



## **Director's Report**

**Thirteenth Convocation**

**Friday, 27 May 2011**

**Indian Institute of Technology Guwahati**

Shri Jairam Ramesh, Hon'ble Minister of Environment and Forests, Govt. of India, Dr. R. P. Singh, Chairman, Board of Governors, members of the Board of Governors, members of the Senate, invited guests, graduating students, faculty and staff of the Institute, parents and guardians, ladies and gentlemen – it is my pleasure to welcome you all to the Thirteenth Convocation of IIT Guwahati.

I take this opportunity to thank Shri Jairam Ramesh for accepting our invitation to be the Chief Guest of this Convocation and for kindly agreeing to deliver the Convocation Address.

Today, BTech, BDes, MTech, MDes, MSc, MA and PhD degrees are going to be awarded to 737 students. I extend my heartiest congratulations to all of them.

Now I am going to present a brief report on the activities and achievements of the Institute during the year 2010-2011.

## **THE BOARD OF GOVERNORS**

Shri Prabhat Sawyan, architect and industrialist joined the Board as the nominee of the Govt. of Meghalaya in July 2010. Prof. Samarendra Dandapat, Dean (Administration) and Professor, Department of Electronics and Electrical Engineering, IIT Guwahati joined the Board in December 2010 as a Senate's nominee. On behalf of the Board, I welcome them both to the Board and I thank the outgoing Board member, Prof. Alike Khare, Department of Physics, IIT Guwahati, for her contributions during her tenure.

## **ACADEMIC ACTIVITIES**

The Institute offers

- Bachelor of Technology (BTech) Programmes in Biotechnology (BT), Chemical Engineering (CL), Chemical Science and Technology (CT), Civil Engineering (CE), Computer Science and Engineering (CS), Electronics and Communication Engineering (EC), Electronics and Electrical Engineering (EE), Engineering Physics (EP), Mathematics and Computing (MC), and Mechanical Engineering (ME),
- Bachelor of Design (BDes) programme in the Department of Design,
- Master of Technology (MTech) programmes in BT, CL, CE, CS, EE and ME,

- Master of Science (MSc) programmes in Chemistry (CH), Mathematics and Computing (MC), and Physics (PH),
- Master of Arts (MA) programme in Development Studies (DS) in the Department of Humanities and Social Sciences (HS), and
- Doctor of Philosophy (PhD) programmes in all departments and in the Centres for Energy (EN), the Environment (EV), and Nanotechnology (NT).

The Department of Electronics and Communication Engineering (EC) has been renamed as the Department of Electronics and Electrical Engineering (EE) in order to accommodate all its current activities more appropriately.

The total number of enrolled students in 2010-2011 is 3379. Of these, 46.4% are post-graduate students. The detailed break up is

### **Preparatory Programme: 7**

#### **Four-year BTech and BDes: 1804**

4<sup>th</sup> Year (2007 Batch): 350 (BT-29, CE-40, CL- 35, CS-52, CT-19, DD-19, EC-52, EP-21, MC-28, ME-55)

3<sup>rd</sup> Year (2008 Batch): 388 (BT-26, CE- 43, CL-35, CS-58, CT-21, DD-22, EC-53, EE- 28, EP-20, MC-26, ME-56)

2<sup>nd</sup> Year (2009 Batch): 467 (BT-32, CE- 51, CL-47, CS-68, CT-30, DD-23, EC-60, EE- 29, EP-27, MC-32, ME-68)

1<sup>ST</sup> Year (2010 Batch): 573 (BT-43, CE-66, CL-63, CS-72, CT-33, DD-43, EC-66, EE- 43, EP-31, MC-36, ME-77)

From Earlier Batches: 26

#### **Two-year MSc: 214**

2<sup>nd</sup> Year (2009 Batch): 87 (CH-35, MC-27, PH-25)

1<sup>st</sup> Year (2010 Batch): 121 (CH-38, MC-42, PH-41)

From Earlier Batches: 6

#### **Two-year MA (DS): 61**

2<sup>nd</sup> Year (2009 Batch): 17

1<sup>ST</sup> Year (2010 Batch): 44

#### **Two-year MTech: 548**

2<sup>nd</sup> Year (2009 Batch): 239 (BT-24, CE- 54, CL-32, CS-42, EE-42, ME-45)

