



## **Director's Report**

**Tenth Convocation**

**Friday, 23 May 2008**

**Indian Institute of Technology Guwahati**

Distinguished Chief Guest of the convocation and the Governor of Assam, His Excellency Lt. Gen. Ajai Singh, Chairman Board of Governors, Dr. M. K. Bhan, 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 – I, on behalf of the Institute, welcome all of you to this the Tenth Convocation of Indian Institute of Technology Guwahati.

I take this opportunity to thank the Honourable Governor of Assam 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, MSc and PhD degrees are going to be awarded to 468 students. I extend my heartiest congratulations to all of you degree recipients.

Now I am going to present a report on the activities and achievements of the Institute during the year 2007-2008.

## **THE BOARD**

Prof. Vinod Kumar Singh, IIT Kanpur, Shri P. Sharat Chandra, Principal Secretary, Government of Manipur, Prof. A. T. Khan, IIT Guwahati have joined as new members of the Board of Governors. I would like to thank the outgoing members, Shri P. K. Lahiri, Chairman, Indian School of Mines, Dhanbad, Shri P. Bharat Singh, Commissioner to the Govt. of Manipur, and Prof. J. B. Baruah, IIT Guwahati for their contributions to the development and administration of the Institute as members of the Board.

## **ACADEMIC ACTIVITIES**

The Institute has 11 academic departments, 3 inter-disciplinary academic centres and 4 service centres. No additions were made this year. These are:

### *The Departments are*

Biotechnology (BT), Chemical Engineering (CL), Chemistry (CH), Civil Engineering (CE), Computer Science and Engineering (CSE), Design (DE), Electronics and Communication Engineering (ECE), Humanities and Social Sciences (HSS), Mathematics (MA), Mechanical Engineering (ME), and Physics (PH).

### *The Academic Centres are*

Centre for Energy, Centre for the Environment, Centre for Nanotechnology

### *The Service Centres are*

Computer and Communication Centre, Central Instruments Facility, Centre for Educational Technology, Centre for Mass Media Communication.

The Institute offers academic programmes covering a wide range of science, engineering, and humanities disciplines. Two new programmes will start from the coming academic session – BTech in Electronics and Electrical Engineering and MTech in Biotechnology.

The number of students on the rolls in the academic year 2007-2008 at the undergraduate, postgraduate and PhD levels was **2114**. About 37% are post-graduate students. The detailed break up is given below:

**BTech/BDes: 1192**

4<sup>th</sup> Year (2004 Batch): 234 (BT-22, CE-24, CL-21, CSE-50, DD-19, ECE-50, ME-48)

3<sup>rd</sup> Year (2005 Batch): 252 (BT-23, CE-27, CL-26, CSE-53, CST-7, DD-15, ECE-53, ME-48)

2<sup>nd</sup> Year (2006 Batch): 345 (BT-30, CE-45, CL-36, CSE-57, CST-8, DD-22, ECE-53, MA-22, ME-57, PH-15)

1<sup>st</sup> Year (2007 Batch): 355 (BT-32, CE-46, CL-39, CSE-49, CST-21, DD-21, ECE-48, MA-23, ME-53, PH-23)

From Earlier Batches: 6

**Two Year MSc: 142**

2<sup>nd</sup> Year (2006 Batch): 69 (CH-25, MA-21, PH-23)

1<sup>st</sup> Year (2007 Batch): 70 (CH-21, MA-26, PH-23)

From Earlier Batches: 3

**MTech: 396**

2<sup>nd</sup> Year (2006 Batch): 191 (CE-36, CL-23, CSE-43, ECE-42, ME-47)

1<sup>st</sup> Year (2007 Batch): 200 (CE-45, CL-29, CSE-39, ECE-44, ME-43)

From Earlier Batches: 5

**MDes: 14**

1<sup>st</sup> Year (2007 Batch): 14

**PhD: 366**

(BT-36, CE-34, CH-61, CL-21, CSE-27, DD-6, ECE-40, ENERGY-10, ENVIRONMENT- 10, HSS-27, MA-22, ME-39, NANO-5, PH-28)

The numbers of successful candidates who are to receive their BTech, BDes, MSc, MTech and PhD degrees today are as follows:

**BTech/BDes**

Biotechnology: 23

Chemical Engineering: 25

Civil Engineering: 28

Computer Science and Engineering: 41

Design: 19

Electronics and Communication Engineering: 49

Mechanical Engineering: 40

Total: 225

**MSc**

Chemistry: 24

Mathematics and Computing: 26

Physics: 23

Total: 73

## **MTech**

Chemical Engineering: 13  
Civil Engineering: 21  
Computer Science and Engineering: 37  
Electronics and Communication Engineering: 33  
Mechanical Engineering: 39  
Total: 143

