office 2003 prof. OLP NL-AE
- Microsoft studio 8 Edu paper license
- Microsoft windows XP prof. Media kit on CD
- Microsoft office 2003 prof. Media kit on CD
- Microsoft studio 8 Edu media kit on CD
- 1SE Design Suite Foundation 8.1i,9.1i,10.1i,11.1i, 12.1i, 13.1i
- Chip scope Pro
- Embedded Development kit
- Plan Ahead
- System Generator
- Accel DSP
- ModelSim XE Simulator

iii) Electronics Equipment:

Sl. No.	Name of the Item	Qty
1	Microcontroller Kit SDA 51	12
2	P-N Sequence generator	04
3	Function Generator	09
4	Test ROM for NIFC- 27	01
5	26 pin I/O connector	15
6	PMS DSP 320C 30Trainer KIT	06
7	Parallel Port Cable for DSP C-30	06
8	Input /Output Cable	06
9	Power Supply for SDA –51	12
10	8085 Microprocessor Trainer kit	18
11	8086 Microprocessor Trainer kit	06
12	Digital Trainer kit	08
13	Digital Communication Trainer kit	15
14	Traffic Light simulator Interface Kit (ALS -NIFC-11)	06
15	DAC for ADC Temperature Sensor Dual slope ADC interface for µP trainers(ALS-NIFC-10)	04
16	Interface to study A/D and D/A converter(NIFC-27)	02
17	JP6 of Interface card to Trainer Kit Connector	02
18	Test ROM for NIFC- 01and NIFC-11	01
19	CROSS COMPILER FOR DSP	01
20	DIGITAL STORAGE OSCILLOSCOPE	01
21	CATHODE RAY OSCILLOSCOPE	11
22	SPECTRUM ANALYZER	01
23	Vector Signal Generator	01
24	Spartan-3 AN FPGA Development Board	05
25	Spartan-3 FPGA Development Board	01
26	Virtex-5 FPGA Development Board	02
27	Vector Signal Analyzer	01
29	Agilent N5182A-403 Calibrated AWGN	01

Name of the laboratories:

Laboratory description in the curriculum	Exclusive use / shared	Number of students	Number of experiments	Quality of instruments	Laboratory manuals
Computer Lab-I	Exclusive	66	40 / semester	All computers in the laboratory have dual core and core2Duo	Manuals for the laboratory instructions are uploaded on the website.
Computer Lab-II	Exclusive	66	40 / semester	All computers in the laboratory have P4 configuration	Manuals for the laboratory instructions are uploaded on the website.
Computer Lab-III	Exclusive	40			

Computer Lab-IV	Exclusive	50			
ME Lab I	Exclusive	10	9 / semester Used for research related works	All computers in the laboratory have Intel i5 configuration	
ME Lab II	Exclusive	10	9 / semester Used for research related works		
Electronics and Communication Lab	Exclusive	30	25	Instruments	
Research Lab	Exclusive	10			

Support staff position:

Sanctioned technical post ……

Technical staff profile (in the following table)

TECHNICAL ASSISTANT				
Name	Designation	Highest Qualification	Contact No	E-mail
Soma Sardar	Technical Assistant	D.C.S.T, MCA, M.TECH	9433487298	somabeit@gmail.com
Soumen Gope	Technical Assistant	D.C.S.T, B.TECH, M.TECH	9433985637	soumencse@gmail.com
Souvik Patra	Technical Assistant	D.C.S.T, B.TECH, M.TECH	9433730433	souvik.patra804@gmail.com
Subhajit Biswas	Technical Assistant	D.C.S.T, AMIE(PURSUING)	9830146357	subhajitbesu@gmail.com
Snehashis Saha	Technical Assistant	M.Sc(Math),P.G.D.C.A, M.SC(Computer)	9830573478	snehasissaha@yahoo.com
Amiya Ratan Rout	Technical Assistant	M.Sc(Computer),M.TECH	9232606401	shiboham@gmail.com
Bishnu Pada choudhury	Technical Assistant	B.Sc, MCA	9432926952	bisbnu1@yahoo.com
Suman Chakraborty	Technical Assistant	B.TECH, M.TECH	9831399726	sumanrbrbehala@gmail.com
Sanchayita Dhara	Technical Assistant	D.E.T.C, AMIE(Pursuing)	9433957440	sanchayita.dhara@gmail.com
OFFICE STAFF				
Malay Dhir	Office Assistant	B.com	9831365531	malay_dhir@yahoo.co.in
Suman Sarkar	Group D	Madhyamik	9007612086	sarkar_becit@yahoo.co.in
Dinabandhu Sadhukhan	Group D	Madhyamik	9062477213	

Ongoing Sponsored Research / projects: (mention area)

Dr. Tuhina Samanta

Fault Tolerant Routing in Wireless Sensor Networks , Rs. 7,80,000/-	University Grant Commission, New Delhi
Design and Analysis of Algorithms for Design Automation of Digital Microfluidic Biochip, Rs. 3,35,000/-	AICTE, New Delhi

Dr. Indrajit Banerjee:

"Fault Tolerant Routing in Wireless Sensor Networks	UGC

Ongoing :

"Efficient Test Infrastructure Design for 3D Multi-Core Integrated Circuits", Sponsored by UGC, 3years (2011-14), Completion date 31st June 2014.

3D TV - 3D View from All Directions without glasses ,Sponsor: Council of Scientific and Industrial Research (CSIR), Government of India (GOI)CSIR Scheme No: 22(2769)/11

Generation, Decomposition, and Analysis of the Isothetic Polygons in Digital Geometric Paradigm Sponsor: University Grants Commision (UGC), Government of India (GOI)

Details of publications of each faculty member (2015 – 16)

Journal …22

Conference …42

Books / Monograms …7

Seminar / Workshops / Conferences / Training programme organized by the department (2015 - 16)

- Emerging & Post CMOS Technology , June 16- 18 ,2014
- Research Promotion Workshop on Digital Geometry, June 23-24 ,2014
- Symposium on Problems in Scientific Research , 9th March, 2015
- In-house computer training course on computer & LAN literacy & office related software, May 18-22,2015
- Industry Institute Interaction For Labview Workshop , January 19-23 , 2015
- Professional English language training (for 6th semester students)---Sponsored by TEQIP Duration: 27th January 2016 to 10th March 2016

Advancements under TEQIP – Phase II

- MATLAB Software (10 users)
- Arbitrary Function Generator
- Digital Storage Oscilloscope
- Network Simulator
- LCD Panel
- Monochrome Frame Grabber
- Online Biometric Kit
- Sensor Laboratory Equipment
- High Performance Environment for Image Analysis and Image Understanding

Foreign visits and Invited Lectures

Prof. Santi P. Maity:

1. 22nd International Conference on Pattern Recognition 2014 , 24-28th August, 2014, Stockholm, Sweden (attended and presented research paper)

Mr. Surajit Roy:

1. Attended VLSI-SOC 2015 conference and presented the work "A Thermal Estimation Model for 3D IC Using Liquid Cooled Microchannels and Thermal TSVs " at Daejeon, Korea 5-7 October, 2015.

Dr. Tuhina Samanta:

1. Invited presentation in International Conference on Green Computing and Internet of Things (ICGCIoT 2015), Galgotia College of Engineering and Technology, October 2015, Greater Noida
2. Invited talk in a Faculty development program on "VLSI System Design" at Calcutta institute of Engineering and Technology, September 2015, Tollygunge
3. Laboratory visit and knowledge sharing in the department of computer and electrical engineering, Duke university, Durham, hosted by Prof. Krishnendu Chakrabarty, William H. Younger Distinguished Professor of Engineering, Department of Electrical and Computer Engineering April 2015.
4. An open talk on "Sensor localization and scheduling scheme" in the department of computer and electrical engineering, University of Central Florida, during post doctoral fellowship of Dr. Tuhina Samanta at UCF, hosted by Prof. Mainak Chatterjee, Associate Professor, department of computer and electrical engineering, University of Central Florida, November 2014.
5. Laboratory visit and an experimental knowledge and idea sharing with Prof. Suman Chakraborty and his research scholar at Microfluidics and Microscale Transport Processes Laboratory, Department of Mechanical Engineering, Indian Institute of Technology, Kharagpur, May 2014.

Dr. Malay Bhattarcharya:

1. Attended AAAI Spring Symposium Series and presented the work "The Curse of Competitive Crowd Intelligence" at Stanford University, Palo Alto, USA, during March 22, 2016.

Dr. Indrajit Banerjee:

1. Has given lecture on "UNIX Command" at Department of EE, IIEST Shibpur a TEQIP –II Sponsored Workshop on 26thAugust 2016.
2. Has given lecture on "Design of Internet" on MCKV Institute of Engineering at FDP on 16th March 2016.

3. Has given Invited Lecture on “Multi agent system design with WSN” on One day Workshop on Networking and Multi-agent system organized by Pailan College of Management and Technology on 18th November 2015.
4. Has given Invited Lecture on “Digital India: an application of WSN” at Central Institute of Engineering and \Management, Tollygunge on 22nd June 2015.
5. Has Given Invited talk on “Design and development of WSN with its Emerging Application” at EECS, UCF USA on 29th April, 2015

Delivered Invited talk:

1. “Cognitive Radio: Scopes and Challenges for Future Wireless Communication”, on 27th January, 2014 at Faculty development program (FDP) on "Fundamentals of fiber and wireless communications for the next generation systems" at Institute of Radio Physics and Electronics, University of Kolkata.
2. “Information Security and Media Protection” on 5th April, 2014 in Seminar on Web page design and information security at Ellite Institute of Engineering and Management, Sodepur, Kolkata.
3. “Convex Optimization and Some Applications on Signal Processing and Communications, on 12 th June, 2014 workshop on Advanced Optimization Techniques in Engineering Application (OTA 2014) held on 10th-14th June 2014 at National Institute of Technology, Durgapur.
4. “Image Reconstruction from Sparse Representation” on 17th June, 2014 Short Term Course on Computer Vision and Pattern Recognition (CVPR-2014) held on 16th-20th June 2014 at National Institute of Technology, Durgapur (Pre-lunch session).
5. “Introduction to Pattern Recognition, Fuzzy C-means clustering and some applications” on 17th June, 2014 Short Term Course on Computer Vision and Pattern Recognition (CVPR-2014) held on 16th-20th June 2014 at National Institute of Technology, Durgapur (Post-lunch session).
6. “ Energy Efficient Cognitive Radio Network" on 9th July, 2015 at Faculty Development Program on “Recent Advances in Computer Networking” organized by the Dept. of Comp. Sc. & Engg. of RCCIIT, Kolkata, held from 7th July to 11th July.
7. “Energy Efficient Cognitive Radio Network: Scope and Future Challenges” 3rd International Conference on 'Computing, Communication and Sensor Network *December, Puri, Odisha, 12-14th, 2014* .
8. Delivered couples of guest lectures as a part of the course on Advanced Topics in VLSI Systems (CSCE 6933) during Winter 2013 at Department of CSE, University of North Texas, USA.
9. Invited talk on "3D NoC: A Promising Alternative For Tomorrow's Nanoscale System Design" at JIS College of Engineering, India during September 2014.

Tutorial talk:

1. International Conference on Contemporary Computing and Informatics (IC3I 2014), Mysore on 27-29th November, 2014.
   Title of Tutorial- Digital Watermarking: Optimization Framework, Random Gain Attack and Compressed Sensing
2. International Image Processing, Applications and System Conference (IPAS 2014) on 5-7th November, Hammamet, Tunisia (over Skype)
   Title of Tutorial- Digital Image Watermarking: Optimization Framework, Random Gain Attack and Compressed Sensing.

Visitors to your Department (Indian & Foreign)

1. Prof. Mainak Chatterjee, Associate Professor, department of computer and electrical engineering, University of Central Florida: One day seminar on August 2015, Venue Department of I.T., IIESTS.
2. Dr. Shamik Sengupta Assistant Professor Department of Computer Science & Engineering University of Nevada, Reno One day seminar on August 2015, Venue Department of I.T., IIESTS

Training and Placement

Sl. No.	Date of Visit	Company Visited	Student Intake	
			UG	PG
1		LEXMARK(PPO)	1	
2	14^{TH} & 21^{ST} AUGUST 2015	ZS ASSOCIATE	3	
3	24.08.2015	TCS(EIS,CTO,DIGITAL)	1	1
4	25.08.2015	EWC	3	
5	01.09.2015	TCS	7	
6	02 & 03.09.2015	ACCENTURE	16	
7	04.09.2015	WIPRO	15	3
8	7 & 8.09.2015	IBM	6	2
9	09 & 10.09.2015	CTS	15	3
10	12 & 14.09.2015	INFOSYS	6	
11	29.09..2015	DYNAMIC DIGITAL	2	
12	03.10.2015	CYBAGE	1	

New Academic / Research Initiatives

Academic Collaboration

1.Laboratory visit and knowledge sharing in the department of computer and electrical engineering, Duke university, Durham, hosted by Prof. Krishnendu Chakrabarty, William H. Younger Distinguished Professor of Engineering, Department of Electrical and Computer Engineering April 2015.

Detailed Publications (2015 – 2016)

Journal

1. S. K. Roy, C. Giri and H. Rahaman**,** Optimization of Test Architecture in 3D Stacked ICs for Partial Stack/Complete Stack using Hard SOCs, Accepted for publication in Journal of IEEE Computer and Digital Techniques, 9(5), pp. 268-274, 2015
2. Kamalika Bhattacharjee and Sukanta Das: Reversibility of d-State Finite Cellular Automata. J. Cellular Automata 11(2-3): 213-245 (2016)

3.Biswanath Sethi, Souvik Roy and Sukanta Das: Asynchronous Cellular Automata and Pattern Classification. Complexity. doi: 10.1002/cplx.21749, (2016)

4.Subhamita Mukherjee, Tuhina Samanta, "Distributed Scan Like Fault Detection and Test Optimization for Digital Microfluidic Biochips", Journal of Electronic Testing: Theory and Applications (Springer Verlag), Volume 31(3), June 2015, pages: 311 - 319.

5.5. Indrajit Banerjee, Prasenjit Chanak, Tuhina Samanta, Hafizur Rahaman, "Effective Fault Detection and Routing (EFDR) Scheme for Wireless Sensor Network", in Elsevier journal of Computers & Electrical Engineering, Volume 40, Issue 2, Feb. 2014, pages 291 - 306.

6.S. Kandar A Novel 3-4 Image Secret sharing scheme", ICACCI-2015, Kochi, 2015 pp-2072-2075 [IEEE xplore**]**

7.S. Kandar A (k, n) Multi Secret Sharing Scheme Using Two Variable One Way Function with Less Public Values." Information Systems Security,Vol 9478 pp 532-541 [**LNCS, Springer**]

8.M. Bhattacharyya, J. Nath and S. Bandyopadhyay, Identifying Significant microRNA-mRNA Pairs Associated with Breast Cancer Subtypes, Molecular Biology Reports, 43(7):591-599, 2016, DOI: 10.1007/s11033-016-4021-z. (IF 2015: 1.698)

9.A. Roy and M. Bhattacharyya, Identifying MicroRNAs related to Alzheimer's Disease from Differential Methylation Signatures, Gene Reports, 4:104-111, 2016, DOI: 10.1016/j.genrep.2016.04.006.

10.M. Bhattacharyya, J. Nath and S. Bandyopadhyay, MicroRNA Signatures Highlight New Breast Cancer Subtypes, Gene, 556(2):192-198, 2015, DOI: 10.1016/j.gene.2014.11.053. (IF 2015: 2.319)

11.M. Bhattacharyya and S. Bandyopadhyay, Finding Quasi Core with Simulated Stacked Neural Networks,Information Sciences, 294:1-14, 2015, DOI: 10.1016/j.ins.2014.09.032. (IF 2015: 3.364)

12.Sarkar, A., A. Biswas, M. Dutt, P. Bhowmick, and B. B. Bhattacharya (2016). A Linear-Time Algorithm to Compute the Triangular Hull of a Digital Ob- ject. Discrete Applied Mathematics. in press, doi:10.1016 /j.dam.2016.01.014, online:http://www.sciencedirect.com/science/article/pii/S0166218X16300014.

13.Bandyopadhyay, O., A. Biswas, and B. B. Bhattacharya (2016). Classication of Long-Bone Fractures basedon Digital-Geometric Analysis of X-ray images. Pattern Recognition and Image Analysis: Advances in Math-ematical Theory and Applications. accepted.

14.Karmakar, N., A. Biswas, and P. Bhowmick (2016). Reeb Graph based Segmentation of Articulated Components of 3D Digital Objects. Theoretical Computer Science 624. DOI = 10.1016/j.tcs.2015.11.013, 25-40.

15.Bandyopadhyay, O., A. Biswas, and B. B. Bhattacharya (2016). Long-bone Fracture Detection in Digital X-ray Images Based on Digital-Geometric Techniques. Computer Methods and Programs in Biomedicine 123, 2-14.

16.Bera, S., A. Biswas, and B. B. Bhattacharya (2015). A Fast and Automated Granulometric Image Analysis Based on Digital Geometry. Fundamenta Informaticae 138, 321-338.

17.Surajit Kumar Roy, Chandan Giri and Hafizur Rahaman**,** Optimization of Test Architecture in 3D Stacked ICs for Partial Stack/Complete Stack using Hard SOCs, in IEEE Computer and Digital Techniques (CDT), 9(5), pp. 268-274, 2015.
18.Suman Bhowmik and Chandan Giri**,** "A Fuzzy Communication Model of Sensor Nodes in Wireless Sensor Network", in Intl. Journal of Sensor Network, Inderscience, 2015. (in Press).
19.Surajit Kumar Roy, Chandan Giri and Hafizur Rahaman, "Optimization of Test Wrapper for TSV based 3D SOCs", Accepted for publication in Journal of Electronic Testing: Theory and Applications, Springe, 2016. (in Press),.
20.Prasenjit Chanak, Indrajit Banerjee: Fuzzy rule-based faulty node classification and management scheme for large scale wireless sensor networks. Expert Syst. Appl. 45: 307-321 (2016)
21.Prasenjit Chanak, Indrajit Banerjee:Mobile sink based fault diagnosis scheme for wireless sensor networks. Journal of Systems and Software 119: 45-57 (2016)
22.Prasenjit Chanak, Indrajit Banerjee: Load management scheme for energy holes reduction in wireless sensor networks.Computers & Electrical Engineering 48: 343-357 (2015)
23.Nimisha Ghosh, Indrajit Banerjee:An energy-efficient path determination strategy for mobile data collectors in wireless sensor network. Computers & Electrical Engineering 48: 417-435 (2015)
24.Prasenjit Chanak, Indrajit Banerjee: Robert Simon Sherratt:Simultaneous mobile sink allocation in home environments with applications in mobile consumer robotics. IEEE Trans. Consumer Electronics 61(2): 181-188 (2015)

Conference

1.S. K. Roy, K. Roy, C. Giri and H. Rahaman, "Recovery of Faulty TSVs in 3D SOC" in proc. ISQED, pp. 106-110, 2015.
2. S. K. Roy, H. Rahaman and Chandan Giri, "A Thermal Estimation Model for 3D IC Using Liquid Cooled Microchannels and Thermal TSVs", Accepted for publication at IFIP/IEEE VLSI-SOC, pp. 122-127, 2015
3. Nazma Naskar and Sukanta Das: Scalability of non-uniform Cellular Automata having only point state attractors. Accepted in ACRI 2016 for presentation
4. Kamalika Bhattacharjee, Dipanjyoti Paul and Sukanta Das: Pseudorandom Pattern Generation using 3-state Cellular Automata. Accepted in ACRI 2016 for presentation
5. Prasun Seal, Mainak Chatterjee and Tuhina Samanta, "Robust energy Efficient Multipath Routing Protocol for Wireless Sensor Networks, in proceedings of IEEE International Symposium on Nanoelectronic and Information Systems, Indore, India, 2015, pages: 35 - 40.
6.Benazir Salma, Mainak Chatterjee and Tuhina Samanta, "Extensive Game model for Concurrent Routing in Wireless Sensor Network", in proceedings of IEEE International Conference on Green Computing and Internet of Things, Greater Noida, October 2015, pages 1151 - 1155.
7.Benazir Salma, Mainak Chatterjee and Tuhina Samanta, "A Game Theoretic Routing Framework Based on Energy-Delay Conservation in WSNs", accepted for publication at 2015 IEEE Tenth International Conference on Intelligent Sensors, Sensor Networks and Information Processing, Singapore, April 2015, pages 1 - 5.
8.Mrinmoy Sen, Indrajit Banerjee, Mainak Chatterjee, and Tuhina Samanta, "Sensor Localization using Received Signal Strength Measurements for Obstructed Wireless Sensor Networks with Noisy Channels, in proceedings of 2015 IEEE Wireless Communications and Networking Conference (WCNC) - Workshop - Energy Efficiency in the Internet of Things, and Internet of Things for Energy Efficiency (IEEE WCNC 2015 - Workshop - E2IoT), USA, March 2015, pages 47 - 51.
9.Partha Pratim Saha, Sumanto Saha and Tuhina Samanta, "Rectilinear Steiner Clock Tree Routing Technique with Buffer Insertion in Presence of Obstacles", in proceedings of

IEEE 28th International Conference on VLSI Design, Bangalore, India, January 2015, pages 447 – 451.
10. Supantha Das, Indrajit Banerjee, Mainak Chatterjee and TuhinaSamanta, "Performance analysis of TDMA Based Data Transmission in WSN", in proceedings of IEEE 2014 14th International Conference on Intelligent Systems Design and Applications (ISDA 14), Japan, November 2014, pages 107 - 112.
11. Indrajit Pan, Tuhina Samanta, "Voltage Driven Electrowetting based Microfluidic Operations for Efficient Droplet Routing in Digital Microfluidic Biochips", in the proceedings of the 10th IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA'14) Senigallia, ITALY, September 2014, pages 1 - 6.
12. S. Chatterjee, S. K. Mridha, S. Bhattacharyya, S. Shakhari and M. Bhattacharyya, Dynamic Congestion Analysis for Better Traffic Management using Social Media, S. Das and S. C. Satapathy (Eds.), *Springer Smart Innovation, Systems and Technologies* 51, Vol. 2, Chapter 09, pp. 85-95, 2016, DOI: 10.1007/978-3-319-30927-9_9 (ISBN: 978-3-319-30926-2). [Appeared in the*International Conference on ICT for Intelligent Systems* (ICTIS), Ahmedabad, India, November 28-29, 2015]
13. M. Bhattacharyya, The Curse of Competitive Crowd Intelligence, In *Proceedings of the AAAI 2016 Spring Symposium on Intelligent Systems for Supporting Distributed Human Teamwork* (Teamwork), Palo Alto, USA, March 21-23, *SS*-16, pp. 264-267, AAAI Press, 2016 (ISBN: 978-1-577-35754-4).
14. (Member Review Committee) 5th International Conference on Informatics, Electronics & Vision (5th ICIEV), 13 14 May, 2016, Dhaka, Bangladesh.
15. CTIC-2016:(Member Program Committee) 6th International Workshop on Computational Topology in Image Context, Marseille, France June 15-17, 2016.
16. IWCIA-2015:(Program Chair) Seventeenth International Workshop on Combinatorial Image Analysis, November 24-27, 2015, ISI, Kolkata, India.
17. IWCIA-2015:(Program Chair) Seventeenth International Workshop on Combinatorial Image Analysis, November 24-27, 2015, ISI, Kolkata, India.
18. Surajit Kumar Roy, Kaustav Roy, Hafizur Rahaman and Chanda Giri, "Recovery of faulty TSVs in 3D ICs", in the proc. of IEEE 16th International Symposium on Quality Electronic Design (ISQED), pp: 533-536, 2015.
19. Tanik Seikh, Chandan Giri and Sudip Naskar, Shibaji Bandyopadhyay, "Textual Entailment Using Different Similarity Metrics" accepted in 16th International Conference on Intelligent Text Processing and Computational Linguistics(CICLing), pp:14–20, April, 2015, Cairo, Egypt, 2015. (Springer: *Lecture Notes in Computer Science*).
20. Tanusree Kaibartta, Chandan Giri, HafizurRahaman, Debesh K. Das, "Optimizing Test Time for Core-Based 3-D Integrated Circuits by Genetic Algorithm", in Proc. of IEEE ASQED, pp: 62-67, 4-5th August, 2015, Malaysia.
21. Surajit Kunar Roy, Hafizur Rahaman and Chandan Giri, "A Thermal Estimation Model for 3D IC Using Liquid Cooled Microchannels and Thermal TSVs", in Proc. of IFIP/IEEE VLSI-SOC, pp. 122-127, 2015.
22. Sumit Dhuwalia, Nikhil Khemka, Prince Gupta, Surajit Kumar Roy, and Chandan Giri, "Test Time Optimization for 3D-SICs having multiple towers", Proc. Intl. Conf. on iNIS, 2015, pp: 21-23 Dec, 2015, Indore, India.
23. Suman Bhowmik, Sushovan Das and Chandan Giri, *"Tree Based Tracking Target in Wireless Sensor Network*: Acceptedd for publication in Fourth International Symposium on Intelligent Informatics (ISI) 2016.
24. Shuvajyoti Paul, Indrajit Banerjee: DAPR: Delay-Aware Priority Based Routing Scheme to Alleviate Congestion in Wireless Sensor Networks. ICIT 2015: 31-36
25. Riddhiman sett,Indrajit Banerjee:An overhearing based routing scheme for Wireless Sensor Networks. ICACCI 2015: 2076-2082
26. Anibroto Sarkar, Indrajit Banerjee: A grouping based prioritized sensor data fusion algorithm for deciding the state of a coal mine. ICACCI 2015: 2083-2088
27. Rupam Some, Indrajit Banerjee:A novel routing protocol using heterogeneous Zigbee modules for mobile sensor network.ICACCI 2015: 2096-2102
28. Mrinmoy Sen, Indrajit Banerjee, Mainak Chatterjee, Tuhina Samanta:Sensor localization using received signal strength measurements for obstructed wireless sensor networks with noisy channels. WCNC Workshops 2015: 47-51.

29.Dutt, M. and A. Biswas (2016). Boundary and Shape Complexity of a Digital Object. In: 5th International Symposium Computational Modeling of Objects Presented in Images: Fundamentals, Methods, and Applications: CompIMAGE'16, Niagara Falls, New York, USA. Springer-Verlag. Lecture Notes in Computer Science (LNCS).
30.Kundu, D. and A. Biswas (2016). Finding Shortest Isothetic Path inside a 3D Digital Object. In: 5th International Symposium Computational Modeling of Objects Presented in Images: Fundamentals, Methods, and Applications: CompIMAGE'16, Niagara Falls, New York, USA. Springer-Verlag. Lecture Notes in Computer Science (LNCS).
31.Mukherjee, S., O. Bandyopadhyay, and A. Biswas (2016). Automated Brain Tumor Diagnosis and SeveritycvAnalysis from Brain MRI. In: 5th International Symposium Computational Modeling of Objects Presentedcvin Images: Fundamentals, Methods, and Applications: CompIMAGE'16, Niagara Falls, New York, USA.cvSpringer-Verlag. Lecture Notes in Computer Science (LNCS).
32.Sarkar, A., A. Biswas, M. Dutt, and A. Bhattacharya (2016). Finding Largest Rectangle inside a Digital Object. In: 6th International Workshop on Computational Topology in Image Context: CTIC 2016, Marseille, France. Vol. 9667. Springer-Verlag. Lecture Notes in Computer Science (LNCS), pp.170-179.
33.Karmakar, N. and A. Biswas (2016). Shape Matching of 3D Topologically Segmented Objects. In: 6th International Workshop on Computational Topology in Image Context: CTIC 2016, Marseille, France. Vol. 9667. Springer-Verlag. Lecture Notes in Computer Science (LNCS), pp.170-179.
34.Karmakar, N. and A. Biswas (2016). Construction of an Approximate 3D Orthogonal Convex Skull. In: 6th International Workshop on Computational Topology in Image Context: CTIC 2016, Marseille, France. Vol. 9667. Springer-Verlag. Lecture Notes in Computer Science (LNCS), pp.180-192.
35.Sarkar, A., A. Biswas, S. Mondal, and M. Dutt (2016). Finding Shortest Triangular Path in a Digital Object. In: 19th IAPR International Conference on Discrete Geometry for Computer Imagery: DGCI'16, Nantes, France. Vol. 9647. Springer-Verlag. Lecture Notes in Computer Science (LNCS), pp.206-218.
36.Sarkar, A., A. Biswas, M. Dutt, and A. Bhattacharya (2015). Generation of Random Digital Curves Using Combinatorial Techniques. In: Conference on Algorithms and Discrete Applied Mathematics: CALDAM'15. Vol. 8959. Kanpur, India: Lecture Notes in Computer Science (LNCS), pp.286 -297.
37.Sarkar, A., A. Biswas, M. Dutt, and A. Bhattacharya (2015). Detection of Bifurcation Angle in a Retinal Fundus Image. In: Eighth International Conference on Advances in Pattern Recognition (ICAPR), 2015. Vol. 8959. Kolkata, ISI, India: IEEE Explore, pp.1-6.
38.Sarkar, A., A. Biswas, M. Dutt, and A. Bhattacharya (2015). Generation of Random Triangular Digital Curves using Combinatorial Techniques. In: 6th International Conference on Pattern Recognition and Machine Intelligence (PReMI'15). Vol. 9124. Warsaw, Poland: Lecture Notes in Computer Science (LNCS), pp.136 - 145.
39.Dutt, M., A. Biswas, and B. B. Bhattacharya (2015). Enumeration of Shortest Isothetic Paths inside a Dig- ital Object. In: 6th International Conference on Pattern Recognition and Machine Intelligence (PReMI'15). Vol. 9124. Warsaw, Poland: Lecture Notes in Computer Science (LNCS), pp.105 -115.
40.Karmakar, N. and A. Biswas (2015). Construction of 3D orthogonal Convex Hull of a Digital Object. In: 17th International Workshop on Combinatorial Image Analysis: IWCIA'15. Vol. 9448. DOI: 10.1007/978-3-319-26145-4 10. Kolkata, India: Lecture Notes in Computer Science (LNCS), pp.125-142.
41.Phani, S., S. Lahiri, and A. Biswas (2015). Authorship Attribution in Bengali Language. In: Twelfth International Conference on Natural Language Processing (ICON-2015). Trivandrum, India.
42.Dutt, M., A. Biswas, and B. Nagy (2015). Number of Shortest Paths in Triangular Grid for 1- and 2-Neighborhoods. In: 17th International Workshop on Combinatorial Image Analysis: IWCIA'15. Vol. 9448. DOI: 10.1007/978-3-319-26145-4 10. Kolkata, India: Lecture Notes in Computer Science (LNCS), pp.115-124.

Books / Monograms

1.Data Abstraction and Problem Solving with JAVATM Walls and Mirrors , 3rd Edition 2011, Janet J Prichard [Bryant University] ,Frank Carrano [University of Rock Island], Indrajit Banerjee [Bengal Engineering and Science University, Shibpur] (International Edition contribution), (International Edition contribution) Pearson. ISBN 13:978-0-273-75120-5.

2.Indrajit Pan, and Tuhina Samanta, "Weighted Optimization of Various Parameters for Droplet Routing in Digital Microfluidic Biochips", Advances in Intelligent Systems and Computing (ISI 13), Volume 235, pages: 131 – 139, Springer Cham Heidelberg, London.

3.Indrajit Banerjee, Anirban Datta, Sonalisa Pal, Soujanya chatterjee, and Tuhina Samanta, "A Novel Fault Detection and Replacement Scheme in WSN, Advances in Intelligent Systems and Computing (ISI 13), Volume 235, pages: 303 – 310, Springer Cham Heidelberg, London.

4.Santanu Datta, Indrajit Banerjee, and Tuhina Samanta, "Mobile Sink Management for Nonuniformly Distributed Sensor Node Coverage using a Game Theoretic Approach", Advances in Intelligent Systems and Computing (ISI 13), Volume 235, pages: 311 – 319.

5.Prasun Ghosal, Saraju Mohanty, "3D NoC: A Promising Alternative for Tomorrow's Nanosystem Design", in CMOS and Post-CMOS Perspectives of Electronic Device Scaling, Editors - Saraju P. Mohanty and Ashok Srivastava, IET (IEEE Counterpart of UK) [Accepted, Manuscript under preparation, 2015 (to be published)]

6.Prasun Ghosal, Mayukh Sarkar, Saraju Mohanty, "A New Paradigm towards Performance Centric Computation beyond CMOS: DNA Computing", in CMOS and Post-CMOS Perspectives of Electronic Device Scaling, Editors - Saraju P. Mohanty and Ashok Srivastava, IET (IEEE Counterpart of UK) [Accepted, Manuscript under preparation, 2015 (to be published)]

7.Chapter Title - An Advanced Strategy for Droplet Routing in Digital Microfluidic Biochip using Ant Colony Optimization
Authors: Indrajit Pan, Tuhina Samanta
Book Name: "Handbook of Research on Swarm Intelligence in Engineering."
Publisher Name: IGI Global, Pennsylvania 17033-1240, USA, 2015

Department of Mathematics

About the Department

Since the inception of Bengal Engineering College, the Department of Mathematics earned a glorious heritage of conducting research activities in various fields of Applied Mathematics. The Department undertakes teaching Mathematics in various fields like Probability, Statistics, Operations Research, Numerical Analysis and Computational Techniques using computers, to undergraduate and postgraduate students in various branches of Engineering. The Department started a two year M.Sc. (Applied Mathematics) programme in the year 2000 with an intake of 25 students and it is successfully running in the Department. Apart from regular routine work like teaching, setting question papers and evaluation of answer scripts in various examinations of this institution, the Department conducts M.Sc. and Ph.D. admission every year. The faculty members are also involved in many other academic and administrative activities of the Institution. The Department has a significant role in research. All the faculty members of this Department are involved in research activities in various fields of Pure and Applied Mathematics e.g. Fracture Mechanics, Thermoelasticity, Operations Research and Optimization, Reliability Theory, Statistics, Functional Analysis, Fuzzy Set Theory, Dynamical Systems, Mathematical Ecology, General Relativity, Cosmology, Mathematical Modeling in Epidemiology, Information Theory, Mathematical Biology, Quantum Mechanics, Fluid Dynamics, Financial Mathematics, Mathematical Elasticity, Nonlinear Data Analysis, Neural Network etc. As a mark of this, the number of research scholars awarded Ph.D. from this Department and the number of research publications in various reputed journals are increasing steadily. At present **about 71 research scholars are registered for Ph.D. programme** and currently **10** students have been enrolled for Ph.D. programme in the year 2016.

17 research scholars have submitted their Ph.D. thesis and 4 research scholars have been awarded Ph.D. degree during the period March 16 to July 16. In the last five years **38 research scholars** of this Department have been awarded **Ph.D. degree.**

Academic Programmes: The Department started its Academic Programme, from the very beginning, since the foundation of this Institution in the year 1856.

Undergraduate Level:

At present, the Department is offering **11 courses** in undergraduate level in different branches of Engineering and Architecture. **In every branch of Engineering, Undergraduate programme has a Mathematics course in each of the first three semesters (approximately 640+665+585= 1890 students**). Department of Mathematics also offers **three elective** courses in **B.E. 8th semester** and **two open elective** courses for **5th semester** students of Dual Degree B.Tech-M.Tech. This Department also teaches **two courses in the B.Arch**. programme in the first two semesters.

Post Graduate Level

The Department also offers Mathematics courses in the **Master of Engineering (M. E.)** programmes to almost all engineering branches. At present, the Department of Mathematics is offering **3 courses** together with **three sessionals** to **all Engineering branches** in **Post Graduate level**. **Master of Science (M.Sc.)** programme in **Applied Mathematics** has been started in the year 2000. The programme contains **24 courses**, **2 sessional papers** together with **project thesis and viva-voce**.

I. Degree offered	**M.Sc in Applied Mathematics**
II. Sanctioned students' intake	**30**
III. Additional intake through other programmes (i.e. QIP)	Nil
IV. Specialisations in	Solid Mechanics, Operations Research, Mathematical Biology

Doctoral & Post Doctoral Research Programme

There was a heritage of doing research work by the faculty members of the Department of Mathematics, when the Institution was a constituent college of the University of Calcutta. After introducing M.Sc. in Applied Mathematics the productivity is increasing rapidly. At present **about 71 research scholars** have been **registered for doing Ph.D.** work in various fields of Mathematics. This year **10** students **have enrolled (in the January cycle)** in the Ph.D. programme in this Department. **17 research scholars have submitted their Ph.D. thesis and 4 research scholars have been awarded Ph.D. during the period March 2016-July 2016.** Apart from regular routine work, all the faculty members of this Department are engaged in research work in various fields of Mathematics and Statistics. **About 108 research papers (list attached in Annexure I) have been published in various journals of national and international repute in the session 2015-2016. 38 students of this Department have received their Ph.D. degree in the last 5 years**. :

I.	Degree offered	Ph.D.(Sc)
II.	No of candidates enrolled	**10 (in January 2016 cycle)**
	registered	**41 (12 in 2015 and 29 in 2016)**
	awarded	**12**

Faculty position:

Sanctioned faculty post: **17** Vacant Post: 03

Faculty profile (in the following table)

Name	**Designation**	**Highest Qualification**	**Specialisation/ Research Area**	**Contact No. E-mail**
Basudeb Mukhopadhyay	Professor	Ph.D.	Elasticity, Thermo elasticity, Thermo visco elasticity, Micropolar elacticity	bmukherjee2006@yahoo.co.in
Binayak Sammadar Choudhury	Professor	Ph.D.	Functional Analysis, Topology, Nonlinear Dynamics, Mathematical Economics, Quantum Information theory, Fuzzy systems, Stochastic differential equation	binayak@.becs.ac.in, binayak12@yahoo.co.in
Guruprasad Samanta	Professor	Ph.D.	Mathematical Biology and Operations Research	g_p_samanta@yahoo.co.uk
Murari Mitra	Professor	Ph.D.	Reliability Theory, Mathematical Statistics, Operations Research, Nonparametric Inference	murarimitra@yahoo.com
Jagabandhu De	Professor & Head	Ph.D.	Elasticity & Plasticity, Mathematical Methods, Fracture Mechanics,Fluid Mechanics	jagabandhu_de@yahoo.com
Tapan Roy	Professor	Ph.D.	Fuzzy and Intuitionistic Fuzzy set Theory, Inventory, Transportation, Reliability Optimization, Information Theory, Portfolio Optimization, Fuzzy and Stochastic Optimization	roy_t_k@yahoo.co.in
Sanat Kumar Mazumder	Professor	Ph.D.	Information, Optimizition, O.R, Entropy Optimization and its applications in different branches of Science and Technology	majumder_sk@yahoo.co.in
Asoke Kumar Dhar	Professor	Ph.D.	Non-linear waves in Ocean	asoked @math.becs.ac.in
Parbati Saha	Professor	Ph.D.	Computational Intelligence	parbati_saha@yahoo.co.in

Name	Designation	Highest Qualification	Specialisation/ Research Area	Contact No. E-mail
Tapan Kar	Professor	Ph.D.	Dynamical systems, stability and bifurcation theory, population dynamics, Mathematical Ecology (Theoretical studies on ecology, population management, food chain, conservation of aquatic ecosystems, sustainable use of ecosystem services), Mathematical modeling in ecology and epidemiology, Pest control.	t_k_kar@yahoo.com
Pritha Das	Associate Professor	Ph.D.	Mathematical biology, Neural network, Nonlinear data analysis	prithadas01@yahoo.com
Shariful Alam	Assistant Professor	Ph.D.	Financial Mathematics	salam50in@yahoo.co.in
Ujjal Debnath	Assistant Professor	Ph.D.	Relativity, Cosmology and Astrophysics.	ujjaldebnath@yahoo.com
Smita Pal (Sarkar)	Assistant Professor	Ph.D.	Mathematical Theory of Elasticity & Plasticity	smita1308gmail.com

Research area : Mathematical Biology , Operations Research, Fuzzy and Intuitionistic Fuzzy set Theory, Inventory, Transportation, Reliability Optimization, Information Theory, Portfolio Optimization, Fuzzy and Stochastic Optimization, Information, Optimization, Entropy Optimization, Mathematical Ecology, Dynamical systems, stability and bifurcation theory, population dynamics, mathematical modelling in ecology and epidemiology, management and conservation of fisheries, bio-economic modelling of renewable resources, Neural network, Nonlinear data analysis , Relativity, Cosmology, Astrophysics, Lie theory and Special Functions, Functional Analysis, Topology, Nonlinear Dynamics, Mathematical Economics, Quantum Information theory, Mathematical theory of Elasticity , Thermo elasticity, Thermo visco elasticity, Micropolar elasticity, Fracture Mechanics, Fluid Dynamics, Non-linear waves in Ocean, Computational Intelligence, Reliability Theory, Mathematical Statistics, Nonparametric Inference

Research facilities: (name specific equipment / picture, infrastructure etc.) :
Computers, Printers, Copier

Name of the laboratories:

Numerical Laboratory

Research Laboratory

Support staff position:

Sanctioned technical post **…..01**

Ongoing Sponsored Research / projects: (mention area)

Ongoing (Prof value)	**Sponsoring agency**
Incorporating ecosystem objectives into the management sustainable marine fisheries: Ecological economic modeling with some case studies along the costal side of West Bengal. – by Prof. T. Kar **Rs.12,00,000/-**	UGC
Transmission Dynamics and Spread of Infectious Diseases: Modelling, Prediction and Control by Prof. T. Kar **Rs. 10,00,000/-**	CSIR

Details of publications of each faculty member (2015-16),

Journal ……about **121** (List attached in **Annexure-I**)
Conference……
Books/Monograms -------- **06** (List attached in **Annexure-II**)

Seminar / Workshops/ Conferences/ Training programme organized by the department (2015-16) : Ph.D course work,

Foreign visits and Invited Lectures:

1.Prof. G.P. SamantaI visited the Institute of Mathematics, National Autonomous University of Mexico (UNAM), Mexico as a TWAS-UNESCO Associate for collaborative research work during 1st May to 30th June 2015.

2. Prof. B.S.Choudhury delivered his lecture as Invited Speaker at the 19th International Mathematics Conference, BRAC University and Bangladesh mathematical Society, Dhaka, Bangladesh, Dec 18-20, 2015.

3.Prof. B.S.Choudhury delivered his keynote address at the 4th International Conference on Science and Engineering in Mathematics, Chemistry and Physics (Scie Tech 2016), Kuta, Bali-Indonesia, 30-31, January, 2016

4.Prof. B.S.Choudhury delivered his Invited Talk at International Conference on Nonlinear Dynamics, Analysis and Optimization, Jadavpur University, Kolkata, 9-11, December, 2015.

5.Prof. B.S.Choudhury delivered his Invited Talk at National Conference on Analysis and Applications, Institute of Science, Banaras Hindu University, 5-7, February, 2016

6.Prof. B.S.Choudhury delivered his Invited Talk at International Conference on Recent Trends in Mathematical Sciences and Applications, Department of Mathematics, University of Burdwan, 9-11February, 2016.