1<sup>ST</sup> Year (2010 Batch): 293 (BT-30, CE-64, CL-39, CS-52, EE-46, ME-62)

From Earlier Batches: 16

**Two-year MDes: 35**2<sup>nd</sup> Year (2009 Batch): 141<sup>st</sup> Year (2010 Batch): 21**PhD: 710**

(BT-81, CE-63, CH-113, CL-51, CS-40, DD-19, EE-86, EN-19, EV-17, HS-51, Math-32, ME-64, NT-12, PH-62)

Today, **737** students, who have successfully completed their programmes will receive their degrees in the following disciplines:

**BTech/BDes**

BT: 26, CE: 37, CL: 33, CS: 53, CT: 18, DD: 20, EC: 59, EP: 20, MC: 22, ME: 52;

**Total: 340****MA**DS: 13; **Total: 13****MSc**CH: 35, MC: 26, PH: 26; **Total: 87****MTech/MDes**BT: 25, CE: 47, CL: 34, CS: 34, DD: 14, EE: 39, ME: 44; **Total: 237****PhD**BT: 8, CE: 8, CH: 14, CL: 3, CS: 2, EE: 3, EN: 2, EV: 2, HS: 4, Math: 1, ME: 7, NT: 3, PH: 3; **Total: 60****ACADEMIC INFRASTRUCTURE DEVELOPMENT**

The Internet bandwidth has been upgraded to 180 Mbps with the addition of 100 Mbps from the National Knowledge Network of which the Institute is an active partner. The network backbone is being upgraded to 10 Gbps capacity. The ADSL broadband network facility has been extended to the staff quarters in the campus.

The Central Library now has a collection of 1,30,583 items. This includes 9,795 subscribed online journals and magazines. The availability of research papers online has helped the students and faculty members a lot in their academic activities. A number of new equipment have been added to the laboratories of all the Departments and Centres. Some of the major equipment and facilities acquired by the Institute during the last year are

- Physical Property Measurement System – ₹ 1.77 crores
- Spectroscopic Ellipsometer – ₹ 1.34 crores

- High Resolution Mass Spectrometer – ₹ 1.26 crores.
- Nanoindenter – ₹ 94.4 lakhs
- Fast Protein Liquid Chromatography System – ₹ 34.35 lakhs
- Bench-Top Powder X-Ray Diffractometer – ₹ 33.75 lakhs
- Ultra violet - visible - near Infra-red Spectrophotometer – ₹ 25 lakhs

## **RESEARCH AND DEVELOPMENT**

The number of PhD students on campus is increasing every year. This year has seen a big jump in numbers, growing from 575 last year to 710. The current faculty to PhD students' ratio of 2.64 surpasses the target of 2.5 set by us last year. The number of PhDs graduating per faculty is 0.22. This may seem low, but I would like to point out that about a third of our faculty have spent less than four years in the Institute and so they could not have supervised any graduating PhD student. The ratio rises to 0.33 when we exclude them. Nevertheless, our goal is to increase the number of PhDs graduating every year.

The other component of our research programme is sponsored (or directed) research. There are 200 research staff (of which 31 are also enrolled for PhD).

IIT Guwahati considers it essential for all members of its faculty to be involved in research and development for contributing to the knowledge pool and/or developing new technologies for the benefit of humanity. We offer a 'Start-up Research Grant' to newly-joined faculty members of the Institute to start their research activities. During this year, 20 projects have been sanctioned under this scheme worth ₹ 98.20 lakhs.

In 2010-2011, the Institute obtained sponsored research and consultancy projects worth ₹ 40 crores as compared to ₹ 39 crores last year, while the total funds received has gone up from ₹ 22 crores to ₹ 42 crores. Over 330 projects were in progress during this year. The R&D projects were mainly sponsored by Government Ministries and Departments with major support coming from Ministries of Environment (MoE), Human Resource Development (MHRD), Departments of Science and Technology (DST), Biotechnology (DBT), Atomic Energy (DAE), Information Technology (DIT), Council of Scientific and Industrial Research (CSIR) and Defence Research Labs (DRL). The following table provides a comparison of this year's R&D project profile with that of last year.