## **PhD**

Biotechnology: 2  
Chemistry: 6  
Chemical: 1  
Civil Engineering: 4  
Physics: 1  
Electronics and Communication Engineering: 3  
Mechanical Engineering: 5  
Mathematics: 2  
Total: 27

**Grand Total: 468**

## **ACADEMIC INFRASTRUCTURE DEVELOPMENT**

A High Performance Compute Cluster (HPCC) was installed in the Computer Centre to meet the high performance computational requirements of the Institute. The Institute is a part of a computational grid called GARUDA which connects educational institutes across 17 cities. The HPCC is also available to members of this grid. The HPCC has 16 nodes with each node having 8 CPUs, making it a 128 CPU system. It is the largest computing system in the North-East region. To cater to Internet requirements, a 34 Mbps link has been taken on lease. This has brought the total Internet bandwidth of the institute to 46 Mbps. Frequent cuts in fibre-optic cables of the service providers, due to the numerous construction activities in the city, has however, resulted in frequent disruptions of communication facilities.

The Central Library continues to grow in terms of its resources, facilities, and services. 9444 books and back-volumes were acquired leading to a total collection of about 96000. The amount involved on purchase of books was about Rs.1.5 crores. 414 periodicals were subscribed to and this involved an expenditure of Rs. 2 crores.

All the Departments and Centres have upgraded their laboratories by acquiring new equipment for the purpose of teaching and research. Many new laboratories have been established and upgraded. Some of the major equipment and facilities acquired by the Institute are:

- An X-Ray Photoelectron Spectrometer has been purchased for the Central Instruments Facility at a cost of Rs.181 lakhs
- A Picosecond Time Resolved Steady State Fluorescence Spectrometer was purchased for the Central Instruments Facility at a cost of Rs. 90 lakhs

- The EPABX system in the Computer and Communication Centre has been upgraded at a cost of Rs. 42 lakhs
- A Layer 3 managed rack mounted switch has been procured for the Computer and Communication Centre at a cost of Rs. 33 lakhs

## RESEARCH AND DEVELOPMENT

Research and Development is a very important component of the Institute's activities. IIT Guwahati tackles problems based on both national needs and global developments. It considers both fundamental and applied research to be equally important. Faculty and research staff are encouraged to keep pace with the rapidly expanding frontiers of knowledge, and working on fundamental problems helps. In applied research, the Institute aims to cater to the needs of the academic, corporate and social sectors. Particular emphasis is given to tackling problems that are of significance to the region in which the Institute is located, that is, the North-East region of the country.

The institute undertakes research and development projects through sponsored research projects, through consultancy projects, and also through the use of internal resources. Besides, the faculty, those taking part in R&D activities are staff in projects, scientific officers of the Institute, and PhD, Masters' and also some BTech students. The fact that there are 366 PhD students, clearly shows that R&D is vibrant in the Institute.

In 2007-2008, the Institute obtained sponsored research and consultancy projects worth Rs. 15.4 crores. Actual receipt of funds in the year was Rs. 12.71 crores. Last year, we received a total of Rs. 4.55 crores. There has therefore been a significant increase in extra-mural R&D funding. 183 projects were underway during the year, 9 of which were completed. The R&D projects were mainly sponsored by government Departments and Ministries with major support coming from Departments of Science and Technology (DST), Biotechnology (DBT), Atomic Energy (DAE), Environment (MoE), Information Technology (DIT), and CSIR, Defence Research Labs, and BRNS.

A comparison between last year and this year is shown in tabular form in the written version of this report.

Particulars	2006-07	2007-08
Total Number of Sponsored Projects received	31	55
Total Number of Consultancy Projects received	186	214
Total value of the above sanctioned Sponsored Projects	4.52	12.40
Total value of the above sanctioned Consultancy	1.25	3.00
Total amount received for all Projects (new and continuing)	3.35	10.93
Total amount received for all Consultancy (new and continuing)	1.20	1.78

Some of the research projects received during the year are:

Project Title	Funding Agency	Discipline	Amount Sanctioned (In Rs. lakhs)
Novel Nanoscale Materials: Generation, Characterization and Device Applications	DST	Nanotechnology	190.00
Investigation on Magnetic Properties of Select Novel Magnetic Materials	DST	Physics	144.00
Nanoscale Materials with Therapeutic implications	DBT	Nanotechnology	102.00
Study of Source Features for Speech Synthesis and Speaker Recognition	UKIERI	Electronics	88.00
Establishing an Information System on Water Resources of the Brahmaputra River System	DST	Civil Engg.	50.00
Optical properties of functionalized 1,8-naphthalimide derivatives and related compounds and their supramolecular chemistry	DST	Chemistry	39.00
Construction of Enzymatic Biofuel Cells for Biomedical Applications	DBT	Energy	35.00
A Testbed for a Mobile e-learning System	HP, USA	Computer Science	32.00
Study to Identify and Develop Sensors and triggering mechanisms for shutting down of electronic systems in heavy lightning situations	ATM	Electronics	30.00
In-vitro Production of Haploids in Tea	DBT	Biotechnology	29.00
Resource Centre for Indian Language Technology Solution (2nd Phase – Assamese and Boro)	DIT	Computer Science	27.00
Mechanisms of Photochemical Reactions in ionic Liquids	DST	Chemistry	24.00
Fault Tolerance with Checkpoint and Recovery Protocols in Cluster based Distributed Systems	DST	Computer Science	23.00

### National Projects

The following national level projects are continuing in the Institute:

- Rural Technology Action Group for North East (RuTAG-NE), established during 2005-06.
- Regional National Board for Higher Mathematics, Dept. of Atomic Energy, Library for North East Region
- Technical Backup Unit (TBU) supported by the Khadi and Village Industry Commission (KVIC)

Through consultancy projects, an important goal is being achieved, that of contributing to the industrial, economic and social growth of the North East Region,. Faculty are providing services to Assam State Government Departments, the N. F. Railway, National Highway Authority of India, Oil and Gas Sector companies, and the North Eastern Council, among others. Areas where consultancies are being provided include E-governance, river bank erosion, road and bridge construction, flood control, drainage systems. Carrying out testing of materials, soil, etc. mainly for the construction industry is also an important contribution to the development of the region.

A total of 214 consultancy projects (including the testing and recommendation jobs) were carried out in the year. The total value of the consultancy projects undertaken during the year is approximately Rs. 3.00 crores, and Rs.1.78 crores was received.

### **Memoranda of Understanding**

An MoU was signed with Ecole Centrale Nantes, France on 14 June 2007 for exchange of students and faculty members, and for research collaborations.

An MoU was signed with Oil India Ltd., Duliajan on 28 May 2007 to undertake collaborative projects.

An MoU was signed with Reseau "N+i", France on 26 January 2008 for exchange of students and faculty members.

An MOU was signed with Tata Consultancy Services to lease out about 1500 sqm of built-up space on the campus to enable them to set a Learning Centre. This is part of the initiative of the State Government to attract IT majors to invest in the State of Assam.

### **FACULTY AND STAFF**

The faculty strength at the end of March 2008 was 197. This is an increase of 21 from 176 at the end of last year. The current student to faculty ratio is a healthy 10:1. Besides faculty, we also have 23 scientific staff at present, the number of which remained the same as the last year. The non-faculty staff strength was 283 with an increase of 30 from 253 last year.

### **PUBLICATIONS**

The faculty of the Institute has been actively publishing research papers in international and national journals as well as in conference proceedings. The publications during the past one year include:

**Journal Papers: 323**

**Conference Papers: 263**

Compared to the previous year, the number of journal publications has increased from 288 to 323. This works out to an average journal publication of about 1.64 papers per faculty. This is satisfactory, especially considering the fact that many faculty are young, but

we must strive to do even better, and also improve the impact our work has in the advance of knowledge and technology.

## CONFERENCES/WORKSHOPS/SYMPOSIA/COURSES

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

- International Workshop on Earthquake Hazards and Mitigations, 5-8 December 2007
- 6<sup>th</sup> Indo-German Winter Academy, 13-19 December 2007
- 15<sup>th</sup> International Conference on Advanced Computing and Communication, 18-21 December 2007
- International Workshop on Image and Signal Processing, 28-29 December 2007
- International Workshop and Conference on Statistical Physics Approaches to Multidisciplinary Problems, 7-13 January 2008
- International Conference on Northeast India and Its Transnational Neighbourhood, 17-18 January 2008
- International Workshop cum Symposium on Visual Content Coding Techniques in Usability Research, 9-17 February 2008
- 1<sup>st</sup> Indo-US Symposium on Advances in Mass Transit and Travel Behaviour Research, 12-15 February 2008
- Workshop on High Energy Physics: Particle Physics, Strings and Cosmology, 21- 23 February 2008