Others: Students awarded Ph.D.(Sc) in 2015-16 (received certificate in the convocation, 2016)

Uttam Das, Monaj Kumar Mondal, Payel Ghosh, Shri Ashok Kumar Shaw, Biplab Chandra Chandra, Piyali Bagchi Khatua, Kalipada Samanta, Milan Chakraborty, Shilpi Pal, Joydeb Mondal, Samarpita Bhattacharyya, Samadyuti Haldar

Annaxure – I

Research Publication for the year 2015-16

- D.Pal, G.S. Mahapatra and **G.P.Samanta**, Effects of fuzzy harvesting on logistic growth models for uncertain ecological parameter, Journal of Interdisciplinary Mathematics, Vol. 19(3); DOI : 10.1080/09720502.2014.914277, pp. 433-451 , 2016.
- S. P. Bera , A. Maiti and **G.P.Samanta**, Dynamics of a food chain model with herd behaviour of the prey, Modeling Earth Systems and Environment, DOI 10.1007/s40808-016-0189-4 , pp. 1-9, 2016
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- S.P.Bera, A.Maiti and **G.P.Samanta**, Stochastic Analysis of a Prey-Predator Model with Herd Behavior of Prey, Nonlinear Analysis: Modelling and Control, Vol.21(3), pp. 345-361, 2016.
- Swarnali Sharma and **G.P.Samanta**, Analysis of the Dynamics of a Tumor-Immune System with Chemotherapy and Immunotherapy and Quadratic Optimal Control, Differential Equations and Dynamical Systems, Vol. 24(2), pp. 149–171, 2016.
- D. Jana, P. Dolai, A. K. Pal and **G.P.Samanta**, On the stability and Hopf-bifurcation of a multidelayed competitive population system affected by toxic substances with imprecise biological parameters, Modeling Earth Systems and Environment, DOI 10.1007/s40808-016-0156-0 , pp. 1-16, 2016
- Debasis Manna and **G.P.Samanta**, A nonlinear irreversible investment model with vonbertalanffy law of growth, International Journal of Mathematics and Statistics, Vol. 17(1), pp. 67-90, 2016.
- Swarnali Sharma and **G.P.Samanta**, Stability analysis and optimal control of an epidemic model with vaccination, International Journal of Biomaths, Vol. 8(3), DOI: 10.1142/S1793524515500308, 28 pages, 2015.
- S.P.Bera, A.Maiti and **G.P.Samanta**, A Prey-predator Model with Infection in Both Prey and Predator, Filomat, Vol. 29(8), pp. 1753–1767, 2015.
- Swarnali Sharma and **G.P.Samanta**, A Leslie–Gower predator–prey model with disease in prey incorporating a prey refuge, Chaos, Solitons & Fractals, Vol. 70, pp. 69–84, 2015.
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- Swarnali Sharma and G.P.Samanta, Analysis of a predator-prey population model, International Journal of Ecological Economics & Statistics, Vol.36 (4), pp. 18-44, 2015.
- S.P.Bera, A.Maiti and **G.P.Samanta**, A Delay Dynamic Model for HIV Infected Immune Response, J. Appl. Math. & Informatics, Vol. 33(5 – 6), pp. 559-578, 2015.
- Ricardo Gómez Aíza, Swarnali Sharma and **G.P.Samanta**, Analysis of a mathematical model of periodically pulsed chemotherapy treatment, International Journal of Dynamics and Control, DOI: 10.1007/ s40435-015-0204-z, pp. 1-16, 2015.
- S.P.Bera, A.Maiti and **G.P.Samanta**, Modelling herd behavior of prey: analysis of a prey-predator model, World J. of Modelling and Simulation, Vol. 11(1), pp. 3-14, 2015.

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- **Ujjal Debnath**, Entropy Bound of Horizons for Accelerating, Rotating and Charged Plebanski-Demianski Black Hole, *Annals of Physics,* Vol. 372, pp-449-456 (2016).

Annexure II

Books and Monograms publisher in 2015-2016

- **Prof**. **G.P. Samanta**: A Text Book of Engineering Mathematics-II, Published by New Age International (P) Limited, New Delhi. (2016)
- **Prof. G.P. Samanta** : A Text Book of Operations Research, Published by Knowledge Kit Publications, Kolkata.(2015)
- **Prof. G.P. Samanta:** A Text Book of Engineering Mathematics-I, Published by New Age International (P) Limited, New Delhi. (2015)
- A. Garai, **Prof**.**T.K. Roy**, P. Mandal, Fuzzy and Intuitionistic Fuzzy Sets: A Beginner's Guide, Lambert Academic Publishing, Germany (2016).
- **Prof. S.K. Mazumder** : A First Course on Operations Research and Information Theory (Second Edition) by, New Central Book Agency (2015)
- Jana, S. and **Kar, T. K.,** Complex dynamics of some ecological systems with special emphasis on epidemiological problems. LAP LAMBART Academic Publishing, 2015.

Department of Mechanical Engineering

About the department

The inception of the Mechanical Engineering Department may be traced back to 1921 when a diploma course in Mechanical Engineering was started in this Institute. The first degree course in Mechanical Engineering was started from 18th July, 1930. Over the last eight decades, the Department of Mechanical Engineering consolidated to its present condition offering 8-Semester Undergraduate Course with an approximate current intake of 66 students annually and 4-Semester Post-graduate Course with an intake of 27 students annually. Now after conversion to IIEST, Shibpur the department is offering 10-semester Dual Degree Course. The post-graduate course in the department started in the year 1954. Currently, PG course is offered in three specializations, namely, Machine Design, Heat Power and Production Engineering, leading to the degree of Master of Engineering. The department has state of the art research facilities to carry research in the leading areas of Mechanical Engineering and at present about 40 research scholars are working for their Ph.D degree.

Academic Programs:

Dual Degree Course

Degree offered: B.Tech-M.Tech Dual Degree

Sanctioned students' intake**: 90**

Post Graduate Level

Degree offered: Master of Engineering (Mechanical)

Sanctioned students' intake: **27**

Additional intake through other programs (i.e. QIP): Nil

Specializations: Machine Design, Heat Power Engineering and Production Engineering

Doctoral & Post Doctoral Research Program (During the period)

Degree offered: Ph.D (Engineering)

No of Candidates enrolled: **09**

No. of Candidates registered**: 02**

No. of Candidates awarded: **03**

Faculty Position:

Sanctioned faculty post: 26 **Vacant: Post**: 10

LIST OF EXITING FACULTY MEMBERS

Name	Designation	Highest Qualification	Specialization/Research Area	Contact Information E-mail/Telephone No.
Dr. B.K. Mandal	Professor and Head	Ph.D.	Alternative Fuels, CFD, Combustion, Refrigeration	bijan@mech.iiests.ac.in 98300-17592
Dr. A.K. Dutta	Professor	Ph.D.	Production Engineering	apurba@mech.becs.ac.in 86970-50870
Dr. S.K. Saha	Professor	Ph. D.	Heat Power Engineering, Heat Transfer Enhancement.	sujoy_k_saha@hotmail.com 98304-93430
Dr. D. Datta	Professor	Ph.D.	Ultrasonic Non-destructive evaluation, Composite Materials, Machine Design	26684561, Ext.: 298 M: 9830349590 ddatta@mech.iiests.ac.in us@gmail.com
Dr. S.K. Guha	Professor	Ph. D.	Machine Design & Bearing Lubrication, Tribology	sk_guha@rediffmail.com 98364-06297
Dr. S.K. Karmakar	Professor	Ph.D.	Tribology (Friction, Wear Modeling, Contact Mechanics, Machine Design	skk@mech.becs.ac.in 98311-45516
Dr. B.K. Bhattacharyya	Professor Re-employed	Ph.D.	Production Engg.	bidyut@mech.becs.ac.in 98304-32255
Dr. S. Chatterjee	Professor	Ph.D.	Nonlinear Dynamics of mechanical and Micro-mechanical systems	shychat@gmail.com 2668-4561; Extn: 357 98316-89337
Dr. S. Chakrabarti	Professor	Ph.D.	Power Plant Engineering, CFD, Biomedical	somnathbec@rediffmail.com 91–33–2644 1781
Dr. A.K. Chowdhuri	Associate Professor	Ph.D.	M/C. Design, Combustion	achinkumar_becs@rediffmail.com
Dr. P.P. Dey	Associate Professor	Ph.D.	CAD/CAM, Fracture Mechanics, Non Traditional machining	ppdey2000@yahoo.com 93309-65313

Name	Designation	Highest Qualification	Specialization/Research Area	Contact Information E-mail/Telephone No.
Dr. S. Ghosh	Associate Professor	Ph.D.	Energy	sudipghosh.becollege@gmail.com +91-33-2668-4561, Extn:279 98363-35270
Dr. S C Mondal	Associate Professor	Ph.D.	Manufacturing, Quality Engineering, Modeling and optimization of manufacturing processes	scmondall@gmail.com 97326-52968
Sri A Guha	Assistant Professor	M. Tech.	Advanced Machining, Fluid flow	aguha_me@rediffmail.com 94335-86921
Dr. A. Ganguly	Assistant Professor	Ph.D.	Heat Power Engineering, Solar Energy, Solar Hydrogen systems, Greenhouse Technology	aritra78@gmail.com aritra@mech.iiests.ac.in 94330-32840, Extn.-795
Sri U. Rana	Assistant Professor	M. Tech.	Thermal Engineering, CFD	rana.uttam@gmail.com 97344-42497
Sri R.N. De	Assistant Professor	M.E.	Production Engineering, Quality Management	rathin@mech.iiests.ac.in 97481-15936

Awards and Laurels received by the faculty members: - Dr. B.K. Bhattacharya received Best Track Paper award in IEOM conference held in September, 2015 at Orlando, Florida, USA

Research area (only mention broad titles without description in detail) :

Numerical Heat Transfer
Combustion
Fluid flow analysis and bio-medical engineering
Multi-phase Flow and CFD
Alternative fuels
Bio-fluid Dynamics
Refrigeration
Energy
Renewable Energy
Greenhouse Technology
Tribology
Bearing Lubrication
Dynamics, Vibration and Control

Composite Materials
Ultrasonic NDT/Wave Propagation
Application of finite element method for stress analysis in biomechanics
Modeling of impact phenomena
Fracture Mechanics
CAD/CAM
Non-traditional Machining
Quality Management
Modeling and optimization of manufacturing processes
Quality Engineering

Research facilities: (name specific equipment / picture, infrastructure etc)*

1.	3D Non-Contact Profilometer (Rtec Instruments make) (created under DST-FIST)
2.	Polishing Machine (Buehler make) (procured under grant from DST-FIST)
3.	Micro Balance (Sartorius AG make) (created under DST-FIST)
4.	Tribometer, UMT with Humidity Controller (created under DST-FIST)
5.	Tribometer with 150^0C Rotary Drive Humidifier(created under DST-FIST)
6.	Bio-mass Gasifier Set Up (under TEQIP -II)
7.	Variable Compression Ratio Engine (under TEQIP -II)
8.	Exhaust Gas Analyzer and Diesel Smoke meter (under TEQIP-II)
9.	Ultrasonic Processor (Homogenizer for preparation of water emulsified diesel)

Name of the laboratories: Biomass gasification Laboratory has been set up during this period**.**

Support staff position:

Sanctioned technical post: 08

Technical staff profile (in the following table)

Name	**Designation**	**Highest Qualification**	**Contact No.**	**E- mail**
Asish Kumar Paul	Tech. Asst. Grade I	DME	94333-43232	
Bijit Kumar Dey	Tech. Asst. Grade II	M.E	94334-13093	bijitde@yahoo.com
Subhasish Pradhan	Tech. Asst. Grade II	DME, B.Sc.	94344-67729	
Nani Gopal Roy	Tech. Asst. Grade II	M.E	94331-03465	
Kankar Mohan Das	Tech. Asst. Grade II	DME	98304-36517	
Pradip Kumar Dey	Mechanic	ITI	99037-70323	

Ongoing Sponsored Research / projects: (mention area)

Title of the Project	Project value (INR) and Name of PI	Sponsoring Agency
Heat transfer enhancement on flow in a circular tube having twisted tape with oblique teeth & wire coil inserts	2,16,667 Prof. S.K. Saha	All India Council of Technical Education (AICTE)
Development of a unified model to simulate uniaxial & multi-axial LEF and rote heating for nuclear piping	41.00 Lac Prof. P.P. Dey	BRNS (Dept. of Atomic Energy, Govt. of India)

Industry – Institute Interaction

The department maintains close liaison with the leading industries and arranges for summer internship and industrial training to the 4^{th} and 6^{th} semester UG students. Also, a visit was organized at Sagardighi Thermal Power Station under WBPDCL for the present final year UG students of the department under the financial assistance from TEQIP-II.

Details of publications of each faculty member (2015 – 16)

Journals: 46

Conference: 21

Books / Monograms : 5

(Lists are included at the end of this report

Patents / Invention Disclosure / Technology Transfer / Copyright

Granted Patent No.: 272891 (Patent Application No.; 1491/KOL/2008)

Title: A PERMENANT SPLIT TYPE MANDREL FOR USE IN REPEATED MANUFACTURING OF HELICALLY WOUND COMPOSITE PIPES

Inventors: DEY PARTHA (FORMER MASTER OF ENGG. STUDENT) and DATTA DEBASIS (PROFESSOR) OF DEPT. OF MECHANICAL ENGINEERING, IIEST, SHIBPUR.

Patent Certificate Issued by: THE PATENT OFFICE, GOVERNMENT OF INDIA

Seminar/Workshops/Conferences/Training program organized by the department (2015 - 16):

- Half-day Seminar on Upstream Petroleum was organized by the Mechanical Engineering Department at the Conference hall on 2nd September, 2015
- Two days training on AUTOCAD was organized at the conference hall of this department on 5th and 30th September, 2015.
- Half day Seminar on NX, A software on CAD, CAM and CAE from SIMENS on 16th March, 2016 at the Conference hall.
- Seminar on ABAQUS, a finite element software for solving mainly non-linear statics and dynamics problem was organized on 14th October, 2015 at the Conference hall of the department

Advancements under TEQIP – Phase II

The following two instruments/equipment have been procured under TEQIP-II

- Exhaust Gas Analyzer and Diesel Smoke meter (under TEQIP-II)
- Ultrasonic Processor (Homogenizer for preparation of water emulsified diesel)

Also about ten numbers of PG and Ph.D students attended and presented papers in International conferences within India. Some students have also taken special training in India after being sponsored by TEQIP- Phase II.

Foreign visits and Invited Lectures

- Dr. Bijan Kumar Mandal visited Dhaka Bangladesh and presented two technical papers entitled "A computational study of radiation and gravity effect on temperature and soot formation in a methane air co-flow diffusion flame" and "Effect of compression ratio on the performance, combustion and emission from a diesel engine using plam biodiesel" in ICME 2015 held in BUET from 18-22 December 2015.
- Dr. S.K. Karmakar visited Dhaka Bangladesh and presented a technical paper entitled "Temperature rise and wear of sliding contact of alloy steels" in International Conference on Mechanical Engineering (ICME 2015) held in BUET from 18-22 December 2015.
- Dr. S.K. Karmakar delivered an Invited Talk at Dhaka University on 24th December, 2015 on " Biotribology-Its relevance in Healthcare"
- Dr. Subhash Chandra Mondal visited Singapore and presented a technical paper entiled "Study of Multivariate process Capability Indices in Manufacturing Processes" in IEEE International Conference during 06-09 December 2015.
- Dr. Sujoy Kumar Saha visited Peking University, Beijing, China during 20-21nd December 2015 and delivered a speech on "Advances in Energy Conservation by heat transfer Enhancement".

- Dr. Sujoy Kumar Saha visited Kyoto, Japan to present a technical paper in International Conference during 11th -15th April 2015.
- Dr. B.K. Bhattacharya visited USA from 9-11th September 2015 and delivered a talk as Distinguished Speaker in international conference IEOM 2015, in Orlando, Florida, USA.
- Mr. Ambarish Datta, PhD Scholar, visited Bangladesh and present a technical paper entitled "Numerical investigation of the effects of EGR on CI engine characteristics using soyabean biodiesel" in ICME 2015 held in BUET, Dhaka from 18-22 December 2015.
- Mr. Pradip Mondal, PhD Scholar visited Dhaka Bangladesh and presented two technical papers entitled "Simulated Performance of A Biomass Gasification Based Combined Power and Refrigeration Plant for Community Scale Application" and "Performance Analysis of a Biomass-gasification based Indirectly-Heated Combined Cycle employing Humid Air Turbine" in ICME 2015 held in BUET from 18-22 December 2015.

Visitors to your Department (Indian & Foreign)

- Er. Kamal Gupta an alumnus of the institute delivered a lecture on Petroleum Exploration 2nd September, .2015.
- Dr. Jayanta S Kapat Lockheed Martin Professor, University of Central Florida delivered a talk on Advanced Turbo machinery and Energy Research with Alternative Fuels 6th January 2016.
- Prof. Asok Kumar Mallick Honorary Distinguished Professor delivered a talk on Mechanicas to and from Geometery on 30th March, 2016.
- Prof. P.K.Mallick William E Stirton Professor University of Michigan delivered a lecture on Advanced Materials for Lightweight Automobiles on 009.02.2016.

Alumni Contribution to your Department: An amount of Rs. 50,000.00 has been donated to BESUS Foundation account for organizing Annual/Bi-annual PC Ganguly Memorial Workshop in the Department of Mechanical Engineering. Late Purna Chandra Ganguly served as an Assistant Professor of Mechanical Engineering in the then Bengal Engineering College during the period of 1920 to 1934.

Training and Placement:

The Department arranged summer internship and vocational/industrial training to the 4th and 6th semester undergraduate students in leading core industries and power plants. As on April 2016, about 45 students were placed through campus interviews in various leading organizations. Some students also opted for higher studies like M. Tech. and MBA in leading institutions through qualifying examinations like GATE and CAT respectively.

Two Under graduate students, Suhail Dutta and Agniprobho Mazumder have got admission for for MS in Mechanical Engineering and Management at Purdue University (West Lafayette, Indiana), USA and for Ph.D. in Mechanical Engineering (specialization Solid Mechanics) at Kansas State University (Manhattan, Kansas), USA respectively.

Extension Activities and Societal outreach

The Department responds to the needs of local small scale industries when they seek guidance and support in resolving technological issues. However, no major and notable activity took place during the period concerned. The teachers of the Department regularly acts as external examiners for surrounding technical colleges and Universities and most professors also act as experts in selection and inspection committees of other Universities and Public Service Commission and Staff Selection Commission.

New Academic / Research Initiatives

Academic Collaboration

Prof. P.P. Dey is working in collaboration with CGCRI and has produced two Master Degree Thesis with Joint Collaboration.

Prof. S. Chakrabarti is collaborating with Jadavpur University, Kalyani Government Engineering College, College of Engineering and Management, Kolaghat, Dr. Sudhir Chandra Sur Degree Engineering College, and Heritage Institute of Technology with respect to paper publication, writing of books and supervision of Ph.D. students.

Also, many of the faculty members are undertaking joint research activities with leading academic institutions like IIT, NIT, Jadavpur University and laboratories of DRDO which result in joint research publications in various reputed international journals.

Industrial Collaboration

The department is collaborating with many organizations like NTPC, DVC, Tata Steel, Honda Motors, Tata Motors, AIR INDIA, Blue Star, Voltas, M.N. Dastur, PWC etc. to arrange for the summer internship and vocational Training of the 4th and 6th Semester undergraduate students.

List of Journal Publication (2015-16)

1. Ambarish Datta and Bijan Kumar Mandal, Numerical investigation of the performance and emission parameters of a diesel engine fuelled with diesel - biodiesel - methanol blends, Journal of Mechanical Science and Technology, 30(4), 1923-1929, 2016, DOI: 10.1007/s12206-016-0351-y. (IF: 0.838), (Scopus Citation: 00), (GS Citation: 00)
2. Ambarish Datta and Bijan Kumar Mandal, A comprehensive review of biodiesel as an alternative fuel for compression ignition engine, Renewable and Sustainable Energy Reviews, 57:799-821, 2016 DOI: 10.1016/j.rser.2015.12.170. (IF: 5.901), (Scopus Citation: 00), (GS Citation: 00)
3. Ambarish Datta and Bijan Kumar Mandal, Impact of alcohol addition to diesel on the performance combustion and emissions of a compression ignition engine, Applied Thermal Engineering, 98:670-682, 2016, DOI: 10.1016/j.applthermaleng.2015.12.047. (IF: 2.739), (Scopus Citation: 00), (GS Citation: 00)
4. S. Samanta & S. Ghosh, A thermo-economic analysis of repowering of a 250 MW coal fired power plant through integration of Molten Carbonate Fuel Cell with carbon capture, International Journal of Greenhouse Gas Control (In press), 2016. Impact Factor: 4.727 Citations:0
5. D. Misra & S. Ghosh, Growth and export status of Indian floriculture: A review, Agri. Review, 37 (1) : 77-80, 2016.
6. S. Mukhopadhyay & S. Ghosh, Solar tower combined cycle plant with thermal storage: energy and exergy analyses, Advances in Energy Research, Vol. 4, No. 1 pp.29-45, 2016 Impact Factor: 0.869
7. S. Samanta & S. Ghosh, Economic impact of repowering of an existing coal fired power plant through pressurized pulverized coal combustion and waste heat recovery, Perspectives in Science, 2016
8. Mondal, S.C.; Maiti, J., Ray, P.K. and Shafiee, M. (2016) "Modelling process robustness: a case study of centrifugal casting ", International Journal of Production Planning & Control, Taylor & Francis, Vol. 27, No. 3, pp. 169-182. Citation- , Imp factor-1.466.
9. T. Das and S. Chakrabarti, Pressure Characteristics Study for the Configuration of Sudden Expansion with Central Restriction and Suction, Open Journal of Fluid Mechanics, Vol. 6 (2016), pp. 30-41.
10. S. Saha and S. Chakrabarti, MHD Laminar Modeling and Numerical Simulation on Ferromagnetic Fluid Flow in a Channel, International Journal of Fluid Mechanics Research, Vol. 43, No. 1 (2016), pp. 79-92.
11. Anindya Malas and S. Chatterjee, Modal self-excitation by nonlinear acceleration feedback in a class of mechanical systems. Journal of Sound and Vibration (in press) (2016)
12. Dipankar N Basu and A. Ganguly, "Solar Thermal-Photovoltaic Powered Potato Cold Storage - Conceptual Design and Performance Analyses" Applied Energy, Elsevier, Vol. 165(1), 2016, pp.308-317. (Impact Factor 6.330).
13. S. K. Saha, B. Sunden, S. Acharya, P. K. Das, S. Chakrabarty, C. Balaji, 2016, Editorial on special issue on ISHMT-ASME Heat Mass Transfer Conference, (Papers on Applications), IIT Kharagpur, India, ASME J Thermal Sciences and Engineering Applications, 8(1):010301-010301-1. doi:10.1115/1.4031594. NA/Invited Special Issue Editorial
14. Arup Jyoti Bhowal and Bijan Kumar Mandal, 2016, Radiation effect on temperature distribution and NO formation in a diffusion flame under reduced gravity conditions, International Journal of Heat and Mass Transfer , DOI: 10.1007/s00231-015-1552-0. (IF: 0.946), (Scopus Citation: 00), (GS Citation: 00)
15. Arup Jyoti Bhowal and Bijan Kumar Mandal, 2016, A Computational Study of Soot Formation in Methane Air Co-Flow Diffusion Flame Under Microgravity Conditions, Microgravity Science and Technology, DOI: 10.1007/s12217-016-9489-6. (IF: 0.910), (Scopus Citation: 00), (GS Citation: 00)

16. Ambarish Datta and Bijan Kumar Mandal, 2016, A numerical study on the performance, combustion and emission parameters of a compression ignition engine fuelled with diesel - palm stearin biodiesel and alcohol blends, Clean Technologies and Environmental Policy, (accepted): (IF: 1.934), (Scopus Citation: 00), (GS Citation: 00).
17. Mondal P., Ghosh S., Bio- gasification based externally fired combined cogeneration plant: Thermo-economic and Exergo-economic Analyses, Int Journal of Exergy, 2015 Impact Factor: 0.88
18. S. Samanta & S. Ghosh, Efficiency improvement and CO2 emission reduction of coal fired power plant by repowering through pressurized pulverized coal combustion and waste heated feed water heating, Journal of Power Technologies, 2015. Impact Factor: 0.32 Citations:1
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25. S Sarkar, PP Dey (2015) Tolerance constraint CNC tool path modeling for discretely parameterized trimmed surfaces engineering with Computers 31 (4), 763-773 Impact Factor: 1.451.
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Configurations, International Journal of Fluid Mechanics Research, Vol. 42, No. 6 (2015), pp. 509-535.
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41. Anindya Malas and Shyamal Chatterjee, Modal self-excitation in a class of mechanical systems by displacement feedback. Journal of Vibration and Control, (2016) 1-13. DOI: 10.1177/1077546316651786.
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43. Anuja Roy, A. Ghosh and S. Chatterjee, Influence of tuning of passive TLD on the seismic vibration control of elevated water tanks under various tank-full conditions, Sturctural Control and Health Monitoring (2016).
44. Ranjan Kumar Mitra; Atul K Banik, and Shyamal Chatterjee, State feedback control of surge oscillations of two-point mooring system, Journal of Sound and Vibration (2016) accepted. (Impact Factor 1.81).
45. Ramen Kanti De and A, Ganguly, Thermal model development and performance analysis of a solar photovoltaic supported greenhouse dryer, International Journal of Renewable Energy Technology, Inderscience Publishers (2016).
46. S. C. Mondal and J. Kumar, Application of Box-Behnken Design for the Optimization of Process Parameters in Dry Drilling Operation, International Journal of Productivity and Quality Management (2016), vol. 18, No. 4, pp. 456-473.

List of Conference Publications (2015-16)

1. Subrata Das and Sisir Kumar Guha (2016), Turbulent effect on the dynamic response coefficients of finite journal bearings lubricated with micropolar fluid, accepted for publication in Procedia Technology (Elsevier) 3rd International Conference on Innovations in Automation and Mechatronics Engineering, ICIAME, India.
2. Arkadeep Narayan Chaudhury, Arnab Ghosh, Krishnendu Banerjee, Abhijit Mondal and Debasis Datta (2016): Analysis of Prismatic Springs of Non-Circular Coil Shape using Finite Element Method, Proceedings of the 28th International Conference on CARs & FoF 2016, Vol. 1, Kolaghat, 6-8 January, 2016, Springer.
3. Ranendra Roy and Bijan Kumar Mandal, Numerical Simulation of Vapour Compression Refrigeration System Using Refrigerant R152A, R404A, R507 and R600A, Proceedings of the 2nd International Conference on Advances in Mechanical Engineering and Its Interdisciplinary Areas (ICAMEI-2015), Kolaghat, West Bengal, India.
4. Ambarish Datta and Bijan Kumar Mandal, Numerical Investigation on the Effects of EGR on CI Engine Characteristics Using Soyabean Biodiesel, 11th International Conference on Mechanical Engineering (ICME2015), BUET Dhaka, Bangladesh.
5. Ambarish Datta and Bijan Kumar Mandal, Effect of Compression Ratio on the Performance, Combustion and Emission from a Diesel Engine Using Palm Biodiesel, 11th International Conference on Mechanical Engineering (ICME2015), BUET Dhaka, Bangladesh.
6. Arup Jyoti Bhowal and Bijan Kumar Mandal, A Computational Study of Radiation and Gravity Effect on Temperature and Soot Formation in a Methane Air Co-Flow Diffusion Flame, 11th International Conference on Mechanical Engineering (ICME2015), BUET Dhaka, Bangladesh.
7. Avik Ray, Arup Jyoti Bhowal and Bijan Kumar Mandal, A Comprehensive Review of Soot Formation in Diffusion Flame at Microgravity Conditions, 11th International Conference on Mechanical Engineering (ICME2015), BUET Dhaka, Bangladesh.
8. Aritra Chatterjee and Bijan Kumar Mandal, Computational Study of Natural Convection in Square Cavity Filled with Water and Heated from the Bottom, 11th International Conference on Mechanical Engineering (ICME2015), BUET Dhaka, Bangladesh.
9. A. Roy, M. Gazi, M. Rana, J. K. Biswas and S. K. Karmakar; Intervertebral Disc Degeneration and Its Current Surgical Remedies: An Overview, ICAMEI, 2015, pp 383-389.
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11. Pradip Mondal and Sudip Ghosh, Bio-gasification based Externally Fired Combined Cogeneration Plant: Energetic and Techno-economic Performance Analyses, Vth International Conference on Advances in Energy Research (ICAER 2015), IIT Bombay.
12. Samiran Samanta and Sudip Ghosh, Thermodynamic Evaluation of Two Repowering Schemes for an Old Coal Fired Plant Through Integration of Moltern Carbonate Fuel Cell, Vth International Conference on Advances in Energy Research (ICAER 2015), IIT Bombay, India.
13. Sankhadeep Mukherjee, Pradip Mondal and Sudip Ghosh, Performance Analysis of a Biomass-gasification based Indirectly-Heated Combined Cycle employing Humid Air Turbine, 11th International Conference on Mechanical Engineering (ICME2015), BUET Dhaka, Bangladesh.

14. Suman Chattopadhyay, Pradip Mondal and Sudip Ghosh, Simulated Performance of a Biomass Gasification Based Combined Power and Refrigeration Plant for Community Scale Application, 11th International Conference on Mechanical Engineering (ICME2015), BUET Dhaka, Bangladesh.
15. S. C. Mondal and M. Salim, Multivariate Process Control Charts: An Overview and Application, 57th National convention of Indian Institution of Industrial Engineering and 3rd International Conference on Industrial Engineering (ICIE-2015), Sardar Vallabhbhai National Institute of Technology, Surat,
16. S. C. Mondal, A Study of Multivariate Process Capability Indices in Manufacturing Processes", Proceedings of the 2015 IEEE International Conference on Industrial Engineering and Engineering management, Suntec Singapore Convention Centre, Singapore.
17. A. Saha and S. C. Mondal, Optimization of Multi-performance Characteristics (weld bead width and bead hardness) in Submerged Arc Welding, International Conference on Precision, Meso, Micro and Nano Engineering (COPEN-9), 2015, IIT Bombay, Maharashtra, India.
18. P. Mandal and S. C. Mondal, Optimization of Surface Roughness in CNC Turing operation using Particle Swarm Optimization Technique, International Conference on Precision, Meso, Micro and Nano Engineering (COPEN- 9), 2015, IIT Bombay, Maharashtra, India.
19. A. Malas and S. Chatterjee, Amplitude Controlled Adaptive Feedback Resonance in a Single Degree-of-freedom mass-spring Mechanical System, International Conference on Vibration Problem, 2015, IIT Guwahati, India.
20. S. Sardar, S.K. Karmakar and D. Das, Ultrasonic Assisted Fabrication of Magnesium Matrix Composites: A Review, 5th International Conference on Materials Processing and Characterization (ICMPC- 2016), 2016, GRIET Hyderabad, India.
21. A. Pramanick, S. Sarkar, N.G. Roy, P.P Dey, P.K.Das, Advanced Materials and Manufacturing Technology', ICMMT – 2015", International Conference on Materials and Manufacturing Technology, December 3rd -5th 2015, Bangalore

List of Books

1. Fluid Mechanics and Hydraulic Machines by Dr. S Chakraborti, Vikash Publishing House Private Limited, Noida, UP.
2. Critical Heat Flux in Flow Boiling in Micro Channels by Dr. S K Saha, Springer International Publishing, Switzerland.
3. Heat Transfer & Pressure Drop in Flow Boiling in Micro Channels by Dr. S K Saha, Springer International Publishing, Switzerland.
4. Instability in Flow Boiling in Micro Channels by Dr. S K Saha, Springer International Publishing, Switzerland.
5. Advance in Heat Transfer Enhancement by Dr. S K Saha, Springer International Publishing, Switzerland.

Department of
Metallurgy and Materials Engineering

About the Department:

The Department of Metallurgy and Materials Engineering started its journey at the Bengal Engineering College in 1939 as Department of Metallurgy, Chemistry and Geology with the introduction of a three year degree course in Metallurgy under Calcutta University. Bengal Engineering College is one of the oldest engineering institutions in India and the department is the second oldest Metallurgy department of the country. The duration and syllabus of the course changed time to time and the name of the department also changed to Metallurgy and Materials Engineering keeping pace with the advancement in the field of materials. Presently the last batch of 4-year 8-semester course for B.E. degree in Metallurgy and Materials Engineering are going to pass out and the three batches of students have been admitted in the 5-year 10-semester Dual degree (B.Tech. + M.Tech.) programs.

In 1953, the Department introduced the 2-year Postgraduate degree programme in Physical Metallurgy which, after changes time to time, is presently a 4-semester course at the All India level offering the degree in Metallurgy and Materials Engineering with two specializations in Iron and Steel Technology and Surface Engineering instead of Physical Metallurgy, which was the first postgraduate course in Metallurgy in this country. Prof. N. N. Sen who later became Principal of the College, was the first Professor and Head of the then Department of Metallurgy, Chemistry and Geology which subsequently separated in 1965 and the Department of Metallurgy started journey on its own. In 1949, Prof. W. Baukhloh of Techniche Hach Schule, Berlin joined the Department as a Professor of Metallurgy and many foreign trained faculties joined the Department during this long period. There was a spurt in the research activity in the Department since 1949 particularly after Dr. A. K. Seal joined the Department in 1955 after completing his Ph. D. in Sheffield University.

In 2000, the department started a 5 semester self sponsored part time post graduate course in Industrial Metallurgy on approval from AICTE in 1999 with intake strength of 15 plus reservation as per rules, which subsequently converted to a 6-semester course. Till date the course is catering the metallurgy / mechanical engineers with B. E. degree plus a minimum of 2 years experience with the aspiration of getting post graduate degree and classes are being held in the evening after working hours and on holidays. The department was the only one to introduce such a course in the field of Metallurgy against a circular from AICTE in 1995 seeking to open such courses.

Over the years the Department has produced a good number of eminent metallurgists working with distinction in India and abroad who have made significant contribution in the fields of Metallurgy and Materials Engineering. The Department has, so far, produced good number of PhDs, and several PhD programs are running in the Department. This Department always tries to remain abreast with the recent trends in the fields of Metallurgy and Materials Engineering and evolve suitable means for effective technology transfer to the existing industries. The Department has already pioneered in the development of certain important steels and alloys like HSLA steels, maraging steels, shape memory alloys etc. These developments have had a tremendous impact on

the total development of the subject in the national scenario and by this it has contributed significantly to the cause of Metallurgy and Materials Engineering of India today. In spite of inadequate resources, the Department has achieved academic distinction which is observed from its good number of alumni holding many important positions around the globe. All efforts have been successful solely due to excellent interaction with industries, institutions and research houses created by a band of devoted faculty members. The department feels proud to announce its collaborative ventures with organisations like Tata Steel, SAIL, ISRO, BARC, NML, ICDC, NMRL, INSDAG and many others.

The Department is now actively engaged in modernizing the existing laboratories along with the development of newer ones in accordance with the current trends in Metallurgy and Materials Engineering for which it has received aids as well as in the form of Sponsored Research Grants from various sources for further consolidating the undergraduate and postgraduate training and research and maintain the tradition as one of the leading centers for metallurgical education and research in the country. During the Golden Jubilee celebration of the Department in 1989-1990, M/s. M. N. Dastur & Co. showed its affection towards the Department by advancing funds for Research on Materials Science and Engineering. Further, Tata Steel Chair Professor was instituted during the same year by an endowment of Tata Steel to lead advanced research and consultancy work. Ministry of Steel, Govt. of India introduced Steel Chair Professor and this department is also a beneficiary of this scheme.

The Department to-day is thus in a position to undertake various advanced research and consultancy work in various fields, to fulfill the vision of those who were pioneer in establishing and in nurturing the Department. A vigorous PhD programs continues in the Department and presently 38 numbers of PhD candidates are pursuing their PhD programs. Faculty members of the Department also received awards, medals, fellowships from Government of India and other professional bodies. Some faculty members are also pursuing collaborative programs with foreign universities.

Academic Programs:

Undergraduate Level

Degree offered: B. E. Degree
Sanctioned students' intake: 30

Post Graduate Level
Degree offered: 4-semester M.E. Degree
Sanctioned students' intake: 8 in each specialization
Additional intake through other program (i.e. QIP): Nil
Specializations in: *Iron & Steel Technology* and *Surface Engineering*

Current degree to which students admitted

Integrated 5-year dual degree (B.Tech. + M.Tech.) introduced in 2014-15
Sanctioned intake in 2014-15: 34
Sanctioned intake in 2015-16: 46

Doctoral and Post Doctoral Research Program
Degree offered: Ph. D. in Metallurgy and Materials Engineering
No. of candidates enrolled in 2015-16: 04
No. of candidates registered in 2015-16: 11
No. of candidates awarded in 2015-16: 03

Faculty Position:

Sanctioned faculty post: **14** On lien: **1**, Vacant Post: **4**

Permanent Faculty Profile:

Name	**Designation**	**Highest Qualification**	**Specialisation/ Research Area**	**Contact No. E-mail:**
Swarup Kr. Ghosh	Professor and Head	Ph. D.	Processing-structure-property correlations of steels	(033) 26684561 to 63, Extn. 236 / 239 hod@metal.iiests.ac.in swarupkrghosh@gmail.com
S. Chatterjee	Professor & Director, SMSE	Ph. D.	Microalloyed Steel, Advance joining technique	033-2668-4561 to 63 schatterjee@metal.iiests.ac.in schatterjee46@yahoo.com
A. Basumallick	Professor and Associate Dean	Ph. D.	Nanostructured Materials, Electronic and Magnetic materials	033-2668-4561 to 63 (Ext- 240) abasumallick@metal.iiests.ac.in
P. P. Chattopadhyay	Professor (On-lien)	Ph. D.	Phase Transformation	+919830286711 partha.besus@gmail.com
Sanjoy Sadhukhan	Associate Professor	M.Tech.	Physical Metallurgy, Mechanical testing, Heat treatment	033-2668-4561 to 63 skhan_besus@yahoo.co.in
Sumit Ghosh	Associate Professor	M.E.	Development and Characterization of metal matrix composites	033 2668-4561 to 63 g_sumit@metal.iiests.ac.in sumit_papan1@rediffmail.com
Manojit Ghosh	Associate Professor	Ph.D.	Aluminium alloys, Crystallographic texture	033-2668-4561 to 63 manojit_ghosh1@rediffmail.com
Debdulal Das	Associate Professor	Ph.D.	Wear of Materials Nanomaterials & Nanocomposites	033-2668-4561 to 63 debdulal_das@metal.becs.ac.in debdulal_das@yahoo.com
Sukumar Kundu	Assistant	Ph.D.	Advance Joining	033-2668-4561 to 63

Name	**Designation**	**Highest Qualification**	**Specialisation/ Research Area**	**Contact No. E-mail:**
	Professor		techniques, Corrosion	skundu@metal.iiests.ac.in erskundu@gmail.com
Tapendu Mandal	Assistant Professor	M.Tech.	Electronic Materials, Biomaterials, Carbon based Composites	033-26684561 to 63 tapendu@gmail.com

Others:

Name	Designation	Highest Qualification	Specialisation/ Research Area	Contact No. E-mail:
K. K. Ray	Visiting Faculty	Ph. D.	Deformation and Fracture	9434230710 kkrmt@metal.iitkgp.ernet.in
P. S. Banerjee	Visiting Faculty	Ph. D.	Extractive metallurgy, Foundry, Corrosion	9836663015 psban_2000@yahoo.co.in
Ramanath Datta	Visiting Faculty	M. Tech.	Electronics	9830374001 ramanath.datta@gmail.com

Research Area (only mention broad titles without description in detail):

- Ultra high strength steel, TWIP steel, Micro-alloyed high carbon steel
- Microstructure and texture in aluminium base alloy
- Aluminium based coating on steel
- Colour coated steel
- Diffusion bonding, Friction Stir Welding
- Wear of Materials
- Nano-structured materials
- Electronic Materials
- Biomaterials
- Composites

Research Facilities: (Name specific equipment /picture, infrastructure etc)

Up-gradation of research facilities in the Department of Metallurgy and Materials Engineering is a continuous process for creating a better environment for academics and research. A number of new equipment and instruments are acquired regularly for various laboratories, pertaining to rapidly expanding research horizons. A major research area for materials development and characterization comprises the broad fields of Metallography and Optical and Electron microscopy laboratories, the X-ray laboratory and the Differential Scanning Calorimetry (DSC) laboratory. The Physical Metallurgy laboratory, which has traditionally been the most important one in the Department, consists of an adequate sample preparation section, including Electro-polishers; a number of heat treatment furnaces with programmable control; high temperature (1700^{o}C) furnaces capable of powder sintering.

The optical microscopy section has been modernised with a number of Research grade microscopes with micro-hardness testing facility. The Scanning Electron Microscope with EDS system has given a new impetus to advanced research. For research in the field of Mechanical Metallurgy, the department has one Instron Testing machine. A laboratory scale Rolling mill, various hardness testers, Impact testing machine etc. are the other facilities in this area.

Recent additions have been made to augment the gamut of research areas. The Wear Testing facility enables investigations in the field of Tribology. Researches have been in progress in the field of nano-structured materials, produced by different routes. Planetary Ball Mills have been installed for the mechanical alloying route for powders. A device for evaluating magnetic properties of materials is another notable addition in the field of research on new materials. The X-ray diffraction unit for Phase identification and Texture study and the Differential Scanning Calorimeter for characterization are the important facilities, which are now used intensively for meaningful research.

The Department also has a computer laboratory with internet connectivity, which shall induce further in researches on simulation and modelling. The department has procured FESEM under DST-FIST grant which has been installed recently and working satisfactorily. Procurement of several other equipments, which is in the pipe line, shall further boost the research capability of the Department in near future. The Department can boast of a rich tradition of research, mostly with practical and industrial applications. Sponsored and Collaborative projects have been taken up and completed for organisations like Bhabha atomic Research Centre (BARC), Indian Space Research Organisation (ISRO), UGC, AICTE, Ministry of Steel, Govt. of India, Ministry of Defence, Govt. of India, Defence Research and Development Laboratory, Naval Research Laboratory etc. The important Projects of the Department are mentioned in a separate section to give a glimpse of the wide range of vigorous research activity of the faculty members of the small but dynamic Department.

Instrument and Equipment facilities:

- Air Induction furnace for melting of steel
- Heat Treatment Furnaces,
- Jominy Hardenability Testing unit
- Grinding and Polishing facilities, Electropolisher
- Optical Microscopes, including Research microscopes (Carl Zeiss, Leica)
- Hardness Testers
- Micro-hardness Testers (Leica)
- Scanning Electron Microscope (JEOL) with EDS facility (Oxford)
- Differential Scanning Calorimeter (Perkin Elmer DSC 8000)
- Instron Testing machines - Static
- Charpy Impact Testing machine
- Diffusion bonding set-up for joining dissimilar metals
- X-ray Diffraction unit ((Philips)
- X-ray Diffraction unit ((Bruker)
- Planetary Ball Mill for nano-material preparation and Mechanical alloying
- Wear Testing machine
- Computer laboratory
- Magnetic hysterisis measuring device
- Friction stir welding Machine

Name of the Laboratories:

- Metallography Laboratory
- Testing of Metals Laboratory
- Heat Treatment Laboratory
- Corrosion Laboratory
- X-ray Laboratory
- SEM Laboratory
- Metal Casting Laboratory
- Smithy & Forging Laboratory
- Welding Laboratory
- Computer Laboratory
- Physics of Metals Laboratory
- Nanostructure processing Laboratory

Consultancy Work:

- "Stainless Steel for Construction Segment" – sponsored by INSDAG – PI: Prof. S. Sadhukhan – Completed.
- "Welding & Fabrication of Steel work" – sponsored by INSDAG – PI: Prof. M. Ghosh, Co-PI: Prof. S. Sadhukhan- Completed.
- "Brand Ambassador of PMC Prestige TMT Bar" – sponsored by Purulia Metal Casting (P) Ltd. – PI: Prof. S. Sadhukhan – Completed.