<b>Particulars</b>	<b>2009-2010</b>	<b>2010-2011</b>
New sponsored projects received	51	88
New consultancies received	202	203
Total sanctioned value of the new sponsored projects (in crores of ₹)	34.00	37.00
Total sanctioned value of the new consultancy projects and others (in crores of ₹)	5.00	3.18
Total amount received for all projects (new and ongoing) (in crores of ₹)	17.77	37.92
Total amount received for all consultancy projects and others (new and ongoing) (in crores of ₹)	4.05	3.77

Some of the major research projects received during the year are

<b>Project Title</b>	<b>Funding Agency</b>	<b>Dept. / Centre</b>	<b>Amount Sanctioned (lakhs of ₹)</b>
Study of apoptotic signalling pathways in mesenchymal stem cells during normal and differentiated state	DBT	BT	63.45
Betraying the parasite's redox system: Studies on spermidine synthase of leishmania donovani	DBT	BT	82.18
Development of aptamer based molecular diagnostics for breast cancer	DBT	BT	67.2
Development of on line handwriting recognition system for Indian language (OHWR) – Phase II – Deployment of an application and improvement of engine performance	DIT	EEE	70
Speech-based access for agricultural commodity prices in six Indian languages	DIT	EEE	57.62
Climate change water and rural livelihoods: Assessing socio-economic vulnerability and potential adaptive strategies in eastern Himalayan region, India	SIDA*	HSS	100
Design and development and fabrication of OLED organic solar cells and organic TFTs based on molecular polymeric and composite materials	DST	NT	523.15

Ganga river basin management plan	MoEF	CE	59.5
FIST: to strengthen research activities in the areas of fluid mechanics, advanced materials and clean energy and simulation studies	DST	CL	225
FIST: to strengthen research activities in the areas of structural engineering and water resources	DST	CE	305
FIST: to strengthen student training and research facilities in the area of "Medical Image Processing"	DST	EEE	108
FIST: to strengthen activities in Physical Sciences	DST	PH	229

\*SIDA – Swedish International Development Cooperation Agency

In addition to sponsored Research Projects, IIT Guwahati undertakes consultancy assignments for various State Government Departments, Railways, National Highways Authority of India, Oil and Gas Sector, Construction and Infrastructure Companies, Power Sector, Education Institutes, Health and Pharmaceutical Industries and Financial Institutions.

A total of 203 consultancy projects (including the testing and recommendation jobs) were carried out in the year. The total value of the consultancy projects undertaken during this year is ₹ 3.18 crores, and ₹ 3.77 crores was received for all consultancies.

The 'IIT Guwahati Technology Incubation Centre' was established to facilitate co-operation and interaction between the Institute and entrepreneurs in various sectors of science and engineering, and promote innovation through formal and informal means. The activities of the centre are progressing well with five active incubatees already in its fold.

## **FACULTY AND STAFF**

The faculty strength at the end of March 2011 was 269. This is an increase of 18 from 251 at the end of last year. This is in comparison to an increase of 31 last year. Even though a number of faculty are due to join in the coming months, we need to increase our efforts in recruitment. We should have had 338 faculty members rather than the 269 we had.

The non-faculty staff strength remains unchanged at 323. But I am glad to inform you that after many years of struggle, we were able to get the Ministry's approval for the creation of 100 new posts. While many of the posts are to absorb those

already on contract, we are in the process of adding about 30 more staff. Another 50 posts are likely to be created in August after the new batch of students come in. You may be aware that the approved student to staff ratio is 100:11. So with 3800 students by August, the number of posts will become 418. We have also submitted a promotion policy to MHRD with the approval of the Board. This will help in the career progression of staff.

## **PUBLICATIONS**

The faculty members of the Institute have been actively publishing research papers in international and national journals as well as in conference proceedings. The number of publications during the past one year are

**Journals** : **457**

**Conferences** : **481**

The number of journal publications have gone down from 478 last year, while the number of conference publications have increased, from 426 last year. Even though the per faculty output is satisfactory at 1.7 for journals and quantity alone cannot measure success, there is no room for complacency here and the reduction from last year is a cause of worry.