Support Staff Position:

Sanctioned technical post: 11

Technical Staff:7 (full time)

2 (contractual)

Supporting Staff: 6 (full time) and 1 (contractual) for laboratory

2 (full time) for dept. office

Clerical Staff: 1 (contractual)

Technical and supporting staff profiles (in the following table)

Technical Staff:			
Name	**Designation**	**Highest Qualification**	**Contact No.**
Sri Santanu Chattopadhyay	Supdt. Tech	Diploma (Mech.)	09830229800
Sri Rash Behari Nayak	Supdt. Tech	Diploma (Mech.) & Adv. Diploma in Foundry Tech.	09231828193
Sri Jayanta Kr. Chandra	Supdt. Tech	Diploma (Mech.) & Adv. Diploma in Foundry Tech.	09433739104
Sri Bagala Prasad Patra	Supdt. Tech	H.S., ITI, NCVT & Craft Instructor Training	09932004412
Sri Ranjit Karmakar	Carpentry Instructor (Temporary contractual)	Non-Matriculate	09433609711
Sri Rup Chand Naskar	Workshop Instructor	ITI	07872331640
Sri Salil Kr. Dalui	Tech. Asst. II	B.E. (Met.Eng.)	09831435065
Sri Swapan Kr. Jana	Tech. Asst. II	AMIIM (Met. Eng.)	09231701660
Sri Chabilal Kar	Welding Instructor (Temporary Contractual)	H.S., ITI, NCVT trade test (Welder)	9231385267
Supporting Staff:			
Sri Ashoke Kumar Das	Record Supplier	Class V	9830484398
Sri Yeasin Mullick	Turner & Fitter	Class X	09433393053
Sri Tarak Nath Dey	Junior Peon	Madhyamik	9830788505

Name	Designation	Highest Qualification	Contact No.
Sri Manoj Bhagat	Junior Peon	Class V	9163728807
Sri Hiru Kumar Majhi	Hammer Man	Class VIII	9007485181
Sri Biswanath Darjee	Junior Darwan	Class VIII	9062445528
Sri Badal Chandra Das	Helper Gr. - II	Class V	9433212531
Sri Debasish Mondal	Junior Darwan	Class I	8902183415
Sri Jitan Das	Office Assistant	Golden Hospitality Services Pvt. Ltd.	9674392082
Sri Suraj Shaw	Technical Assistant	Golden Hospitality Services Pvt. Ltd.	9903667252

Ongoing Sponsored Research Project:

Sl No.	Title of the Project	Sponsoring Agency	Investigator (PI/Co-PI)	Project value
1.	Development of high strength multiphase steel through various processing conditions	Tata Steel Limited, Jamshedpur	PI: Dr. S. K. Ghosh	1.80 lakh
2.	Microstructure and mechanical properties of thermo-mechanically processed micro-alloyed high carbon steels	Tata Steel Limited, Jamshedpur	PI: Dr. S. K. Ghosh	1.97 lakh
3.	Development of 2000 MPa steels for Defence applications	Ordnance Factory Board, Govt. of India	PI: Dr. S. Chatterjee	30.00 lakh
4.	Influence of Silver and Tin on Microstructure and texture in Al-Zn-Mg Alloy	University Grants Commission, Govt. of India	PI: Dr. M. Ghosh	12.52 lakh
5.	Evolution of microstructure and texture in dissimilar alloys during Electron beam and Friction Stir Welding	Department of Atomic Energy, Govt. of India	PI: Dr. M. Ghosh	17.74 lakh
6.	Influence of silver and tin on microstructure and texture in Al-Zn-Mg alloys	DST-BELSPRO	PI: Dr. M. Ghosh	17.20 lakh
7.	Deformation and damage behaviour of automobile grade steels under cyclic loading	Tata Steel Limited, Jamshedpur	PI: Dr. D. Das	1.60 lakh
8.	Fatigue Property Evaluation and Microstructural Characterization of Hot Rolled Steels	Tata Steel Limited, Jamshedpur	PI: Dr. D. Das	14.85 lakh
9.	Wear performance evaluation of high strength microalloyed steels	Tata Steel Limited, Jamshedpur	PI: Dr. D. Das	1.97 lakh

Sl No.	Title of the Project	Sponsoring Agency	Investigator (PI/Co-PI)	Project value
10.	Micromechanism of Fatigue Failure of a Few High Strength Grade Steels Produced Through TSCR Route	Tata Steel Limited, Jamshedpur	PI: Dr. D. Das	14.85 lakh
11.	Development of diffusion bonded joints between Titanium alloy and micro-duplex stainless steel with intermediate materials	Fast Track for Young Scientist, DST, Govt. of India	PI: Dr. S. Kundu	14.00 lakh

Industry-Institute Interaction:

- Colorado School of Mines, Golden, USA
- Tata Steel Limited, Jamshedpur
- IIT, Kharagpur
- IIT, Kanpur
- NML, Jamshedpur
- Jadavpur University
- INSDAG, Kolkata
- Ptof. S. Sadhukhan – an incubate at Tagore Centre for Green Technology Business Incubation Centre (TCGTBI) under IIEST, Shibpur and one of the Directors of COSTEEL Pvt. Ltd. for advanced research and production of coloured stainless steel products.

Details of publications of each faculty member:

Sl No.	National/ International	Journal / Proceeding/Books/Monograms	Title of Paper, Publication Date (yyyy)	Journal/ Proceeding Name Volume No, Page No	Belongs To	Citations (Google Scholar)
1.	International	Journal	The latent fingerprint in mass transport of polycrystalline materials (2016)	Heat and Mass Transfer, 52 (2) 217-225	Gopinath T, S. Kundu, S. Chatterjee	Nil
2.	International	Journal	Development of ternary iron vanadium oxide semiconductors for applications in photoelectrochemical water oxidation (2016)	RSC Advances (6) 4992-4999	H. Mandal, S. Shyamal, P. Hajra, A. Bera, D. Sariket, S. Kundu, C. Bhattacharya	Nil
3.	International	Journal	Effect of Bonding Temperature on Phase Transformation of Diffusion-Bonded Joints of Duplex Stainless Steel and Ti-6Al-4V Using Nickel and Copper as Composite Intermediate Metals (2015)	Metallurgical and Materials Transactions A 46 5756-5771	S. Kundu, G. Thirunavukarasu, S. Chatterjee and B. Mishra	Nil
4.	International	Journal	Diffusion Bonding of Duplex Stainless Steel and Ti Alloy with and without Interlayer (2014)	Materials Science Forum 783(7) 9-14	S. Chatterjee, S. Kundu**,** S. Sam, B. Mishra	Nil
5.	International	Journal	Diffusion Bonding of Microduplex stainless steel and Ti alloy with and without interlayer: Interface microstructure and strength properties (2014)	Metallurgical and Materials Transactions A 45 (1) 371-383	S. Kundu, S. Sam, B. Mishra and S. Chatterjee	2
6.	International	Journal	Electrochemical Study of Diffusion Bonded Joints between Micro-duplex Stainless Steel and Ti6Al4V Alloy, (2014)	Journal of Materials Science & Technology 30 (2) 163-171	S. M. Bhola, S Kundu, R. Bhola, B Mishra, S. Chatterjee	5
7.	International	Journal	Effect of Bonding Time on Interfacial Reaction and Mechanical Properties of Diffusion-Bonded Joint Between Ti-6Al-4V and 304 Stainless Steel Using Nickel as an Intermediate Material (2014)	Metallurgical and Materials Transactions A 45 2078-2090	Gopinath T, S. Kundu, B. Mishra, S. Chatterjee	2
8.	International	Journal	Effect of Bonding Temperature on Interfacial Reaction and Mechanical Properties of Diffusion-Bonded Joint Between Ti-6Al-4V and 304 Stainless Steel Using Nickel as an Intermediate Material (2014)	Metallurgical and Materials Transactions A 45 (4) 2067-2077	G Thirunavukarasu, S Kundu, B Mishra, S Chatterjee	4

Sl No.	National/ International	Journal / Proceeding/Books/Monograms	Title of Paper, Publication Date (yyyy)	Journal/ Proceeding Name Volume No, Page No	Belongs To	Citations (Google Scholar)
9.	International	Journal	Structure and properties of solid state diffusion bonding of 17-4PH stainless steel and titanium, (2014)	Materials Science and Technology 30 (2) 248-256	S. Kundu, S. M. Bhola, B. Mishra and S. Chatterjee	Nil
10.	International	Journal	Microstructure-Property Correlations of Multifunctional Si-Fe Nanocomposite (2016)	Nano Hybrids, 9, 15-23	K. Basu, S. Chatterjee, A. Roychowdhury, D. Das, A. Basumallick	Nil
11.	International	Journal	A simple stir casting technique for the preparation of in situ Fe-aluminides reinforced Al-matrix composites (2016) (Article in Press).	Perspectives in Science, Article in Press.	S. K. Pradhan, S. Chatterjee, A. Basumallick and D. Das	Nil
12.	International	Journal	Effect of microstructure and residual stresses on nano-tribological and tensile properties of Al_2O_3-and SiC-reinforced 6061-Al metal matrix composites (2016)	Journal of Composite Materials 50 (19) 2687-2698	S. Chatterjee, S. G. Sur, S. Bandyopadhyay, A. Basumallick	1
13.	International	Journal	HVOF sprayed WC-CoCr coating on mild steel: Microstructure and wear Evaluation (2016)	Journal of Applied Physics 8(1) 585–591	D. Naha, S. Chatterjee, M. Ghosh, J. Dutta Majumdar and A. Majumdar	Nil
14.	International	Journal	Correlating r-value and through thickness texture in Al–Mg–Si alloy sheets (2015)	Journal of Alloys and Compounds 619, 585–591	M. Ghosh, A. Miroux, L. A. I. Kestens	4
15.	International	Journal	Structural, optical, hyperfine and magnetization studies of ZnO encapsulated α-Fe nanoparticles (2014)	Materials Research Bulletin 60, 566–571	A. K. Rathore, S. P. Pati, A. Roychowdhury, M. Ghosh, D. Das	Nil
16.	International	Journal	Examining Energy and Environment Issues in Non-ferrous Metallurgy in the Light of Industrial Metabolism (2014)	Journal of Materials and Environmental Science 5 (2) 380-389	M. Ghosh, P. S. Banerjee and H. S. Ray	Nil
17.	International	Journal	Warm Deep-drawing And Post Drawing Analysis of Two Al-Mg-Si Alloys (2014)	Journal of Materials Processing Technology 214 (4) 756-766	M. Ghosh, A. Miroux, R. J. Werkhoven, P. J. Bolt and L. A. I. Kestens	17
18.	International	Journal	Environmental Pollution Due to Gaseous Emissions During Non-ferrous Extraction Processes (2014)	Russian Journal of Non-Ferrous Metals 55 (3) 263-269	Manojit Ghosh, P. S. Banerjee and H. S. Ray	Nil
19.	International	Journal	Effect of Trace Added Sn on Mechanical Properties of Al-Zn-Mg alloy (2014)	Advanced Materials Research Journal 828, 73-80	S. Sadhukhan, M. Kundu and M. Ghosh	Nil
20.	International	Journal	Processing temperature dependent morphological and optical properties of ZnO nanorods (2014)	Materials Science in Semiconductor Processing 20, 55-60	N. Shakti, A. Prakash, T. Mandal, M. Katiyar	11

Sl No.	National/ International	Journal / Proceeding/Books/Monograms	Title of Paper, Publication Date (yyyy)	Journal/ Proceeding Name Volume No, Page No	Belongs To	Citations (Google Scholar)
21.	International	Journal	Optimization of milling parameters for the mechanosynthesis of nanocrystalline hydroxyapatite (2014)	Powder Technology 253 650-656	T. Mandal, B. K. Mishra, A. Garg, D. Chaira	9
22.	International	Journal	Crack Propagation Resistance of α-Al_2O_3 Reinforced Pulsed Laser-Deposited Hydroxyapatite Coating on 316 Stainless Steel (2014)	JOM 66 (10) 2095-2107	S. Bajpai, A. Gupta, S. K. Pradhan, T. Mandal, K. Balani	Nil
23.	International	Journal	Ultra-high strength steel: Present perspective and futuristic applications (2015)	Iron and Steel Review 59, 41-47	S. Chatterjee and S. K. Ghosh	Nil
24.	International	Journal	Thermo-mechanically controlled processed ultrahigh strength steel: Microstructure, texture and mechanical properties (2016)	Materials Science & Engineering A 663, 126 -140	S. Mandal, N. K. Tewary, S. K. Ghosh, D. Chakrabarti and S. Chatterjee	Nil
25.	International	Journal	Phase transformation and mechanical behaviour of thermo-mechanically controlled processed high strength multiphase steel, (2016)	Journal of Materials Science 51 (14) 6569–6582	G. Mandal, S. K. Ghosh and S. Mukherjee	Nil
26.	International	Journal	Microstructure, mechanical properties and corrosion performance of a few TMT rebars, Corrosion Engineering, (2016):	Corrosion Engineering, Science and Technology 51, 1-13	S. K. Nandi, N. K. Tewary, J. K. Saha and S. K. Ghosh	Nil
27.	International	Journal	Characterisation of microstructure, texture and mechanical properties in ultra low-carbon Ti-B microalloyed steels (2015)	Metals and Materials International 21, (1) 85–95	R. Shukla, S. K. Ghosh, D. Chakrabarti, and S. Chatterjee	1
28.	International	Journal	Effect of annealing on microstructural and mechanical behavior of cold rolled Low C High Mn TWIP steel (2015)	International Journal of Metallurgical Engineering 4(1) 12–23	N. K. Tewary, S. K. Ghosh and S. Chatterjee	Nil
29.	International	Journal	The latent fingerprint in mass transport of polycrystalline materials (2016)	Heat and Mass Transfer 52 (2) 217-225	Gopinath T, S. Kundu, S. Chatterjee	Nil
30.	International	Journal	Computational intelligence based designing of microalloyed pipeline steel (2015)	Computational Materials Science 104, 60-68	S. Pattanayak, S. Dey, S. Chatterjee, S. G. Chowdhury, and S. Datta	Nil
31.	International	Journal	Diffusion Bonding of Duplex Stainless Steel and Ti Alloy with and without Interlayer (2014)	Materials Science Forum 783 (7) 9-14	S. Chatterjee, S. Kundu, S. Sam, B Mishra	Nil
32.	International	Journal	Influence of cold rolling on microstructure, texture and mechanical properties of low carbon high Mn TWIP Steel (2014)	Materials Science & Engineering A 615, 405-415	N. K. Tewary, S. K. Ghosh, Supriya Bera, D. Chakrabarti, S. Chatterjee	12

Sl No.	National/ International	Journal / Proceeding/Books/Monograms	Title of Paper, Publication Date (yyyy)	Journal/ Proceeding Name Volume No, Page No	Belongs To	Citations (Google Scholar)
33.	International	Journal	Influence of dynamic precipitation during low cycle fatigue of under-aged AA6063 alloy (2016)	Transitions of Indian Institute of Metals 69 (2) 319-324	S. Nandy, A. P. Sekhar, D. Das. S. J. Hossain and K. K. Ray	Nil
34.	International	Journal	Understanding compressive deformation behavior of porous Ti using finite element analysis, (2016)	Materials Science and Engineering C 64, 436-443	S. Roy, N. Khutia, D. Das, M. Das, V. K. Balla, A. Bandyopadhyay and A. Roy Chowdhury	Nil
35.	International	Journal	Process model to predict yield strength of AA6063 alloy (2015)	Materials Science and Engineering A 644, 413-424	S. Nandy, K. K. Ray, D. Das	1
36.	International	Journal	Influence of Ageing on Mechanical Properties of 6063 Al Alloy (2015)	Materials Today: Proceedings 2, 1234-1242	S. Nandy, M. A. Bakkar and D. Das	Nil
37.	International	Journal	Simulation of LCF Characteristic of AA6063 Al Alloy under Different Ageing Conditions; (2015). DOI: 10.1016/j.matpr.2015.07.242	Materials Today: Proceedings 2, 2226-2235	S. K. Basantia, M. A. Bakkar, N. Khutia and D. Das	Nil
38.	International	Journal	Cryogenic processing to improve wear performance of die steels (2015)	International Journal of Surface Science and Engineering 9, 124-144	D. Das and K. K. Ray	1
39.	International	Journal	High and low-cycle fatigue performance comparasion between micro-alloyed and TMT rebar (2014)	Construction and Building Materials 54, 170-179	S. K. Paul, P. K. Rana, D. Das, S. Chandra and S. Kundu	5
40.	International	Journal	Ultrasonic Cavitation Based Processing of Metal Matrix Nanocomposites: An overview (2014)	Advanced Materials Research 1042, 58-64	S. Sardar, S. K. Karmakar and D. Das	Nil
41.	International	Journal	Microstructural evolution and mechanical behaviour of surface hardened low carbon hot rolled steel, (2014)	Materials Science & Engineering A 606, 58-67	N. K. Tewary, B. Syed, S. K. Ghosh, S. Kundu, S. M. Shariff, G. Padmanabham	Nil
42.	International	Journal	Influence of Cold Rolling on Microstructural Evolution in 2205 Duplex Stainless Steel (2014)	Steel Research International 85 (5) 776-783	S. Pramanik, S. Bera, and S. K. Ghosh	3
43.	International	Journal	Influence of 10% Cold Rolling Reduction on Ageing Behaviour of Hot Rolled Al-Cu-Si–Mn-Mg Alloy, (2014)	Journal of the Institution of Engineers (India) Series D 95 (2) 95-101	S. K. Ghosh	Nil
44.	International	Journal	Phosphorous Control in Induction Furnace Steel Melting using LD Slag, (2016)	International Journal of Engineering Research & Technology 5(6) 729-734	A. De, S. Bhattacharya, R. Dey and S. Sadhukhan	Nil
45.	International	Journal	Formability of Al-killed AISI 1040 Medium Carbon Steel for Cylindrical Cup Formation (2016)	ISIJ International 56 (4) 610-618	A. K. Parida, S. Soren, R. N. Jha and S. Sadhukhan	Nil

Sl No.	National/ International	Journal / Proceeding/Books/Monograms	Title of Paper, Publication Date (yyyy)	Journal/ Proceeding Name Volume No, Page No	Belongs To	Citations (Google Scholar)
46.	International	Book	Cryogenic Treatment	Encyclopedia of Iron, Steel, and Their Alloys, Eds. Rafael Colas and George E. Totten Publisher: CRC Press, Taylor & Francis Group ISBN 9781466511040 - CAT# K14814	D. Das and K. K. Ray	Nil

Patents/ Invention disclosure / Technology transfer / Copyright:

Sl. No.	Obtained/ Filed	Patent Registered National/ International	Patent Title	Patent Type Product / Process	Patent Number	Patent Grant Year	Commercialized Yes/ No	Institution/ Joint	Joint with Academic Institute/ R&D Institute/ Institute
1.	Obtained	National	A process for combined chemical polishing and etching of plain carbon steels, low alloy steels and cast iron samples - The Gazette of India, February 21, 2004	Process	192123 Application date: 10.04.1997 Application No.: 624/Cal/97	1997	No	Self	Inventor: Prof Sanjoy Sadhukhan
2.	Obtained	National	Development of microalloyed ultra high strength steel	Product	235705 Application date: 04.04.2007 Application No.: 551/KOL/2007	2007	Yes	Patentee: Metal & Steel Factory, Ishapore	One of the inventors is Prof. Dr. Subrata Chatterjee
3.	Applied for	International	Development of Low-Carbon Copper-Bearing Ultra-High-Strength Steels on a Laboratory Scale	Product	NA	NA	NA	Patentee: Colorado School of Mines	One of the inventors is Prof. Dr. Subrata Chatterjee

Seminar/ Workshops/Conferences/Training program organized by the department:

1. Workshop on Materials Characterization: Principles and Practices – jointly organized with CoE from 25th July, 2016 to 05th August, 2016.
2. Colloquium on Nuclear Materials (CNM 2016) - 19th August, 2016.

Advancements under TEQIP – Phase II:

New equipment such as (i) Vacuum Oven, (ii) Micro-hardness Tester with touch screen display, (iii) Automatic contact extensometer, (iv) Electro polisher and (v) Impedance analyser will be procured very shortly.

The Faculties, Research Scholars and the UG and PG students as well as staff members have got support for attending conference, seminars, workshops and other academic programs and training programs in India and Abroad which help in the enhancement of performance and upgrade academic environment.

Foreign visits and Invited Lectures:

Dr. Manojit Ghosh, Associate Professor, visited Ghent University, Belgium as Visiting Scientist under FEA-CWO mobility program from 15th August to 14th September, 2015. During this period Prof. Ghosh had the opportunity to do research as visiting scientist along with invited lecture.

Visitors to your Department (Indian & Foreign):

Dr. Manish Ray – DMRL, Hyderabad, as INAE-AICTE Professor

Dr. Jayanta Kr. Saha – INSDAG, as INAE-AICTE Professor

Mr. Keith Dicks-Application Expert, Oxford Instruments, UK - to train in newly purchased and installed FEG SEM system attached with EDS and EBSD facility as well as to deliver lecture on the occasion on Regional EBSD Workshop-Kolkata held on 30th June, 2016 jointly organized by Oxford Instruments India Pvt. Ltd. and Department of Metallurgy and Materials Engineering, IIEST, Shibpur.

Alumni Contribution to your Department:

Technical talk delivered by Dr. Suman Guha in the field of Mechanical Metallurgy.

Training and Placement:

Adequate no. of students after 6th semester took training in different Integrated Steel Plants, private industries, CSIR Laboratories etc. More than 70% students of 8th semester got placement and the rest opted for higher studies.

Extension Activities and Societal outreach:

6-semester part time M. E. degree in Industrial Metallurgy for the practicing Engineers in Metallurgy and Mechanical by the Department.

3-semester Certificate course on Steel Making and Rolling Technology sponsored by NISST, Govt. of India by the Department.

New Academic / Research Initiatives

(a) Academic Collaboration

INSDAG, Kolkata

(b) Industrial Collaboration

Tata Steel Limited, Jamshedpur

Department of Mining Engineering

About the Department:

Mining and Agriculture are the two oldest professions of mankind. But, notwithstanding the emphasis made by Koutilya (*Arthasastra*; c. 300 – 250 BC), Georgius Agricola (*de Re Metallica*; 1556), and a few other philosophers, its advent as a scientific discipline was rather delayed. The situation was more conspicuous in India where coal mines were opened up in 1774 but mining education started more than a century later, in 1906, at this institute (the then Bengal Engineering College). Meanwhile it was felt, - amongst others by the Indian National Congress -, that a School of Mines be established in India in the model of the Royal School of Mines, London. The desire was transformed into reality with the establishment of Indian School of Mines (ISM) in 1926 at Dhanbad and B E College stopped imparting mining education. As such the department was closed and all its scientific and human resources were transferred to ISM Dhanbad.

However post independence period witnessed a purposeful thrust on mining sector. A consequential fall out was the re-establishment of the Department of Mining and Geology at Bengal Engineering College Shibpur in 1956.

Ever since its re-establishment, the mining engineering department has been catering to the quality-manpower needs of the mining industry. Important milestones covered by the department include, *inter-alia*, the following:

As on date academic course run by the department are: BE(Mining Engineering); Integrated dual (BTech/MTech) degree programme in mining engineering and regular 4 semester (a) ME programme in Mining Engineering and (b) MTech programme in Geo-informatics. Over the years the department has built up advance research capabilities in almost all the sub-disciplines of Mining Engineering. Ever since the institute was elevated to a deemed-university, the department has been undertaking regular academic and sponsored research programmes. In the recent past several cutting-edge *avant-garde* research projects have been completed by the department. Of late several outreach services have been extended to the user agencies. Based on its infrastructure and human resource potential the department has identified a few major thrust areas for pursuing top-notch research.

Academic Programmes:

Details of the academic programmes offered under the aegis of the department are furnished below:

Undergraduate Level

Degree offered	B.E. in Mining Engineering
Sanctioned students intake	30

Post graduate Level

Degree offered	Dual (BTech/ MTech) degree in Mining Engineering
Sanctioned students intake	40

Degree offered	M.E. in Mining Engineering
Sanctioned students intake	18
Additional intake through other programmes (i.e. QIP)	Nil
Specialisations in	Mining Engineering

Degree offered	M.Tech in Geoinformatics
Sanctioned students intake	18
Additional intake through other programmes (i.e. QIP)	Nil
Specialisations in	Geoinformatics

Doctoral Level

Degree offered:	Ph.D in Mining Engineering
No. of candidates enrolled:	19
No. of candidates Registered:	12
No. of candidates Awarded:	00

Faculty Position:

Sanctioned faculty strength:	12
Vacant:	4

Faculty profile:

Name	Designation	Highest Qualification	Specialisation/ Research Area	Contact No E-mail
P.K.Paul	Professor	PhD	Metal Mining. GIS and Remote Sensing	Prabirpaul59@gmail.com
N.C.Dey	Professor	PhD	Coal Mining. U/G mining machinery Safety & Legist ion and Ergonomics	ncdey@mining.iiests.ac.in
I.N.Sinha	Professor	PhD	Surface Mining,Mine Environment Science and Management	indranaths@mining.iiests.ac.in
S. Sinha	Professor	PhD	Mine Environment, Mine Planning & Design and Mineral Economics	suranjan1980@gmail.com
P.Dutta	Professor & Head	PhD	Rock Mechanics and Coal Bed Methane(CBM)	dutta.pratik@gmail.com

Name	Designation	Highest Qualification	Specialisation/ Research Area	Contact No E-mail
S. Mukhopadhyay	Associate Professor	PhD	Mineral Dressing and Bulk Material Handling	sudipta1973@yahoo.com
G .C.Roy	Assistant Professor	PhD	Coal Mining, Mining Machinery And Optimization Techniques	gcroy_besus@yahoo.co.in
Md.M.Islam	Assistant Professor	M.Tech	Mining Pollution control and Management	miraj77@gmail.com

Awards and Laurels received by the faculty members: -

Research area (only mention broad titles without description in detail)

Principal research strengths of the department lies in the areas of

a. Mining Geo-Spatials
b. Occupational Safety and Health of Miners
c. Environmental Management of Mining Operations
d. Mineral Beneficiation
e. Carbon Sequestration and Exploitation of Coal-Bed-Methane
f. Ground Control and Underground Space Engineering

Ever since the accordance of deemed university status to the institute the department has been running regular academic and sponsored research programmes. Academic research undertaken in the recent past focused on the following areas:

- Occupational health and safety
- Rock mechanics and strata control
- GIS / GPS and remote sensing application
- Mineral beneficiation
- Environmental appraisal and planning
- Mine system optimization
- IT application in Mining
- Rock blasting with explosives
- Simulation & behavioural modelling

Sponsored research carried out by the department hinged around the following focal points:

- Mathematical modelling on dust generation in large opencast coal mines
- Risk assessment of occupational injuries through epidemiological approaches in underground coal mines.
- Impact of sorption and diffusion properties on deliverability of coal-bed methane.
- Study of health condition and monitoring of haulage drive and mechanical ventilator in an underground coal mine.
- Benchmarking of large opencast project in India
- Techno-economic feasibility of high angle conveyor in large opencast mines in India.
- Sillimanite investigation in Purulia district, W.B.
- Economic analysis of impact of mechanised surface mining on natural resources and economy of iron ore mining belt of eastern India
- Development of a methodology for cumulative impact assessment of non coal mining projects
- Development of a methodology to integrate environmental economics in EIA of surface iron ore mines in eastern India
- Development of a GIS based information system for coal mining areas of West Bengal
- Quantitative risk assessment of mine workers – a useful management tool to improve mine safety performance.
- A tecno-economic study on processing of china clay of West Bengal
- Improving mine safety performance through GIS.
- Assessment of suitable rest break period for selective underground coal miners – an ergonomics approach

During the past decade the department had extended outreach services in the areas of Rock testing, Topographical survey, Surveying for railway corridor, Highway survey, Mine Planning, Volume computation, Blast vibration monitoring *etc*.

Having analysed its resource strengths and the needs of the present day mining industry the department has identified the following major thrust areas for pursuing *avant garde* research:

- Mine Planning and IT application
- Mine Safety Engineering
- Geo-Informatics and Ergonomics
- Mine environmental Management
- Mineral Beneficiation
- Rock Mechanics and Strata Control.
- Mineral Economics.

Research facilities: (name specific equipment / picture, infrastructure etc):

GIS and Remote Sensing: The department has well established GIS and Remote Sensing research laboratories. The facilities include GIS software's like ARCMAP, ILWIS, GEOMEDIA etc. and Remote Sensing software's like ERDAS, ENVI etc. The department has AO scanner, AO plotter, workstations, handheld GPS and other associated software.
Safety and Ergonomics: The department has a good infrastructure for research and consultancy in the field of safety and ergonomics. The infrastructure include Oxylog consumption monitor, whole body vibration meter, hand arm vibration meter, mobile heart rate monitor. Asman Hygrometer etc
Rock Mechanics: The department has well established rock mechanics laboratory which includes, UTM, Rock drilling and cutting machines, Shear testing apparatus, Triaxial set up and software necessary for analysis.
Mine Planning: The department uses SURPAC and MINEX software for mine planning and design.
Survey: The department has well established survey laboratory. The equipment in lab includes, total station, electronic theodolite, DGPs and single frequency GPS.

Name of the Laboratories:

MINERAL DRESSING / MINERAL BENEFICIATION LABORATORY

Name of Equipment	Number of Equipment
1.Pneumatic Cyclone Assembly	1 Lot
2.Jaw CRUSHER	1
3.Moisture Drier	1
4. Bucket Elevator	1
5.Jig machine pilot plant	1
6.Mozley Hydro cyclone Test Rig	1
7.Vibrating Screen with AC variable Speed drive	1
8.Ball Mill	1
9.Sieve Shaker (Different size)	2
10.Forth Floatation cell	1
11.Rod Mill	1
12.Screw Washer with AC variable speed drive	1
13. Microtrac Particle Size Analyzer	1
14. Weighing Scale (with density Gauge)	1
15. Weighing Balance (electronic)	1
17. Hydrocyclone test rig	1
18. Raymond Mill	1
19. Pulverizer	1

MINE ENVIRONMENTAL SCIENCE AND VENTILATION ENGINEERING LABORATORY

1.High Volume Dust Samplers	2
2.Gravimetric Dust Sampler	1
3.Sound Level Meter	2
4.Humidity/Temperature meter	1
5.Lux Meter	1
6.Nephelo Meter	1
7.PH Meter	1
8.Water analysis kit	1
9.uv-vis Spectro photo Meter	1
10.Whirlling hydro Meter	2
11.Anemo Meter	1
12.Methano Meter	1
13. Blast Vibration Meter	1
14.CO Detector	1
15. Flame Safety Lame	1
16. Gas Tasting Arrangement	1
17. Peristaltic Pump	1
18. Water Bath	1
19. Auto Clave	1
20. Nephelometer	1
21. Soil and Water Analysis Kit	1
22. Weather Monitoring System	1
23. Gas chromatograph	1
24. Crossing Point Apparatus	1

UNDERGROUND MINING MACHINERY LABORATORY

1.Headgear Structure	2
2.Drumwinding System	1
3. Skip winding system	1
4.King Detaching Safety Hook	1
5. Armored Detaching Safety Hook	1
6.Electric Coal Drill Machine	1
7. Jack Hammer Drill Machine	2
8.Direct Rope Haulage Model	1
9.Endless Rope Haulage Model	1
10. Main & Tail Rope Haulage Model	1
11.Gate Belt Conveyor	1
12.Scraper Chain Conveyor	1
13.Shaker conveyor	1
14. Load Haul Dumper (LHD)	1
15.Side Discharge Loader (SDL)	1
16. Continuous Miner /Road Header	1
17.Jim Crow	1
18. Back Stay	1
19. Reliance Rope Capel	1
20.Single & Double C- coupling	2
21. Single & Double D - Coupling	2
22.Haulage Appliances (Stop Block , Jazz Rail, Crossings etc)	1
23.Different types of wire ropes	1
24.Different types of Gear	1
25. Long wall Panel Model	1

MINE SURVEY LABORATORY

1.Dual frequency GNSS Receivers for DGPS survey	1
2. Single frequency GNSS receivers for DGPS survey	1
3.Auto Level	5
4. Electronic Theodolite	3+3
5.Total Station	1+1
6. Prismatic Compass	2
7.GPS	2
8.Tripod	12
9.Staff	6
10. Ranging Rod	20
11.Engineers Chain	12
10. Measuring Tape(30m)	6

GIS / GPS LAB

1.Scanner AO size	
2.ARC info software (3 user)	
3.Workstation 4no's	
4.ERDAS software (5 user)	
5.Plotter AO size	
6.SERVO UPS	
7. Envi 5.0 (10 Users)	
8. Envi 5.0 (10 Users)	
9. Geomedia Professional	
10. Raster to vector software	
11. ILWIS	

ROCK MECHANICS LAB

1.UnivarsaTestinsg Machine(U.T.M.)	1Nos
2.Poinst Load Testing Machine	1
3.Tri axial cell with pressure system	1
4.Brazilian Test apparatus	1
5.Proto Dyakonov apparatus	2
6.Slake Durability Test apparatus	1
7. Precision Vacuum oven apparatus	1
8.Rock cutting Machine	1
9 Rock polishing Machine	2
10.Schmit hammer	1
11.Rock permeability test apparatus	1
12.Shear testing apparatus	1

COMPUTER APPLICATION LAB

1.B.E. Computer Lab	25
2.M.E. Computer Lab	6
3.Surpac Software	
4.Minex Software	
5.Rock science Software	
6.GEM Software	
7.Whittle Software	

MINE DEVELOPMENT LABORATORY

Model for Shaft Sinking	1

BULK SOLID HANDLING LABORATORY (Elective II)

Weighing Scale (with density Gauge)	
Vibrating Screen with AC variable Speed drive	
Bucket Elevator	
Hopper with Vibrating Feeder (Electro-magnetic type)	

Consultancy Work:

Sl No	Department	Consultancy Type	Consultancy Title	Client Name	Year
1	Mining Engg	Geotechnical study of Rock & gassiness	Geotechnical study of Rock & gassiness for Moonidih U/G coal mines.	MINOP Innovative Solutions Pvt Ltd	2014
2	Mining Engg	Analysis & Interpretation of stress cell and exensometer data collected	Analysis & Interpretation of stress cell and exensometer data at Sharda Highwall mining project of South Eastern Coal Fields ltd.	South Eastern Coal Fields ltd. under Cuprum Bagrodia Ltd.	2014
3	Mining Engg	Scientific Evalution of mine closure Plan	Scientific Evalution of mine closure Plan with reference to sustainable development of govt. of India	Govt of India for Dongri Bujurg mine MOIL.	2014
4	Mining Engg	Scientific Study for Trench T-3 of Sharda Highwall Mining	Scientific Study for Trench T-3 of Sharda Highwall Mining Project of CUPRUM BAGRODIA LIMITED	CUPRUM BAGRODIA LIMITED	2015

Support staff position:

Sanctioned technical post : 5

Technical staff profile (in the following table)

Name	Designation	Highest Qualification	Contact No.	E- mail
Prasanta Gope	Tech-Asst-(Gr-l)	Diploma in Mining Engineering	9432160424	prasantagope.min@gmail.com
Janardan Kar	Tech-Asst-(Gr-ll)	Diploma in Mining Engineering	9432684391	mr.jkar@rediffmail.com
Amitava Chowdhury	Tech-Asst-(Gr-ll)	Diploma in Mining Engineering	9474831932	amitavachowdhury74@gmail.com

Name	Designation	Highest Qualification	Contact No.	E- mail
Saibal Ghosh	Sr. Mechani (Gr II)	I.T.I	9831520241	saibal_gh@yahoo.com
Sandipan Patra	Tech-Asst. (Contractual)	B.Tech in Electrical Engineering	9733853714	patra_29@yahoo.com
Gobardhan Nayak	Sr.Record Suppler	VIII Passed	8582802642	
Sanjoy Ghosh	Jr.Durwan	10 +2 Passed	9804930061	sghoshiiest@gmail.com

Ongoing Sponsored Research / projects: (mention area)

Ongoing (Prof value)	Sponsoring agency
Mine closure	MOEF
Environment	DST
Mineral Dressing	UGC
GIS and Remote Sensing	MOEF
Coal Bed Methane	DST

Industry – Institute Interaction:

Details of publications of each faculty member (2015 – 16)

Journal ……08……

Conference ……08……

Books / Monograms ……03……

(List to be included)

Patents / Invention Disclosure / Technology Transfer / Copyright

Seminar / Workshops / Conferences / Training programme organized by the department (2015 - 16):

Sl. No.	Conducted (Seminar/ Conferences/ Workshop/Symposium)	Title	Dept	Date From	Date to
1	Workshop	Ergonomics approach in industrial Mining	Mining Engineering	Jan 2016	
2	Seminar	Meeting the Natural Challenges strategies and perspective	Mining Engineering	8.4.2016	9.4.2016

Foreign visits and Invited Lectures:

Prof. N.C.Dey and Prof G.C.Roy were visited in University of Alaska Fairbanks, USA.

Visitors to your Department (Indian & Foreign) :

1. Prof. Stephen Fyatas
   University of New Castle, Australia
2. Mr. Manish Sharma
   G.M., I.O.C.L.

Alumni Contribution to your Department:

Placement:

1. Coal India Limited - 05
2. Joy Mining Services – 04
3. Cuprum Bagrodia Ltd. – 02
4. IT Industries - 15

Extension Activities and Societal outreach:

New Academic / Research Initiatives

c) Academic Collaboration

d) Industrial Collaboration

Department of Physics

About the department

The department of Physics has a century old past and has come through the era of revolutionary thoughts in the world of physics to the present century of technological revolution. As far back in 1926, Prof. Satyendra Nath Bose and Prof. Meghnad Saha , then post graduate students of Calcutta University used to come to this department to study original works of Max. Planck and Albert Einstein. Our library was so rich even at that time under the able leadership of Prof. Bruhl. They also used to do their M.Sc. practical in the laboratory of this physics department. An unforgettable name in the history of the department is Prof. S.S. Boral, who initiated the course on Electronics and Telecommunications which itself finally branched out to be one of the advanced engineering department of the university. Our department can justifiably feel proud of eminent teachers like Prof. P.K. Chattopadhyay, Prof. B.R. Gupta, Prof. N.C. Mukherjee, Prof. M. Mitra and others who taught the undergraduate engineering students of B.E. College and made a strong base for their further studies. Our present faculty members are also faithfully tracing their paths.

The year 2000 was a landmark for our department when the M.Sc. course in Applied Physics was introduced. New faculty members started joining the department, having expertise in modern thrust areas of physics and related technology. On the one hand, theoretical works are being pursued in the field of Nuclear and High energy physics and Atomic and Molecular physics; on the other hand in view of latest technological advancement, different studies are carried out in the field of Fiber Optics, Electroceramics, Spectroscopy of Laser and Luminescent materials, Transport phenomena in solids, Synthesis of Nanomaterials by sol gel route and their characterization, Silicon nanostructure based : Light emitters, Detectors, Sensors, Plasma bio-medical application, carbon nanotubes, graphene etc. At the same time, experimental works are undertaken creating a rich environment of advanced research. In the last five years the faculty members of the department have contributed more than 200 research papers in international journals of repute and international conference proceedings. Many of our students are engaged in research and some of them are also in scientific jobs in various premier research institutions of India, such as SINP, IACS, TIFR, BARC, IPR, CGCRI etc. A considerable number of them are pursuing Ph.D. programme in the department itself.

Academic Programmes:

Undergraduate Level
Degree offered: B.Tech (Physics course for 1st, 2nd semesters (all), excluding Architecture students)

Sanctioned students' intake: 620 approximately

Post Graduate Level
Degree offered:M.Sc. in Physics

Sanctioned students' intake:28

Specialisations in:Material Physics

Nuclear Physics

Doctoral & Post Doctoral Research Programme

Degree offered : PhD (Engineering / Science / Humanities & Management Science) :Science
No of Candidates enrolled :23
No. of Candidates registered:12
No. of Candidates awarded:2 (and No. of Candidates submitted: 4)

Ph.D awarded:
1. Subrata Mitra (under the sole supervision of Dr. Samar Jana), November 2015.
2. Navonil Bose (under joint supervision of Dr. Sampad Mukherjee and Dr. Mousumi Basu), October 2015.

Faculty Position:
Sanctioned faculty post ……14……. Vacant Post …1…

Faculty profile (in the following table)

Name	**Designation**	**Highest Qualification**	**Specialization / research area**	**Contact No. E-mail**
Dr. (Mrs.) Dipali Banerjee	Professor	M.Sc., M.Phil., Ph.D	Solid State Physics, Transport properties of solids	9830299253 dipalibanerjeebesu@gmail.com dbanerjee@physics.iiests.ac.in
Dr. Bichitra Kumar Guha	Professor and **Dean (*Faculty Affairs*)**	M.Sc., M.Phil., Ph.D	Solid State Physics, Electroceramics	9830155316 bkg@physics.iiests.ac.in bkguha.phys@gmail.com
Dr. Sukhendusekhar Sarkar	Professor	M.Sc., Ph.D	Theoretical Nuclear Structure and Nuclear Astrophysics	9433006526 ss@physics.iiests.ac.in sukhendusekhar.sarkar@gmail.com
Dr. Mousumi Basu	Professor	M.Sc., M.Tech. Ph.D	Fibre Optics in linear and nonlinear domain	9433306461 mbasu@physics.iiests.ac.in, mousumi_basu@yahoo.com
Dr. Sampad Mukherjee	Associate Professor	M.Sc., Ph.D	Solid State Physics Synthesis and characterization	9433579392 smukherjee@physics.iiests.ac.in smukherjee.besu@gmail.c

Name	Designation	Highest Qualification	Specialization / research area	Contact No. E-mail
			of nano materials	om
Dr. Samar Jana	Associate Professor and **Head**	M.Sc., Ph.D	Spectroscopy of Laser and Luminescent materials	9433428035 hod@physics.iiests.ac.in samarjana@physics.iiests.ac.in samarjana@yahoo.com
Dr. Krishnendu Mukherjee	Associate Professor	M.Sc., Ph.D	High Energy Physics,	9432273434 kmukherjee@physics.iiests.ac.in krisnendumukherjee@yahoo.com
Dr. Amit Kundu	Associate Professor	M.Sc., Ph.D	High Energy Physics, Cosmology	9433906370 amitkundu@physics.iiests.ac.in amit_iop@yahoo.com
Dr. Debasis Ray	Assistant Professor	M.Sc., Ph.D	Theoretical Atomic Physics Atomic Physics in Plasmas, Laser-atom interactions.	9433092009 debasisray@physics.iiests.ac.in ray.debasis@gmail.com
Dr. S. M. Hossain	Assistant Professor	M.Sc., Ph.D	Low dimensional Solid State Physics	9230446483 shminhaz@physics.iiests.ac.in shminhaz@gmail.com
Dr. Sukhen Das	Assistant Professor of Jadavpur University (UGC special programme: upto April 2016)	M.Sc., Ph.D	Nano-materials/biophysics	9433091337 sukhendas29@gmail.com
Dr. Abhijit Majumdar	Assistant Professor (UGC-FRP)	M.Sc., M.Tech, Ph.D	Plasma Physics, Plasma Surface Interaction, Transport properties of transition metal ions	8902781531 majuabhijit@gmail.com
Dr. Manish Pal Chowdhury	Assistant Professor (UGC-FRP)	M.Sc., Ph.D	Carbon nanotubes, Graphine, Nanoelectronics and Nanoscience	8902703093 manishpc@gmail.com
Dr. Abhijit Bisoi	Assistant Professor	M.Sc., Ph.D	Experimental Nuclear Physics and Nuclear Astrophysics	9830629051 abijitbisoi@gmail.com

Name	Designation	Highest Qualification	Specialization / research area	Contact No. E-mail
Dr. Mojammel Haque Mondal	Assistant Professor	M.Sc., Ph.D	Experimental condensed matter physics	9432180899 mojamelm@gmail.com
Dr. Dwipesh Majumder	Assistant Professor	M.Sc., Ph.D	Theoretical condensed matter physics	7602207766 dwipesh@gmail.com

Research area (only mention broad titles without description in detail):

- Synthesis and characterization of thermoelectric nanomaterials and composites
- Characterization of Fuel cells & its components
- Development and Spectroscopic characterization of Laser and Luminescent materials
- Photoluminescence, Fluorescence, Phosphorescence and Upconversion in rare earth doped glasses
- Synthesis and Optical properties of rare earth Nano-materials
- Processing and characterization of electroceramic materials used as capacitor dielectrics, sensors and actuators etc.
- Preparation & characterization of oxide glass by sol-gel route
- Preparation of nanocomposites and their structural, dielectric, thermal, magnetic and ultrasonic characterization.
- Physics and applications of Nano-crystalline solids
- Design and optimization of optical fibers for dense WDM system.
- Nonlinear pulse propagation through single mode optical fibers.
- Nuclear structure and nuclear astrophysics
- High energy physics
- Quantum field theory at finite temperature and density
- Atomic Physics in Plasmas, Laser-atom interactions.
- Spectroscopy of confined quantum systems, Many-body techniques in atomic physics.
- Nanostructure based Photonics, Photovoltaics and, Sensors.
- Experimental and Theoretical (Large Basis Shell Model (LBSM) and Particle Rotor Model (PRM) Calculation) studies of nuclear structure properties in the mass A~40, A~ 100 and A~150 regions.
- Spectroscopic study in A~40 region
- Theoretical studies of nuclear structure in the space above and below ^{132}Sn core.
- Preparation and Characterization of implanted target for nuclear experiments.
- Study of structural aspects, chemical kinetics and interfacial properties of the ultrathin films
- Plasma surface interaction,
- Plasma on biomedical application.
- Transport property of transition metal ions
- Carbon nanotubes, Graphene, Nanotechnology
- Collective excitation in fractional quantum Hall effect
- Non-equilibrium statistical mechanics and Quantum Chromodynamics.
- Nano-materials/biophysics

Research facilities: (name specific equipment / picture, infrastructure etc)

1.Microprocessor controlled 1800^0C box furnace 2.Hydraulic pressing machine. 3.HP LCR Meter
4.Spectrophotometer (UV-Visible: 190-1100 nm) 5.Luminescence Spectrometer 6.Electric Furnace (1400^0C)
7.Combined PL & EL setup 8.IV-CV measurement with temperature variation 9.Electro-Chemical setup for preparation of nanostructure materials
10.IBM- Z pro work station 11.Dell T7500 work station
12.Ultrasonic Pulse Receiver 13.Spin Coater, Centrifuge & Hydrothermal Unit 14.Tube Furnace 15.UV-Vis Spectrophotometer (190-900 nm)
16.Magnetic susceptibility measurement unit 17.Closed cycle liquid helium cryostat 18.Vacuum coating unit 19.Magnet with power supply 20.GM Counter and radioactive sample with lead shield 21.Thermal conductivity measurement set up 22.Z-scan instrument for measuring nonlinear properties of optical materials 23.Linear stage setup for pulling fiber from micro to nano dimensions 24.High precession Ammeter and source meter 25.NaI detector with multichannel analyser
26.Thermal chemical vapor system
27.Plasma jet
28.Indigenously developed PVC coated Chemical bench/Fume hood 29.Computer interfaced I-V characteristics measurement setup—Agilent 30.Computer interfaced LCR meter (1 MHz) --- Agilent

Name of the laboratories:

Research Laboratories:

1.	Composite and Nanomaterial Research Laboratory
2.	LASER and Luminescent Materials Research Laboratory
3.	Fiber Optic Design Laboratory
4.	Electro-ceramics Laboratory
5.	Optical & Piezoelectric Materials Lab
6.	Nano material synthesis lab
7.	Low dimensional Solid State Physics Laboratory
8.	Plasma Physics Laboratory

9.	Nanomaterial and Surface Physics Laboratory
10.	Nuclear Physics Laboratory
11.	Theoretical and computational Physics Laboratory

Laboratories for PG & UG studies:

1.	General laboratory
2.	Electronics laboratory
3.	Advanced Optics laboratory
4.	Advanced Material Physics laboratory
5.	Nuclear physics laboratory
6.	UG (B.Tech) general laboratory

Support staff position:

Sanctioned technical post : 3

Technical staff profile (in the following table):

Name	Designation	Highest Qualification	Contact No.	E-mail
Dr. Bibhas Ch. Mitra	TA-II	Ph.D	9434715128	bcmitra@yahoo.com
Mr. Amal Kr. Mandal	TA-II	M.Sc.	9830586320	akm627@yahoo.co.in
Mr. Sintu Das	TA-II	B.Sc.	9903262750	-
Mr. Amiya Kr. Paul	Junior Peon	H.S.	9433819077	amiyaamrita_01@yahoo.co.in
Mr. Asim Das Chakraborty	Junior Asst.	M.A.	9433126999	-

Ongoing Sponsored Research / projects:

No.	Ongoing (Prof value)	Sponsoring agency
1.	Synthesis and characterization of (1) ultra-long carbon naotubes and resist free fabrication of carbon nanotube field effect transistor (CNTFET) for sensor application and (2) carbon nanotube carpet for thermoelectric application. (Duration: 3 Yrs) P.I. Dr. Manish Pal Chowdhury and Co P.I: Prof. Dipali Banerjee *Rs. 42 Lakhs*	DST, Govt. of India
2.	Nonlinear Pulse Dynamics in Dispersion Managed Optical Fibers including Micro or Nano Dimensions (OFMN)". (Sanctioned in 2016) P.I.: Prof. M. Basu Rs. ~ 26 lakhs	DST, Govt. of India
3.	Generation of silent green energy with performance and efficiency enhancement using inorganic/organic hybridization and nano structuring in fuel cell system. Co P.I : Dr. Dipali Banerjee (in collaboration with J.U) Rs. 38,90,000/-	DST, Govt. of India
4.	Synthesis and characterization of low dimensional Bi-Te for thermoelectric application P.I : Dr. Dipali Banerjee (in collaboration with J.U) Rs. 36,90,800/-	DST, Govt. of India
5.	A Biotechnological approach for rapid detection of aflatoxin in food using optical nanofiber probes (Rs.43,04,600/-) Co P.I. Dr. S Mukherjee	DBT, GOI
6.	Investigation of effect of structure of jute and allied fibre products on sound insulation property. Co-PI (Total budget- Rs.1,78,05,960/- ; Institute budget- Rs.31,71,390/-) Co P.I. Dr. S Mukherjee	NASF, ICAR, GOI
7.	Non-thermal Plasma jet on blood coagulation and skin disease treatment (Duration: 3 years) P.I.- Dr. Abhijit Majumdar (in collaboration with IPGMER, Kolkata, W.B) Rs. 21,09,000/-	BRNS
8.	Solar Energy Hub at BESU (Rs. 8.5 Crore) Co-PI: Dr. Syed Minhaz Hossain (in collaboration with Center of Excellence for	DST

No.	Ongoing (Prof value)	Sponsoring agency
	Green Energy and Sensor Systems, IIEST)	
9.	Development of Eco Friendly High Density Nanocrystalline Mullite Rich Ceramic Pigment / Filler from Low Cost Ceramic Materials/Flyash (Rs. 11,45,800/-) P.I : Dr. S. Das	UGC
10.	Development and characterization of supercapacitors using various metal oxide electrode materials: A competitive study." (Rs. 35,00,000/-) P.I : Dr. S. Das	DST

Details of publications of each faculty member (2015 – 16)

Journal

*1.*Facile electrochemical deposition of Cu_7Te_4 thin films with visible-light driven photocatalytic activity and thermoelectric performance, Amrita Ghosh, Mousumi Mitra, **Dipali Banerjee**, Anup Mondal, *RSC Advances 6 22803-22811 (2016).*

2."Galvanic synthesis of $Cu_{2-X}Se$ thin films and their photocatalytic and thermoelectric properties" Amrita Ghosh, Chiranjit Kulsi, **Dipali Banerjee** and Anup Mondal, *Applied Surface Science 369 525-534(2016).*

3."Effect of different surfactants and thicknesses on electrodeposited films of bismuth telluride and its thermoelectric performance" Chiranjit Kulsi, Mousumi Mitra, Kajari Kargupta, Saibal Ganguly, **Dipali Banerjee** and Shyamaprosad Goswami, *Materials Research Express 2 (10) 106403 (2015).*

4."Effect of solvent on nanostructure and thermoelectric properties of bismuth" C Kulsi, M Mitra, K Kargupta, S Ganguly and **D Banerjee,** *Indian Journal of Physics (In press published online 17th October, 2015).*

5."Conductivity of phosphoric acid: an in situ comparative study of proton in phosphoric acid fuel cell, T Paul, **D Banerjee**, K Kargupta, *Ionics 1-8 (2015).*

6."Improved photoluminescence property of CTAB assisted polyaniline-AlZnO nanocomposite" Mousumi Mitra, Kajari Kargupta, Saibal Ganguly, and **Dipali Banerjee,** *AIP Conference Proceedings 1665, 050149 (2015)* doi: 10.1063/1.4917790.

7."Reduced graphene oxide-polyaniline composites-synthesis, characterization and optimization for thermoelectric applications" Mousumi Mitra, Chiranjit Kulsi, Krishanu Chatterjee, Kajari Kargupta, Saibal Ganguly, **Dipali Banerjee** and Shyamaprosad Goswami, *RSC Advances 5 (2015) 31039-31048.*

*8.*Relativistic compact stars in f (T) gravity admitting conformal motion, Amit Das; Farook Rahaman; **B. K. Guha**; Saibal Ray, *Astrophysics and Space Science (2015) 358:36.*

*9.*Influence of growth conditions on microstructure and defects in diamond coatings grown by microwave plasma enhanced CVD, Kalyan Sundar Pal, Sandip Bysakh, Awadhesh Kumar Mallik, Nandalal Dandapat, Someswar Datta and **Bichitra K. Guha**, *Bulletin of Materials Science, vol. 38 (June, 2015), 1 – 8.*

*10.***"**Intense orange emission in Pr^{3+} doped lead phosphate glass", Subrata Mitra and **Samar Jana,** *Journal of Physics and Chemistry of Solids, Volume 85, Page 245-253, (2015).*

*11.***"**Absorption and luminescence of $PrCl_3$ in methanol, iso-propanol and butanol solvents", Subrata Mitra and **Samar Jana,** *Optik - International Journal for Light and Electron Optics, Volume 126, Page 4037-4041, (2015).*

*12.***"**Properties of the energy bands, Judd-Ofelt parameters and the fluorescence of neodymium chloride ($NdCl_3$) in methanol, iso-propanol and butanol solvents**",** Subrata Mitra and **Samar Jana,** *Journal of Fluorescence (Springer), Volume 25, Page 541-549, (2015).*

13.Study of isospin nonconservation in the framework of spectral distribution theory, Kamales Kar and **Sukhendusekhar Sarkar**, *J. Phys. G: Nucl. Part. Phys. 42 (2015)* 055110.

*14.*Shape coexistence in ^{153}Ho, Dibyadyuti Pramanik, **S. Sarkar**, M. Saha Sarkar, **Abhijit Bisoi,** Sudatta Ray, Shinjinee Dasgupta, A. Chakraborty, Krishichayan, Ritesh Kshetri, Indrani Ray, S. Ganguly, M. K. Pradhan, M. Ray Basu, R. Raut, G. Ganguly, S. S. Ghugre, A. K. Sinha, S. K. Basu, S. Bhattacharya, A. Mukherjee, P. Banerjee and A. Goswami, *Physical Review C 94, 024311 (2016).*

*15.*Structure of $^{132}_{52}Te_{80}$: The two-particle and two-hole spectrum of $^{132}_{50}Sn_{82}$, S. Biswas, R. Palit, A. Navin, M. Rejmund, **A. Bisoi,** M. Saha Sarkar, **S. Sarkar**, S. Bhattacharyya, D. C. Biswas, M. Caamano, M. P. Carpenter, D. Choudhury, E. Clement, L. S. Danu, O. Delaune, F. Farget, G. de France, S. S. Hota, B. Jacquot, A. Lemasson, S. Mukhopadhyay, V. Nanal, R. G. Pillay, S. Saha, J. Sethi, Purnima Singh, P. C. Srivastava, and S. K. Tandel, *Physical Review C 93, 034324 (2016).*

16."Parabolic and semi-parabolic pulse dynamics in optical fibers", Navonil Bose, **Sampad Mukherjee,** and **Mousumi Basu**, Optical Engineering, 54 (2015) 016108.

17."Silica based highly nonlinear fibers to generate parabolic self-similar pulses," Debasruti Chowdhury, Dipankar Ghosh, and **Mousumi Basu,** Optical and Quantum Electronics, DOI 10.1007/s11082-015-0144-z, March, 2015.

18." Enhancement of electroactive β phase crystallization and dielectric constant of PVDF by incorporating GeO2 and SiO2 nanoparticles", EpsitaKar, Navonil Bose, Sukhen Das, Nillohit Mukherjee, **Sampad Mukherjee**, Phy Chem. Chem. Phy, 2015, 17, 22784-22798.

19."Synthesis of a-Fe_2O_3-functionalised graphene oxide nanocomposite by a facile low temperature method and study of its magnetic and hyperfine properties" Sanchyita Nag, Anirban Roychowdhury, Dipankar Das, **Sampad Mukherjee,** Materials Research Bulletin 74 (2016) 109–116.

20.Significant Enhancement of the Electroactive β Phase of PVDF by Incorporating Hydrothermally Synthesized Copper Oxide Nanoparticles", Biplab Dutta, Epsita Kar, Navonil Bose, **Sampad Mukherjee** , RSC Advances, DOI: 10.1039/C5RA21903E.

21.Non-resonant elastic scattering of low-energy photons by atomic sodium confined in quantum plasmas, Avijit Ghosh and **Debasis Ray**, Physics of Plasmas 22, 032707 (2015).

22.Influence of dense quantum plasmas on fine-structure splitting of Lyman doublets of hydrogenic systems, Madhab De and **Debasis Ray,** Physics of Plasmas 22, 054503 (2015).

23.Black silicon solar cell: analysis optimization and evolution towards a thinner and flexible fiture, AB Roy, A Dhar, M Choudhuri, S Das, **S M Hossain**, A Kundu, Nanotechonology 27 (30), 305302 (2016).

24.Electrical Transport Mechanism in Au Modified Nano Porous Silicon., J Das, S Pradhan, **SM Hossain,** J Nanomater Mol.Nanotechnology 7, 2 (2016).

25.Superliner Photo Response in Colloids of Silicon Quantum Dots, N R Bandyopadhyay, **SM Hossain**, U. Ghanta, M. Ray, INT. J. INNOVATIVE RES. SCI. ENG. TECHNOL. 3 (15 - 18) (2015).

26.Development of power supply for atmospheric pressure plasma jet at room temperature for bio-medical applications, Sadhan Chandra Das, **Abhijit Majumdar**, Subroto Mukherjee, Sumant Katiyal, T. Shripathi, IEEE Explore (Accepted), 2015.

27."Simultaneous determination of dispersion model parameters and local thickness of thin films by imaging spectro-photometry" David Necas, J. Vodak, I. Ohlídal, M. Ohlídal, **Abhijit Majumdar**, L. Zajíčková, Applied Surface Science, 350, 149-155, (2015)

28."Electronic bond structure of carbon nitride thin film deposited by HiPIMS and dc magnetron plasma"- **Abhijit Majumdar** , Sadhan Chandra Das, Vitaslav Stranak, Rainer Hippler, Journal of Coating Science and Technology 2, 28-37 (2015).

29.Antimagnetic rotation and sudden change of electric quadrupole transition strength in ^{143}Eu, S. Rajbanshi, S. Roy, Somnath Nag, **Abhijit Bisoi,** S. Saha, J. Sethi, T. Bhattacharjee, S. Bhattacharyya, S. Chattopadhyay, G. Gangopadhyay, G. Mukherjee, R. Palit, R. Raut, M. Saha Sarkar, A.K. Singh, T. Trivedi, A. Goswami, Physics Letters B, 748 387(2015).

30.Characterisation of a composite LEPS, M. Roy Basu, S. Ray, **Abhijit Bisoi** and M. Saha Sarkar, JINST 10 T07002 (2015).

31."Development of transition metal oxide–kaolin composite pigments for potential application in paint systems,", Swagata Roy, Subrata Kar, Biswajoy Bagchi, **Sukhen Das**, *Applied Clay Science, 107 (2015) 507-512.*

32."A comparative study between electrical properties of bulk and synthesized nano material of zinc sulphide.", Sutapa Ganguly, Kumaresh Halder, Nur Amin Haque, **Sukhen Das**, Sujata G Dastidar, *American Journal of Research Communication, 3 (2015) 68-80.*

33."Green Synthesis of zinc oxide nanoparticles using Hibiscus subdariffa leaf extract: effect of temperature on synthesis, anti-bacterial activity and anti-diabetic activity.", Niranjan Bala, S. Saha, M. Chakraborty, M. Maiti, **S. Das**, R. Basu and P. Nandy, *RSC Advances, 5 (2015) 4993-5003.*

34."Marsilea Minutal Plant Extract Mediated Synthesis of Gold Nanopartocle for Catalytic and Antimicrobial Application.", Niranjan Bala, Arpan Kool, Praqdip Thakur, **Sukhen Das**, Papiya Nandy, Ruma Basu, *International Journal of Pharmacy, 5 (2) 600-609, (2015).*

35."The Role of Cerium (III)/Yttrium (III) nitrate hexahydrate salt on electroactive β phase nucleation and dielectric properties of poly(vinylidene fluoride) thin films.", Pradip Thakur, Arpan Kool, Biswajoy Bagchi, Nur Amin Hoque, **Sukhen Das**, Papiya Nandy, *DIO: 10.1039/c5ra03524d., RAC Adv. 5, 28487- 28496, 2015.*

36. “Anorthite porcelain : Synthesis, phase and microstructure evolution.”, Mousumi Pal, **Sukhen Das**, Swapan Kumar Das, *Bull. Mater. Sci., Vol. 38, No. 2, pp 1-5, April 2015.*

37. “Development and Optimization of a Non-contact Optical Device for Online Monitoring of Jaundice in Human Subjects.”, N. Polley, S. Saha, S. Singh, A. Adhikari, **S. Das**, B. Roy Choudhury and S. K. Pal, *J. Biomed. Optics, 20(6), 097001-1-6, 2015*.

38. “Safe & Symptomatic Medicinal Use of Surface Functionalized Mn3O4 Nanoparticles for Hyperbilirubinemia Treatment in Mice.”, N. Polley, S. Saha, A. Adhikari, S. Banerjee, S. Darbar, **S. Das** and S. K. Pal, *Nanomedicine (2015)*.

39. “In situ synthesis of Ni(OH)2 nanobelts modified electroactive poly(vinylidene fluoride) thin films: Remarkable improvement in dielectric properties.”, Pradip Thakur, Arpan Kool, Biswajoy Bagchi, Nur Amin Hoque, **Sukhen Das**, Papiya Nandy. *Physical Chemistry Chemical Physics: DOI: 10.1039/c5cp01207d; 17, 13082-13091, 2015*.

40. “Rapid single step green synthesis of copper oxide nanoparticle from vigna radiata using three salts and study its antimicrobial nature.”, Monalisa Chakraborty, Anindita Dey, Niranjan Bala, **Sukhen Das**, Ruma Basu, Papiya Nandy, *Int J Pharm, (IJPNL), 5(1),93-97, 2015.*

41. “Invigoration and root growth enhancement of mung bean seed through pre-treatment with Allium Cepa 30C-an agrohomeo study.”, Anindita Dey, Ruma Basu, **Sukhen Das**, Papiya Nandy, *Intern. Journal of Innovative Res. In sci. and Engineering (IJIRSE) ISSN (Online) 2347-3207, Vol 3,74-78, 2015*.

42. “Effect of Dilution on Thermovoltage generation using homeopathic nanomedicine Zincun oxydatum.”, Poonam Bandyopadhyay, Papiya Nandy, Ruma Basu, Durga Sankar Dhar, **Sukhen Das**, *Intern. Journal of Innovative Res. In sci. and Engineering (IJIRSE) ISSN(Online) 2347-3207, Vol 3, Iss.6, 225-230, 2015*.

43. “Experimental Evaluation of Antimicrobial Potentiality of Chemically Synthesized ZnS Nanoparticles, Sutapa Ganguly, Bidisha Ghosh, **Sukhen Das**, Sujata G. Dastidar, *Journal of Chemical, Biological and Physical Sciences,MARCH-2015,5(2), ISSN-2249-1929*

44. “Microstructural and phase evolution in metakaolin geopolymers with different activators and added aluminosilicate fillers.”, Madhuchhanda Sarkar , Kausik Dana , **Sukhen Das**, *Journal of Molecular Structure 1098, 110-118, 2015.*

Conference Proceedings:

1."Temperature dependent thermoelectric property of reduced graphene oxide-polyaniline composite" Mousumi Mitra, **Dipali Banerjee**, Kajari Kargupta and Saibal Ganguly **International Conference on Condensed matter & Applied Physics (ICC-2015),** Veterinary University Auditorium, Bikaner Rajasthan, 30-31st October 2015. **(AIP Conference Proceedings).**

2."Dopant dependent photocatalytic activity of polyaniline towards the degradation of Rose Bengal dye" Mukulika Jana Chatterjee , **Dipali Banerjee**, Amrita Ghosh and Anup Mondal **International Conference on Condensed matter & Applied Physics (ICC-2015),** Veterinary University Auditorium, Bikaner Rajasthan, 30-31st October 2015. **(AIP Conference Proceedings).**

3."Process Dependent Thermoelectric Properties of EDTA Assisted Bismuth Telluride" Chiranjit Kulsi, Kajari Kargupta and **Dipali Banerjee 2nd International Conference on Emerging Technologies: Micro to Nano 2015 (ETMN 2015),** Manipal University, Jaipur, Rajasthan 24-25th October 2015. **(AIP Conference Proceedings).**

4.Mousumi Mitra, Dipali Banerjee, Kajari Kargupta and Saibal Ganguly, "Preparation and thermoelectric properties of reduced graphene oxide-polypyrrole composite" **International Conference on Organic and Hybrid Thermoelectrics (ICOT 2016), Kyoto, Japan, 18-20th January 2016.**

5.Mukulika Jana Chatterjee, Krishanu Chatterjee and Dipali Banerjee, "Thermoelectric performance of structurally ordered polyaniline–carbon nanotube composite" **International Conference on Organic and Hybrid Thermoelectrics (ICOT 2016), Kyoto, Japan, 18-20th January 2016.**

6. Subrata Mitra and **Samar Jana,** *Energy bands, oscillator strengths and fluorescence of $PrCl_3$ in methanol,* Abstracts of **5th International Conference on Luminescence and its Applications (ICLA-2015), PES University, Bangalore, India**, (9-12 February, 2015).

7. Nonlinear Pulse Dynamics in Passive and Active Optical Fibers , **Mousumi Basu** (Invited Speaker), Proceedings of 3rd International Conference on Lasers, Optics and Photonics in Valencia Spain, Optics 2015, 1st - 3rd September, 2015.

8. Debasruti Chowdhury, Navonil Bose, Dipankar Ghosh and **Mousumi Basu**, "Generation of triangular optical pulses through a normally dispersive highly nonlinear fiber," Optics-2015, Proceedings of 3rd International Conference and Exhibition on Lasers, Optics and Photonics, Valencia, Spain, 1st - 3rd September, 2015.

9.An analytical perturbation approach to analyze the generation of parabolic pulses in a dispersion decreasing fiber amplifier in normal dispersion regime," Debasruti Chowdhury**,**Dipankar Ghosh,and **Mousumi Basu**, *ICOP-2015, XXXIX Conference on Optics and Photonics, Nanotechnology campus, C.U., W.B., 20th -22nd February, 2015.*

10.^{136}Sn and three body forces, M. Saha Sarkar, **S. Sarkar**, Proceedings of the Conference on 75 years of Nuclear Fission: Present Status and Future Perspective (Fission 75) Bhabha Atomic Research Centre, Mumbai 400 085, India, 8–10 May 2014, Editors D C Biswas, K. Mahata and V.M. Datar, Pramana Special Issue 19July 2015.

11. Low energy cluster states in ^{34}S, ***Abhijit Bisoi***,***S. Sarkar***,*M Saha Sarkar* Proc. DAE-BRNS Symp.Nucl.Phys.(India) **60**, 78 (2015).

12. Investigation of nuclear structure below the ^{132}Sn core, *Sangeeta Das, **Abhijit Bisoi**, **S. Sarkar**,M. Saha Sarkar* Proc. DAE-BRNS Symp.Nucl.Phys.(India) **60**, 108 (2015).

13. Lifetime of the 6792 keV state in ^{15}O, ***Abhijit Bisoi**,Indrani Ray, L.C. Tribedi, D. Misra, S. Biswas,K. V. Thulasi Ram,M. V. Rundhe,Anoop KV,V Nanal,Sunil Ojha,P. Banerjee,**S. Sarkar**,M. Saha Sarkar* Proc. DAE-BRNS Symp.Nucl.Phys.(India) **60**, 892 (2015).

14."Effect of Photon Injection on the Lateral Metal-Insulator-Semiconductor Porus Silicon Tunnel Structure", U. Ghanta, P Kar, S. Ghosh, A. Bose, and **S. M. Hossain** ; National Conference on Emerging Trends in Engineering & Science 2015 (ETES – 2015), 16-17 July, 2015, Asansol Engineering college, Asansol, Bardwan, India, Trak-4, Pages 255-257 (ISBN: 978-93-84867-63-2).

15. Unconventional Spin-Wave Excitations in Fractional Quantum Hall Ferromagnets, **Dwipesh Majumder**, Current Trends in Computational Physics, 17th May 2015. University of Gour Banga West Bengal, India

Seminar / Workshops / Conferences / Training programme organized by the department (2015 - 16)

1.One day S**eminar** on 17.02.2015 at Physics department
Speakers:

Dr. D. Das, UGC-DAE CSR, Kolkata

Title: Mossbauer spectroscopy: basic principles and applications in cross-disciplinary fields.

Prof. D. Sahadev, Department of Physics, IIT, Kanpur

Title: Resolving Aton in our Backyards: Indigenous Technology in a Globalized World.

Title: Exotic Magnetic Oxides: Microscopic insights from ab-initio approach

2.**Two-days Workshop** and theme meeting of "*Board of Research in Fusion Science and Technology (BRFST)*" during June 25-26, (2015).

3.**Seminar/Lecture** on *"Exploring Novel Quantum Phenomena in Photonic Settings: From Fundamentals to Technological Applications" by* Dr. Somnath Ghosh, of the Institute of Radio Physics and Electronics, Calcutta University, 13th August, (2015).

4.**One day Seminar** on "*Understanding Electronic Structure of Transition Metal Oxide*" Prof. Dipankar Das Sarma, of Indian Institute of Science, Bangalore on 3rd September, (2015).

5.**Lecture** on "*Physics of and with Non -Linear waves- why they matter*" by Prof. Surajit Sen, Dept. of Physics, SUNY Buffalo, USA & Adjunct Professor , Brock University, St. Catharines, Canada, on 27th October (2015).

6.**Lecture** on "*Dynamical State Reduction Models: Pedagogic Introduction and Advantages*" by Dr. Sujoy K. Modak, JSPS Fellow, KEK High Energy Accelerator Research Organization, Japan, on 22 December (2015).

7.**Two-days Seminar:** by Prof. Ajoy Ghatak, of Indian Institute of Technology, New Delhi, on 20th January 2016 and **Lecture** on "*EINSTEIN & THE LIGHT QUANTUM* " on 21st January (2016).

8.**Seminar** on "*Fourier transform & its Applications*" by Prof. Ajoy Ghatak, of Indian Institute of Technology, New Delhi, on 1st February (2016).

9.**Lecture** on "*Gravitation, cosmology & quantum field theory*" by Dr. Suman Ghosh, of Tata Institute of Fundamental Research (TIFR), Mumbai, India, on 16th February (2016).

10.**Seminar** on "*Low temperature Physics: (magnetism, superconductivity and strongly correlated systems)"* by Dr. Vivek Kumar Anand, of Helmholtz Zentrum Berlin, Germany, on 23rd February (2016).

11.**Seminar/Lecture** on "*Are there quantum limits to diffusion in quantum many-body systems?*" by *Dr. Nandan Pakhira*, School of Mathematics & Physics, The University of Queensland, Australia, on 26th April (2016).

12.**Lecture** on "*Higgs Boson Physics and Silicon Detector Development at the CMS Experiment" Dr. Somnath Choudhury*, Indian Institute of Science, Bangalore, on 24th May (2016).

13.**Workshop** on "***National Graduate Physics Examination (NGPE)-Part C***" in collaboration with *Indian Association of Physics Teachers (IAPT)*, during 9th & 10th June 2016.

Foreign visits and Invited Lectures:

i. Energy Materials Nanotechnology (EMN) meeting on Polymer held on January 7-10, 2015 at Orlando, FL, USA

ii. Invited Talk : "Composite of conducting polymer with inorganic counterpart for thermoelectric applications" by Dr. Dipali Banerjee

iii. Delivered Invited Lecture at CKM Memorial workshop at SNBNCBS on 30th May, 2015. By Dr. Syed Minhaz Hossain.

iv. Nonlinear Pulse Dynamics in Passive and Active Optical Fibers, (Invited Speaker: Dr. Mousumi Basu), Proceedings of 3rd International Conference on Lasers, Optics and Photonics in Valencia Spain, Optics 2015, 1st - 3rd September, 2015.

v. Invited talk by Dr. A. Bisoi in DAE-BRNS Symposium on Nuclear Physics (SNP-15) held at SSSIHL Prasanthi Nilayam, AP on Dec-2015.

Extension Activities and Societal outreach:

"***National Graduate Physics Examination (NGPE)-Part C***" in collaboration with *Indian Association of Physics Teachers (IAPT)*, during 9th & 10th June 2016, was organized and held in our Dept.

New Academic / Research Initiatives

Academic Collaboration

1. CGCRI, Kolkata.
2. Jadavpur University, Kolkata
3. IACS, Kolkata.
4. UGC-DAE- Kolkata Centre, UGC -DAE, Indore, M.P. India
5. Institute for Plasma Research, Gandhinagar, Gujarat, India
6. MCKV Institute of engineering, Liluah
7. Saha Institute for Nuclear Physics (SINP), West Bengal
8. Calcutta University
9. IIT, Kharagpur

School of
Community Science and Technology

About the department

School of Community Science & Technology (SOCSAT) was created in 2004 at University for facilitating the development and growth of the unorganized sector in our country.

The objective of the school is to foster sustainable development of different marginalized communities by empowering stakeholders with inputs from institutionalized Science & Technology Community.

The school since then made significant progress in the frontier areas of basic and applied research in juxtaposition with various training programmes that are congruous with the objectives of the school. In this respect various science awareness programmes, several training programme on Advanced Pottery, Metal Art, Batik, Jute diversification including Advance Food Processing & Preservation Technology were organized by this school. The objectives of these programmes are to impart training to the marginalized people especially women Self-Help Groups of Howrah district in order to promote technology and create entrepreneurship. The training on food processing will improve the technical skills and knowledge in the processing of fruits and vegetables to the women of the rural areas and to take up income generating activities. As a result, two **SHGs named Suktara and Prayas** comprising those women were formed in Howrah District with the initiative of this School.

The Academic Council of the University approved a four semester M.Sc. Course on **"Food Processing& Nutrition Science"** which had been started from the **Academic session (2007-2008).** Around 200 students obtained MSc degree from this University under this course and placed in the Food Processing industries, R&D organization in food sectors.

The Ph.D programme had been started from 2010-11.

Besides above **Government of India's Corporate Social Responsibility(CSR) scheme,** The Garden Reach Shipbuilders & Engineers Limited (GRSE),Kolkata, a Govt. of India undertaking under the Ministry of Defence, entrusted SOCSAT with a CSR project to impart "Skill development/Vocational Training to the unemployed youth around the locality in Metiabruz, Kolkata" where the GRSE plant is situated. The objective of the proposed programme is to appropriately train the unemployed youth for their employment in appropriate trade and /or to enable them to start entrepreneurship.

Academic Programmes:

Post Graduate Level

Degree offered : **Master of Science in Food Processing and Nutrition Science.**

Sanctioned students' intake: **32nos. students per semester**

Additional intake through other programmes (i.e. QIP): **NA**

Specializations in: **(a) Microbial Enzyme Technology (b) Nutritional Biochemistry**

Doctoral & Post Doctoral Research Programme

Degree offered: **Ph.D Science**

No of Candidates enrolled: **28**

No. of Candidates registered: **27**

No. of Candidates awarded: **1, Submitted -2**

Post Doctoral Research Programme: Dr. Avery Sengupta, Post Doctoral fellow of UGC-Dr. D.S. Kothari PDF, under Prof. D. K. Bhattacharyya.

Faculty Position:

Faculty profile (In the following table)

Name	Designation	Highest Qualification	Specialization/Research Area	Contact no E-mail
Prof.S.K. Mukherjea	Professor & Director	PhD	Computational Fluid Dynamics	9831209985 mksujay@gmail.com
Prof.D.K. Bhattacharyya	Visiting Faculty	PhD (Science)	Oil Technology	9231586943 Dkb_olitech@yahoo.co.in
Dr. Minakshi Ghosh	Assistant Professor (Contractual)	PhD (Science)	Analytical Chemistry/ Extraction Technology	9831118228 g_minakshi2000@yahoo.com
Dr. Jayati Bhowal	Assistant Professor (Contractual)	PhD (Science)	Biochemistry and Microbiology	9831672455 bjayati@yahoo.com

Awards and Laurels received by the faculty members: -

1. **Award for best poster presentation in Challenges in Product development of *medicinal* implants and devices, IIEST Shibpur, Dec. 2016** "Production of superior quality protein hydrolysate from edible oyster mushroom (*Pleurotus Ostreatus*)" by Bhaswati Goswami and **Jayati Bhowal**.
2. **Award for best poster presentation in Challenges in Product development of *medicinal* implants and devices, IIEST Shibpur, Dec. 2016** Cardio protective effect of long chain pufas (mainly 20:5, 22:6 and 18:3 gla) containing soy yogurt against cholesterol induced liver damage in swiss albino mice" Samadrita Sengupta, **Jayati Bhowal and D. K. Bhattacharyya**

Research area:

- Nanotechnology in food products
- Extrusion technology in food
- Development and evaluation of nutritionally enriched spread products
- Isolation and utilization of non oil constituent of oil bearing materials
- Technology developments for Non- Dairy products of superior Nutritional Quality at significantly reduced cost.
- Technology development particularly microbial fermentation process for making value-added products from waste fruits and vegetables for food applications.
- Microbial oils for functional Food and Neutraceuticals from Micro organisms screened and isolated from soils mainly.
- Colour from soil microbes for food uses and microbial enzymes such as Lactase, Lipases etc. for food industries.
- Shelf life both oxidative and microbial of non- dairy food products and food products in general.
- Production and application of bioactive peptides from natural and microbial sources for food use.
- Development of biotechnological processes for the production of bioflavour.

Research facilities: (name specific equipment / picture, infrastructure etc)

Research facilities:

Name of Equipment	**Few words**	**Pictures**
Twin Screw Extruder	Twin screw extrusion is used extensively for mixing, compounding, or reacting polymeric materials. The flexibility of twin screw extrusion equipment allows this operation to be designed specifically for the formulation being processed. The configurations of the screws themselves may be varied using forward conveying elements, reverse conveying elements, kneading blocks, and other designs in order to achieve particular mixing characteristics.	

Centrifuge	In Centrifuges the centrifugal force is mechanically generated by turning the equipment containing the fluid in a circular path causing the fluids to separate. This method has been used in the laboratories and primitive industries for over a century. It has mainly been used to separate fluids in static state, i.e., specific volumes which needed to be separated.	
Vacuum Tray Drier	Under the condition of vacuum, the boiling point of raw material will decrease and make the pushing force become greater. Therefore for a certain amount of heat radiation, the conducting area of evaporator can be saved. The heat source for operation of evaporation may be low pressure steam or surplus heat steam. The heat loss of evaporator is less. During the period of drying, there is no impurity material mixing. It belongs to static drier. So the shape of raw material to be dried can not be destroyed.	

Hot Air Oven	This electrical devices used in sterilization. The oven uses dry heat to sterilize articles. Generally, they can be operated from 50 to 300 °C (122 to 572 °F). There is a thermostat controlling the temperature. These are digitally controlled to maintain the temperature.	
Laminer Flow	Horizontal Laminar Airflow Table Top Workstation provides a HEPA filtered clean work area that is ideal for operations requiring a particle-free, bacteria-free, clean air environment. .The clean work area provides an excellent work space for small laboratory appliances, microscopes, pipetting, or similar applications.	

BOD Incubator	This electrical device helps to maintain temperature. Digitally controlled temperature regulator is present to preset the temperature as per the required incubation temperature.	
Microwave		
Reynolds apparatus	To determine the Reynold's number and hence the type of flow either Laminar or turbulent and also to determine upper & lower critical Reynold's number's & velocities.	

Sieves Shaker with Brass Sieves	Used to agitate sieves for determining gradation in soils and finest modules in aggregates. Unique orbital motion ensures precise gradation. Quick release adjustable clamps secure sieves firmly in position. Hold feature on the 15-minute timer permits continuous agitation. Holds up to eight sieves plus a dust pan and accepts either eight or twelve inch sieves.	
Colorimeter	A device used in colorimetry. In scientific fields the word generally refers to the device that measures the absorbance of particular wavelengths of light by a specific solution. This device is most commonly used to determine the concentration of a known solute in a given solution by the application of the Beer-Lambert law, which states that the concentration of a solute is proportional to the absorbance.	
Microscope	An instrument used to see objects too small for the naked eye. The science of investigating small objects using such an instrument is called microscopy. Microsc opic means invisible to the eye unless aided by a microscope.	

Penetrometer	An instrument used to determine the penetration value of food products. Penetration value helps to determine the hardness and texture of the product.	
Homogeniser	A device which helps to homogenize two immiscible phases by applying rotating force at high RPM.	
Centrifuge	In Centrifuges the centrifugal force is mechanically generated by turning the equipment containing the fluid in a circular path causing the fluids to separate. This method has been used in the laboratories and primitive industries for over a century. It has mainly been used to separate fluids in static state, i.e., specific volumes which needed to be separated.	

Micro-centrifuge	In Centrifuges the centrifugal force is mechanically generated by turning the equipment containing the fluid in a circular path causing the fluids to separate.	
Refrigerator	An electrical equipment which helps to keep the food samples and chemicals cool in lower temperature.	
Freezer	This electrical device helps to maintain cold temperature. Digitally controlled temperature regulator is present to preset the temperature as per the required incubation temperature.	

Gas Liquid Chromatograph	A sophisticated instrument which helps in fatty acid analysis, flavor analysis of different samples.	

Lyophiliser	An instrument which helps in freeze drying process of samples. Liquid Nitrogen is used to carry out the process.	
Spectrophotometer	An instrument which gives spectrum measurement of various sample solution. This device is most commonly used to determine the concentration of a known solute in a given solution by the application of the Beer-Lambert law, which states that the concentration of a solute is proportional to the absorbance.	
Sonicator	An instrument which involves the act of applying sound energy to agitate particles in a sample, for various purposes. Ultrasonic frequencies (>20 kHz) are usually used, leading to the process also being known as ultrasonication or ultra-**sonication**.	

Name of the laboratories:

1. Food Processing Lab.
2. Food Preservation Lab.
3. Microbiology Lab.
4. Unit Operation Lab.
5. Chemical Analysis Lab.

Ongoing Sponsored Research / projects: (mention area)

Ongoing (Prof value)	Sponsoring agency
Creation of infrastructural facilities for running degree course in food processing technology" **Value:74.75 lakhs**	Ministry of Food Processing Industry Govt.of West Bengal

Industry – Institute Interaction

Corporate Social Responsibility (CSR) project to impart "***Skill development/Vocational Training to the unemployed youth around the locality in Metiabruz, Kolkata***" by Garden Reach Shipbuilders & Engineers Limited (GRSE), Kolkata, a Govt. of India undertaking under the Ministry of Defense.
Value: 70.00 lakhs

Details of publications of each faculty member (2015 – 16)

A. Dr. Minakshi Ghosh

(Journal)

Sl. No.	Title of Research paper	Title of the Journal	Year	Vol./ issue No	Page Nos.
01.	Effect of tamarind kernel powder incorporation in property and quality aspects of biscuit, bread and cake making	Archives of Applied Science Research	2016	volume 8, issue 1	30-39
02.	Isopropanol Fractionation of Coconut Oil into its Olein and Stearin Fractions	International Journal of Scientific Research in Science & Technology	2015	Vol. 01 Issue 5	83-88
03	Production of Protein Enriched Ready-To-Eat Extruded Food Products Using Edible Quality Sesame Flour, Rice Flour and Bengal Gram Flour	International Journal of Food Safety, Nutrition, Public Health and Technology	2015	vol.7, issue-2	5-12

Conference:

1."Studies on utilization of different oilseeds in preparation of nutritionally superior quality fermented food" by Priyadarshini Chakraborty*, Minakshi Ghosh, D.K.Bhattacharyya, N.R. Bandyopadhyay in 70th Annual Convention of Oil Technologists' Association of India& National Conference, Oil Technoilogists' Association of India Nov,21-22, 2015.

2."Study of nutrient rich leaf blend and its incorporation in extruded food and pasta products, "by Priyadarshini Chakraborty, Minakshi Ghosh, N.R. Bandyopadhyay, D.K. Bhattacharyya On "International Conference on Advances in Bioprocess Engineering and Technology (ICABET 2016) January ,20-22, 2016.

3."Study on effect of fermentation of Tamarind kernel powder and Jackfruit seed flour using Yeast and Lactobacillus" by Priyadarshini Chakraborty*, Minakshi Ghosh, N.R.Bandyopadhyay, D.K.Bhatacharyya in 11th International Food Data Conference Food Composition and Public Health Nutrition by at National Institute of Nutrition, Hyderabad. November, 3-5,2015.

4.*Evaluation of Nutritional Characteristics of some Health Beneficial Peanut Butter like Spreads*" by Sanjukta Kar*, Mahua Ghosh, Minakshi Ghosh, D.K.Bhattacharyya in 70th Annual Convention of Oil Technologist's Association of India, held at CGCRI, Kolkata, Nov,20-22, 2015.

5.*"Evaluation of Nutritional Characteristics of Health Beneficial DAG Rich oil based Spreads*" by Sanjukta Kar*, D.K.Bhattacharyya, Minakshi Ghosh in International Conference on Advances in Bioprocess Engineering and Technology, Jan, 2016 .

6."*Potential Health Benefits of Some Modified Peanut Spreads*" by Sanjukta Kar*,D.K. Bhattacharyya and Minakshi Ghosh in Annual conference on Obesity, Diabetes and Cardiovascular Diseases organized by Society for Nutrition & Dietetics, Jan,2016.

Details of publications of each faculty member (2015-2016) Dr. Jayati Bhowal

(Journal)

Sl. No.	Title of Research paper	Title of the Journal	Year	Vol./ issue No	Page Nos.
01.	Production of Protein Enriched Ready-To-Eat Extruded Food Products Using Edible Quality Sesame Flour, Rice Flour and Bengal Gram Flour.	International Journal of Food Safety, Nutrition, Public Health and Technology,	2015	7/2	5-12
02.	Study on Enzymatic Hydrolysis of Sal Shorearobusta Starch to Dextrin	Annals of Biological Research, 2015	2015	6 (6)	8-12.
03	Isolation, Identification and Analysis of Probiotic Properties of Lactobacillus Spp. from Selected Regional Dairy Product	Int.J.Curr.Microbiol.App.Sci.	2015	4(6)	621-628.