## **CONFERENCES/WORKSHOPS/SCHOOLS/COURSES**

Various conferences, seminars, workshops and schools were organised by the Departments and Centres of the Institute during the year. A few of them are

- ICM satellite conference on Galois Representations in Arithmetic and Geometry, 10-13 August 2010.
- International Workshop on Recent Advances in Computational Fluid Dynamics (RACFD 2010), 30 August – 2 September 2010.
- SERC Preparatory School on Modern Optics, 10-13 November 2010.
- Advanced Instructional School on Numerical Linear Algebra, 2-22 December 2010.
- National Conference on Frontiers in Chemical Sciences (FICS-2010), 3–4 December 2010.
- International Conference on Fibre Optics and Photonics (PHOTONICS 2010), 11–15 December 2010.
- International Conference on Climate Change and Water: Assessing Vulnerability, Impact, and Adaptation in the Eastern Himalayas, 3–5 January 2011.



- Winter School on Speech and Audio Processing (WiSSAP 2011), 8–11 January 2011.
- DST SERC Winter School on Green Chemistry on the theme Research, Teaching and Application: Exploring Opportunities in Green Chemistry, 7–19 March 2011.
- National Workshop on Information Security Education and Awareness, 7–11 March 2011.

A total of nineteen short-term courses were also organised by the Departments and Centres of the Institute.

## **FACULTY ACHIEVEMENTS**

Dr. Arupjyoti Saikia has published a book titled, “Forests and Ecological History of Assam, 1826-2000” which has been well received. Prof. Arun Goyal, Department of Biotechnology, was elected as Fellow of the National Academy of Biological Sciences. Dr. Anugrah Singh, Department of Chemical Engineering, was awarded the Indo-US Science and Technology Forum fellowship for the year 2010 to visit California Institute of Technology, USA. Dr. Tamal Banerjee, Department of Chemical Engineering, received the Indo-US Fellowship in Engineering Sciences, 2011. Prof. T. Punniyamurthy, Department of Chemistry, received JSPS Bridge Fellowship 2010 and JSPS Short-Term Invitation Fellowship 2011. The symbol designed by Dr. D. Udaya Kumar, Department of Design, was chosen by the Govt. of India to represent the Indian Rupee. He was a student at IIT Bombay at that time. He was also adjudged Young Indian Leader by CNN-IBN and an ‘achiever under 35’ by India Today. Prof. Pradeep Yammiyavar, Department of Design, was empanelled by the Government of India as Scientific Adviser to the Controller General of Patents Design and Trademarks. Prof. Pinakeswar Mahanta, Department of Mechanical Engineering, was awarded India Distinguished Visiting Fellowship at University of Nottingham, United Kingdom. Dr. P. Muthukumar, Department of Mechanical Engineering, received DAAD Research Award for a short term research stay at University of Stuttgart, Germany. Dr. N. Sahoo, Department of Mechanical Engineering, received a DAAD Research Fellowship for a research visit to Aachen University, Germany. Prof. Subhash C. Mishra, Department of Mechanical Engineering, was elected fellow of the Indian National Academy of Engineering (INAE). Dr. P. K. Giri, Department of Physics, received the IIT-DAAD Faculty-Exchange-Visit Fellowship.

Our congratulations to all of them.

## CONSTRUCTION AND CAMPUS DEVELOPMENT

The construction activity in the campus is progressing in accordance with the increase in the number of students enrolled. There are now eight boys' hostels with a total capacity of 2940. The construction of the remaining portion of the eighth boys' hostel with a total capacity of 500 is going on and 240 rooms have already been occupied. Another 120 rooms are expected to be ready by June 2011. The construction of the ninth boys' hostel with a capacity of 1000 students was started in August 2009. Around 330 rooms will be ready for occupation from the next semester starting in July 2011. On completion of the eighth and ninth boys' hostel, the total capacity for boys will be 4200.

The girls' hostel has at present a capacity of 472 seats with expansion work going on for another 42 rooms along with kitchen and dining space. These rooms will be ready by July 2011. Construction of another block with an additional 112 rooms has been sanctioned and the construction work will begin shortly. With this, the total capacity of the girls' hostel will be 626.

The conference centre consisting of four halls (two of 150 capacity and two of 200 capacity) with audio-visual and air-conditioning facilities and a food court was completed in December 2010. The international conference on Fibre Optics and Photonics (PHOTONICS 2010) was held successfully in the centre in December 2010.