List of seminar/ conference attended

2016	*International Conference on Advances in Bioprocess Engineering and Technology (Jan20th-22nd) organized by Heritage Institute of Technology, Kolkata*	Hypolipidemic Effects of Soy Yogurt Fortified with Antioxidant Rich Vegetable Oil on Albino Mice Fed High Cholesterol Diet by Samadrita Sengupta and Jayati Bhowal
2016	*International Conference on Advances in Bioprocess Engineering and Technology (Jan20th-22nd) organized by Heritage Institute of Technology, Kolkata*	Production of Microbial Color from soil microbes for food use by Sucharita Chatterjee and Jayati Bhowal
2016	*International Conference on Advances in Bioprocess Engineering and Technology (Jan20th-22nd) organized by Heritage Institute of Technology, Kolkata*	Studies On Screening, Isolation & Biochemical Characterization Of Lipase Producing Bacteria From Soil by Upasika Datta and Jayati Bhowal
2015	*4th International Conference and Exhibition on Food Processing and Technology (10-12th August), London, UK, Organized by OMICS Group International.*	Optimization of Parameters for the Production of Protein Hydrolysate from Edible Oyster Mushroom (*Pleurotus Ostreatus*) by Bhaswati Goswami and Jayati Bhowal.
2015	*The International Conference On 3s Safety, Security And Sustainability: Innovations In Food And Bioprocess Industries February 27& 28, 2015 Organized By Department Of Food Technology And Biochemical Engineering, Jadavpur University Kolkata 700 032, India.*	" Effects of Nano Protein on Properties of Non-Dairy Yogurt "
2015	*The International Conference On 3s Safety, Security And Sustainability: Innovations In Food And Bioprocess Industries February 27& 28, 2015 Organized By Department Of Food Technology And Biochemical Engineering, Jadavpur University Kolkata 700 032, India.*	Study on enzymatic saccharification of Cauluflower waste
2015	*70th Annual Convention of Oil Technologists' Association of India and National Conference to be held at Kolkata during Nov 20-22, 2015.*	"Hepatoprotective effect of gamma-linolenic acid containing soy yoghurt against cholesterol induced liver damage in swiss albino mice"

List of Poster presentation

Year	Topic	Seminar/Conference	Rewards
2015	Production of Superior Quality Protein Hydrolysates from Edible oyster Mushroom (*Pleurotus ostreatus)* Bhaswati Goswami and Jayati Bhowal	Conference on Challenges in Product Development of Medical Implants and Devices, held at IIEST,Shibpur during Dec 18-19,2015	Won 1st prize
2015	Cardio protective effect of long chain pufas (mainly 20:5,22:6 and 18:3 gla) containing soy youghurt against cholesterol induced liver damage in swiss albino mice. Samadrita Sengupta,D K Bhattacharyya and Jayati Bhowal	Conference on Challenges in Product Development of Medical Implants and Devices, held at IIEST,Shibpur during Dec 18-19,2015	Won 2nd prize

Prof. D. K. Bhattacharya

(Journal)

Sl. No.	Title of Research paper	Title of the Journal	Year	Vol./ issue No	Page Nos.
01	Effect of tamarind kernel powder incorporation in property and quality aspects of biscuit, bread and cake making	Archives of Applied Science Research	2016	volume 8, issue 1	30-39
02	Isopropanol Fractionation of Coconut Oil into its Olein and Stearin Fractions	International Journal of Scientific Research in Science & Technology	2015	Vol. 01 Issue 5	83-88
03	Production of Protein Enriched Ready-To-Eat Extruded Food Products Using Edible Quality Sesame Flour, Rice Flour and Bengal Gram Flour	International Journal of Food Safety, Nutrition, Public Health and Technology	2015	vol.7, issue-2	5-12
04	Production of Protein Enriched Ready-To-Eat	International Journal of Food Safety,	2015	7/2	5-12

Sl. No.	Title of Research paper	Title of the Journal	Year	Vol./ issue No	Page Nos.
	Extruded Food Products Using Edible Quality Sesame Flour, Rice Flour and Bengal Gram Flour.	Nutrition, Public Health and Technology,			
05	Study on Enzymatic Hydrolysis of Sal Shorearobusta Starch to Dextrin	Annals of Biological Research, 2015	2015	6 (6)	8-12.
06	Isolation, Identification and Analysis of Probiotic Properties of Lactobacillus Spp. from Selected Regional Dairy Product	Int.J.Curr.Microbiol. App.Sci.	2015	4(6)	621-628.

Conference

1."Studies on utilization of different oilseeds in preparation of nutritionally superior quality fermented food" by Priyadarshini Chakraborty*, Minakshi Ghosh, D.K.Bhattacharyya, N.R. Bandyopadhyay in 70th Annual Convention of Oil Technologists' Association of India& National Conference, Oil Technoilogists' Association of India Nov,21-22, 2015.

2."Study of nutrient rich leaf blend and its incorporation in extruded food and pasta products, "by Priyadarshini Chakraborty, Minakshi Ghosh, N.R. Bandyopadhyay, D.K. Bhattacharyya On "International Conference on Advances in Bioprocess Engineering and Technology (ICABET 2016) January ,20-22, 2016.

3."Study on effect of fermentation of Tamarind kernel powder and Jackfruit seed flour using Yeast and Lactobacillus" by Priyadarshini Chakraborty*, Minakshi Ghosh, N.R.Bandyopadhyay, D.K.Bhatacharyya in 11th International Food Data Conference Food Composition and Public Health Nutrition by at National Institute of Nutrition, Hyderabad. November, 3-5,2015.

4.Evaluation of Nutritional Characteristics of some Health Beneficial Peanut Butter like Spreads" by Sanjukta Kar*, Mahua Ghosh, Minakshi Ghosh, D.K.Bhattacharyya in 70th Annual Convention of Oil Technologist's Association of India, held at CGCRI, Kolkata, Nov,20-22, 2015.

5."Evaluation of Nutritional Characteristics of Health Beneficial DAG Rich oil based Spreads" by Sanjukta Kar*, D.K.Bhattacharyya, Minakshi Ghosh in International Conference on Advances in Bioprocess Engineering and Technology, Jan, 2016 .

6."*Potential Health Benefits of Some Modified Peanut Spreads*" by Sanjukta Kar*,D.K. Bhattacharyya and Minakshi Ghosh in Annual conference on Obesity, Diabetes and Cardiovascular Diseases organized by Society for Nutrition & Dietetics, Jan,2016.

Seminar / Workshops / Conferences / Training programme organized by the department (2015 - 16):

- Skill development/Vocational Training to the unemployed youth around the locality in Metiabruz, Kolkata" , Garden Reach Shipbuilders & Engineers Limited (GRSE),Kolkata, a Govt. of India undertaking under the Ministry of Defence, 2015.

Technology Developed / Innovations

a)*Production of bioflavours from waste fruits through microbial fermentation*

b)*Bioethanol production*

c)Nutritionally enriched health beneficial Peanut butter like Spread products

d)Products development by Nanotechnology process

Foreign visits and Invited Lectures

Oral Presentation in 4th International Conference on Food Processing and Technology organised by OMICS Group held on August 10 – 12, 2015, London, UK "Optimization of parameters for production of protein hydrolysate using edible oyster mushroom (*Pleurotus ostreatus*)" by Bhaswati Goswami & Jayati Bhowal Abstract Published in the Journal of Food Processing and Technology, 6(8) : 107. 2015

Training and Placement

Training Scenario 2015-16

Module name	No.of Trainees	Traning Duration (Hrs)
Repair & Maintenance of Air Conditioner	38	600
Repair & Maintenance of Domestic Electronic Appliances	20	620
Plumbing	34	600
Electrician – Industrial	40	800
Welding Technology	39	800
Total	171	

Placement assistance of Trainees are providing after completion of the training programme into a few companies like Weather Makers Pvt Ltd (A.C), Bharati Shipyard Ltd (Welding) etc. And various govt. Empanelled contractors like Genius Enterprise, Landscape solutions Pvt Ltd, S.R.Enterprise, World Electrics House, Sk. Nizzamuddin etc.

Extension Activities and Societal outreach

Skill development/Vocational Training to the unemployed youth around the locality in Metiabruz, Kolkata" , Garden Reach Shipbuilders & Engineers Limited (GRSE),Kolkata, a Govt. of India undertaking under the Ministry of Defense.

A Tripartite MOU with Garden reach Shipbuilders & Engineers Ltd. (GRSE) and Kolkata Police has been signed on 9th June 2014(2014-2017 and extendable to 2 years)

Dr. M.N. Dastur School of Materials Science and Engineering

About the department

Dr. M. N. Dastur School of Materials Science and Engineering started functioning since 2001 as a multidisciplinary educational and research centre with a vision to create a vibrant, supportive community of materials scientists and engineers committed to expand fundamental understanding of materials, develop advanced technologies, and provide leadership through education and innovative research geared to meet the current and future needs of society. The School is an integral part of Indian Institute of Engineering Science and Technology, Shibpur and aims at providing an ideal environment for interdisciplinary teaching and research.

Since its inception the School has embarked on several programmes to facilitate fundamental developments in the physics and chemistry of materials alongside applications in manufacturing processes and engineering design. Over these years, its central function has been imparting education to postgraduate students by providing them with the opportunity to conduct independent and creative research at the forefront of materials science and engineering. The School offers a full time M.Tech. programme on Materials Science and Technology, with specialization on Materials Design and Application and has a concrete plan for introducing a four year post-B.Sc. integrated M.Tech. programme on Materials Science.

The School started its modest journey in 2001 with extremely limited facilities which included a furnace and few computers. Ever since then, the faculty members, research scholars and the staff members of the School have worked relentlessly to develop new facilities and infrastructure through sponsored projects and with the assistance of the erstwhile University. In the brief span of 14 years we have been able to develop major experimental facilities for synthesis/fabrication and characterization of materials, including a high resolution transmission electron microscope. Till date**24 scholars have been awarded their doctoral degree** and more than **133 students have received their M.Tech degree from the School**.

The School has several sponsored projects funded by different funding organizations like DST, MoS,GoI, UGC, SERB (DST), SEED (DST) etc. and have been able to develop collaborations with some leading material scientists and their groups both at the national as well as at the international level. Additionally, the Schools activities are closely linked with leading industries like Tata Steel and M. N. Dastur Company. Recently the School has signed a memorandum of agreement with M. N. Dastur Company, who has agreed to provide generous support for up gradation of the School.

What started as an insignificant centre with a furnace, dilapidated furniture and few computers in 2001 has now emerged as a centre that is starting to make modest footprints in the international materials research community.

Academic Programmes

Postgraduate Level

Degree Offered: Master of Technology in Materials Science and Technology

Sanctioned Students' intake: 18 nos.students per year (AICTE approved)

Additional intake through other programmes (i.e. Q.I.P). Nil

Specialisation in (a) Materials Design & Application

Doctoral & Post Doctoral Research Programme (2015-2016)

Degree Offered: Engineering

No of candidates enrolled: 05 Registered: 08Awarded: 01

Submitted: 02

Post-doctoral level: 01

Faculty position:

Sanction faculty post (permanent):04, **Vacant post: 03**

Endowment Faculty: 01, Vacant: 0

Contractual Faculty: 02, Vacant: 0

DST Inspire Faculty: 01

Faculty profile

Name	Designation	Highest Qualification	Specialisation/Research Area	Contact no E-mail
Dr. S. Chatterjee	Director	Ph.D. (Engineering), PRS (in Science)	Phase Transformation, HSLA Steel, High Strength Steel, Diffusion Bonding of Similar and Dissimilar Materials, Friction Stir Welding of Similar and Dissimilar Materials	schatterjee46@yahoo.com directorsmse@gmail.com
Dr. N. R. Bandyopadhyay	Professor	Ph.D. (Engineering)	Physical Metallurgy of Steel, Materials Characterization, Nano-materials, Energy Materials	nrb@matsc.iiests.ac.in nrbbesus@gmail.com
Dr. Mallar Ray	Assistant Professor (Endowment)	Ph.D. (Engineering)	Experimental and theoretical investigations on semiconductor and hybrid nanostructures.	mray@matsc.iiests.ac.in
Dr. ArijitSinha	Assistant Professor (Contractual)	Ph.D. (Engineering)	Nanomaterials Characterization, Composite Materials, Shape Memory alloys, Mechanical alloying	arijit@matsc.iiests.ac.in sinharijit@gmail.com
Dr. T.K. Roy	Visiting Professor	Ph.D. (Engineering)	Making, shaping and treating of steel and conceptual plan Project monitoring	tkroy.tatachair@gmail.com
Prof. R. K. Ray	Visiting Professor	Ph.D. (Engineering)	Physical Metallurgy and Materials Engineering	rkray@iitk.ac.in
Prof. Bhairab Chandra Mitra	Visiting Professor	Ph.D. (Engineering)	Polymer and Polymer Composites	bhairabchandramitra@rediffmail.com
Prof. Ajit Kumar Chakrabarti	Visiting Professor	Ph.D. (Engineering)	Metallurgical manufacturing (foundry, Machining, Welding, Surface Engg.), Extractive Metallurgy	akc1940@gmail.com
Dr. ProsenjitSaha	Assistant Professor (Inspire Faculty)	Ph.D. (Science)	Polymer Nanocomposites, Polymeric Biomaterials, Water Purification using Nanomaterials, Electrospinning and 3D printing of polymeric materials	prosenjit@matsc.iiests.ac.in, senjitiitkgp@gmail.com
Dr. Diptonil Banerjee	Assistant Professor (Contractual)	Ph.D. (Engineering)	Nanomaterials, Carbon nanotube, graphene, composite materials, field emission	nilju82@gmail.com

Awards, Honours and Laurels:

N. R. Bandyopadhyay, Professor

- **Fellow**, West Bengal Academy of Science and Technology (WAST)
- **Fellow,** The Institution of Engineers (India) and **Member** of its National Council
- **Council Member,**The Institution of Engineers (India)
- **Past Chairman –** West Bengal State Centre, The Institution of Engineers (India)
- **Editor –in - Chief**, The Institution Of Engineers (India) – Springer Series D Journal.
- **Chairman,** Metallurgical & Materials Engineering Division Board, The Institution of Engineers (India)
- **Chairman**, Committee for Advancement of Engineering and Technology (**CATE**), The Institution Of Engineers (India)
- **President of** The Institution Of Engineers (India)'s Nominee to
- **Advisor Board**, Bureau of Indian Standards
- **Vice-President,** Materials Research Society of India (MRSI)

Mallar Ray, Assistant Professor

- Guest Editor of International Conference on Functional Nano-Materials (IC-FNM 2016) issue of Materials Today: Proceedings, Elsevier Ltd.
- Lead Guest Editor for a Special Issue on Nanostructure based thermoelectric, 2016, of 'Journal of Nanotechnology,' Hindawi Publications
- Editorial Advisory Board Member of the journal 'Nanotechnology and Nano Science,' Bioinfo Publications
- Life member, Materials Research Society of India (MRSI) – Membership No. LMB 927

Arijit Sinha, Assistant Professor

- Member of The Institution of Engineers (India) (**Membership Number: M 145718-1**), Metallurgical and Materials Engineering (MME) Division.
- Life Member of Electron Microscope Society of India (**Membership Number: LM 1211**).
- Life Member of The Indian Institute of Metals **(Membership Number: BO1-LM-50967**).
- Life Member of Materials Research Society of India (**Membership Number: LMB 2541**).

Prosenjit Saha, Assistant Professor (Inspire Faculty)

- Life Member, The Indian Institute of Metals (IIM), Membership No. 55083.
- Fellow Member, American Chemical Society (ACS, Membership No.- 31011465)
- Young Scientist Research Award from SYST-DST, GoI, 2016
- Early Career Research Award from SERB-DST, GoI, 2016.
- Biodata selected for Marquis Who's Who(https://cgi.marquiswhoswho.com/OnDemand/Default.aspx?last_name=saha&first_name=prosenjit)

Diptonil Banerjee, Assistant Professor

- Editorial Board Member of the journal 'Nanotechnology and NanoScience'(Bioinfo Publications)
- International Journal of Applied Nanotechnology' (Pub Publications)
- International Journal of Nanomaterials and Nanostructures' (Pub Publications)

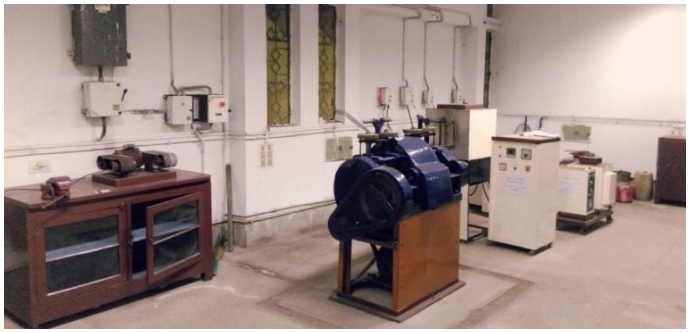
Research area

- Carbon Nanostructure
- Composites Materials
- Field Emission
- Water Purification

Research facilities:

Materials Processing and Heat Treatment Lab:

This laboratory houses several furnaces (details furnished below), a two-way high rolling mill, belt grinder, bench vice, abrasive cutting wheel and related accessories.



The rolling mill and high temperature furnaces in the 1.Materials Processing and Heat Treatment Lab.

Furnace Type	Maximum Temperature	Orientation
High Temperature Furnace	1200˚	Horizontal
Tube Furnace	750˚	Horizontal
Salt Bath Furnace	900˚	Vertical
Muffle Furnace	650˚C	Vertical

Metallographic Lab:

This laboratory houses the following:

i. Polishing facilities (indigenously designed polishing wheels)
ii. Fritz P6 planetary ball mill
iii. Fritz P0 mono-mill

The polishing weels (left) and the ball mills (right) in the metallographic lab at MND-SMSE

Polymer Processing Lab:

This laboratory houses the following instruments:

i. Mechanical Stirrer (Remi RQ 120 max. speed 4000 rpm)
ii. Hot air oven
iii. Thermostatic bath
iv. Digital pH meter

Besides above the laboratory is equipped with basic accessories needed for polymer processing including reagents and glassware.

Modelling and Optimization Lab

The modelling and optimization laboratory houses computational facilities that allow *ab-initio* modelling of materials along with multivariate optimization procedures. Density functional theory (DFT) based Materials Studio software with CASTEP and DMol3 packages enable calculations of band structure and density of states.

Besides Materials Studio there are software packages Matlab and Mathematica, using which Artificial Intelligence and Genetic Algorithm based computation are regularly performed.

Microscopy and Electrical Characterization Lab:

The microscopy laboratory houses:

i. Optical microscope - Olympus CK 4OM and Olympus GX41
ii. LECO LM 100 Micro-Vickers tester
iii. I-V characteristics measurement facility – KEITHLEY 2602B system source meter.

The Olympus optical microscope (left), LECO LM 100 Micro-Vickers tester (centre) and the Keithley 2602B double channel source meter (right)

SMALL (Laboratory for Low-dimensional Advanced Material Synthesis)

Development of a variety of nanostructures, ranging from metal, semiconductor to conducting polymer and topological insulators like graphene are carried out using the different facilities available at SMALL. These include (but are not limited to) the following:

i. General purpose and HF acid usage fume hoods (make: Labguard) with continuous supply of DI water, nitrogen, argon, etc that provides a clean environment for variety of chemical synthesis
ii. Glove box (MTI corporation) that can be evacuated and purged with different gases
iii. Single chamber PECVD (Hind Hi Vac) with turbo pump
iv. Optical microscope (Olympus)
v. Microbalance (MetlerTolledo)
vi. Spin coater (Apex)
vii. Millipore DI water units – Elix and Direct Q both capable of supplying 18 MΩ-cm resistivity water
viii. Centrifuge (Tarson up to 14000 rpm, Remi up to 10,000 rpm)
ix. Hot Air oven
x. Temperature controlled Ultrasonic bath (PiezoUsonic)
xi. Probe sonicator (PiezoUsonic)
xii. UV-visible spectrometer (Jasco V750) with integrating sphere.
xiii. Photoluminescence spectrometer (Horiba JobinYvonNanolog) with quantum yield measurement facility.
xiv. 325 nm HeCd laser
xv. Indigenously designed electrochemical etching unit with computer controlled interface.

The indigenously designed (left) and labguard (right) fumehoods and the Hind Hi Vac PECVD (centre) at SMALL

The microscope and spectrometers at SMALL

Computer Lab

The student computer lab at MND-SMSE is aimed to provide basic computational facility to all the postgraduate students. The number of computers at present are inadequate and the students share the facilities. We intend to procure computers so that at least one computer may be allotted for 2 students.

Name of laboratories:

1. Heat Treatment and Materials Processing Laboratory
2. Metallographic Laboratory
3. Polymer Processing Laboratory
4. Modelling and Optimization Laboratory
5. Microscopy and Electrical Characterization Laboratory
6. SMALL (Laboratory for Low-dimensional Advanced Material Synthesis)
7. Computer Laboratory

Support staff position:

Sanctioned technical post: 01(permanent): Vacant Post: 01

Technical staff profile

Name	Designation	Highest Qualification	Contact no	E-mail
Dr. Malay Kundu	Scientific Officer (Contractual)	Ph.D. (Engineering)	2668-8140 (Office)	mkundu@matsc.iiests.ac.in

Administrative Staff & Lab. Staff: 4 nos. (Contractual)

Name	Designation	Highest Qualification	Contact no	E-mail
Sanjay Sarkar	Office Assistant	B.A. (Hons), M.A. Pursuing)	9830450599	ss@matsc.iiests.ac.in
Pradip Kumar Majumder	Office Peon	Secondary	8420281986	-
SudipBhattacharjee	Laboratory Attendant	B.Com	9331177191	sudipannand@gmail.com
Kumar Nayak	Laboratory Attendant	B.Com		kumar.nayak55@gmail.com

Ongoing Sponsored Research (during 2015-2016):

Sl. No.	Title of Research Project	Sponsoring Agency	Year of Start and duration
01.	Development of natural green polymer based nanocomposite for artificial skin materials by electrospinning and 3-D printing technology **Value : Rs. 35.00 Lakhs**	DST Inspire, GoI	2015-2020Five (5) years
02.	Development of nanofiber reinforced plant polymer based durable, fire-retardant biocomposites **Value : Rs. 31.00 Lakhs (Aprox.)**	SEED-DST, Under SYST Scheme, GoI.	2016-2019 Three (3) years
03.	Engineered Biomimetic Cellulose Nano-scaffold for Skin and Bone Replacement **Value : Rs 52.00 Lakhs**	DST-SERB, Under Early Career Research Grant, GoI	2016-2019 Three (3) years
04.	Synthesis of some one or two dimensional carbon nanostructures/related composites and its novel electronic applications by virtue of its amorphousness **Value : Rs 23.00 Lakhs**	DST-SERB, Under First Track Research Grant, GoI	2014-2017 Three (3) years
05.	 **Value : Rs 628.00 lakhs**	Ministry of Steel , Govt. of India	Three (3) years

No. of Publications (during 2015-2016)

S. Chatterjee, Head of the Department

S. Pattanayak, S. Dey, **S. Chatterjee**, S.G. Chowdhury, and S. Datta: Computational intelligence based designing of microalloyed pipeline steel, Computational Materials Science 104 (2015) 60-68.

N. R. Bandyopadhyay, Professor

1. Bhabatosh Biswas, SumitChabri, Bhairab Chandra Mitra, Nil Ratan Bandyopadhyay, ArijitSinha, "Mechanical Behaviour of Aluminium Dispersed Unsaturated Polyester/Jute Composites for Structural Applications", Journal of The Institution of Engineers (India): Series C, 10.1007/s40032-016-0329-7 (2016).

2. Arnab Dhara, Bibhutibhushan Show, Apurba Baral, Sumit Chabri, Arijit Sinha, **Nil RatanBandyopadhyay**, Nillohit Mukherjee, "Core-shell CuO-ZnO p-n heterojunction with high specific surface area for enhanced photoelectrochemical (PEC) energy conversion" - Solar Energy, vol.136, p. 327–332 (2016).

3. TamshukChowdhury, S. Sivaprasad, H.N. Bar, S. Tarafder and **N.R. Bandyopadhyay**, "Comparative assessment of cyclic J-R curve determination by different methods in a pressure vessel steel" - Journal of Nuclear Materials, vol.472 p.55-64 (2016).

4. Arnab Dhara, ApurbaBaral, SumitChabri, ArijitSinha, **Nil Ratan Bandyopadhyay** and Nillohit Mukherjee: "An Efficient Approach Towards the Photodegradation of Indigo Carmine by Introducing ZnO/CuO/Si Ternary Nanocomposite as Photocatalyst" - J. Inst. Eng. India Ser. D DOI 10.1007/s40033-016-0111-2, 2016.

5.T. Chowdhury, S. Sivaprasad, H. N. Bar, S. Tarafder and **N. R. Bandyopadhyay, "**Cyclic fracture behaviour of 20MnMoNi55 steel at room and elevated temperatures" – Int. Journal of Fatigue and Fracture of Engineering Materials and Structures, vol.38, Issue 7, p.813–827, (2015).

6.TamshukChowdhury, S. Sivaprasad, H. N. Bar, S. Tarafder, **N. R. Bandyopadhyay**, "Incremental cyclic fracture behaviour of 20MnMoNi55 steel at room temperature" – Int. Journal of Fracture, vol.192, p.117-132 (2015).

7.BhabatoshBiswas, SumitChabri, Bhairab Chandra Mitra, Kunal Das, **Nil RatanBandyopadhyay** and ArijitSinha: "Effect of Copper/Graphite Addition on Electrical Conductivity and Thermal Insulation of Unsaturated Polyester/Jute Composites" - J. Inst. Eng. India Series D (DOI 10.1007/s40033-015-0107-3), 2015.

8.Clio Zandvliet, **N.R. Bandyopadhyay** and Dipa Ray: Surface Resistance of Jute Fibre/Polylactic Acid Biocomposite to Wet heat- J.Inst.Eng.India, Series D (DOI 10.1007/s40033-015-0073-9), 2015.

9.Clio Zandvliet, **N.R. Bandyopadhyay** and Dipa Ray: Proposition of an Accelerated Ageing Method for Natural Fibre/Polylactic Acid Composite- J.Inst.Eng.India, Series D (DOI 10.1007/s40033-015-0070-z), 96 (2015), 151-158.

Book Chapter:

1.ArijitSinha, SouriddhaSanyal, **Nil RatanBandyopadhyay**, Thermal Treatment for Strengthening Titanium Alloys in Comprehensive Materials Finishing, Elsevier (Status-Production Stage), 2016. ISBN: 978-0-12-803249-7.

2.ArjunDey, **Nil RatanBandyopadhyay**, A.K. Mukhopadhyay, "Nanoindetation on HAp Coating" in the book on Nanoindentation of Brittle Solids, Chapter 32 (CRC press)

Mallar Ray, Asst. Professor

1.S. Dutta Gupta, J. B. M. Krishna, **M. Ray**, Thermoelectric Property of Silicon Nanoparticle-Polyaniline composite, Accepted, E-MRS **2016** Fall Meeting, to be published.

2.S. Choudhury, **M. Ray**, S. Chatterjee, S. K. Saha, Light emission from a solid state silicon polymer nanocomposite, Accepted, E-MRS **2016** Fall Meeting, to be published.

3.A. Hazra and **M. Ray**, Bimetallic core@shell nanoparticles, Proceedings of National Thematic Workshop on Recent Advances in Materials Science, Burdwan University, India, **2016**.

4.A. Hazra and **M. Ray**, Plasmon-plasmon interaction in bimetallic core-shell nanostructures, Proceedings of National conferences on Nanotechnology: Materials and Applications, Jadavpur University, Kolkata, India, June **2016.**

5.A. Hazra and **M. Ray**, Gold-Silver nanostructure: plasmon-plasmon interaction, Accepted, E-MRS **2016** Fall Meeting, to be published.

6.C. Josh and **M. Ray**, Self assembled films of Si nanoparticles on water surface, Proceedings of National Thematic Workshop on Recent Advances in Materials Science, Burdwan University, Burdwan, India, March **2016.**

7.C. Josh, M. Choudhuri, A. Datta and **M. Ray**, Self assembled Langmuir films of Silicon Nanoparticles on air-water interface, Proceedings of National conferences on Nanotechnology: Materials and Applications, Jadavpur University, Kolkata, India, June **2016**.

8.C. Josh, M. Choudhuri, A. Datta, **M. Ray**, Self assembled films of luminescent silicon nanocrystals, Accepted, E-MRS **2016** Fall Meeting, to be published.

9.D. Karar and **M. Ray**, Quasi 2D crystalline silicon with tunable surface termination, Accepted, E-MRS **2016** Fall Meeting, to be published.

10.U. Ghanta, **M. Ray**, N. R. Bandyopadhyay and S. M. Hossain, "Superliner Photo Response in Colloids of Silicon Quantum Dots" INT. J. INNOVATIVE RES. SCI. ENG. TECHNOL. 3, 15-18, **2015**.

Book Chapter:

1.M. Ray, A. Hazra, S. D. Gupta, Silicon Based core-shell nanostructures in K. Sattler Ed. Source book of Silicon nanostructures, Taylor and Francis, to be published.

ArijitSinha, Asst. Professor

1. BhabatoshBiswas, SumitChabri, PravinSawai, Bhairab Chandra Mitra, Kunal Das, **Arijit Sinha**, "*Effect of Copper Incorporation on the Mechanical and Thermal Behaviour of Jute fibre reinforced Unsaturated Polyester Composites",* Polymer Composite (2016) Accepted.
2. ArnabDhara, ApurbaBaral, Bibhutibhushan Show, SumitChabri, Nil RatanBandyopadhyay, **Arijit Sinha,** NillohitMuherjee "*Core-shell CuO-ZnO p-n heterojunction with high specific surface area for enhanced photoelectrochemical (PEC) energy conversion",* Solar Energy, **136** (2016), 327–332.
3. BhabatoshBiswas, SumitChabri, Bhairab Chandra Mitra, Nil RatanBandyopadhyay, **Arijit Sinha**, *"Mechanical Behaviour of Aluminium Dispersed Unsaturated Polyester/Jute Composites for Structural Applications",* Journal of The Institution of Engineers (India): Series C, 10.1007/s40032-016-0329-7 (2016).
4. BhabatoshBiswas, SumitChabri,PravinSawai, Bhairab Chandra Mitra, Kunal Das, **Arijit Sinha**, "*Effect of Aluminium Addition on the Mechanical and Thermal Behaviour of Unsaturated Polyester/Jute Composites*", Advances in Polymer Technology, doi:10.1002/adv.21724 (2016).
5. Tuhin Das, R. Karunanithi, **Arijit Sinha**, K.S. Ghosh, SupriyaBera, *"Deformation, decomposition and hardening behavior of nano Al7075 alloy prepared by mechanical milling and hot pressing",* Advanced Powder Technology, doi:10.1016/j.apt.2016.05.010 (2016).
6. SouriddhaSanyal, SumitChabri, SubhranshuChatterjee, NandagopalBhowmik, Avijit Kumar Metya, **Arijit Sinha**, *"TribologicalBehavior of Thermomechanically Treated Al-Mg-Si Alloy by Nanoscratch Measurements",* Tribology International, **102 (**2016)125-132.

7. ArnabDhara, ApurbaBaral, SumitChabri, Nil RatanBandyopadhyay, **Arijit Sinha,** NillohitMuherjee**,** *"An efficient approach towards the photodegradation of Indigo Carmine by introducing ZnO/CuO/Si ternary nanocomposite as photocatalyst",* Journal of The Institution of Engineers (India): Series D, doi: 10.1007/s40033-016-0111-2 (2016).
8. BhabatoshBiswas, SumitChabri,Bhairab Chandra Mitra, Kunal Das, Nil RatanBandyopadhyay and **Arijit Sinha**, "*Effect of Copper/Graphite addition on Electrical Conductivity and Thermal Insulation of Unsaturated Polyester/Jute Composites*", Journal of The Institution of Engineers (India): Series D, doi:10.1007/s40033-015-0107-3 (2016).
9. SumitChabri, ArnabDhara, Bibhutibhushan Show, **Arijit Sinha** and Nillohit Mukherjee, "*MesoporousCuO-ZnO p-n heterojunction with high specific surface area for enhanced photocatalysis and electrochemical sensing"*, Catalysis Science & Technology, **6** (2016) 3238-3252.
10. SubhranshuChatterjee, SumitChabri, HimelChakraborty, NandagopalBhowmik and **Arijit Sinha, "***Micromechanical and nanoscratchbehavior of SiC_p dispersed metal matrix composites"*, Journal of Materials Engineering and Performance, **24** (2015) 3407-3418.
11. **Arijit Sinha**, GobindaGopal Khan, BholanathMondal, JyotsnaDuttaMajumdar and ParthaProtimChattopadhyay, "*Effect of Aluminum Coating on the Surface Properties of Ti-(~ 49 at. pct) Ni Alloy*", Metallurgical and Materials Transaction B, **46** (2015) 1951-1958.
12. BholanathMondal, SumitChabri, GargiSardar, NandagopalBhowmik, **Arijit Sinha** and ParthaProtimChattopadhyay, "*Magnetic and Mechanical properties of Cu (75 wt. %) - 316L grade stainless steels synthesized by ball milling and annealing",* Journal of Magnetism and Magnetic Materials, **381** (2015) 14-20.

Book Chapter:

1. **Arijit Sinha**, SouriddhaSanyal, Nil RatanBandyopadhyay, Thermal Treatment for Strengthening Titanium Alloys,in: ShahjahanMridha, SaleemHashmi (Eds.), Comprehensive Materials Finishing, Elsevier (Status-Production Stage), 2016. ISBN: 978-0-12-803249-7.

Prosenjit Saha, Assistant Professor (Inspire Faculty)

1.Suvendu Manna, Debasis Roy, **ProsenjitSaha**, R K Sen, BasudamAdhikari, "Removal of 2,4-dichlorophenoxyacetic acid from aqueous medium using modified jute", Journal of the Taiwan Institute of Chemical Engineers, July, 2016(Accepted for publication).

Edited Books:

1.Edited Book "Multicomponent Polymer Mterials", for Springer, Editors: Jin Kuk Kim-Sabu Thomas-ProsenjitSaha (to be published in 2016). ISBN 978-94-017-7324-9.

Book Chapters:

1.Multi Component Materials, Chapter-1, **Prosenjit Saha**, SukanyaChowdhury, Min cheol Kim, and Jin Kuk Kim. Ed: Jin kuk Kim. Sabu Thomas, ProsenjitSaha. Multicomponent Polymeric Materials, Springer, ISBN 978-94-017-7324-9, 2016.

2.JaideepAdhikari, Sukanyachowdhury, **ProsenjitS aha**, Jin kuk Kim. Design for Multicomponent Materilas, Ed: Jin kuk Kim, Sabu Thomas, ProsenjitSaha. Multicomponent Polymeric Materials, Springer, ISBN 978-94-017-7324-9, 2016.

3.Lignocellulosic materials for Geotextiles and Geocomposite for Engineering Applications. **Prosenjit Saha**, S. Chowdhury, J Adhikari, Springer, Lignocellulosic Composite Materials, Edited by SusheelKalia, 2016.

4.Improvement of physical, mechanical and chemical properties of lignocellulosic natural fibers for use in various applications, S. Manna, **P. Saha**, S. Chowdhury, S. Thomas, Lignocellulosic Biomass Production and Industrial Applications, Edited by A Kuila, V Sharma, SCRIVENER PUBLISHING, 2016.

Diptonil Banerjee, Assistant Professor

1.K.K. Chattopadhyay, D Ganguly, D Pahari,Nirmalya S Das, P Howli, B. Das,
D. Banerjee, All-amorphous CNT-MnO2 nanoflaky hybrid for improved supercapacitor applications. *J. Electroanalytical Chemistry*(2016, Just Accepted)

2.**D. Banerjee**, K.K. Chattopadhyy, Non-Linear Conduction behaviour of Chemical Vapour Deposited Zinc Doped Diamond Like Carbon. *Advanced Science, Engineering and Medicine*(2016, Just Accepted)

3.S. Sarker, **D. Banerjee**, U.K. Ghorai, N.S. Das, K.K. Chattopadhyay, Size Dependent Photoluminescence Property of Hydrothermally Synthesized Crystalline Carbon Quantum Dots. *J. Luminescence* 178 (2016) 314-23.

4.D. Pahari, N.S. Das, B. Das, K.K. Chattopadhyay, **D. Banerjee**, Tailoring the Optical and Hydrophobic property of Zinc Oxide Nanorod by Coating with Amorphous Graphene.*PhysicaE* 83 (2016) 47-55.

Conference:

Papers published in the Proceedings of International and National Conferences

1.Dimitra Das, Diptonil Banerjee, DebabrataPahari, Uttam Kumar Ghorai, K.K. Chattopadhyay, Copper Doped Graphitic Carbon Nitride and Its Unique Optical Properties. Recent Advances In Materials Science(*Department Of Industrial Chemistry; Ramakrishna Mission VidyamandiraBelur Math*; 28-29th March- 2016) (Conference Proceedings ISBN: 978-81-928110-9-3) Page 9-17

2.Debabrata. Pahari, K. K. Chattopadhyay, Diptonil Banerjee, Enhanced Hydrophobicity of Amorphous Graphene Coated Zinc Oxide Nanorod. Recent Advances In Materials Science (*Department Of Industrial Chemistry; Ramakrishna Mission VidyamandiraBelur Math*; 28-29th March- 2016) (Conference Proceedings ISBN: 978-81-928110-9-3) Page 83-90.

3.Sudeep Kumar Das, Soma Mitra, Diptonil Banerjee, Determination of Different Critical Exponents for Competitive Growth Model in 1+1 Dimension. Recent Advances In Materials Science (*Department Of Industrial Chemistry; Ramakrishna Mission VidyamandiraBelur Math*; 28-29th March- 2016) (Conference Proceedings ISBN: 978-81-928110-9-3) Page 110-118 [Mode of presentation in the conference: Oral].

4.DipsikhaGanguly, Debabrata. Pahari, Uttam Kumar Ghorai, Diptonil. Banerjee, K. K. Chattopadhyay, Red Emission from Chemically Synthesized Europium Hydroxide-Amorphous Carbon Nanotube Core-Shell Structure. Recent Advances In Materials Science (*Department Of Industrial Chemistry; Ramakrishna Mission VidyamandiraBelur Math*; 28-29th March- 2016) (Conference Proceedings ISBN: 978-81-928110-9-3) Page 139-145.

Papers presented in the different International and National conference:

1.D. Pahari, **D. Banerjee**, Enhancement of supercapacitor performance of amorphous carbon nanotube-Manganese-di-oxide hybrid by conducting polymer wrapping. NCoN:M&A (*School of Material Science and Technology, Jadavpur University;*16-17th June 2016)
[Mode of presentation in the conference: Poster].

2.U. Ray, **D. Banerjee**, K.K. Chattopadhyay, Amorphous Carbon Nanotubes-Silica Hybrids Composites for the Treatment of Industrial Dye Effluents NCoN:M&A 2016 (*School of Material Science and Technology, Jadavpur University;*16-17th June 2016)
[Mode of presentation in the conference: Poster].

Seminar/Workshops/Conferences/Training programme organised by the Department (during 2015-2016) :

Organising a International Conference on "Functional Nano-Materials (IC-FNM-2016)" during to be held September 28-29, 2016

Technology Developed/Innovations

Solar cell coated with Silicon nano-crystals which is fabricated at Nano-semicondutor Laboratory at MNDSMSE shows considerable increase in open-circuit voltage and short- circuit current which can potentially increase overall efficiency of coated solar cells

Foreign visits and Invited Lectures:

1.**ArijitSinha, Invited talk** in Fourth International Conference on Natural Polymers, Bio-Polymers, Bio-Materials, their Composites, Blends, IPNs, and Gels: Macro to Nano Scales (ICNP-2015), Kottayam, Kerala, India.10-12th April, 2015. (Topic: Effect of aluminium addition on the thermal stability and scratch behavior of jute/unsaturated polyester composites)

2.**N. R. Bandyopadhyay**, **Invited Annual Technical Lecture** held March 01, 2015, organized by Sustainable Development Forum, The Institution of Engineers (India), Patna Local Centre, Patna (Topic: Engineering Education to Meet the Challenges of Sustainable Development)

3.**ArijitSinha, Invited talk** in national seminar on "Recent Trends and Future Advancements in Manufacturing Technology (RTFAMT 2015)", 28th February, 2015, organized by Swami Vivekananda Institute of Science and Technology, Kolkata. (Topic: Manufacturing: A Materials' Perspective)

4.**N. R. Bandyopadhyay**, **Key note speaker** at the Twenty Eight National Convention of Metallurgical and Material Engineers held January 23 & 25, 2015, organized by The Institution of Engineers (India), Visakhapatnam Local Centre, Visakhapatnam (Topic: Performance Enhancement of Crystalline Silicon Solar Cell by Coating with Luminescent Silicon Nano structures Fabricated by an Inexpensive and Reproducible Technique).

5.**M. Ray, Invited lecture** at the National Workshop on Nano Science and Technology (NWNST), Bankura Unnayani Institute of Engineering, Bankura, January 19-23, 2015 (Topic: How Size Matters? Case Studies of Silicon and Noble Metal Nanoparticles)

6.**M. Ray, Invited Lecture** at National Institute of Technology, Raipur in the Workshop on Advanced techniques on Materials Characterization, January 22-23, 2016 (Topic: Spectroscopy for beginners)

7.**M. Ray, Invited Lecture** at Workshop on Materials Characterization: Principles and Practices, July 25-August 5, 2016, IIEST, Shibpur (Topic: Fundamentals of absorption and emission spectroscopy)

8.**Arijit Sinha,** Joint Chairpersons of the Session "Renewal Materials / Green Composites /Green Materials -I" in Fourth International Conference on Natural Polymers, Bio-Polymers, Bio-Materials, their Composites, Blends, IPNs, and Gels: Macro to Nano Scales (ICNP-2015), Kottayam, Kerala, India. 10-12th April, 2015.

9.**ArijitSinha**, Invited talk in 29th National Convention of Metallurgical and Materials Engineering & National Seminar on Green Technologies for Iron & Steel Production, 30-31st January, 2016, organized by The Institution of Engineers (India), Durgapur. (Topic: Recovery Behaviour of Cryogenic Treated on the Shape Recovery Behavior of Martensitic Ti-Ni Alloy)

10.**ArijitSinha**, Invited talk in 2nd national seminar on "Recent Trends and Future Advancements in Manufacturing Technology (RTFAMT 2016)", 23th April, 2016, organized by Swami Vivekananda Institute of Science and Technology, Kolkata. (Topic: Manufacturing: Correlation between Processing, Property and Performance).

11.**ArijitSinha**, Invited Speaker on "Scratch Testing in the Sub-micron Scale" in Workshop on Materials Characterization: Principles and Practices, July 25-August 5, 2016, IIEST, Shibpur, Howrah, India, Organized by Centre of Excellence (CoE) TEQIP II, Indian Institute of Engineering Science and Technology, Shibpur

12.**D. Banerjee**, In The Regime of Technology Where small means large.
Emerging trends of Advance Science and Humanities for the applications in Technology.*Techno India Batanagar, Batanagar Campus;*22nd April 2016.

Visitors to our Department (Indian & Foreign):

1.**Dr. Indranil Chattopadhyay**, an eminent scientist attached to the Aryabhatta Research Institute of Observational Sciences (ARIES), India.

2.**Professor Shamal Kumar Lahiri**, an eminent scientist who was associated with IBM, USA and played a key role in establishing the electronic materials programme at NTU and NUS, Singapore.

3.**Dr. Kuruvilla Joseph**, Sr. Professor and Dean (SA), Department of Chemistry, Indian Institute of Space Science and Technology (IIST), Department of Space, Government of India Thiruvananthapuram.

Academic Collaboration:

- **University of Calcutta, Kolkata**
- **CGCRI, Kolkata**
- **SINP, Kolkata**
- **NIT, Durgapur**
- **IIT, Khargpur**
- **Mahatma Gandhi University, Kottayam**
- **IPGMER (SSKM Hospital, Kolkata)**
- **IJIRA, Kolkata**
- **NIRJAFT, Kolkata**

Industrial Collaboration:

School has been awarded for Joint Research Project from DST, SEED Division for research on June Composite in collaboration with industrial partner KE-AMERSIL Pvt. Ltd, Kharagpur.

A Memorandum of Agreement (**MoA**) between **MNDSMSE**, IIEST**, Shibpur and** KE-AMERSIL Pvt. Ltd, Kharagpur for collaborative research on Jute Composite.

Others

- Signing of Memorandum of Agreement (**MoA**) between **MNDSMSE**, **BESU, Shibpur** and **M.N.Dastur& Co (P) Ltd, Kolkata** on 10.07.2013 **for furthering the activities of the school.**

School of Management sciences

About the department

School of Management Sciences has emerged as an Institution of excellence in all facets of management education with highly specialized, sophisticated and 21st Century oriented courses and curriculum. The goal of SOMS is to achieve professional growth through holistic management education to shape future leaders for the corporate through intermingling of functional knowledge of Marketing, Finance, Operations, Human Resource & IT Management**.**

The MBA programme is designed to deliver the latest business education. The emphasis of the programme is on an integrated understanding of the totality of business, its philosophy and socio-economic inter-relationship. The programme is specially designed to develop and enhance the basic managerial skills and abilities of students and to equip them with tools & techniques of modern management for better decision-making.

Different teaching methods like case studies, simulation games, group discussions, group seminars, scenario building and project work are used to make the teaching-learning process interesting. Students are encouraged to analyze, innovate and prepare themselves for professional challenges of the industry. The two years' programme leading to the Masters in Business Administration

Academic Programmes:

Post Graduate Level

Degree offered – 2 year Full Time MBA

Sanctioned students' intake 60

Additional intake through other programmes (i.e. QIP) NA

Specialisations in- Human Resources Management, Financial Management, Marketing Management, Operations Management

Doctoral & Post Doctoral Research Programme

Degree offered: PhD (Management Science) :

No of Candidates enrolled : 0

No. of Candidates registered:1

No. of Candidates awarded:3

Faculty Position:

Sanctioned faculty post …….. Vacant Post ……

Faculty profile (in the following table)

Name	Designation	Highest Qualification	Specialisation / Research Area	Contact No. E - mail
Dr. Prabir Kumar Paul	Director, SOMS	Doctorate of Philosophy	GIS, RS & MIS	033 26688355 prabirpaul59@gmail.com
Poulomi Mukherjee Mondal	Assistant Professor On Contract	Ph.D. (Engg)	Operations Management/ Management Information System	26684561 extn: 435 poulomi.mukherjeemondal@gmail.com
Shyamal Kumar Chakraborty		ME,PGDBM	Operations Management/	26684561 extn:433
Sumanta Deb	Assistant Professor On Contract	**MBA**	Marketing Management	26684561 extn:436 sumanta04@gmail.com
Surabhi Sinha	Assistant Professor On Contract	**MBA**	Human Resource Management	26684561 extn:438 surabhisinha@yahoo.com
Monalika Dey	Assistant Professor On Contract	**MBA**	Human Resource Management	26684561 extn:438 monalika.dey@gmail.com

Research area:

Management Information System, Operations Management, Human Resource Management

Research facilities: EBESCO and JGATE, SPSS and Prowess, CRISIL, SAP, Bloackboard

Name of the laboratories: Computer Laboratory at U821

Support staff position:

(a)(i) Sanctioned technical post ……

(ii) Technical staff profile (in the following table)

Name	Designation	Highest Qualification	Contact No.	E- mail
Goutam Sarkar	Office Assistant	B. Com.(H)	26684561 Extn: 439	monti.papu@gmail.com
Mousumi Shaw (Das)	Assistant Librarian	M. Sc., BLIS	26684561 Extn: 442	shaw.mousumi@yahoo.in
Dipsikha Chandra (Pal)	Computer Assistant	M. Sc.,	26684561 Extn: 443	dipsikha84@gmail.com
Pranab Satpathi	Office Peon	H. S.	26684561 Extn: 439	pranab_satpathi@yahoo.co.in
Sukanta Guha	Office Peon	H. S.	26684561 Extn: 439	

Details of publications of each faculty member (2015 – 16)

Name	Journal Publication	Conference Publication	Books / Monograms
Dr. Prabir Kumar Paul	**2**	**-**	**-**
Dr. Poulomi Mukherjee Mondal	**-**	**1**	**1**
Surabhi Sinha	**-**	**-**	**-**
Sumanta Deb	**8**	**-**	**-**
Monalika Dey	**2**	**1**	**-**

Training and Placement

2015 – Total Pass out 24 (Opted out of placement – 1)

Placement on Campus: 0

Placement off Campus: 13

School of VLSI Technology

ANNUAL REPORT 2015-16

School of VLSI Technology
Indian Institute of Engineering Science & Technology (IIEST), Shibpur
(Formerly Bengal Engineering & Science University, Shibpur)
P.O. Botanic Garden, Howrah-711103, India

About the department

The research and education at School of VLSI Technology is closely associated with industry and several other primary academic Institutions of repute with an aim to foster cutting edge research and establishes the School as one of the pronounced leaders in field of VLSI and Microelectronics.

In the School of VLSI Technology, We have sufficient latest VLSI tools and hardware in our VLSI and Embedded systems Laboratories. The UG/PG/Doctoral students from Information Technology/Computer Science/Electronic Engg./Electrical Engg. are getting exposure with these industry standard tools and equipment. In eastern India, only two or three university/institutes have this type of laboratory.

VLSI being an interdisciplinary field involving various aspects of electrical, communications, computer science, information technology, semiconductor physics and materials science, the SOVLSIT closely collaborates with other departments within BESU and other reputed academic institutions in both India and abroad to cater to the needs of the engineers in the making. Faculty members of this Institute are also running a number of industry and Govt. funded research projects with active participation of SOVLSIT. A number of tools have been developed to carry out the VLSI research. About 8 PhD theses have been completed during the last five years in the field of VLSI design and test. Another seven students have already been registered for PhD in this area.

The School was established on July, 2006 with the introduction of a flagship course of M-Tech (VLSI Design) with an intake of 12 students under special requirement of a Special Manpower Development Project in VLSI Design and related Software (Phase II), a mission project of Govt. of Government of India to promote the research and education in the various areas of VLSI Design. The need to integrate to efforts of scientists and engineers working with different fields of microelectronics and semiconductors devices has been the primary motivation of creation of this school. The research and education at School of VLSI Technology is closely associated with industry and several other primary academic Institutions of repute with an aim to foster cutting edge research and establish the School and one of the pronounced leader in field of VLSI and Microelectronics.

M.Tech (VLSI Design) course under SMDP-II project was started during academic session 2006-2007 and continues to be a sought after program of the institute. Students of SOVLSIT have established their credentials through recruitment of international VLSI Design Companies and selection in PhD admission to different research laboratories/ IIT/IISC/ISI/Foreign Universities.

Academic Programmes:

Post Graduate Level

I. Degree offered:M. Tech in VLSI Design
II.Sanctioned students' intake:18
III.Additional intake through other programmes (i.e. QIP):
IV.Specializations in:VLSI Design

Doctoral & Post Doctoral Research Programme

I. Degree offered : PhD (Engineering / Science / Humanities & Management Science) :
PhD (Engineering)

II.No. of Candidates enrolled in 2015-16:6

Sl. No.	Scholar's Name
1.	Sanghamitra Ghosal
2.	Anindita Chakraborty
3.	Supriyo Srimani
4.	Indranil Maity
5.	Subhajit Chatterjee
6.	Procheta Chatterjee

III.No. of Candidates registered in 2015-16:6

Sl. No.	Scholar's Name
1.	Sudipta Bardhan
2.	Arnab Mukherjee
3.	Lupamudra Banerjee
4.	Manas Kumar Parai
5.	Sarosij Adak
6.	Sudip Poddar

IV.No. of Candidates awarded:1

Sl. No.	Scholar's Name
	Soumajit Poddar

Faculty Position: Sanctioned faculty post … 3 (Contractual) …… Vacant Post …2 ……

(a) Faculty profile (in the following table)

Name	Designation	Highest Qualification	Specialization / Research Area	Contact No. and E - mail
Prof. Hafizur Rahaman	Director	PhD. Post-doc(UK)	Logic Synthesis, VLSI Design and Test, CAD for Microfluidic Biochips, Nanotechnologies, Reversible Computing	+91-33-26684561/62/63 hafizur@vlsi.iiests.ac.in
Dr. Pranab Ray	Assistant Professor	Ph.D (Engg.)	Biochip design Automation, Embedded System, Algorithm and data structures , VLSI physical design, Object oriented System Design	033-22270143 9433800260 ronmarine14@yahoo.co.in
Mr. Sudip Ghosh	Assistant Professor	M. Tech.	Digital VLSI Design & VLSI Architectures, Digital Image Watermarking, Synthesis and Verification, VLSI Testing.	033-22191833 8017040884 sudip_etc@yahoo.co.in sudip.ghosh@vlsi.iiests.ac.in
Dr. Amretashis Sengupta	INSPIRE Faculty	Ph.D (Engg) and Post-doc	2-D materials based FET, atomistic simulations	033-26689016, 9434879016 a.sengupta@vlsi.iiests.ac.in, dr.a.sengupta@ieee.org
Mr. Partha Sarathi Gupta	Assistant Professor	M. Tech.	Nanophotonics and novel 2D materials: Modeling and Simulation	9674128771 033-24152571 gupta_parthasarathi@yahoo.co.in
Mr. Indranil Hatai	Assistant Professor	M.S.	Digital VLSI Design, Digital Signal Processing, Wireless Communication, Biomedical System Design, Architectural Design of ICs.	7074715197 9474713304 indranil.hatai@gmail.com
Dr. Kasturi Ghosh	Project Faculty (SMDP-C2SD)	PhD (Engg)	Design and testing of Analog VLSI circuits	9475308870 kghosh@vlsi.iiests.ac.in

Awards and Laurels received by the faculty members :-

- Dr. Amretashis Sengupta: DST INSPIRE Faculty award 2013 (II), DST Post-doctoral Fellowship in Nano Science and Tech. 2012-2017.
- DST-DAAD has awarded collaborative research fellowship to Prof. Hafizur Rahaman under Indo-German (DST-DAAD) Bilateral Cooperation during 2013-2015 (with Prof. Rolf Drechsler, Professor and Director, Computer Architecture Group, University of Bremen, Germany).
- Hanse-Wissenschaftskolleg (HWK) Fellowship in energy research (Germany) (2016-17) awarded to Dr. Amretashis Sengupta

Research area (only mention broad titles without description in detail) :

1.Digital VLSI Design
2.Analog and Mixed Signals
3.VLSI Testing
4.Nanotechnology
5.Bio-chip Design Automation
6.NOC & SOC Design
7.FPGA Synthesis and Testing
8.VLSI Physical Design Automation
9.Digital Watermarking

10.VLSI architectures
11.System on chip architectures
12.Network on Chip
13.3D IC and 3D Biochips

Academic and Research Infrastructure

In the School of VLSI Technology, We have following latest VLSI tools and hardware in our VLSI and Embedded systems Laboratories. The UG/PG/Doctoral students from Information Technology/Computer Science/Electronic Engg./Electrical Engg. are getting exposure with these industry standard tools and equipment.

EDA Tools:

- ❑Mentor Graphics
- ❑Synopsys
- ❑Cadence
- ❑Xilinx ISE (FPGA Applications)
- ❑Vivado Design Suite
- ❑Matlab
- ❑Synopsys TCAD
- ❑Comsol Multiphysics
- ❑Quantumwise ATK (DFT+SE , VNL GUI)
- ❑NI LabVIEW

FPGA Board

- ❑FPGA Spartan 3E Kits
- ❑XUP Virtex-II Pro Board
- ❑Virtex 6 Pro Board
- ❑Video Decoder Board
- ❑Other Accessories

Name of the laboratories

1.	Ganapati Sengupta VLSI Laboratory (Research Lab)
2.	SMDP-II Laboratory
3.	Advanced FPGA Lab.
4.	Advanced VLSI Design Lab.
5.	Chip to System Design (C2SD) Lab.
6.	Advanced Semiconductors and Computational Nanoelectronics Lab

Support staff position:

Technical post

Name	Designation	Highest Qualification	Contact No.	E-mail
Mr. Goutam Paul	Technical Assistant	B-Tech (E.C.E.)	9874405431	goutam@vlsi.iiests.ac.in
Mr. Subhajit Das	Laboratory Engineer (SMDP-C2SD)	M.Tech (E.C.E.-Embedded Systems)	9800245339	subhajit.das.rs2014@vlsi.iiests.ac.in
Ms. Samhita Dasgupta	Research Assistant (SMDP-C2SD)	M.Tech (E.E.-C.I.)	9547347749	samhita.dasgupta98@gmail.com

Ongoing Sponsored Research / projects : (mention area)

Project Title	Sponsoring agency	Duration
Modernization of VLSI Design Laboratory (Rs.17.80 lac.)	AICTE, INDIA	2013-2016
Synthesis of Reversible Circuits using Probabilistic Methods and Functional Transformations (Rs.10 lac)	DST India and DAAD Foundation, Germany	2013-2015 (September 2016)
Design and ASIC implementation of (i) Data Converter and (ii) Embedded DSP Architecture for Seismic Sensors (To be embedded with Versatile Data Acquisition and Signal Processing Platform with Emphasis on Seismic Sensors based Application)	Deity, MCIT, Government of India	Starting February 2015.
ASIC Implementation of Power Aware Reconfigurable Analog to Digital Converter (PARA)	Deity, MCIT, Government of India	Starting February 2016

Details of publications of each faculty members (2015 – 16)

Journal = 12
Conference = 21
Books / Monograms = 1

Book:

A. Sengupta and C.K. Sarkar (Eds.), "Introduction to Nano: Basics to Nanoscience and Nanotechnology", Springer Verlag (Germany), 2015. (ISBN: 978-3-662-47313-9)

Journals

1.Soumyajit Poddar, Prasun Ghosal, and Hafizur Rahaman, "Design of a High Performance CDMA Based Broadcast Free Photonic Multi Core Network on Chip",*ACM Transactions on Embedded Computing Systems*, vol. 15, Issue 1, January 2016, Article No.(2), DOI:-10.1145/2839301.

2.Debaprasad Das and Hafizur Rahaman, "Investigating the Applicability of GrapheneNanoribbon asSignal and Power Interconnects for Nanometer Designs", ***Journal of Circuits, Systems, and Computers(JCSC),*** World Scientific, Vol. 25, No. 2 (2016), pp-1-14, DOI: 10.1142/S02181266165000.

3.Sudip Ghosh, Arijit Biswas, Santi Prasad Maity and HafizurRahaman,"FPGA and SoC Based Implementation of DFWHT Domain Image Watermarking Architecture for Real-Time Applications", ***Journal of Low Power Electronics (JOLPE),*** American Scientific Publishers, Vol. 11 No. 3, pp.375-386.

4.Partha Sarathi Gupta, Sanatan Chattopadhyay, Partha Sarathi Dasgupta and Hafizur Rahaman,"A Novel Photo-sensitive Tunneling Transistor For Near-Infrared Sensing Applications: Design, Modeling and Simulation", ***IEEE Transactions on Electron Devices****, (TED 2015),* DOI: 10.1109/TED.2015.2414172.

5.Kamalika Datta, Indranil Sengupta, and Hafizur Rahaman,"A Post-Synthesis Optimization Technique forReversible Circuits Exploiting Negative Control Lines", ***IEEE Transactions on Computers*** **2015**, vol. 64(4), pp.1208-1214, DOI: 10.1109/TC.2014.2315641.

6.Sayan Kanungo, Sanatan Chattopadhyay, Partha Sarathi Gupta and Hafizur Rahaman, "Comparative Performance Analysis of the Dielectrically Modulated Full Gate and Short Gate Tunnel FET based Bio-Sensors", *IEEE Transactions on Electron Devices, (TED 2015),* Vol.62, Issue 3, DOI:10.1109/TED.2015.2390774.

7.Debasis Mitra, Sarmishtha Ghoshal, Hafizur Rahaman, Krishnendu Chakrabarty, and Bhargab B. Bhattacharya,"Automated Washing Schemes for Residue Removal in Digital Microfluidic Biochips to Enhance Reliability, ACM Transactions *on Design Automation of Electronic Systems, 2015.*

8.Indranil Hatai, Indrajit Chakrabarti, Swapna Banerjee, "An efficient constant multiplier architecture based on vertical-horizontal binary common subexpression elimination algorithm for reconfigurable FIR filter synthesis", IEEE Transactions on Circuits and Systems-I: Regular Papers, vol.62, no.4, pp.1071-1080, April 2015, doi: 10.1109/TCSI.2015.2388838 (Impact Factor : 2.403)

9.Indranil Hatai, Indrajit Chakrabarti, Swapna Banerjee, "An Efficient VLSI Architecture of a Reconfigurable Pulse-Shaping FIR Interpolation Filter for Multi-Standard DUC", IEEE Transactions on Very Large Scale Integration (VLSI) Systems, vol.23, no.6, pp.1150-1154, June 2015 doi: 10.1109/TVLSI.2014.2321171 (Impact Factor : 1.356).

10.**A. Sengupta**, M. Audiffred, T. Heine, T.A. Niehaus, 'Stacking dependence of carrier transport properties in multilayered black phosphorous', **Journal of Physics: Condensed Matter,** vol. 28, pp. 075001 (1-10) (**2016**). [Impact Factor : 2.346 Citations: 0]

11.Bikash Sharma, Arnab Mukhopadhyay, **Amretashis Sengupta**, Hafizur Rahaman, C. K. Sarkar, 'Analysis of tunneling currents in Multilayer Black Phosphorous and MoS_2 non-volatile flash memory cells', **Journal of Computational Electronics,** Vol. 15, Issue 1, pp. 129-137 **(2016**). [Impact Factor : 1.520 Citations: 0]

12.A. Mukhopadhyay, L. Banerjee, **A. Sengupta**, H. Rahaman 'Effect of Stacking Order on Device Performance of Bilayer Black Phosphorene-FET' **Journal of Applied Physics,** vol. 118, pp. 224501 (1-5) (**2015**)**. [**Impact Factor : 2.276 Citations: 0]

International Conference Papers

1.Laxmidhar Biswal, Chandan Bandyopadhyay, Robert Wille, Rolf Drechsler, Hafizur Rahaman, "Improving the Realization of Multiple-Control Toffoli Gates Using the NCVW Quantum Gate Library", *29th IEEE/ACM International Conference on VLSI Design (VLSI Design 2016),* pp.573-574.

2.Malay Kule, Hafizur Rahaman and Bhargab B. Bhattacharya, "On Finding a Defect-Free Component in Nanoscale Crossbar Circuits", *4th ICECCS 2015 (Elsevier Procedia Computer Science 70 (2015) 421 – 427), pp.421-427.*

3.Anindita Chakraborty and Hafizur Rahaman, "Reconfigurable Crossbar Architectures for Memristor based Digital Gates", 6th IEEE International Conference on Computers and Devices for Communication (CODEC) 2015, December 16-18, pp.1

4.A. Chanana, **A. Sengupta**, S. Mahapatra, "Analysis of vacancy defects in hybrid graphene-boron nitride armchair nanoribbon based n-MOSFET at ballistic limit", 2015 International Workshop on Computational Electronics (IWCE), Purdue University, West Lafayette, IN, USA, Sep 2, 2015.

5. Arnab Mukhopadhyay, Lopamudra Banerjee, **Amretashis Sengupta**, Hafizur Rahaman, Strain Modulated Variations in Monolayer Phosphorene n-MOSFET', 2015 IEEE Conference on Electron Devices and Solid State Circuits (IEEE EDSSC - 2015) Singapore, June 1-4, 2015.

6.Sudipta Bardhan , Manodipan Sahoo and Hafizur Rahaman , Analytical Drain Current Model for Graphene Metal-Oxide semiconductor Field-Effect Transistor", *IEEE 2nd International Conference on Electrical Information and Communication Technologies (EICT)* 2015.

7.Manodipan Sahoo and Hafizur Rahaman, "Modeling of Crosstalk Induced Overshoot/Undershoot Effects in Multilayer Graphene Nanoribbon Interconnects", *IEEE 2nd International Conference on Electrical Information and Communication Technologies (EICT)* 2015.

8.Sabir Ali Mondal, Suraj Gupta and Hafizur Rahaman,"Improved supply regulation and temperature compensated current reference circuit with low process variations", 19th International Symposium on VLSI Design and Test (VDAT), 2015, DOI: 10.1109/ISVDAT.2015.7208049.

9.Pranab Roy, Mriganka Chakrabarty, Aatreyi Bal, Hafizur Rahaman, Parthasarathi Dasgupta, "Decision-based Biochips: A Novel Design for Concurrent Executionof Networked Bioassays integrated in Scalable DMFBs", 6th IEEE Asia Symposium on Quality Electronic Design (ASQED) 2015, pp.138-143

10.T Kaibartta, C Giri, H Rahaman, DK Das, "Optimizing test time for core-based 3-D integrated circuits by genetic algorithm", 6th IEEE Asia Symposium on Quality Electronic Design (ASQED) 2015,pp. 62-67

11.S Ghosh, N Das, S Das, SP Maity, H Rahaman, "An adaptive feedback based reversible watermarking algorithm using difference expansion", *IEEE 2nd International Conference on Recent Trends in Information Systems (ReTIS)* 2015.

12.Rupam Bhattacharya, Hafizur Rahaman, Pranab Roy, "A new heterogeneous droplet routing technique and its simulator to improve route performance in Digital Microfluidic Biochips", IEEE International conference on Microelectronics, Computing and Communication (Microcom), 2016, pp. 1-6.

13.Pranab Roy, Khokan Mondal, Mayuri Kundu, Hafizur Rahaman, "A New Sample Preparation Technique for Linear Dilution Gradient with Minimal Sample Utilization and Waste Generation in DMFBs", 2nd IEEE conference on Electrical Information and Communication Technology , 2015, Khulna, Bangladesh.pp. 205-210

14.Pranab Roy, Mriganka Chakrabarty, Aatreyi Bal, Hafizur Rahaman, Parthasarathi Dasgupta, "Decision-based Biochips: A Novel Design for Concurrent Executionof Networked Bioassays integrated in Scalable DMFBs" – Proc, of 6th IEEE ASQED, 2015, Kualalampur, Malaysia .pp 138-143.

15.Pranab Roy, Mriganka Chakrabarty, Aatreyi Bal, Hafizur Rahaman, Parthasarathi Dasgupta, "Decision-based Biochips: A Novel Design for Concurrent Executionof Networked Bioassays integrated in Scalable DMFBs", *6th IEEE ASQED ,2015,*Kualalampur,Malaysia.

16.Sudip Ghosh, Nachiketa Das, Subhajit Das, Santi P Maity and Hafizur Rahaman " An Adaptive Feedback based Reversible Watermarking Algorithm using Difference Expansion" in IEEE 2nd International Conference on Recent Trends in Information Systems (RETIS 2015), 9-11 July 2015, India.pp. 207-212.

17.Sudip Ghosh, Sayandip De, Santi Prasad Maity and Hafizur Rahaman "A Novel Dual Purpose Spatial Domain Algorithm for Digital Image Watermarking and Cryptography Using Extended Hamming Code", 2nd IEEE International Conference on Electrical Information and Communication Technologies (EICT-2015), 10-12 December 2015, pp. 167-172.

18.Sudip Ghosh, Sambaran Hazra, Santi P Maity and Hafizur Rahaman "A New Algorithm for Grayscale Image Histogram Computation", *12th IEEE India International Conference (INDICON) 2015*, 17-20 December 2015, India. pp. 1-6.

19.Subhajit Das, Debaprasad Das**,** Hafizur Rahaman, "Design of 9-Transistor Content Addressable Memory Cells using Schottky-barrier Carbon Nanotube Field Effect Transistors", International Conference on Microelectronics, Computing and Communication (MicroCom 2016), January 23-25, 2016, India.

20.Manas Parai, Kasturi Ghosh and Hafizur Rahaman, "Fault detection of continuous time filter using non-linear based OBIST", CODEC, December 16-18, 2015.

21.Aritra Chatterjee, Kasturi Ghosh and Hafizur Rahaman, "Parametric fault detection from time domain analysis of linear analog circuits," Third International Conference on Electronics and Communication Systems, Feb. 25-26, 2016, Coimbatore, India.

WORKSHOPS /SEMINARS / SYMPOSIUMS / CONFERENCES / SHORT-TERM COURSES ATTENDED in 2015 – 16

Sudip Ghosh			
SL. No.	Topic	Held at	Duration
1	A New Algorithm for Grayscale Image Histogram Computation" in 12th IEEE India International Conference (INDICON)	Jamia Millia Islamia, New Delhi, India	17-20th December, 2015
2	A Novel Dual Purpose Spatial Domain Algorithm for Digital Image Watermarking and Cryptography Using Extended Hamming Code" in 2nd IEEE International Conference on Electrical Information and Communication Technologies (EICT-2015)	Khulna University of Engineering and Technology (KUET), Khulna, Bangladesh	10-12th December, 2015
3	An Adaptive Feedback based Reversible Watermarking Algorithm using Difference Expansion" in IEEE 2nd International Conference on Recent Trends in Information Systems (RETIS 2015)	Jadavpur University, Kolkata	9-11th July, 2015
Amretashis Sengupta			
1.	CEFIPRA Indo-French Workshop on Emerging Trends in Electron Device Modeling	IISc, Bangalore	30th March -1st April, 2015
Partha Sarathi Gupta			
1	CODEC	Swiss Hotel, Kolkata	16th -18th December, 2015
Indranil Hatai			
SL. No.	**TOPIC**	**HELD AT**	**DURATION**
1.	Short term course on High power CMOS modeling	NIT Durgapur	10th March, 2016
2	IEP on System Level Design on Platform FPGAs	IIT Delhi	7th -9th December, 2015
3	Delivered invited talk on VLSI design	B.C. Roy Engineering College, Durgapur	October, 2015

Patents / Invention Disclosure / Technology Transfer / Copyright

- Budhaditya Majumdar, Sudipta Chakraborty, and Hafizur Rahaman, "A Novel Reusable Sub Volt Differential Amplifier Module for Use as a Preamplifier Output Stage", Indian Patent, No. 169/KOL/2013A (Filed on 13-02-2013, Issued on 25-09-2015)

Modernization of Academic, Laboratory :

- Modernization of EDA and TCAD Laboratories under AICTE MODROBS grant
- Chip-to-System (C2SD) Laboratory under India Chip Programme, Diety, MCIT, India

Foreign visits and Invited Lectures

- Prof. Hafizur Rahaman has been invited to visit System Design/Wireless Broadband Communication Systems Laboratory, (Dr.-Ing. Zoran Stamenkovic, Scientist), IHP on 4th June 2015 and has delivered Lecture on Testing and Design-for-Testability for VLSI Circuits" on 4th June 2015at 14:00.

- Prof. Hafizur Rahaman has delivered lecture on "Issues on Design and Synthesis of Reversible Quantum Circuit" in Department of Computer Science, University of Bremen, Germany on 11th June 2105during my visit under DST-DAAD invitation (31st May-13th June 2015)

Visitors to your Department (Indian & Foreign)

The University has been privileged to receive a good number of important visitors both from India and abroad. Following illustrious visitors have visited the School of VLSI Technology.

1. Dr.Sanjit K. Mitra, Research Professor of Electrical & Computer Engineering University of California, Santa Barbara, CA, USA visited School of VLSI Technology on 15/12/2015 and delivered a lecture on "The Digital All Pass Filter: A Versatile Signal Processing Building Block".
2. Prof. Pramod K Meher, School of Computer Science and Engineering, Nanyang Technological University, visited Department of Information Technology on 11/07/2015 and delivered talk on "Efficient Pipelining of Digital Circuits".
3. Prof. Prabhat Mishra, Director Embedded Systems Lab., Department of Computer and Information Science and Engineering,University of Florida, Florida, USA, visited School of VLSI Technology on 12/08/2015 and delivered a lecture on "Design Automation of Embedded Systems".
4. Prof. Rolf Drechsler, IEEE Fellow, University of Bremen, Germany delivered lecture on "Hardware-Software Co-Visualization - Developing Systems in the Holo deck", on 14/08/2015.

New Academic / Research Initiatives

a) Academic Collaboration: We have already research collaboration with following University/Institutes…

1.Department Computer Science and Engineering, Duke University, Durham, USA (Research Professor)
2.Department Computer Science, University of Bristol, UK (Royal Society Programme)
3.Department of Computer Science, University of Bremen, German (DST-DAAD Programme)
4.ACM Unit, Indian statistical Institute, Kolkata, India (DST Programme)
5.Department of Computer Science and Engineering, IIT Karagpur, India (India Chip Programme, PhD Collaboration)
6.Department of Electronics and Communication Engg., IIT Karagpur, India (India Chip Programme)
7.Department of Electronics and Communication Engg., IISC., Bangalore, India (India Chip Programme)
8.Institute of Radio Physics, Calcutta University, Kolkata, India (Research Collaboration, Clean Room Facility)
9.Department of Electronics Science, Calcutta University, Kolkata, India (Research Collaboration, Clean Room Facility)
10. Department of Electronics and Communication Engg., National Institute of Technology Durgapur, India (India Chip Programme, Research Collaboration)
11.Department of Electronics and Tele-communication Engg., Jadavpur University, Kolkata (India Chip Programme, Research Collaboration)
12.Calcutta University, Kolkata (India Chip Programme, Research Collaboration)

b) Research Initiatives: Initiative has been started to establish "Centre of Excellence for Microfluidics and Nanobiosensor Based Applications" in collaboration with IIT Kharagpur and ISI Calcutta under DIT, Nanotechnology Initiative Mission

Centre of Excellence for Green Energy and Sensor Systems

About the department/ centre

Worldwide efforts are going on for switching over to sustainable alternative/ renewable energy sources (non-polluting, non-fossil-fuel, environmentally friendly sources now known as **Green energy** sources). For these purposes, the Institute on its own has set up a Centre of Excellence entitled "Centre of Excellence for Green energy and Sensor Systems (CEGESS)" in November, 2009. The center envisages to provide the required environment and facilities for the scientists, engineers and technicians to work in critical R&D areas.

Research & Development:

i. Establishment of state of the art fabrication and characterization facility of crystalline silicon solar cells.
ii. Establishment of state of the art fabrication and characterization facility of amorphous silicon solar cells.
iii. Efficiency enhancement of c- Si, a- Si and other thin film solar cells.
iv. New generation Solar cells and systems with novel nano- materials and green methods.
v. New methodologies of solar energy storage (including super capacitors).
vi. Advanced solar photovoltaic systems for lighting and power plant applications.
vii. Smart Micro Grid System in the IIEST Campus
viii. Sensors (including bio-sensors, gas sensors, MEMS) based on novel materials (including quantum dots).
ix. Sensor systems and techniques for agricultural, environmental, automobile and healthcare applications.

Academic Programmes:

Undergraduate Level

Degree offered:X

Sanctioned students' intake:X

Additional intake through lateral entry in 3rd Semester:X

Post Graduate Level

Degree offered: **M. Tech**

Sanctioned students' intake: **15 Nos**

Additional intake through other programmes (i.e. QIP):X

Specializations in **Renewable Energy Science and Technology**

Doctoral & Post-Doctoral Research Programme

Doctoral Research Program:

Degree offered: PhD (Engineering)

Registered Students

1. Arijit Bardhan Roy
2. Suchismita Mitra
3. Sukanta Bose
4. Ankur Bhattacharjee
5. Jayashree Roy Sharma
6. Soma Ray
7. Kaustav Dasgupta
8. Hemanta Ghosh
9. Deepanjana Adak
10. Susmita Biswas
11. Arindam Basak

Awarded Students (thesis defense end of Aug, 2016)

1. Kalyan Kumar Mistry

Faculty Position:

Faculty profile (in the following table)

Name	**Designation**	**Highest Qualification**	**Specialisation / Research Area**	**Contact No. E - mail**
Prof. Anup Mondal	Professor and Head & Professor (Department of Chemistry)	Ph. D	Photovoltaics, Nanomaterials, Sensors	hod@cegess.iiests.ac.in
Prof. A.K.Barua	Visiting Faculty	Ph.D, D.Sc	Photovoltaics	baruaasok@gmail.com
Prof. R. Bhattacharya	Visiting Faculty	Ph.D	Photovoltaics and Sensors	raghubhatin@yahoo.com
Prof. H. Saha	Visiting Faculty	Ph.D	Photovoltaics and Sensors	sahahiran@gmail.com
Prof. S.P. Gon Chaudhuri	Visiting Faculty	Ph.D D. Sc	Green Energy and Technology	nbirt2008@yahoo.com
Prof. Bibek Bandyopadhyay	Visiting Faculty	Ph.D	Photovoltaics and Solar Thermal	bbibek@nic.in
Prof. Partha Chaudhury	Visiting Faculty	Ph.D	Photovoltaics	partha.iacs@gmail.com
Dr. Sumita Mukhopadhyay	Assistant Professor (on contract)	Ph.D	Photovoltaics	mukhopadhyay_sumita@yahoo.co.in
Dr. Nillohit Mukherjee	Assistant Professor (on contract)	Ph.D	Nanomaterials and sensors	nilsci@yahoo.co.uk
Dr. Avra Kundu	Assistant Professor (on contract)	Ph.D	Photovoltaic,Sensors and MEMS	avra@cegess.iiests.ac.in
Dr. Snehanshu Patra	Inspire Faculty	Ph.D	Electrochemistry and Energy storage systems	patras218@gmail.com

Note: Prof. Swapan Kumar Datta breathed his last in the session 2015-16.

Dr. Chandan Banerjee (National Fellow and Faculty Research) left IIEST, Shibpur to pursue his career elsewhere.

Awards and Laurels received by the faculty members: -

Prof. Asok K. Barua

- Invited speaker (expert) at the Brainstorming Session to Identify Thrust Areas in R and D on Renewable Ener4gy sources Convened by MNRE in January, 2016.
- Acted as Chairman of the Standing Committee of DST for Indo-UK Joint Venture on Virtual Research Centre.
- Acted as a Member of the National Advisory Committee of National Centre for Photovoltaic Research and education. IIT, Bombay.

Dr. Bibek Bandopadhyay

- Associate Editor: Renewable and Sustainable Energy Reviews, Elsevier

Prof. Hiranmay Saha

- Member RAC, NTPC-NETRA, Expert Member PAC DST-CERI.

Dr. S. P. Gon Chaudhuri

- Research Project funded by DST, Govt of India. The title of the Project is "Development of PV Integrated Micro Solar Dome".

Dr. Nillohit Mukherjee

- Life Membership, Materials Research Society of India

Dr. Snehanshu Patra

- DST Inspire Faculty Award, 2015

Research area:

Overall:

(a) Photovoltaic

1.Fabrication of crystalline silicon solar cells
2.Fabrication of amorphous silicon solar cells
3.Efficiency enhancement of c- Si, a- Si and other thin film solar cells.
4.New generation Solar cells and systems with novel nano- materials and green methods.
5.New methodologies of solar energy storage (including super capacitors).
6.Advanced solar photovoltaic systems for lighting and power plant applications.
7.Development of Smart Microgrid System in IIEST campus

(b) Sensors

1.Sensors (including bio-sensors, gas sensors) based on novel materials (including quantum dots) and techniques for agricultural, environmental, automobile and healthcare applications. Sensor systems.

Faculty wise:

Prof. A. K. Barua

- Silicon thin film solar cell including development of materials and device fabrication for amorphous, microcrystalline, micromorph solar cell, light trapping, development of advanced transparent conducting oxides and 3D solar cells

Dr. R. Bhattacharyya

- Photovoltaics, photonics, MEMS and Sensors

Bibek Bandyopadhyay

- Solar roof top PV- technology, policy, regulations and financing.

Prof. H. Saha

- Solar Cells and PV Systems, Sensors and Systems

Prof. Partha Chaudhury

- Amorphous silicon and microcrystalline silicon based solar cells, amorphous silicon carbide thin films, silicon nanocrystals and silicon quantum dots and their device applications, enhancement of light absorption in thin silicon films by plasmonic or photonic route, nanopatterning by nano imprint lithography

Dr. Sumita Mukhopadhyay

- Silicon thin film solar cell including development of materials and device fabrication for amorphous, microcrystalline, micromorph solar cell, light trapping, development of advanced transparent conducting oxides and 3D solar cells

Dr. Nillohit Mukherjee

- Fabrication of wide and narrow band gap thin film semiconductors, nanomaterials and modified metal oxide semiconductors for their applications in sensor technology, heterogeneous catalysis and third generation solar cells.

Dr. Avra Kundu

- Nanofabrication technologies including nanosphere lithography and nanoimprint lithography, Microelectronics technology, Solar cells (thin c- Si/ HIT), MEMS, Sensor technology development.

Dr. Snehanshu Patra

- Design of multifunctional materials for the application in Energy storage, conversion and bioelectrochemical systems**.**

Research facilities: (name specific equipment / picture, infrastructure etc)

For Pictures please see Annexure I

Name of the equipment:

Wet Texturization Bench
Oxidation/ Diffusion Furnace
PECVD Cluster Tool (CT-100 /CT150)
Screen Printing machine (2)
Drying (2) and Firing (1) Belt furnaces
E- Beam/ Thermal evaporation apparatus
RF Sputtering unit (MM196/MM203)
Reactive Ion Etching Unit
Laser Scriber
Spin coating unit
Photo-lithography with SCIL
Planetary Ball Mill
Solar Simulator and Spectral Response setup
Large area solar simulator with IV measurement
Four probe resistivity apparatus
Scanning probe microscope
FESEM
Thickness profilometer
Optical microscope with image analyzer
Micro PCD
FTIR
UV-Vis Spectrophotometer
30 kW Solar Array Simulator
30 kW Grid Simulator
Agilent source meters
Data acquisition system
Grid Tied Inverters
Advanced Computational workstations (15 nos.)

Infrastructure:

- 1500 sq. ft. of class 10000 clean room for solar cell (both c-Si and a-Si) processing.
- 1500 sq. ft. of semi- clean room for wet chemical processes, contact printing and belt furnaces.
- 1500 sq. ft. of semi- clean room for housing sophisticated characterization facilities.
- 1500 sq. ft. sitting space for of faculty and research staff.
- 1000 sq. ft. for M. Tech Classes and Laboratory.
- Air Handling Unit (AHU) for the Clean Room and Gas cylinder Shed for housing specialty gases.

Name of the laboratories:

Solar photovoltaic fabrication laboratory
Advanced Characterization laboratory
Sensors design and development laboratory
Solar Photovoltaic Systems Laboratory
Advanced Computational laboratory
Renewable Energy Laboratory including Solar Cells, Wind, Solar Thermal etc.

Support staff position:

Name	Designation	Highest Qualification	Contact No.	E- mail
Sri Animesh Roy	Senior Project Assistant	L.E.E	9836610595	royanimesh53@yahoo.in
Sri Sarat Singha	Technical Assistant	B.Sc (pure Sc.)	9231544357	singha_sarat@rediffmail.com
Ms. Debashree Sardar	Project Assistant	Dip CST	9748510108	debashreesardar2008@gmail.com
Mr. Sushanta Nayak	Technical Assistant	H.S	9088342594	sushantanayak9@gmail.com
Mr. Sandip Dutta	Technical Assistant	B.Com (Hons)	929394853	sandip86@gmail.com
Sri Rittwik Majumdar	Project Assistant	M.Sc	9836424729	rittwik1@gmail.com
Sri Amit Kumar Maji	Technical Assistant	B.A	9609825974	amitcegess@gmail.com
Sri Sandipan Paul	Project Assistant	B. Tech	9088822436	ssandy.paul@gmail.com
Sri Biplab Saha	Technical Assistant	Diploma engineer	8296200430	bsaha.elc@gmail.com

Ongoing Sponsored Research / projects: (mention area)

The centre has already been awarded a number of research projects in the field of solar energy and sensors by different funding agencies of the Govt. of India:

Research Projects	Funding Agency	Sanctioned Amount	Status	Area
Solar Photovoltaic Hub at BESU	DST	12.46 Crores	Ongoing	Solar Cells and related next generation technologies
Advanced Research on thin Film Silicon Solar Cells and PV systems	MNRE	14.76 Crores	Ongoing	Solar Cells, Solar Photovoltaic Systems, Energy Storage and related next generation technologies
Smart Micro-Grid at IIEST	WBREDA	55 lakhs	Ongoing	Solar Photovolatic systems
Development of Multilayer TCO for High Efficiency Thin Film Solar Cell	DST	22.928 lakhs	Ongoing	Solar Cells and related next generation technologies
Realization of high efficiency Inter-digitated Back-Contact (IBC) Silicon HeteroJunction (SHJ) solar cells with novel front structure	DST	70.0 lakhs	Ongoing	Solar Cells and related next generation technologies
High Efficiency Triple Tandem and Heterojunction Silicon based Solar Cell Acronym: HETHSI	MNRE	96.0 Lakhs	Ongoing	Solar Cells and related next generation technologies

Industry – Institute Interaction

(a) Sova Power Limited , Durgapur

(b) Agni Power Pvt Limited, Kolkata

(c) Synchro Electronics , kolkata

(d) Oztron Energy Systems, Australia

(e) Hind Hi Vac Ltd, Bangalore

Details of publications of each faculty member (2015 – 16)

Journal: **27**

Conference:**34**

Books / Monograms:**01**

(List included)

Patents/ Invention Disclosure/ Technology Transfer/ Copyright:

Seminar / Workshops / Conferences / Training programme organized by the department (2015 - 16)

Sl. No.	**Name**	Funding	**Date**	**Type**
1.	IIESTPV 2015	DST & MNRE	20-21st January 2015	Conference
2.	Renewable Energy Education in India	University	22nd January 2016	Workshop
3.	R & D pathways for Achieving 100 GW Solar in India	Vikram Solar & HITK	20th February 2016	Workshop
4.	"Leap years, leap centuries and leap seconds : Less Known yet interesting aspects"	INSA	August 17, 2016	Seminar

Technology Developed / Innovations

1.Dr. Avra Kundu and team developed a working ultra-thin flexible monocrystalline silicon solar cell with a thickness of ~10µm. The champion cell has an efficiency of 5% and the solar cell has been fabricated by a patent-pending process which involves the unification of the mature solar cell technology, microelectronics technology and emerging nanotechnology.

The innovative tapered High Aspect Ratio Pillars (t-HARP) of silicon allows for wide angle light collection as well as orthogonal charged carrier collection allowing for unified photon-electron harvesting critical for achieving high efficiencies for flexible solar cells which may be mounted on any bendable surface.

Foreign visits and Invited Lectures

Prof. A. K .Barua

1. Visit as Organizer: 25th International Photovoltaic Science and Engineering Conference (PVSEC-25), 15th to 20th Nov 2015, Busan, Korea.

Dr. Raghu Bhattacharyya

1. Invited talk: Symposium on "Thin Films, Surface Engineering & Vacuum Technology" 2016, BML Munjal University, Gurgaon-122413, Haryana.
2. Plenary Talk: National Conference on Renewable Energy (NCRE-2016) ,July 27-28, 2016 ,Heritage Institute of Technology, Kolkata

Prof. Bibek Bandyopadhyay

1.Delivered the 'Institute Lecture' of Birbal Sahni Institute of Palaeobotany, Lucknow. Lecture title: The new energy paradigm (13th May, 2015)

2.Presentation on 'Development status and outlook of Solar PV in India' in 2015 PV Summit held in Beijing, China on 12-13th October, 2015.

3.Lecture on 'Recent developments and challenges of solar resource assessment for concentrated solar thermal power applications' in National Conference on Solar Thermal Energy Technologies held in Indian Institute of Technology, Jodhpur (26-28th February, 2016).

4.Inaugural address in National Conference on Solar Photovoltaic and Thermal Energy- State of Art Technology for Rural Development held at National College of Engineering, Kovilpatti, Tamil Nadu (11th March, 2016).

Prof. S. P. Gon Chaudhuri

1. A lecture on Lakshadweep Island Electrification at Australia. The meeting was arranged by an Australian Solar Thermal Storage Company.

Prof. Hiranmay Saha

1.Invited Lecture on Role of Solar Energy: Indian Perspective**,** Seminar on Energy and Environment Challenges: Indian Perspective, GABESU, IIEST, 22 August, 2015

2.Materials for Energy and Sensors: "Recent Trends in Chemical Sciences" (A Symposium in Commemoration of the 154th Birth Anniversary of Acharya Prafulla Chandra Ray) 5th August, 2015.

3.Advanced Research on Thin Silicon Solar Cells and Systems: MNRE R&D Conclave, 5th August, 2014 New Delhi.

Dr. Snehanshu Patra

1. Postdoctoral research associate, University of Evry, Evry, France

Visitors to your Department (Indian & Foreign)

1. Dr. Subhendu Guha (Former Chairman, United Solar Ovonic)
2. Prof. Vikram Kumar (Professor, IIT-D)
3. Prof. E S Raja Gopal and many others

Training and Placement:

PG Student placement (total students: 14):

1.Researcher at IIT-KGP.(1)
2.Researcher at IIT-Delhi.(1)
3.Researcher at IIEST-Shibpur.(3)
4.Project Engineer Agni Power and Electronics Pvt. Ltd.(1)
5.Business Executive at Bhaskar Solar.(1)
6.Junior Engineer at Eastern Railway(1)
7.Software Engineer at Infosys(1)

Doctoral Student placement:

The person to be awarded degree in 2015-16 was already employed.