The Academic Complex of the Institute was initially constructed with floor area of about 74,000 m<sup>2</sup>. With the increase in student strength, the Institute is expanding the Academic Complex in a phased manner. Expansion works in the Departments of Chemical Engineering, Chemistry, Civil Engineering, Computer Science and Engineering, Design, Electronics and Electrical Engineering, Humanities and Social Sciences, Mathematics, Physics and Central Instruments Facility have already started and some of them will be ready for the new academic session.

Residences for faculty and non-faculty members are also under construction. On completion of all these by December 2012, the number of quarters will be F-type: 79, E-type: 114, D-type: 168, C-type: 72, and B-type: 175, for a total of 608.

Construction of residential quarters for the Principal, teachers and staff and an open auditorium for the Kendriya Vidyalaya is expected to be completed by March 2012.

In addition to the present Student's Activity Centre (SAC), work on another SAC building for conducting activities of welfare, cultural and technical boards of the

students' Gymkhana has started. Two food courts are also being built, one of which is for students.

In order to enhance the security of the campus, a road along the boundary wall of the campus is being built. This will allow patrolling of the campus perimeter by the security staff.

The campus beautification and 'make green' initiative started several years ago is progressing well.

## **INSTITUTE EXPENDITURE**

The details of expenditure during the year are as follows:

Recurring (in crores of ₹):	80.49
Non-recurring (in crores of ₹):	95.78
Sponsored Projects (in crores of ₹):	39.32
Total Expenditure (in crores of ₹):	215.59

## **STUDENTS' ACTIVITIES**

### **Alcheringa 2011**

Alcheringa, the annual cultural festival of the Institute, was held from 3-6 February this year. Alcheringa is now regarded as a major students' cultural event of the North-East in which thousands of students across the country take part in various youth oriented competitions, workshops, seminars and informal events. The performances of musicians and performing artistes of repute are the real crowd pullers. This year too well known artistes in the fields of music, dance and drama performed before huge crowds.

### **Techniche 2010**

Techniche 2010 – the annual techno-management festival of the Institute – was organised during 2–5 September 2010 with great success. One of the main attractions of Techniche was the Lecture Series, where eminent scientists, Nobel laureates, entrepreneurs and intelligentsia from around the world delivered lectures on their work, shared their experiences and thus greatly inspired the students. This year, eminent personalities from diverse spheres of technology and management visited the Institute. Among them were Mr. Richard M. Stallman (Father of GNU project, a free Unix-like operating system and founder of Free Software Foundation), Mr. Nathan Schulhof (father of MP3 player industry and developer of

the first word processor for Apple Computers Inc.), Dr. Ferid Murad (1998 Nobel laureate in Medicine) all of whom were on their first ever Indian visit. Some of the other events Techniche 2010 organised were Guwahati Half Marathon, workshop of American Parkour, robotics, paper presentations, quizzes, panel discussions and the international school olympiad technothlon which had a participation of over 1.5 lakh school students.

Following are the other regular events organised by the students during the year:

- Manthan – the intra-IIT cultural festival
- Spirit – the inter-college invitation sports competition
- Spardha – the annual sports meet
- Zest – the annual athletics meet

Along with these, there have been regular events and competitions organised by the various clubs and societies under the Cultural Council like the Movie Club, the Fine Arts Club, the Literary Club, the Photography Club, etc.

## **STUDENTS' ACHIEVEMENTS**

Mr. Sahil Salunke, a student of BTech programme in Mathematics and Computing, won the Classmate Ideas for India Challenge – a nationwide contest organised by ITC. Sahil was among the five best award winners chosen among over 60,000 nation-wide entries. Dr. Siva Murru and Dr. Saitanya K. Bharadwaj, PhD students of the Department of Chemistry, received the first and second prize, respectively in 2010 Eli Lilly and Company Asia Outstanding Thesis Awards at the University of Hyderabad in January 2011. Md. Hanif Choudhury, a PhD student of the Centre for Energy, has been selected for National Renewable Energy Fellowship 2010-2011 of the Ministry of New and Renewable Energy, Govt. of India. Mr. Golla Nani Babu, a student of BTech programme in Mechanical Engineering, broke the 28 year old record in the pole vault in the 46<sup>th</sup> Inter IIT sports meet held at IIT Delhi.