Extension Activities and Societal outreach

A video highlighting the Centre has been done.

https://www.youtube.com/watch?v=KkDV0JkWP9Y

New Academic / Research Initiatives

Academic Collaboration	**Industrial Collaboration**
1)SSN Institute, Chennai	1)Sova Power Limited , Durgapur
2)IIT, KGP	2)Agni Power Pvt limited, Kolkata
3)KIIT, Bhubaneswar	3)Synchro Electronics , kolkata
4)IIIT, Ahmedabad	4)Oztron Energy Systems, Australia
5)IACS, Kolkata	5)Hind Hi Vac Ltd, Bangalore
6)Jadavpur University	
7)MSIT College	
8)ISM, Dhanbad	

Publications

International Journal

1. E. Kar, N. Bose, S. Das, N. Mukherjee, S. Mukherjee, "Enhancement of electroactive β phase crystallization and dielectric constant of PVDF by incorporating GeO2 and SiO2 nanoparticles" Phys. Chem. Chem. Phys. 2015, 17, 22784-22798.
2. S. Ghosh, R. Bhattacharya, H. Saha, C. RoyChaudhuri, N. Mukherjee, "Functionalized ZnO/ZnO2 n-N straddling heterostructure achieved by oxygen plasma bombardment for highly selective methane sensing" Phys. Chem. Chem. Phys. 2015, 17, 27777-27788.
3. H. Saha, B. Mondal, J. Das, C. Roychaudhuri, N. Mukherjee, "Enhanced sensing properties of ZnO-SnO2 based composite type gas sensor" Eur. Phys. J. Appl. Phys. 2015, 73, 10301.
4. S. Chabri, A. Dhara, B. Show, D. Adak, A. Sinha, N. Mukherjee, "Mesoporous CuO–ZnO p–n heterojunction based nanocomposites with high specific surface area for enhanced photocatalysis and electrochemical sensing" Catalysis Science & Technology, 2016, 6, 3238-3252.
5. A. Dhara, A. Baral, S. Chabri, A. Sinha, N. R. Bandyopadhyay, N. Mukherjee, "An Efficient Approach Towards the Photodegradation of Indigo Carmine by Introducing ZnO/CuO/Si Ternary Nanocomposite as Photocatalyst" J. Inst. Eng. India Ser. D. 2016.
6. E. Kar, N. Bose, S. Das, N. Mukherjee, S. Mukherjee, "Temperature dependent dielectric properties of self- standing and flexible poly (vinylidene fluoride) films infused with Er3+ doped GeO2 and SiO2 nanoparticles" J. Appl. Polym. Sci. 2016, 133, 44016.
7. A. Dhara, B. Show, A. Baral, S. Chabri, A. Sinha, N. R. Bandyopadhyay, N. Mukherjee, "Core-shell CuO-ZnO p-n heterojunction with high specific surface area for enhanced photoelectrochemical (PEC) energy conversion" Sol. Energy. 2016, 136, 327-332.
8. B. Show, N. Mukherjee, A. Mondal, "α-Fe2O3nanospheres: facile synthesis and highly efficient photo-degradation of organic dyes and surface activation by nano-Pt for enhanced methanol sensing" RSC Adv. 2016, 6, 75347-75358.
9. S. Banerjee, B. Show, A. Kundu, J. Ganguly, U. Gangopadhyay, H. Saha, N. Mukherjee, "N-acetyle cysteine assisted synthesis of core–shell Ag2S with enhanced light transmission and diminished reflectance: Surface modifier for c-SiNx solar cells" J. Ind. Eng. Chem. 2016, 40, 54-61.
10. A. B. Roy, A. Dhar, M. Choudhuri, S. Das, S. M. Hossain, A. Kundu, "Black Silicon solar cell: Analysis optimization and evolution towards a thinner and flexible future," Nanotechnology, 2016, 27, 305302.
11. A. Kundu, S. Das, H. Saha, and S. K. Datta, "Wide angle light collection with ultralow reflection and super scattering by silicon micro-nanostructures for thin crystalline silicon solar cell applications," Journal of Optics, 2015, 18, 015903.
12. B. Mondal, S. Maity, S. Das, D. Panda, H. Saha, A. Kundu, "Fabrication and packaging of MEMS based platform for hydrogen sensor using ZnO – SnO2 composites", Microsystem Technologies, 2015, 21, 1-8.

13. S. Das, A. Kundu, H. Saha, S. K. Datta, “Investigating the potential of nanoplasmonics for efficiency enhancement of wafer based crystalline silicon solar cells,” Plasmonics, 2015, 10, 1895–1907.
14. S. Mandal, S. Dhar, G. Das, S. Mukhopadhyay, and A. K. Barua, “Development of optimized n-μc-Si:H/n-a-Si:H bilayer and its application for improving the performance of single junction a-Si solar cells,” Sol. Energy, 2016, 124, 278–286.
15. S. Mandal, G. Das, S. Dhar, R. M. Tomy, S. Mukhopadhyay, C. Banerjee, and A. K. Barua, “Development of a novel fluorinated n-nc-SiO:H material for solar cell application,” Mater. Chem. Phys., 2015, 157, 130–137.
16. S. Mandal, S. Mitra, S. Dhar, H. Ghosh, C. Banerjee, S. K. Datta, and H. Saha, “Potential of ITO nanoparticles formed by hydrogen treatment in PECVD for improved performance of back grid contact crystalline silicon solar cell,” Appl. Surf. Sci., vol. 349, pp. 116–122, 2015.
17. S. Mandal, G. Das, S. Dhar, R. M. Tomy, S. Mukhopadhyay, C. Banerjee, and a. K. Barua, “Fabrication of single junction amorphous silicon solar cell/mini module using novel n-type nanocrystalline SiOx:F:H back reflector,” J. Mater. Sci. Mater. Electron., 2015, 26, 331–335,.
18. S. Dhar, S. Mandal, G. Das, S. Mukhopadhyay, P. P. Ray, C. Banerjee, and A. K. Barua, “Silicon heterojunction solar cells with novel fluorinated n-type nanocrystalline silicon oxide emitters on p-type crystalline silicon,” Jpn. J. Appl. Phys., 2015, 54, 08KD03.
19. S. Mitra, H. Ghosh, H. Saha and S. K. Datta, “Investigation of different contact geometries for partial rear metal contact of high-efficiency silicon solar cells”, Journal of Physics D: Applied Physics, 2015, 48.
20. D. Panda, A. Nandi, S. Majumdar, S. K. Datta, H. Saha, “Selective Detection of Carbon Monoxide (CO) Gas by Reduced Graphene Oxide (rGO) at Room Temperature, , RSC Advances, 2016, **6**, 47337 – 47348
21. S. Patra, S. Sene, C. Mousty, C. Serre, A. Chaussé, L. Legrand, Nathalie Steunou, "Design of Laccase−Metal Organic Framework-Based Bioelectrodes for Biocatalytic Oxygen Reduction Reaction" ACS Appl. Mater. Inter. (2016) ASAP
22. S. Patra, C. Andriamiadamanana, M. Tulodziecki, C. Davoisne, P-Louis Taberna, F. Sauvage,"Low-temeprature electrodeposition leading to robust mesoscopic anatase TiO2 films " Scientific reports 2016, 6, 21588.
23. S. Patra, T. H. Crespo, A. Permyakova, C. Sicard, C. Serre, A. Chausse, N. Steunou, L. Legrand, "Design of metal organic framework–enzyme based bioelectrodes as a novel and highly sensitive biosensing platform" J. Mater. Chem B, 2015, 3, 8983-899.
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25. D. Sheberla, S. Patra, Y. H. Wijsboom, S. Sharma, Y. Sheynin, Abd-Elrazek H-Yahia, Adva, H. Barak, O. Gidron, M. Bendikov, "Conducting polyfurans by electropolymerization of oligofurans", Chem. Sci. 2015, 6, 360.
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27. A. Mandal, A. Kole, A. Dasgupta, P. Chaudhuri, “Electrical transport in transverse direction through silicon carbon alloy multilayers containing regular size silicon quantum dots” Applied Surface Science , 2016, 316, 1002-1009.

International Conference

1.S. Dhar, S. Mandal, G. Das, K. Chatterjee, S. Mukhopadhyay, C. Banerjee, A K Barua, "Development of well-defined ITO nano-rods by pulse DC magnetron sputtering as a potential material for photovoltaic applications" IWPSD 2015, Bangalore,India.

2.S. Dhar, P BalajiBhargav, S. Mukhopadhyay, C. Banerjee, P Ramasamy, A K Barua, Gourab Das, Sourav Mandal, "Beneficial effects of high RF frequency on development of hydrogenated microcrystalline silicon material as well as performance of microcrystalline cell" IWPSD 2015, Bangalore ,India

3.S. Bose, J. Roy Sharma, G. Das, S. Mandal, S. Dhar, A. Jana, S. Mukhopadhyay, A K Barua, "Studies on the etching behavior of Al:ZnO thin film to alkalis for application in the front layer of p-i-n solar cells", IWPSD 2015, Bangalore ,India

4.J. Roy Sharma, S. Bose, S. Mandal, G. Das, S. Dhar, A. Jana, S. Mukhopadhyay, A K Barua, "Effect of KOH on the growth of ZnO nanostructures for application in silicon thin film solar cells", IWPSD 2015, Bangalore ,India.

5.G. Das, S. Bose, S. Mandal, S. Dhar, S. Mukhopadhyay, C. Banerjee, A. K. Barua, "Texturization of glass by plasma etching and their application in single junction a-Si thin film solar cell:", PVSEC-25 2015, Busan, Korea.

6.J. Roy Sharma, S. Bose, S. Mandal, G. Das, A. Jana, S. Dhar, R. Mandal, S. Mukhopadhyay, A. K. Barua, "Influence of different types of seeding on the growth of ZnO nanorods for application in radial junction Silicon thin film solar cells" PVSEC-25 2015, Busan, Korea.

7.S. Dhar, S. Mandal, S. Mitra, H. Ghosh, C. Banerjee, S. K. Datta, H. Saha, "Light Trapping in a-Si / c-Si Heterojunction Solar Cells by Embedded ITO Nanoparticles at the Rear Surface", PVSEC-25 2015, Busan, Korea.

8.S. Mandal, G. Das, S. Dhar , P. BalajiBhargav, S. Mukhopadhyay, A.K. Barua, "Studies on the effect of introducing oxide buffer layers at the TCO/p interface of single junction p-i-n structure a-Si solar cell" PVSEC-25 2015, Busan, Korea.

9.G. Das, S. Mandal, S. Dhar, S. Bose, P. BalajiBhargav, S. Mukhopadhyay, C. Banerjee, A. K. Barua, "Synthesis of ITO nanoparticle with Ar plasma in room temperature and its application in flexible thin film solar cell", PVSEC-25 2015, Busan, Korea.

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11.S. Mandal, G. Das, S. Dhar , M. R. Tomy, C. Banerjee, A.K. Barua, "Inclusion of Fluorine to Improve Refractive Index of Nanocrystalline Silicon Oxide Layer for Application in Solar Cell as BRL", IC-EEE, 2015,Cochin ,India.

12.R. Bhattacharyya, C. Mukherjee, Sushil Kumar, P. N. Dixit, “Cold plasma processing for some novel material development”, AIP Conference Proceedings, 2015, 1670, 020002.

13.A. Mandal, A. Kole, T. Ghosh, D. Basak and P. Chaudhuri, “Effect of Ag nanoparticles embedded AZO/ZnO multilayers as front TCO on the QE spectra of the a-Si/a-Si double tandem solar cells”, 31st European Photovoltaic Solar Energy Conference and Exhibition, At Hamburg; Germany, 2015, DOI: 10.4229/EUPVSEC20152015-1BV.7.25

14.S. Ghosh, A. Mallick, A. Kole, P. Chaudhuri, Sean Garner, D. Basak, “Study on AZO coated flexible glass as TCO substrate”, 43 rd IEEE Photovoltaic Specialists Conference, 2016, Portland, OR, USA,2016.

15.H. Ghosh, S. Mitra, C. Banerjee, S. K. Datta, H. Saha, “Analysis of Light Scattering Properties of Tin Oxide (SnO2) Nanoparticles and its Application in c-Si Solar Cell”, 18th International workshop on Physics of Semiconductor Devices at Indian Institute of Science, 2015, Bangalore, India.

16.S. Mitra, H. Ghosh, C. Banerjee, S. K. Datta, H. Saha, “Analysis of Internal Back Reflection with Scattering DBR and Contact Geometry for Partial Rear Metal Contact c-Si Solar Cells”, 18th International workshop on Physics of Semiconductor Devices at Indian Institute of Science, 2015, Bangalore, India.

17.T. Sarkar, J. Jana, H. Saha, “Study of DC Microgrid Accompanying with Renewable Energy Sources for Rural Application”, India Smart Grid Forum, March, 2015.

18.I. Das, J. Jana, A. Das, T. Dutta, A. Guria, H. Samanta, H. Saha, “Efficient MPPT charging of supercapacitor from solar PV module”, 25th International Photovoltaic Science and Engineering Conference and Exhibition Global Photovoltaic Conference 2015.

19.Mohd Alam, J. Jana, H. Saha, “Switched Boost Inverter Applicable for Solar Photovoltaic System Based Micro-Grid”, 2nd International Conference on Control, Instrumentation, Energy & Communication, 2015.

20.S. Adhya, D. K. Saha, A. Das, J. Jana, H. Saha, “An IoT Based Smart Solar Photovoltaic Remote Monitoring and Control unit”, 2nd International Conference on Control, Instrumentation, Energy & Communication, 2015.

21.T. Sarkar, S. Chatterjee, K. D. Bhattacharya, H. Saha, "Development of Ramp-Rate Controller to Assure Voltage Stability for Weak Distribution Grid with High Penetration of Solar PV", PVSEC-25 & GPVC-2015, Busan, South Korea, Nov 2015.

22.T. Sarkar, A. K. Dan, S. Ghosh, "Effect of X/R Ratio on Low Voltage Distribution System Connected with Constant Speed Wind Turbine", CIEC-16, Kolkata, Jan 2016.

23.A. K. Dan, S. Ghosh, T. Sarkar, K. D. Bhattacharya, H. Saha, "Enhancement of fault ride-through grid code of a vector-controlled doubly-fed induction generator for different types of fault", India Smart Grid Week 2016, Delhi, India, Mar 2016.

24.A. Bhattacharjee, H. Saha, “A Generic Electro-Thermal Characteristic Model of Vanadium Redox Flow Battery under Different Charging Conditions”, ICAER 2015, 2015, IIT Bombay.

25.A. Bhattacharjee, D. K. Mandal, H. Saha, “Optimized power management of a Storage enabled DC grid tied Solar PV power system”, International Conference and Exhibition on Smart Grid and Smart Cities, 2016, New Delhi.

26.A. Bhattacharjee, H. Saha, “Demand side power management of a Grid connected Solar PV system with Vanadium Redox Flow Battery storage”, 32nd European PVSEC (PV Solar Energy Conference and Exhibition), 2016, Munich, Germany.

27.A. Bhattacharjee, D. K. Mandal, H. Saha, “Design of an optimized Battery Energy Storage enabled Solar PV Pump for Rural Irrigation”, IEEE International conference on Power Electronics Intelligent Control & Energy Systems, 2016, India.

28.A. B. Roy, A. Dhar, M. Choudhuri, S. Das, P. Banerjee, A. Kundu, “Silicon Micro-Nanopillars as Solar Tracker for Thin Crystalline Photovoltaic Application”, 5th International Conference on Advances in Energy Research (ICAER), 2015, IIT Bombay, Mumbai.

29.A. Dhar, M. Choudhuri, A. B. Roy, P. Banerjee, A. Kundu, “Metamaterial Mirror as Back Reflector for Thin Silicon Solar Cell Application”, 5th International Conference on Advances in Energy Research (ICAER), 2015, IIT Bombay, Mumbai.

30.M. Choudhuri, A. Dhar, P. Banerjee, A. B. Roy, A. Kundu, “Junctionless Ultra-thin c-Si Solar cell with Metamaterial Back Reflector”, 3rd international conference on Nanotechnology for better living, 2016, NIT Srinagar & IIT Kanpur.

31.P. Banerjee, A. B. Roy, A. Dhar, M. Choudhuri, S. Das, A. Kundu, “Whispering Gallery Modes of Silica Nanospheres for Absorption Enhancement in Ultra-thin c-Si Solar Cells”, 3rd international conference on Nanotechnology for better living, 2016, NIT Srinagar & IIT Kanpur.

32.A. Nandi, S. Majumdar, S. K. Datta, H. Saha, “Wet Chemical Synthesis of Reduced Graphene Oxide and its Application as Selective Carbon Monoxide Gas Sensor”, 18th International Workshop on Physics of Semiconductor Devices, 2015, IISc Bangalore.

33.S. Majumdar, A. Nandi, S. K. Datta, H. Saha, “Switching of Selectivity from Sulfur Dioxide to Butane: the Role of V2O5 Concentration in Nanostuctured SnO2 Sensors” IEEE First International Conference on Control, Measurement and Instrumentation (CMI), 2016, Jadavpur University, Kolkata.

34.Sukanta Dhar, Chandan Banerjee, and A. K. Barua, “Development of well dispersed tapered ITO nanorods as a potential light trapping structure for amorphous Silicon based solar cells”, EUPVSEC 2016, Munich, Germany.

Books:

1.H. Saha, T. Sarkar, J. Jana, “Advances in Solar Energy Science and Engineering - Power Generation through Photovoltaics”, *Today and Tomorrow's Printers and Publishers*, ISBN 81-7019-516-7 (India), ISBN 1-55528-572-1 (USA)

Annexure I

Wet Texturization Bench

This is a simple easy to use semi- automatic wet chemical system having tanks made of PP, PVDF and with PVDF pneumatic valves. The temperature controlled bath with heaters are suitable to texture 156 mm sq. silicon wafers along with PSG removal.

Oxidation/ Diffusion Furnace

This is used for high temperature diffusion procesess including doping from solid and liquid dopant sources e.g.: $POCL_3$, BN. Thermal processes like dry oxidation and pyrogenic wet oxidation with external burning system takes place in such 3 stacked quartz reactor chambers.

Laser Scriber

This machine is suitable for scribing and cutting of monocrystalline silicon, multicrystalline silicon wafers. It consist of YAG crystal, krypton lamp, continuous pump, laser with Q switch as work light source and computer controlled two dimensional table that accurately moves according to the preset graphical tracks.

PECVD Cluster Tool

This tool can be used for horizontal deposition of amorphous and µcrystalline Si based doped, un-doped, and its alloy materials. Along with Magnetic / Robotic arm, residual gas analyser and RF power source, it is capable of depositing on substrate sizes of 100 mm diameter (CT-100) and 150 mm diameter (CT-150) at a maximum temperature of 300 degC.

Screen Printing Machine

The Horizon 03iX Platform offer speed improvements, enhanced yields and intelligent board support. The robust chassis and mechanical integrity is the foundation of the Industry Gold Standard 6-Sigma machine alignment capability of greater than 2 Cpk @ +/-12.5 microns. The two screen printing systems are used for taking the front and back contacts of c-Si solar cells to avoid cross-contamination.

Drying and Firing Belt Furnaces

The belt furnaces (2 nos. for front and back paste drying and one for co- firing) are used for making the contacts of c- Si solar cells). The thick film paste is dried at about 300 degC to remove much of the solvents. The firing process consists of four primaries of solvent volatization, burn-out, sintering at around 700-800 degC followed by wafer cool down.

Sputtering Unit

Two sputtering systems with 4" / & 6" magnetron sputtering cathodes are present. Each system has two cathodes with choice of DC, Pulsed DC and/or RF sputtering. Substrate rotation to give high uniformity. Quartz IR lamp based substrate heater control. PLC-PC based automation provides for complete process control including Substrate bias capability.

Reactive Ion Etching Unit

It is a standalone, PC controlled systemwith a shower head gas distribution of Argon (Ar), Oxygen (O_2), SF_6, CHF_3, and N_2 gas distribution. It has a stain less circular chamber that open at the front for substrate loading. Chamber has view port for viewing the plasma. The round substrate holder can accommodate 6inch diameter substrate and the gap can be adjusted between substrate holder and the gas shower-head manually. The chamber is extremely clean in design and reaches 10^{-9} mbar with the turbo-pump based pumping system. The RF power is provided by 600 W 13.5 MHz power supply. The system is completely automated and is PC controlled.

E-beam Evaporation Apparatus

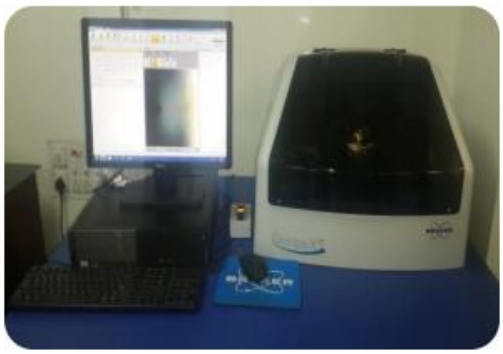
The HHV Auto500 front-loading deposition system can accommodate large-diameter substrates and allows a combination of resistance evaporation alongwith electron beam without breaking vacuum. Pumping system includes dry-running scroll and turbo pumps.

Optical microscope

Laboratory microscope for research applications having dye-cast frame with high stability and ergonomy, for transmitted and reflected light observation.

Thickness profilometer

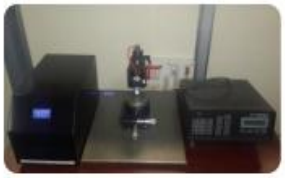
This tool provides repeatable, accurate measurements on varied surfaces, from traditional 2D roughness surface characterization and step height measurements to advanced 3D mapping and film stress analyses. It is used for measuring thin film thickness, stress, and surface roughness and form in applications ranging from educational research verification to semiconductor process control.



Bentham PVE300

Using a monochromatic probe and NMI traceable calibrated reference diodes, the PVE300 permits the quick and accurate determination of solar cell spectral response/ EQE, cell transmittance, reflectance and determination of IQE. It is compatible with all types of photovoltaic devices, from silicon to 3rd generation devices.

Four probe resistivity



The probe guidance system is kinematic and thus free of all lateral play. The needles are positioned by upper and lower jeweled guides, each needle being constrained by a spring-loaded ruby ball at each guide. 4-Point Probe Measurement of wafer sheet resistance, 4-Point Probe Measurement of epitaxial and diffused layer resistivity and 3-Point Spreading Resistance Measurement can be carried out. Further, the Multiposition Wafer Probe combined with the RM3000 Test Unit provides a high quality, easy to use system for measuring the sheet resistance and/or volume resistivity of wafers up to 200mm (8″) in diameter.

FESEM

The SIGMA Series of Field Emission Scanning Electron Microscopes (FESEM) delivers advanced analytical microscopy. Equipped with the GEMINI column with its in-lens secondary electron detection, the SIGMA series brings you unparalleled resolution, contrast and brightness for imaging highly topographical samples. Featuring high vacuum and variable pressure modes of operation we can obtain high definition imaging of conducting and non-conducting samples.

Scanning probe microscope

With the availability AFM and STM the system is capable to perform measurements depending on the working environment. With the analyzing modes like Lateral Force Imaging, Phase Imaging Mode, Force Modulation Mode, Adhesion Force Imaging, the tool can perform measurements on contact, semicontact and non-contact materials.

Center for Healthcare Science & Technology

Format for the Annual Report 2015 - 16

Name of the Department: Centre for Healthcare Science and Technology (CHST).

About the department: Centre for Healthcare Science and Technology (CHST) was established by Bengal Engineering and Science University, Shibpur on 22.01.2010. After conversion to IIEST Shibpur, it is proposed to be developed into a full Department. The centre is also looking after the School of Safety and Occupational Health Engineering of the institute. The vision of the centre is to provide technological solutions for healthcare needs of the country and emerge as a centre for multi-disciplinary interactions between clinicians.

Academic Programmes:

Undergraduate Level

Degree offered: A proposal for UG courses has been prepared.

Sanctioned students' intake

Additional intake through lateral entry in 3rd Semester

Post Graduate Level

Degree offered: M Tech (Biomedical Engineering) and M Tech (Safety and Occupational Health Engineering)

Sanctioned students' intake: 18 and 18 = 36

Additional intake through other programmes (i.e. QIP): NA

Specializations in: Biomedical Engineering and Safety and Occupational Health Engineering

Doctoral & Post Doctoral Research Programme

Degree offered: PhD (Engineering / Science / Humanities & Management Science): Eng and Science

No of Candidates enrolled: 09

No. of Candidates registered: 06

No. of Candidates awarded: 00

No. of Post-Docs: 02

Faculty Position:

Sanctioned faculty post: NIL Vacant Post: NA

Faculty profile (in the following table)

Name	Designation	Highest Qualification	Specialisation / Research Area	Contact No. E - mail
Prof. Amit Roy Chowdhury	Professor of Applied Mechanics & Head, CHST	PhD	Biomechanics, Biomaterials,	arc_98@rediffmail.co; hod@chest.iiests.ac.in
Prof. Jayanta Chakraborty	Adjunct Professor	PhD	Applied Mechanics, Biomechanics	jayantakrchakraborty@yahoo.com
Prof. Dewaki Nandan Tibarewala	Visiting Professor	PhD	Bioinstrumentatio, Biosignal processing	Biomed.ju@gmail.com
Prof. Debatosh Datta	Visiting Professor	PhD	Molecular bIology	debatoshdtt@gmail.com
Prof. Shyamal Kumar Basu	Visiting Professor	PhD	Anantomy	prof.skbasu@gmail.com
Dr. Chitrangada Das Mukhopadhyay	Assistant Professor (contractual)	PhD	Biotechnology, Clinical Microbiology	chitrangadadas@yahoo.com
Dr. Ananya Barui	Assistant Professor (contractual)	PhD	Stem Cells, Cancer and Regeneration	9733388223 ananya.pariksha@gmail.com
Dr. Pallab Datta	Assistant Professor (under DST INSPIRE faculty award [IFA12-LSBM-48 dated 01/02/2013])	PhD	Biomaterials, Biofabrication, Drug Delivery	9474892494 contactpallab@gmail.com

Awards and Laurels received by the faculty members: -

Research area (only mention broad titles without description in detail) :

1.Cancer Biology, Bioinformatics, Drug resistance
2.Biomaterials, Bio-fabrication, Drug Delivery
3.Stem Cells, Cancer and Regeneration
4.Biomechanics
5.Biomedical Instrumentation and Image Processing

Research facilities: (name specific equipment / picture, infrastructure etc)

Lyophilizer, Multiparameter Meter, Electrospinning Equipment, Nikon Epiflorescent Microscope, -20 degree freezer, 3D Scanner, 3D printer, Antigen Retrieval System, Uv/Vis Microplate Reader, PCR, Refrigerated Centrifuges, Thermostat Cooling Baths, CO_2 incubator, Biosafety cabinets, Autoclaves, Fume Hood, Water purification System, Oscilloscope, Electrical Safety Analyzer, Universal testing Machine, Electrochemical Workstation, Function generators
Cardio-pulmonary Laboratory:
Hot Air Ovens, Centrifuges
BioSafety Cabinet
AD Instruments Powerlab 8 port system & Lab Chart pro software CD
Medical equipments for validation of medical instrumentation
BPL Ultima Prime BS Cardiac monitor
Digital Signal & Image Processing
Medical equipments for validation of medical instrumentation
Clinical Microbiology- Biochemistry- Biotechnology Lab

Name of the laboratories:

Cardio-pulmonary Laboratory:
Digital Signal & Image Processing
Medical equipments validation
Clinical Microbiology- Biochemistry-
Biotechnology Laboratory
Computer Laboratory
Stem Cell Regeneration and Early Cancer
Imaging Laboratory
Biomaterials Laboratory

Consultancy Work: Upasana Biomedical Establishment Proposal

Support staff position:

Sanctioned technical post: NIL

Technical staff profile (in the following table)

Ongoing Sponsored Research / projects: (mention area)

Ongoing (Proj Value)	**Sponsoring agency**
Bioactivity guided fractionation of phytochemicals from medicinal plants against brain malignancy authenticated by DNA bar coding (37.43 Lakhs)	NMPB, Govt. of India
Establishment of Dr. Bholanath Chakraborty Laboratory for fundamental research in Homoeopathy (Worth INR 11 Crores)	CCRH, Ministry of AYUSH, Govt. of India.
Translational Center on Biomaterials for Orthopedic and Dental Applications (COE Network Project with IISC Bangalore worth INR 5 Crores)	DBT, Govt. of India
Fabrication of Bio-degradable Honey Based Scaffold for Ex-Vivo Expansion and differentiation of Mesenchymal Stem Cells (21.45 Lakhs)	DST (Fast Track)
Biofabrication of Bioactive Scaffolds for Bone Regeneration. (35 Lakhs)	DST (INSPIRE)
Biofabrication with functionalizable poly(amino acid) hydrogels towards development of bioengineered tissue constructs and biocompatible medical devices (24.60 Lakhs)	DST (Fast Track)
Efficacy of Silicon Microchannel Cytosensor Platform for Electrical Profiling of Multiple Mammalian Cells Under Intervention Towards Diagnostic and Regenerative Applications; PI: Prof. Chirasree RoyChowdhuri, (54.600 Lacs)	SERB, Govt. of India
A Biotechnological approach for rapid detection of aflatoxin in food using optical nanofibre probes	DBT, Govt. of India

Industry – Institute Interaction: Discussion has been held with TCS innovation Labs

Details of publications of each faculty member (2015 – 16)

Journal ……10

Conference ……11

Books / Monograms ……00

Seminar / Workshops / Conferences / Training programme organized by the department (2015 - 16):

1. Challenges in Product Development of Medical Devices and Implants, December 18-19 2016.

Technology Developed / Innovations

Ongoing work on:

- Portable cardiac risk detector – sponsored by Dept. of Science & Technology, Govt. of India
- Multifunction electronic blood pressure machine,
- Computerised auto-analysis of paper-based archived ECG
- Work on clinical Microbiology specially to address drug resistant bacterial strains
- Combinatorial therapy for celiac diseases
- Prototypes developed
  - i) Portable electrical biosensor for bacteria detection
  - ii) Wireless sensor system for health monitoring of elderly people (field testing has started)

Advancements under TEQIP – Phase II

Foreign visits and Invited Lectures

1. Prof. Chitrangada Das Mukhopdhyaya, United States of America.
2. Prof. Sabyasachi Sarkar, United States of America.
3. Prof. Amit Roy Chowdhury, Ireland and United Kingdom

Visitors to your Department (Indian & Foreign)

1.Prof. Subrata Saha, SUNY Brooklyn, USA.
2.Prof. Brian Derby, University of Manchester.
3.Prof. Abhay Pandit, NUS Ireland.
4.Prof. Shamik Bhattacharya , St.Mary's University, San Antonio, Texas.
5.Dr. Sourav Ghosh Loughborough University, UK

New Academic / Research Initiatives

Academic Collaboration: M Tech Biomedical Engineering is introduced this year.

Industrial Collaboration: Alfatek Systems, Kolkata.

Centre of Excellence (COE), TEQIP II, IIEST, Shibpur

Name of the Department/ centre :

"Microstructurally Designed Advanced Materials Development"
Centre of Excellence (COE), TEQIP II, IIEST, Shibpur

About the department / centre:

The Centre of Excellence on Microstructurally Designed Advanced Materials was established in 2013 with the financial assistance received under the TEQIP II scheme. Multipurpose Tribometer, 3D Optical Surface Profilers, Atomic Force Microscope (AFM), Hall Effect Measurement Set-Up, Ultrasonic Vibrator, Melting Furnace & Thermal Evaporation System laboratories were developed and main operational from February 2015. The centre primarily focuses on multi disciplinary research, training and development of concepts in computation, design, characterization and application of materials in the areas of advanced sensor materials, affordable bio-implants, crash worthy structural steel, alternative permanent magnet materials and materials refurbishment. Apart from carrying out research in the areas mentioned above, the centre also aims at creating technologies that can be commercially exploited by industries.

Academic Programmes:
Not applicable

Doctoral & Post Doctoral Research Programme
Registered Research Scholars for PhD program : 09 Nos

Sl. No.	Name of Ph. D. Scholar	Name of the Department	Enrolment No.	Registration No.
01	Mr. Aluru Praveen Sekhar	Met. Engg.	182013BE3	PhD/R/2015/0073
02	Mr. Anindya Pal	Mat. Sc. & Engg.	332013AE4	PhD/R/2014/0106
03	Ms. Asmita Roy	CHEST	462013AE1	PhD/R/2015/0016
04	Mr. Basanta Bhowmik	E.T.C.E	172013AE6	PhD/R/2014/0015
05	Mr. Koushik Dutta	E.T.C.E.	172013AE7	PhD/R/2014/0016
06	Mr. Debanjan Acharya	E.T.C.E	152013BE2	PhD/R/2015/0021
07	Mr. Monojit Seal	Electrical	142013BE4	PhD/R/2015/0023
08	Ms. Tanushree Dutta	Met. Engg.	182013BE2	PhD/R/2015/0071
09	Mr. Angshuman Sarkar	Met. Engg.	182013BE5	PhD/R/2015/0072

COE Associated Research Scholars : 05 Nos.

Sl. No.	Name of Ph. D. Scholar	Name of the Department	Enrolment No.	Registration No.
01	Mr. Susanta Kumar Pradhan	Met. Engg.	18A2012E1	PhD/R/2014/0115
02	Mr. Subhranshu Chatterjee	Met. Engg.	182010E1	PhD/R/2011/0025
03	Mr. Nisith Kumar Tewary	Met. Engg.		
04	Mr. Gurudas Mondal	Met. Engg.		
05	Ms. Samarpita Roy	Met. Engg.	182014AE5	PhD/R/2015/0093

Faculty Position:

Coordinator and Members profile:

Name	Designation	Highest Qualification	Specialisation/ Research Area	Contact No. E-mail:
Swarup Kr. Ghosh	Professor, Member	Ph. D.	Processing-structure-property correlations of steels	(033) 26684561 to 63, Extn. 236 / 239 hod@metal.iiests.ac.in swarupkrghosh@gmail.com
A. Basumallick	Professor and Associate Dean, Coordinator COE	Ph. D.	Nanostructured Materials, Electronic and Magnetic materials	033-2668-4561 to 63 (Ext- 240) abasumallick@metal.iiests.ac.in
Manojit Ghosh	Associate Professor, Member	Ph.D.	Aluminium alloys, Crystallographic texture	033-2668-4561 to 63 manojit_ghosh1@rediffmail.com
Debdulal Das	Associate Professor, Member	Ph.D.	Wear of Materials Nanomaterials & Nanocomposites	033-2668-4561 to 63 debdulal_das@metal.becs.ac.in debdulal_das@yahoo.com
Tapendu Mandal	Assistant Professor, Member	M.Tech.	Electronic Materials, Biomaterials, Carbon based Composites	033-26684561 to 63 tapendu@gmail.com
Partha Bhattacharyya	Associate Professor, Member	Ph.D.	Nanostructured semiconducting oxides, Chemical sensors, MEMS based sensor and its integration to CMOS circuits	pb_etc_besu@yahoo.com
Chirasree Roy Chaudhuri	Associate Professor, Member	Ph.D.	Biosensors, MEMS based pressure and conductivity sensor, VLSI based signal processing	chirosreepram@yahoo.com
Amit Roy Chowdhury	Professor, Member	Ph.D.	Finite Element Method, Solid Mechanics Biomechanics	arc_98@rediffmail.com
Mallar Ray	Assistant Professor, Member	Ph.D.	Nanomaterials, optical and transport properties.	mray@matsc.becs.ac.in
Arijit Sinha	Assistant Professor, Member	Ph.D.	Nanomechanical Characterization, Composite Materials, Shape Memory alloys	arijit@matsc.iiests.ac.in, sinharijit@gmail.com

Awards and Laurels received by the faculty members/ scholars:

1.Sri Basanta Bhowmik and Sri Debanjan Acharya, Research Scholars of COE TEQIP II secured CSIR – Senior Research Fellowship with effect from 01.10.2015.

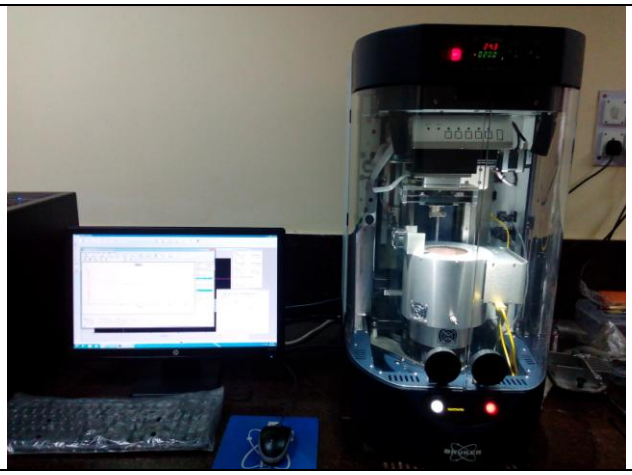
2.Best student research paper award for the paper "Effect of Anodizing medium on the Morphology and Photoluminescent Property of Porous Alumina Flim" Sri Subhranshu Chatterje, Research Scholar in the 3rd Annual International Conference on Materials Science, Metal & Manufacturing (M3 2015), Singapore held on 18th January 2016.

3.Prof. Amitava Basu Mallick of Met & Mat Engineering has been awarded prestigious INSA Teachers Award, 2016.

Research area (only mention broad titles without description in detail) :

- Development of Linear Permanent Magnet Synchronous Motor
- Development of Al based intermetallic reinforced composites through reactive stir casting route
- Studies on Magnesium alloys as a biodegradable biomedical orthopedic implant
- Structure-Property correlation of Age-hardenable Al-alloys
- Preparation of bio-ceramics mainly hydroxyapatite (HAp) from biogenic resources viz., seashells (calm shells), fish bones and fish scales
- Development of Al2O3/Al Nanocomposite by Ultrasonic Cavitation assisted Sir Casting
- Development of Ultra high strength steel
- Development of high energy density MnBi based rare earth free permanent magnet
- Development of hybrid sensors for spoilage and ripeness detection of fruit and vegetables

Research facilities: (name specific equipment / picture, infrastructure etc)

Sl. No.	Description	Pictures
1	**Multipurpose Tribometer**	
	Description of the facility: **Wear Test facility with High temperature** **Operating condition:** Mode of Operation: Pin on disc, ball on disc Max load : 1000N Max rpm : 2500 Max temperature: 1000˚C	

2	**3D Optical Surface Profilers** 3D optical profiler is used to analyze the surfaces of various specimens of automotive and aerospace components, medical devices and implants, semiconductor and microelectronics, precision machining and tooling etc. It works on the principle of white light interferometer. Provision for moveable turret where 5X and 20X are fixed., Film thickness, Surface and substrate roughness, surface height etc. can be measured.	
3	**STM - AFM - MFM** Operates in Contact Mode, Noncontact Mode and Tapping Mode. Additionally, this AFM has another advanced mode, called ScanAsyst mode, to deliver low drift and low noise images. Scanning Tunneling Microscopy (STM) and Magnetic Force Microscopy (MFM). Operating Environment: Temperature: Room temperature; Medium: Air medium .	
4	**Hall Effect Measurement Set-Up** The HMS-3000 Hall Effect Measurement Systems plot concentration versus temperature, mobility versus temperature, resistivity versus temperature, conductivity versus temperature, and Hall coefficient versus temperature. The systems ramp to each user defined temperature, stabilize, makes the measurement (including moving the magnet automatically), and then plots the various temperature dependent material electrical properties. The HMS-3000 includes software with I-V curve capability for checking the ohmic integrity of the user made sample contacts. The systems can be used to characterize various materials including semiconductors and compound semiconductors (N Type & P Type) such as Si, Ge, SiGe, SiC, GaAs, InGaAs, InP, GaN, ZnO, TCOs, metals, etc., at both 300K and 77K (room temperature and liquid nitrogen temperature).	

5	**Melting Furnace** Electric resistance furnace for melting of light metals with provision for bottom pouring or by furnace tilting is required. Temperature range: 450 to 1150 ^{O}C with accuracy of ± 5 ^{o}C or better. Its include suitable pure graphite and alumina crucibles (2 nos. of each type). This is a split type electric resistance furnace for pre-heating of particulate (Temperature range: 100-700 ^{o}C; ±5 ^{o}C or better; Thyristor driven; Single RAM PID controller) under Ar atmosphere and its subsequent control addition in the melt.	
6	**Thermal Evaporation System** Description of the facility in word The HHV Thermal Evaporation System is a versatile and compact coating system which has been developed to meet the demands of the researcher. The system is available with glass bell jar. The vacuum system is controlled and monitored by a rugged PLC with touch screen for easy operation. Pumping options include diffusion, turbo and cryo pumps with oil-sealed or dry scroll backing pumps. Features: Vacuum systems 600l/s diffusion pump, 14.3m3/h oil sealed rotary pump and liquid nitrogen trap as standard. Chambers Domed glass bell jar, Controls and safety PLC system controller with touch-screen for vacuum system control, Automatic high vacuum valve protects pumps and process, Comprehensive interlocks to maximize operator safety Accessories EB3 compact 3kW, four-pocket electron beam source, Temperature controlled sources for organic electronic materials Resistance evaporation systems Static work holders Substrate heating systems Source shutters Glow discharge cleaning Film thickness monitoring Deposited metals •Gold and aluminum	

Name of the laboratories:

3D Optical Profiler Laboratory
Atomic Force Microscopy (AFM)
Multipurpose Tribometer Laboratory
Thermal Evaporation System Laboratory
Hall Effect Measuring System Laboratory
Composite Laboratory (Melting)

Project staff profile

Name	Designation	Highest Qualification	Contact No.	E- mail
Sri Saibal Kumar Mandal	Secretary COE TEQIP II Office	MA	9432147172	coebesu@gmail.com
Sri Santu Das	Office Assistant COE TEQIP II office	B.Com	9836649004	sd6051988@gmail.com

Ongoing Sponsored Research / projects:

Sl. No.	Project Name	Funding Agency	Duration	Total Amount
01	"Development of Semi-conducting Oxide Nanotube based Sensor System for Efficient Quality Monitoring of Apples" Prof. P. Bhattacharyya	CSIR Complex, Library Avenue, Pusa, New Delhi	36 months	2425500.00
02	"Development of High Energy Density Rare Earth Free MnBi and FeCo/Cu Core shell Exchange Spring Coupled Permanent Magnet" Prof. A. Basu Mallick	Science Engineering Research Board (SERB), DST, New Delhi	3 years	7813947.00
03	"Texture Evaluation and study of mechanical properties during Electron Beam Welding for materials used in nuclear applications" Dr. Manojit Ghosh	Govt. of India Dept. of Atomic Energy (DAE) Board of Research in Nuclear Sciences (BRNS)	3 years	2169300.00
04	"Influence of solver and tin on the microstructure and texture of Al-Zn-Mg alloys" Dr. Manojit Ghosh	Indo-Belgium Research and Technology Cooperation	3 years	Euro 29925.00 Rs 17,20000.00

Industry – Institute Interaction:

Sl. No.	Project Name	Funding Agency	Duration	Total Amount	Status
01	"Fatigue Property Evaluation and Micro structural Characterization of Hot Rolled Steels" Prof. Debdulal Das	Tata Steel Pvt. Ltd. Jamshedpur	12 months	1485961.00	Sanctioned

Details of publications of each faculty member (2015 – 16)

1."Reliability study of Nanoporous Silicon Oxide Impedance Biosensor for Virus Detection: Influence of Surface Roughness" – Naren Das and Chirasree Roy Chaudhuri. IEEE Transactions Device and Materials Reliability, VOL 15, No. 3, September 2015.

2."Effect of Annealing on Microstructure and Mechanical Behaviour of Cold Rolled Low C, High Mn TWIP Steel" – N. K. Tewary, S. K. Ghosh and S. Chatterjee. International Journal of Metallurgical Engineering year 2015, 4(1): page 12-23 DOI:10.5923/j.ijmee 20150401.03

3."A Highly Sensitive BTX Sensor based on Electrochemically Derived Wall Connected TiO_2 Nanotubes"- K. Dutta P. P. Chattopadhyay,Chia-Wei Lu, **Mon-Shu Ho**,P. Bhattacharyya, Applied Surface Science, vol. 354, pp. 353-361, (2015).

4."Operating Temperature, Repeatability and Selectivity of TiO_2 Nanotube based Acetone Sensor: Influence of Pd and Ni Nanoparticle Modifications"- Partha Bhattacharyya, BasantaBhowmik, Hans J. Fecht, IEEE Transactions on Device and Materials Reliability , vol. 15,No. 3, pp. 376-383, (2015).