## **TRAINING AND PLACEMENT**

The placement scenario at IIT Guwahati for the year 2010-2011 has been good and better than the year before. A total of 104 companies from various sectors have so far participated in the recruitment process. Out of the total of 623 students (BTech: 309, BDes: 19, MTech: 208, MDes: 15, MSc: 59 and MA: 13) registered for placement, 92.1% BTech and BDes have been placed so far. The highest package offered to the BTech students is ₹ 20 lakhs p.a. with an average package of ₹ 7.40 lakhs p.a.

The percentage of placement till now for the MTech and MDes is reasonable and stands at 67.7%. The highest package offered to MTech students is ₹ 12.07 lakhs p.a. with an average package of ₹ 5.5 lakhs p.a.

For MSc programmes, 3 students have been placed out of the 59 registered candidates. 12 PhD students have also received job offers through the placement cell in various sectors.

Companies from several different sectors have participated in the campus recruitment process. The percentages of participation from various sectors are 29% in Core Engineering, 51% in IT, 13% in Research and Education and 7% in others. Among the core sector companies 11% are PSUs.

The branch-wise placement details are:

Discipline	UG (BTech/BDes/MSc)				PG (MTech/MDes/MA)			
	No. of Student Reg.	Total No. of jobs	No. Student Placed	% of Student Placed	No. of Students Reg.	Total No. of jobs	No. Student Placed	% of Student Placed
CSE	52	57	52	100	38	39	37	97.4
ECE	50	50	46	92	38	29	29	76
ME	54	54	50	93	30	28	28	93
CE	36	32	31	86	49	27	27	55
CL	34	29	29	85	32	11	11	34
BT	21	23	19	90	21	15	15	71
M&C	26	29	25	96	--	--	--	--
CST	18	18	16	89	--	--	--	--
EP	18	19	18	100	--	--	--	--
DD	19	16	16	84	15	4	4	26.7
PH (MSc)	11	--	--	--	--	--	--	--
CH (MSc)	30	--	--	--	--	--	--	--
M&C (MSc)	18	3	3	16.6	--	--	--	--
MA (HSS)	--	--	--	--	13	--	--	--

## **CLOSING REMARKS**

An IIT is an international institute, but it must also be sensitive to the environment it is in. IIT Guwahati has from the very beginning been working on local problems. In recent months, we have been an active participant in the discussions on technical issues regarding the building of hydel projects in the North-East. Our faculty have taken up projects on flood mitigation, river erosion, drainage in the city of Guwahati. Research in Earthquake engineering is a core strength of the Institute. We are strengthening our interaction with Indian Oil Corporation which has three refineries in Assam, and with Oil India Ltd, which has its registered office in Assam. IITG faculty are assisting the Govt. of Assam in areas such as Disaster Management, E-Governance, Higher and Technical Education Policy issues. Our faculty are involved in various academic interactions with the educational institutions in the North East. We have special arrangements with NERIST, NITs Silchar and Agartala to assist their faculty complete PhD degrees. Being the premier educational and R&D Institute in the North-East, we are called upon for assistance by various Central govt. Ministries and I am glad to inform you that our faculty, staff and students have delivered to the best of their abilities. The establishment of the Technology Incubation Centre is an opportunity to create a set of entrepreneurs who will invest in this region and help its economy to grow. The opportunities for contributions are huge especially since the problems are so many and so challenging. I urge the faculty and research students to be alert on the opportunities and challenges for research that the North-East provides.

As 8 new IITs are finding their feet, we have now graduated to the list of established IITs. Sixteen years may not be very long in the life of an Institute, but in this day and age when changes are so rapid, it is a long time. We have done well so far, but we have much more to do before we can truly count ourselves among the top institutes of the world. I am sure the young faculty that we have will be equal to the tasks ahead.

Graduating students, the world is before you and I wish you all success in your future endeavours. Honesty, sincerity, and sensitivity must be your fundamental values. I hope some of you will be able to return and build your career at IIT Guwahati.

Jai Hind.

Gautam Barua  
Director  
Indian Institute of Technology Guwahati