5."Stoichiometry, Length and Wall Thickness Optimization of TiO_2 Nanotube Array for Efficient Alcohol Sensing"- A. Hazra, , B. Bhowmik, K. Dutta, P. P. Chattopadhyay, P. Bhattacharyya, ACS Applied Materials and Interfaces, vol. 7, pp. 9336-9348, (2015).

6."Vertical Mode Gas Sensing Performance of TiO_2 Nanotube Array by Tuning of Surface Area and Carrier Transport Length" -B. Bhowmik, Hans J Fecht, P. Bhattacharyya, IEEE Sensors Journal, vol. 15,No. 10, pp. 5919-5926, (2015).

7."Highly Stable Low Temperature Alcohol Sensor Based on Hydrothermally Grown Tetragonal TitaniaNanorods"- B. Bhowmik, P. Bhattacharyya, RSC Advances, vol. 5, pp. 82159-82168, (2015).

8.S. Nandy, K K. Ray, D. Das: *Process model to predict yield strength of AA6063 alloy*; Materials Science and Engineering A vol 644 (year 2015) page 413-424. DOI: http:// dx.doi.org/ 10.1016/ j.msea.2015.07.070.

9."Statistical analysis of the effects of Wire EDM machining parameters on Material Removal Rate and Kerf Width of commercially available Tool steel", N.G. Roy, A. Pramanick, P. P. Dey and M. Ghosh, 11th International Conference on Mechanical Engineering, ICME 2015, Dhaka

10."Correlating r-value and through thickness texture in Al–Mg–Si alloy sheets", M. Ghosh, A. Miroux, L.A.I. Kestens, *Journal of Alloys and Compounds* vol 619 (year 2015) page 585–591

11. "Effect of microstructure and residual stresses on tribological and tensile properties of Al_2O_3 and SiC reinforced 6.61-Al metal matrix composites. Journal of composite materials" Subhranshu Chatterjee, Sudipta Ghosh Sur, S. Bandyopadhyay and Amitava Basu Mallick. DOI : 10.1177/0021998315611481 vol 2, year 2016

12."Real-time sensing of epithelial cell-cell and cell-substrate interactions by impedance spectroscopy on porous substrates" – D. Mondal, D. Pal and C. Roy Chaudhuri. Journal of Applied Physics vol 118, page (1-14) 044701 (year 2015)

13."An efficient BTX sensor based on p-type nanoporoustitania thin films" – K. Dutta, B. Bhowmik, A. Hazra, P. P. Chattopadhyay, P. Bhattacharyya. Microelectronics Reliability vol 55 (year 2015) page 558-564

14."An efficient BTX sensor based on ZnOnanoflowers grown by CBD method" – D. Acharyya, P. Bhattacharyya. Solid-State Electronics vol 106 (year 2015) page 18-26 date of publication 2015/4/30

Patents / Invention Disclosure / Technology Transfer / Copyright

1)"A process for forming an undoped p-type TiO_2 based sensor device for accurate sensing of low ppm ethanol at low temperature", Partha Bhattacharyya, Arnab Hazra **Applied**

2) "A process for forming a TiO_2 Nanotube based room temperature (27^0C) alchohol sensor device", Partha Bhattacharyya, Arnab Hazra **Applied**

3)"A process for fabrication of nanostructured TiO_2 based p-n homojunction diode with high rectification efficiency", Partha Bhattacharyya, Arnab Hazra - **Applied**

4)"A process for fabrication of hybrid junction of reduced graphane oxide nanoribion and TiO_2 nanotube array (TNTA) based gas sensor system", Partha Bhattacharyya, Debanjan Acharya – **Applied**

Seminar / Workshops / Conferences / Training programme organized by the department / centre (2015 - 16):

1)International Conference on Advance Materials & Energy Technology, IIEST, Shibpur held on 17th December to 19th December 2014.

2) International Conference on Challenges in Product Development of Medical Implants and Devices, IIEST, Shibpur, held on 18th to 19th December 2015.

3) A 10 days workshop on "Materials Characterization: Principals and Practices" (MCPP-2016) IIEST Shibpur, held on 25th July to 5th August 2016.

4) A Colloquium on Nuclear Materials (CNM 2016), IIEST Shibpur, held on 25th August 2016.

5)International Conference on Functional Nano-materials (ICFNM – 2016) – 28 to 29 September 2016.

Foreign visits and Invited Lectures

Sl. No.	Name	Name of Conference	Place of Conference	Date	Paper
01	Prof. Manojit Ghosh Dept. Metallurgy & Materials Engg.	Deakin University, Australia a collaborative work	Institute for Frontier Materials, Deakin University, Geelong, Australia	19 – 26 July 2014	Collaborative work
02	Prof. Partha Bhattacharyya Dept.: ETC	European Conference on Surface Science (ECOSS 30), 2014, Antalya, Turkey	Arber Professional Congress Services Sair Nedim Sokak, Ankara, Turkey	31 August – 5 Sept. 2014	Effect of stoichiometry variation on alchohol sensing properties of electrochemically grown TiO_2 nanotubes
03	Prof. Amitava Basu Mallick Dept. Metallurgy & Materials Engg.	International Conference on Advanced Materials Research and Manufacturing Technologies (AMRMT-2016)	Singapore	16 – 21 August 2016	Magnetic behaviour of FeCo/Cu core shell nanoparticles

Visitors to your Department (Indian & Foreign):

Indian

Sl. No.	Name	Institute
01	D. D. Sarma, Professor	Solid State & Structural Chemistry Unit of IISc, Bangalore
02	G. U. Kulkarni , Professor	Chemistry and Physics of Materials Unit, JNCASR, Bangalore
03	Milan K. Sanyal, Professor	Former director of Saha Institute of Nuclear Physics, Prof. Sanyal is now the co-chairman of the India-Japan Science Council.
04	Alokmay Datta, Professor	Surface Physics and Material Science Division of Saha Institute of Nuclear Physics, Kolkata
05	Ratnamala Chatterjee, Professor	Department of Physics, IIT Delhi and Coordinator of National SQUID facility at IIT-Delhi.
06	Sabu Thomas, Professor	Director, School of Chemical Sciences and Hon. Director , and also the Hon. Director of Centre for Nanoscience and Nanotechnology at Mahatma

		Gandhi University, Priyadarshini Hills P. O. Kottayam, Kerala, India
07	Samit Ray, Professor	Dept. of Physics and Head, School of Nano-Science and Technology, IIT, Kharagpur
08	Sundara Ramaprabhu, Professor	Alternative Energy and Nanotechnology Laboratory (AENL), Nano-Functional Materials Technology Centre (NFMTC), Department of Physics, IIT Madras.
09	Chaitanyamoy Ganguly, Professor	Advisor to Director General & Distinguished Professor, PDPU
10	U, Kamachi Mudali , Professor	Associate Director, IGCAR Kalpakkam
11	Indranil Manna, Professor	Director of Indian Institute of Technology, Kanpur
12	B. D. Mukherjee, Industry	Divisional Manager, Leica Microsystems – India
13	Amitava Ray, PhD, Engg.	Ex-General Manager, R&D Centre, SAIL, Ranchi & Technical Advisor- Material Testing, AIMIL Ltd., Delhi
14	Asish Kumar Panda, Scientist	Scientist, CSIR-National Metallurgical Laboratory (NML), Jamshedpur.
15	Amitava Mitra, Scientist	Sr. Scientist, CSIR-National Metallurgical Laboratory (NML), Jamshedpur.
16	Sandip Bysakh, Scientist	Central Glass and Ceramic Research Institute (CGCRI), Kolkata
17	Dr. K. Muraleedharan	Director, Central Glass and Ceramic Research Institute (CGCRI), Kolkata
18	Rabibrata Mukherjee, Professor	Chemical Engg. Dept., IIT, Kharagpur
19	N. K. Mukhopadhyay, Professor	Department of Metallurgical Engg., Indian Institute of Technology (BHU), Varanasi
20	Tapatee Kundu Roy, Scientist	Sr. Scientist, Variable Energy Cyclotron Centre, Dept. of Atomic Energy under GOI.
21	K. K. Ray, Professor	Department of Metallurgy and Materials Engg., IIT, Kharagpur
22	P. C. Chakraborti, Professor	Metallurgical and Materials Engineering Department, Jadavpur University, Kolkata
23	Rahul Mitra, Professor	Department of Metallurgy and Materials Engg., IIT, Kharagpur
24	U. K. Chatterjee, Professor	Department of Metallurgy and Materials Engg., IIT, Kharagpur
25	Indranil Chattoraj, Scientist	Sr. Scientist, CSIR-National Metallurgical Laboratory (NML), Jamshedpur.
26	Sarmishtha Palit Sagar, Scientist	Principal Scientist, CSIR-National Metallurgical Laboratory (NML), Jamshedpur.
27	Aby C P, Industry	Senior Application Specialist, JEOL India Pvt. Ltd., New Delhi
28	Anup Kumar Biswas, Industry	Zonal Manager East, Carl Zeiss India

29	Shibasis Chatterje, Industry	Product Marketing Application, Carl Zeiss India
30	Somnath Banerjee, Industry	Manager, Microscopy Products, Carl Zeiss India
31	T. Lazar Mathew, Prof.	PSG Institute of Adv. Studies, Coimbatore
32	Bikramjit Basu, Professor	IISc, Bangalore
33	Amitava Dey, Professor	IIT, Bombay
34	Dinesh Bhatia, Professor	NEHU, Shilong
35	Neeraj Sharma, Professor	IIT, BHU, Varanasi
36	Ravi Sarangapani, Director	ADLER MEDIQUIP, Pune
37	Mrinak Kanti Musib, Lecturer	National University of Singapore (NUS).
38	Anindya Deb, Professor	IISC, Bangalore
39	Chandra P Sharma, Scientist	SCTIMST, Trivandrum
40	Naresh Bhatnagar, Prof.	IIT, Delhi
41	Amit Asthana, Principal Scientist	CSIR-CCMB, Hyderabad
42	Karthik Chetan V, Assistant Professor	Chemical Engg. Dept., BITS, Pilani, Hyderabad
43	Nitin S. Kale, Manager	NanoSniff Technologies, IIT Bombay

Foreign :

Sl. No.	**Name**	**Institute**
01	Gavin Conibeer, Professor	Deputy Director of the School of Photovoltaic and Renewable Energy Engineering, New South Wales, Australia
02	Hans-Jörg Fecht, Professor	Chaired Professor and Director of Institute of Micro and Nanomaterials at Ulm University, Germany
03	Jeffrey Snyder, Professor	Materials Science and Engineering at Northwestern University, USA.
04	Marc Madou, Professor	Chancellor's Professor in Mechanical & Aerospace Engineering and Biomedical Engineering at University of California, Irvine, USA
05	Brain Derby, Professor Plenary	Materials Science, University of Manchester and Director of the Manchester Centre for Digital Fabrication, UK
06	Abhay Pandit, Professor	National University, Ireland
07	Prof. Christina Gomez Polo	Dept. Of Physics, Public University of Navarra, Arrosadia Campus, E-31006, Pamplona, Spain

New Academic / Research Initiatives :

The members of CoE were involved in designing the courses for the newly introduced following M. Tech. programs in the institute.

- M.Tech program on BioMedical Engineering is offered from the Centre of Healthcare Science and Technology (CHST).

- M.Tech program on Surface Engineering is offered from the Metallurgy and Materials Engineering department.

- The UG and PG students of ETC and Met and Mat departments use the instrumental facilities of CoE for their laboratory classes.

e) Academic/ Research Collaboration

- National Metallurgical Laboratory, Jamshedpur
  - *Magneto caloric materials for refrigeration (Joint Ph.D program)*
  - *Development of rare earth free permanent magnet (Joint Ph.D program)*
  - *FeCo/Cu core shell nanostructures (M.Tech thesis, Completed)*

- Central Glass and Ceramic Research Institute, Kolkata and Board of Research in Nuclear Sciences', DAE Mumbai
  - *Development of palladium based membrane over porous stainless substrate for selective separation of hydrogen from mixture gases (Joint Research proposal submitted to BRNS for funding)*

- Indian Space Research Organization, Bangalore
  - Development of heat shield materials for space vehicles (M.Tech thesis, completed)

- Variable Energy Cyclotron Centre, Kolkata
  - Development of ZnO-based high performance varistor by grain size control (Joint PhD program)

f) Industrial Collaboration

Tata Steel Pvt. Ltd., Jamshedpur

"Fatigue Property Evaluation and Micro structural Characterization of Hot Rolled Steels" Duration 12 months

Central Research Facility (CRF),

IIEST, Shibpur

Name of the Department/ centre :

Central Research Facility (CRF), IIEST, Shibpur

About the Department / Centre:

The Central Research Facility has been created with the key commitment of providing advanced instrumental facility and scientific services required to support and raise the efficiency of researchers to international level. Currently testing facilities in high end equipment e.g. Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), Instron, Nano-indentation and Glow Discharge Spectrometer is available to the researcher and faculties of this Institute. The CRF have earned a revenue of Rs.92,625/= (Rupees Ninety Two Thousand Six Hundred and Twenty Five) only till date by providing testing facilities and technical services to the researchers of the institute and other institutes.

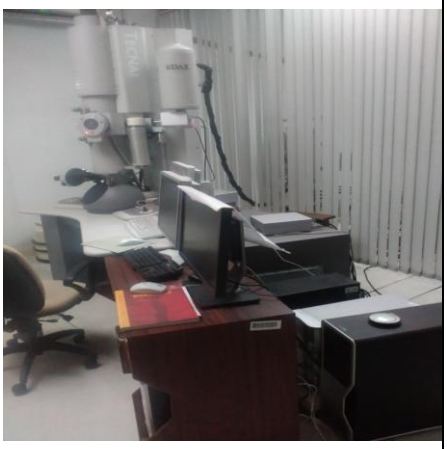
Faculty Position:

Chairman and Prof.- In-Charge profile:

Name	Designation	Highest Qualification	Specialisation/ Research Area	Contact No. E-mail:
A. Basu Mallick	Professor and Associate Dean, Chairman	Ph. D.	Nanostructured Materials, Electronic and Magnetic materials	033-2668-4561 to 63 (Ext- 240) abasumallick@metal.iiests.ac.in
Swarup Kr. Ghosh	Professor, Prof-incharge - TEM	Ph. D.	Processing-structure-property correlations of steels	(033) 26684561 to 63, Extn. 236 / 239 hod@metal.iiests.ac.in swarupkrghosh@gmail.com
Debdulal Das	Associate Professor, Prof-incharge - INSTRON and Nano Indentation	Ph.D.	Wear of Materials Nanomaterials & Nanocomposites	033-2668-4561 to 63 debdulal_das@metal.becs.ac.in debdulal_das@yahoo.com
Sukumar Kundu	Assistant Professor, Prof-incharge - SEM	Ph. D.		erskundu@gmail.com, erskundu@yahoo.com

Facilities: (name specific equipment / picture, infrastructure etc)

Sl. No.	Description	
1	**Scanning Electron Microscope (SEM)** The SEM (S-3400R) accommodates a variety of samples, while the flexible chamber design affords superior analytical analysis. Capable of accommodating a 30 mm diameter sample with a maximum height of 10 mm. A 5-axis motorized stage makes the large chamber ideal for a wide variety of samples. Resolution in SE Imaging (High Vacuum Mode) 3.0nm @30kV, Resolution in BSE Imaging (Low Vacuum Mode) : 4.0nm @30kv, Accelerating Voltage: 0.3 - 30kV, Magnification: 5x - 300,000x, Specimen Stage (X,Y and Tilt), 15mm x 10mm, -20/ 90 degrees, Maximum Specimen Size and Height: 30mm diameter; 10mm (WD=10mm), Computer	

	eccentric stage with 5-axes motorization with navigation software; 5-segment retractable BSED for topo, compo and 3D and TV observation; utilizes same GUI as S-3400N for toolset continuity; integrated PCI Relationship Database and advanced image processing; dual image display with signal mixing	
2	**Transmission Electron Microscope:** **FEI Tecnai 20ST:** The FEI Tecnai 20ST is a Transmission Electron Microscope (TEM) equipped with a EDAX EDS - (D2128). It has a maximum accelerating voltage of 200kV, 120kV, 80kV. It has Bottom mount CCD detector for TEM, EDAX Detector for EDS Analysis in TEM, STEM mode. Different imaging mode are: Bright field (BF), Dark Field (DF), Selective Area Diffraction Pattern (SAD).	
3	The CSM make NHT is designed to provide low loads with depth measurements in the nanometer scale for the measurement of hardness, elastic modulus, creep, etc. The system can be used to characterize organic, inorganic, hard and soft materials. With the unique top surface referencing technique, an indentation measurement can be made in less than 3 minutes without waiting for thermal stabilization.Max. Force: 500 mN, Resolution: 0.04 µN, Max. Depth: 200 µm, Resolution0.04 nm, Load frame stiffness >> 10^7 N/m, International standards: ISO 14577, ASTM E2546, etc. The software provided with this instrument offers all of the following testing modes: - Standard indentation (per ISO and ASTM standards) - Advanced indentation - Constant or Progressive Multicycle - CMC (Continuous Multicycle) - User-defined sequence - Sinus mode (optional) - Line, simple or advanced matrix - User defined profile - Use of a protocol - Multi-samples	
4	The UTM (Instron 8801) is a servo hydraulic fluid controlled machine, consists of a two column dynamically rated load frame with the capacity of load up to 100kN (dynamic), hydraulic power pack (flow rate 45 litre/minute) and 8862 Fast Track 8862 Controller test control systems is stand alone, fully digital, single axis controller with an inbuilt operating panel and display. The controller is fully portable and specifically designed for materials testing requirement. This controller has position, load and strain control capability. The software's available with the machine are: Testing Software for Tensile and compression Test. Fatigue Crack Propagation Test. Fracture Toughness Test. Fracture Toughness Test.	

Ramanujan Central Library

Preamble

The Institute library has the distinction of being one of the oldest and largest resourceful technical libraries in the eastern India. The library not only caters to the basic information needs of faculty members, research scholars and students of this Institute but also provides information and documentation services to researchers of neighbouring universities and research institutes. The library provides open access services for books and journals to its members including students.

Collection

The total collection of books is 1,41,021 as on 31st March 2015. During this period 1,420 books were added in the collection of the library. It has a huge collection of non-book materials, such as patents, standards, technical reports and pamphlets. The library boasts of having a good collection of old and rare books and journals of the nineteenth century.

Computerization

The library has already computerized its entire housekeeping operations and now offered services through the integrated library management system – LibSys4. The library already introduced system generated bar-coded membership card with photograph for speedy charging and discharging of books. The library is also providing online search facilities (WebOPAC) of its catalogue through the website of the Institute for remote access of its database. Library is planning to upgrade its library management software and introducing RFID technology for providing additional and better services to its members.

Services offered

- Web based library services
- Access to electronic resources
- Lending facilities
- Reading Room facilities
- Reference Services
- Digital Question Papers Access Services
- Inter Library Co-operation
- Internet searching/web browsing
- Services to Alumni and other distinguished visitors

Electronic Resources

The facilities in the Library have been significantly improved by the way of introducing new scholarly electronic resources. The access of e-resources – *ASCE Journals, ASME Journals* and *IEL Online (5 simultaneous user)* available through the INDEST-AICTE consortium and *American Chemical Society (ACS), American Institute of Physics (AIP), American Physical Society (APS), Royal Society of Chemistry (RSC), Springer's LINK, T&F Journals, JSTOR* and *Economic and Political Weekly* database through the UGC INFONET Digital Library consortium is continued. The subscription of seven subject collections (namely, Chemistry; Computer Science; Earth and Planetary Sciences; Engineering; Physics and Astronomy; Materials Science; and Mathematics) of Elsevier's *Science Direct* database is also continued. Like previous year, the library is subscribing management science database, *EBSCO Business Suite Plus*.

Participation in Seminars/Conferences/Training Programmes

Dr. H.P. Sharma, Joint Librarian has nominated as a member of the Board of Studies in Bachelor of Library and Information Science programme of the Netaji Subhas Open University, Kolkata. He also acted as a member of the Board of Reviewers of the National Seminar on Distance Learning and Reciprocal Library Services, held in Kolkata during June 6-7, 2014.

Mr. Abani Oraon, Assistant Librarian has attended the Regional Training & Awareness Program on J-Gate@UGC-INFONET, held at Jadavpur University, Kolkata on 16th July 2014.

Central Workshop

The Central Workshop was developed as a core facility, to carry out practical classes and mechanical fabrication works as and when required. Down the years, the Workshop underwent changes in character as well as in the place it occupied in the perception of the people it was meant to serve, yet it continues to serve a large cross-section of this Institute. A basic training in central workshops satisfies the requirement for all streams of engineering during their first or second semester **Second year mechanical engineering, aerospace students; attend the machine shop practice class in workshop.**

Workshop extends its facilities to the UG and PG students to carry out fabrication work of their projects and research activities of PhD students.

The workshop has following well equipped shops: Machine Shop, forging & Welding Shop, Fitting Shop, Electrical Shop, Carpentry Shop. All shops are well equipped with latest machinery, material and equipment.

Apart from conventional machines like lathe, milling, shaper, drilling, grinding etc machine shop under central workshop has **CNC machining center, CNC Milling with ATC, Center-less grinding Machine, Universal milling machine with retrofit. The central workshop is headed by Superintendent of Workshop.**

VISION

In the present age when science and technology form the backbone of industry, a technocrat is expected to acquire greater level of skills and knowledge. He has to confront the complexities of competitive manufacturing and very fast development in the design of machinery and innovations in production methods. Engineering curriculum should therefore conform to the above need effectively. The main purpose of an engineering workshop is to provide the basic working knowledge of the production and the properties of different material used in industry and to appraise the students of basics and applications of various types of tools, equipments, machinery and techniques used in manufacturing to facilitate shaping of these materials into useful products and components.

The central workshop should provide a good theoretical background as well as sound practical hands on practice to a student. The objective of the central workshop is to expose students to basics of manufacturing as it plays a direct role in improvement of quality of human life and creating wealth for the nation. This knowledge is highly essential for pragmatic supervision and control of productive operations in future life
It covers:

- Importance of manufacturing
- Relation between materials and manufacturing
- An overview of manufacturing processes
- Product manufacturing
- Importance of product assembly and inspection
- An overview of manufacturing planning
- Manufacturing automation and computer aided manufacturing for industry.

Annual Convocation

The **2nd Annual Convocation** of IIEST, Shibpur was held at 10.30 am on 4th March, 2016 at the Institute premises.
An academic precession consisting of the Hon'ble Chief Guest, Chairperson, BOG, Director and other dignitaries along with the members of Board of Governors and Senate arrived at the convocation venue at about 10.30 am.

The convocation address was delivered by the **Chief Guest, Shri Atul Sobti,** Chairman and Managing Director, Bharat Heavy Electricals Limited.

Dr. K. Radhakrishnan, former Chairman & Advisor, ISRO and Chairperson, Board of Governors, IIEST, Shibpur presided over the Convocation.

The institute has conferred **Shri Mrinal sen,** an iconic film personality of present epoch, the degree of **Doctor of Literature (Honoris Causa) in absentia.** The Institute also conferred **Pandit Ajoy Chakrabarty,** the famous maestro of Indian Hindustani Classical Music, the degree of **Doctor of literature (Honoris Causa).** The degree of **Doctor of Science (Honoris Causa)** was conferred on **Professor Suhash Chandra Dutta Roy,** INSA Honorary Scientist and on **Professor Goverdhan Mehta,** National Research Professor, School of Chemistry, University of Hyderabad, for their outstanding contribution in engineering and science, respectively.

The Institute also conferred **Distinguished Alumnus Award** to four distinguished alumni who have contributed significantly in their profession, namely i) **Prof. Tathagata Roy**ii) **Dr. Dhrubojyoti Ghosh,** iii) **Prof. Sriman Kumar Bhattacharyya and** iv) **Prof. Ajit Chakraborty. Distinguished Teacher Award** was conferred on three distinguished teachers, who have contributed significantly towards shaping the future of the students of this Institute, namely **i) Prof. Subrata Sengupta ii) Prof. Sujit Kumar Roy and iii) Prof. Susanta Kumar Sarkar.**

Total number of Degree recipients in this Convocation was 916. Degrees and prizes were awarded in this Convocation to a total of 449 Undergraduate students of 10 courses, 410 postgraduate students from different courses and 57 Ph.D. Institute Medals was awarded to 34 candidates who have secured highest marks in different disciplines. **The President of India Gold Medal** was awarded to the student Amrita Roy Choudhury of CST Department who secured 1st position among the undergraduates of all ten engineering disciplines. Some endowment medals were also awarded to the students who stood first in their respective disciplines or have secured highest marks in particular subjects.

List of Consultancy (2015 – 16)

Sl. No.	Financial Year	Dept.	Investigator	Title of the Project	Funding Agency	Sanctioned (Rs. in lakh)
1	2015-2016	Civil	Ambarish Ghosh	Soil Investigation for the Proposed Construction of Boy's Hostel in the premises of Government College of Engineering & Ceramic Technology, Kolkata	College of Engineering & Ceramic Technology, Govt. of West Bengal	1.8000
2	2015-2016	Civil	Saibal Kumar Ghosh	Vetting of G+16 Storied building at New Town Kolkata	PRAKRITIK Housing Co-operative Society Ltd.	1.9465
3	2015-2016	Civil	Saibal Kumar Ghosh	Vetting of 4 Storied Barrack & Type II Residential Building	Aakriti, Kolkata	0.8588
4	2015-2016	IIPC	Ashok Kumar Maitra	Technical Inspection (Visual) of Non-linear Ropeway site at Bhasa	Conveyor & Ropeway Services Pvt. Ltd.	0.3435
5	2015-2016	Civil	Saibal Kumar Ghosh	Vetting of Salt Lake KendriyaVidyalaya	Abhirup Architects & Engineers	0.4000
6	2015-2016	Civil	Asok Adak	Vetting of Hydraulic Design and Drawing of Storm Water Drainage System of Lake Gardens Area under Borough - X of KMC followed by proposal of Drainage Pumping Station	Comtel Consultants &InfraprojectsPvt. Ltd.	1.1000
7	2015-2016	Civil	Subrata Chakraborty	Vetting of structural design of proposed construction of East Bidhannagar Police Station	WBPH & Infrastructure Development Corporation Ltd.	1.7175
8	2015-2016	HRM	Manas Kumar Sanyal	Advisory Services for Carrying out Social and Environment Impact Assessment for SH-13 Package - III	RITES Ltd.	1.3740
9	2015-2016	Civil	Ambarish Ghosh	Independent Assessment of effect of vibration, emanating from installation of Piles for Construction of proposed B+G+XVII office building - Siddha Esplanade Project, Kolkata under M/S SIDDHA REAL ESTATE DEVELOPMENT PRIVATE LIMITED at 6 J.L. Nehru Road, Kolkata – 700007	Siddha Real Estate Development Private Limited	2.0610
10	2015-2016	Civil	Saibal Kumar Ghosh	Vetting of Building in B.R. Singh Hospital	Panchadeep Constructions Ltd.	0.5000
11	2015-2016	Civil	Saibal Kumar Ghosh	Vetting of Structural design - Akademia Tower	ShibNiketanPvt. Ltd.	2.5763
12	2015-2016	Civil	Aparna (Dey) Ghosh	Vetting of Design & Drawings of Effluent Treatment Plant at Haringhata Dairy under KMDA, E&WEPL	Effluent & Water Treatment Engineers (P) Ltd.	0.7584

13	2015-2016	Civil	Saibal Kumar Ghosh	Third Party Inspection of paving block	Haldia Dock Complex	2.5992
14	2015-2016	Civil	Ambarish Ghosh	Independent Assessment of effect of vibration, emanating from installation of Sheet Piles using a vibro-sinker at 2 Judge Court Road, Alipore, Kolkata (for PROPOSED CESC CORPORATE OFFICE BUILDING), on the adjoining structures and providing guidance to the construction team	ShapoorjiPallonji and Company Pvt. Ltd.	1.7368
15	2015-2016	IIPC	Ashok Kumar Maitra	Technical Inspection of DRV Passenger Ropeway at Darjeeling	Conveyor & Ropeway Services Ropeway at Darjeeling	1.8810

16	2015-2016	Civil	Ambarish Ghosh	Strengthening and Widening to 2 lane/2-lane with paved shoulder configuration of Ghatakpukur - Malancha - Sarberia Section of Kolkata Basanti Road (Section of SH-3) in West Bengal, Km29 Ch to Km 60 Ch Length - 31 Km (approx.) District - 24 Pgs. (North and South) Construction of Embankment with Fly Ash - reg.	AdhunikInsfrastructure (P) Ltd.	2.5080
17	2015-2016	Civil	Ambarish Ghosh	Non Destructive Testing and Analysis of Piles at Berth 18 KPD in Kidderpore Dock - II	Kolkata Port Trust	0.5130
18	2015-2016	Civil	Ambarish Ghosh	Review of Structural Stability and Adequacy of Berth 4, 5, & 8 NSD for allowing working of Mobile Harbour Crane (MHC)	Kolkata Port Trust	2.2800
19	2015-2016	Civil	Ambarish Ghosh	Stability test of Dyke / Embankment through the proposed Navigational Channel across Nayachara Island as a Long Term Measures of KoPT	WAPCOS Ltd.	6.2700
20	2015-2016	Civil	SoumyaBhattacharjya	Proof Checking of Warehouse at Agartala	RITES Ltd.	1.7100
21	2015-2016	Civil	Ambarish Ghosh	Analysis and Design of Mastand it's Support System on the building roof top at Sagar	Kongsberg Norcontrol Surveillance Pvt. Ltd., Gujrat	0.6840
22	2015-2016	Civil	Aparna (Dey) Ghosh	Earthquake Resistance Certificate	Shukla Devi Academy for B.Ed.	0.5700
23	2015-2016	Civil	Saibal Kumar Ghosh	Stability Test of 2 Bays at Metal & Steel Factory, Ishapore	Metal & Steel Factory, Ishapore	5.6180
24	2015-2016	Civil	Arun Kumar Chakraborty	Consultancy for compressive strength of 100 mm grout cubes for up-gradation of Man Entry Brick Sewer & allied works along Rashbehari Avenue under JNNURM	Gypsum Structural India Pvt. Ltd.	0.2850
25	2015-2016	Civil	Ambarish Ghosh	Vetting of Structural Design of PrabhuJagatbandhu College at Andul, Howrah	Unitech Construction	1.1400
26	2015-2016	Civil	Ambarish Ghosh	Soil Exploration for Proposed Construction of Road over canal in between South Sealdah Road and Canal South Road	The Kolkata Municipal Corporation, Kolkata	1.9500

27	2015-2016	Civil	Ambarish Ghosh and Sujit Kumar Dalui	Assessment of the stability of the residential building at Premises No. 1665, Nayabad, Ward no. 109, Borough No. 12 under KMC	N.B. Constructor, Kolkata	0.3420
28	2015-2016	Civil	Sudip Kumar Roy and Sandip Chakraborty	Strengthening and Widening/Reconstruction of Koderma - Domchanch - Khorimahua - Jamua Road (SH 13) to two lane with paved shoulder under EPC Mode: Safety Consultant	Ram Kripal Singh Construction Pvt. Ltd.	25.3080
29	2015-2016	Civil	Arun Kumar Chakraborty	Vetting for Civil Design and Drawings for Abutment of Bailey Bridge Bridge (Package for Sambalpur &Sudargarh District, Odisha	Sinha & Associates (Engineers & Design Consultants)	0.8427
30	2015-2016	Civil	Ambarish Ghosh	Vetting of the Design of Foundation and Superstructure system for the proposed project "Construction of G+2 Educational Building at Garhbeta college"	Garhbeta College, Garhbeta, PaschimMedinipur - 721127	0.7500
31	2015-2016	Civil	Ambarish Ghosh	Soil Exploration for Construction of Multi Storied Building in the	SammilaniMahavidyalaya, E.M.	0.9700
32	2015-2016	Civil	Arun Kumar Chakraborty	Consultancy for Material Design for piles etc for DebendrabalaGhat to Newtown 11.5 km Pipe line project	Simplex Infrastructures Limited	0.2247
33	2015-2016	Civil	Tapas Kumar Roy	Technical vetting of structural design and estimate of a new classroom building of Moyna College	Moyna College, PurbaMedinipur	2.0000
34	2015-2016	Civil	Saibal Kumar Ghosh	Inspection of VidyasagarSetu	HRBC	234.1270
35	2015-2016	Civil	Saibal Kumar Ghosh	Vettling of Beck Bagan Flyover &Mridangabhanga Bridge	HRBC	16.8074
36	2015-2016	Civil	Saibal Kumar Ghosh	Vetting of Design & Drawing of Tower at Belilius Park, Howrah	PanchdeepContructions Ltd.	2.2800
37	2015-2016	Civil	Sudip Kumar Roy	Vetting of pavement design of strengthening and widening to Kolkata - Basanti Road (SH-3)	Solo Consulting Services Pvt. Ltd.	0.7500
38	2015-2016	Mining	Netai Chandra Dey& Pratik Datta	Scientific Study for Trench T-3 of ShardaHighwall Mining Project	Cuprum Bagrodia Limited	3.3708
39	2015-2016	Civil	Ambarish Ghosh	Soil Investigation for the Proposed Construction of a Building complex for accommodating the West Bengal State Council of Higher Education and West Bengal College Service Commission	Kolkata Division, Social sector, P.W.Dte., Govt. of West Bengal	2.5900
40	2015-2016	Civil	Sujit Kumar Dalui	Vetting of Design and Drawing of B+G+10 Residence for Hon'ble Minister of Govt. of West Bengal at Alipore, Kolkata	National Building Construction Corporation Ltd.	3.5000
41	2015-2016	Civil	Saibal Kumar Ghosh	Vetting of Design and Drawing of Bearings for ROB at Km 520 + 383	Oriental Structural Engineers Pvt. Ltd.	1.1400
42	2015-2016	Civil	Sujit Kumar Dalui	Vetting of Design and Drawing of B+G+2 Kolkata House of Govt. of	National Building Construction	3.5000

List of ongoing Projects (2015 – 16)

Sl. No.	Financial Year	Dept.	Name of Principal Investigator	Title of the Project	Funding Agency	Total Amount Sanctioned (Rs. in lakh)
1	2015-2016	Chemistry	Nanda Dulal Paul	Metal Ligand Cooperativity in Transition Metal Complexes of Multifunctional Ligands	SERB	30.95
2	2015-2016	Chemistry	Head of the Department	DST-FIST Program	DST-FIST	145.00
3	2015-2016	CHST	Sabyasachi Sarkar	Zinc Protoporphyrin and its Synthetic Variants as Carrier of Trimethylamine N-oxide in Atherosclerosis	SERB	50.00
4	2015-2016	Chemistry	Shyamal Kumar Chattopadhyay	Studies on some aspects of bio-coordination chemistry of vanadium and Copper	DST-WB	9.18
5	2015-2016	CHST	Amit Roy Chowdhury	Programme Support on Translational Research on Biomaterials for Orthopaedic and Dental applications	Dept. of Biotechnology	10.01
6	2015-2016	Chemistry	JayatiDatta	Formulation and Fabrication of composite Titania Matrix with Surface Plasmon and Quantum dots for use in Dye Sensitized Solar Cell and Sensor System	DST-Nano Mission	176.43
7	2015-2016	Chemistry	Nanda Dulal Paul	Development of New Catalytic Methodology using Transition Metal Complexes of Macrocyclic Ligands	CSIR	18.17
8	2015-2016	CST	Amit Kumar Das	Content Based Image Retrieval	INTEL, USA	15.24
9	2015-2016	Civil	Anirban Gupta	Demonstration of child-friendly group handwashing facilities in schools in Malda	UNICEF	19.38
10	2015-2016	Metallurgy	Debdulal Das	Wear Performance Evaluation of High Strength Microalloyed Steels	Tata Steel, Jamshedpur	1.97
11	2015-2016	Metallurgy	Swarup Kumar Ghosh	Microstructure and mechanical properties of thermo-mechanically processed micro-alloyed high carbon steels	Tata Steel, Jamshedpur	1.97
12	2015-2016	Physics	AbhijitMajumdar	Non-thermal plasma jet for blood coagulation and skin disease treatment	Board of Research in Nuclear Science (BRNS)	21.09

13	2015-2016	Chemistry	Mrinal K. Bera	Synthesis of Binol based chiral pyridine and pyrimidine derivatives	Alexander Von Humboldt Foundation, Germany	13.27
14	2015-2016	ETC	MonalisaSingha Roy	Synthesis methodology of analog and digital codesign and optimization	DST (WOS-A)	17.75
15	2015-2016	Civil	Anirban Gupta	Demonstration of child-friendly group handwashing facilities in schools	UNICEF	5.06
16	2015-2016	Chemistry	Chinmoy Bhattacharya	Photoelectrochemical solar cells based on semiconductor bismuth compounds	DST (International Division)	10.76
17	2015-2016	Physics	Sampad Mukherjee	Investigation of effect of structure of jute and allied fibre products on sound insulation property	National Agriculture Science Fund, Indian Council of Agricultural Research (NASF, ICAR)	27.13
18	2015-2016	CEGESS	HiranmoySaha	Collaborative Research with HITK	Heritage Institute of Technology, Kolkata	2.00
19	2015-2016	CEGESS	Chandan Banerjee	Realization of high efficiency interdigitated back-contact (IBC) silicon heterojunction (SHJ) solar cells with novel front structure	DST	55.35
20	2015-2016	VLSI	HafizurRahaman	SMDP-C2SD (SMDP-Chips to System Design)	DEITY, MCIT, Govt. of India	128.00
21	2015-2016	CHST	Jagadis Chandra Misra	Problems on Heat and Mass Transfer in Physiological Fluid Dynamics: Modeling and Simulation	SERB	25.74
22	2015-2016	Metallurgy	Debdulal Das	Fatigue Property Evaluation and Microstructural Characterization of Hot Rolled Steels	Tata Steel, Jamshedpur	14.85
23	2015-2016	Metallurgy	Debdulal Das	Micromechanism of Fatigue Failure of a Few High Strength Grades Produced Through TSCR Route	Tata Steel, Jamshedpur	14.85
24	2015-2016	Metallurgy	Manojit Ghosh	Evolution of microstructure and texture in dissimilar alloys during electron-beam and friction stir welding	Dept. of Atomic Energy (DAE), Board of Research in Nuclear Sciences (BRNS)	17.75
25	2015-2016	CEGESS	HiranmoySaha	Development of Solar Cities	MNRE	5.00

INDIAN INSTITUTE OF ENGINEERING SCIENCE AND TECHNOLOGY
SHIBPUR, HOWRAH - 711 103

BALANCE SHEET AS ON 31ST MARCH 2015

Amount in Rupees

SOURCES OF FUNDS	Schedule	Current Year	Previous Year
CORPUS / CAPITAL FUND	1	1,284,766,126	1,122,532,557
DESIGNATED / EARMARKED / ENDOWMENT FUNDS	2	130,789,989	376,310,484
CURRENT LIABILITIES & PROVISIONS	3	510,188,211	18,953,083
TOTAL		**1,925,744,325**	**1,517,796,124**

APPLICATION OF FUNDS	Schedule		Current Year	Previous Year
FIXED ASSETS	4		827,039,997	638,392,106
- Tangible Assets		770,941,327		-
- Capital Work in Progress		48,800,000		
- Intangible Assets		7,298,670		-
INVESTMENTS FROM EARMARKED / ENDOWMENT FUNDS	5		193,477,483	79,671,640
- Long Term		182,391,859		
- Short Term		11,085,624		
INVESTMENTS - OTHERS	6		210,102,445	198,903,888
CURRENT ASSETS	7		649,657,831	577,825,962
LOANS, ADVANCES & DEPOSITS	8		45,466,570	23,002,528
TOTAL			**1,925,744,325**	**1,517,796,124**

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Finance Officer

Registrar

Director

D. Bandyopadhyay, Proprietor
M. No.- 057861
for DEBASIS BANDYOPADHYAY & CO
Chartered Accountants

INDIAN INSTITUTE OF ENGINEERING SCIENCE AND TECHNOLOGY
SHIBPUR, HOWRAH - 711 103

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2015

Amount in Rupees

Particulars	Schedule	Current Year	Previous Year
INCOME			
Academic Receipts	9	100,299,531	82,048,875
Grants / Subsidies	10	542,390,273	505,013,423
Income from Investments	11	30,181,283	25,933,779
Interest earned	12	18,247,938	12,792,829
Other Income	13	45,213,444	48,994,768
Prior Period Income	14	2,547,779	-
TOTAL (A)		738,880,247	674,783,674
EXPENDITURE			
Staff Payments & Benefits (Establishment expenses)	15	472,957,046	416,539,070
Academic Expenses	16	132,094,284	55,896,011
Administrative Expenses	17	39,876,528	49,166,829
Transportation Expenses	18	1,493,749	1,200,142
Repairing & Maintenance	19	53,888,981	85,212,405
Depreciation		45,723,600	75,871,192
Finance Costs	20	58,509	151,266
Other Expenses	21	-	-
Prior Period Expenses	22	-	-
TOTAL (B)		746,092,697	684,036,915
Balance being excess of Income over Expenditure (A-B)		(7,212,450)	(9,253,241)
Transfer to / from Designated Fund			
Building fund			
Others (specify)			
Balance being Surplus / (Deficit) carried to Capital Fund		(7,212,450)	(9,253,241)

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Finance Officer

Registrar

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INDIAN INSTITUTE OF ENGINEERING SCIENCE & TECHNOLOGY
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RECEIPTS AND PAYMENTS ACCOUNTS FOR THE YEAR ENDED 31st MARCH 2015

RECEIPTS	CURRENT YEAR	PREVIOUS YEAR	PAYMENTS	CURRENT YEAR	PREVIOUS YEAR
I Opening Balances			I Expenses		
a) Cash Balances	31,786		a) Establishment Expenses	472,957,046	
b) Bank Balances			b) Academic Expenses	132,094,284	
i. in Current Accounts	272,216,579		c) Administrative Expenses	39,705,528	
ii. Savings Accounts	161,009,747		d) Transporatation Expenses	1,493,749	
iii. Howrah Treasury PF	101,133,451		e) Repairs & Maintenance	53,888,981	
c) Cheques in hand	36,222,443		f) Prior Period Expenses	-	
II Grants Received			II Payments against Earmarked/Endowment Funds	34,296,737	
a) From Govt. of India	328,300,000				
b) From State Govt.	47,675,400		III Payments againsts Sponsored/Scheme	126,488,041	
c) Form UGC-Non Plan	1,172,364				
c) Form Other Sources (Details)	-		IV Payments against Sporsored/Fellowship/Scholarship	37,593,247	
III Academic Receipts	100,299,531				
IV Receipts against Earmarked/Endowment Funds	22,358,464				
			V Expenditure on Fixed Assets and Capital Works-in-progress		
V Receipts againsts Sponsored/Scheme	159,433,384		a) Fixed Assets	115,797,922	
VI Receipts against Sporsored/Fellowship/Scholarship	46,321,540		b) Capital Works-in-Progress	48,800,000	

... Contd.

Chartered Accountants

RECEIPTS	CURRENT YEAR	PREVIOUS YEAR	PAYMENTS	CURRENT YEAR	PREVIOUS YEA
VII Income on Investments from					
a) Earmarked/Endowment Funds	653,620		VI Refunds of Grants	6,462,218	
b) Other Investments	3,405		VII Deposit and Advances	19,451,011	
VIII Interest Received on					
a) Bank Deposits	10,116,634		VIII Other Payments (Finance Cost)	58,509	
b) Loans & Advances	-				
c) Savings Bank Accounts	18,247,938		IX Term Deposits transactions (net) with Schedule Banks	113,792,568	
d) Providend Fund	7,211,956				
IX Other Income (Including Prior Period Income)	9,805,408		X Closing Balances		
			a) Cash Balances	191,793	
X Deposit and Advances	39,643,240		b) Bank Balances		
			i. in Current Accounts	(68,090,248)	
XI Miscellaneous Receipts including Statutory Receipts	132,954		ii. Savings Accounts	104,049,748	
			iii. Howrah Treasury PF	119,466,666	
XII Any Other Receipts	8,106,373		c) Cheques in hand	11,598,417	
	1,370,096,217			1,370,096,217	

Finance Officer

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