A number of short-term courses were organised. These are:

- Industrial Applications of Turbomachines, Centre for Energy.
- Engineering Aspects of Enzyme and Microbial Processes, Department of Biotechnology.
- Advanced Engineering Polymers, Departments of Chemical and Mechanical Engineering.
- Advances of Membrane Separation Technology, Department of Chemical Engineering.
- Sensors: From Fabrication to Application, Department of Chemistry.
- Recent Trends and Technologies in Industrial Waste Treatment and Management, Department of Civil Engineering.
- Digital Techniques for Control and Instrumentation, Department of Electronics and Communication Engineering.
- Mobile Communications: Systems and Applications, Department of Electronics and Communication Engineering.
- ICT (Information and Communication Technologies) and Development: A Human Interface, Department of Humanities and Social Sciences.
- Theory, Numerics and Applications of Differential Equations, Department of Mathematics.



- Introduction to Linear Elastic Fracture Mechanics, Department of Mechanical Engineering.
- Introduction to Micro-Manufacturing Technologies, Department of Mechanical Engineering.
- A Roadmap of Quantum Mechanics to String Theory, Department of Physics.
- Fibre Optics Technology, Components and Applications, Department of Physics.
- Technical training on computer aided design of RCC structures, Department of Civil Engineering.
- Training to laboratory technicians of Meghalaya Bitchem Pvt. Ltd., Department of Civil Engineering.
- Condensed chemical engineering course at BRPL, Department of Chemical Engineering.

## **CONSTRUCTION AND CAMPUS DEVELOPMENT**

The following major works were either completed or were under construction during the year:

### **1. Hostel Buildings**

Boys' Hostel No. 6 (now named Barak) was partially occupied in July 2007 and is completely ready. Work on Hostel 7 with a capacity of 500 is under progress and 240 rooms are expected to be ready by July 2008. The construction of Boys' Hostel No. 8 with a capacity of 500 was awarded in December 2007 and foundation work is under progress. A contract for the expansion of the Girls' hostel from its current capacity of 172 to 420 was awarded in November 2007 and it is expected that about 100 rooms will be ready by December 2008. Land filling of the site of Hostel 9 has also been started this year.

### **2. Residential Quarters**

Work on the construction of 35 F type quarters for Professors started in December 2007. 12 E type units were occupied during the year, and the remaining 24 units taken up for construction are likely to be ready by July 2008. All the 30 units of D type quarters in 5 blocks were completed and are under occupation. Work on 35 C type units was started in November 2007.

### **3. Lecture Hall Complex**

The lecture hall complex comprising 4 lecture halls of 250 capacity each was completed during the year.

### **4. Auditorium**

The Auditorium with a capacity of 1500 was also completed.

### **5. Kendriya Vidyalaya**

The Kendriya Vidyalaya building completed in July 2007. The second phase of work of establishing a playground and of building staff quarters is to commence soon.

### **6. Community Hall**

The construction of both community halls was completed this year.

## **7. Workshop**

Work on the Institute workshop building was taken up this year. This is a building of 4000 sqm and it is being built with pre-fabricated steel structures.

## **STUDENTS' ACTIVITIES**

### **Alcheringa 2008**

The annual cultural event of the Institute was organised during February 2008. Some of the leading artistes in the country performed in this year's festival. Alcheringa has also been a platform to receive our alumni back on the campus to catch up with their activities and career engagements. Alcheringa is now one of the most eagerly awaited annual events of this region, and is fast gaining its status among the best such events in the country. It has also proved to be a great experience for the students in event management.

### **Techniche 2007**

Techniche 2007, the IIT Guwahati annual national level technical festival was organised during September 2007 and met with resounding success. There were participants from a number of colleges from all over India and various schools of Guwahati. Techniche is now undoubtedly the most popular rendezvous for exchange of technical know-how among the student community. Technical events also included participatory interactive workshops, technical paper presentations for students, and online contests among many others.

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

The various clubs and societies under the Cultural Council including the Movie Club, the Fine Arts Club, the Literary Club, the Photography Club, etc. organised regular events and competitions.

### **Student Achievements**

Mr. Sandeep Reddy M., of the Department of Electronics and Communication Engineering bagged third prize in 'Ideaz' – The Pan IIT Business Idea Competition organized by E-Cell of IIT Bombay in association with various organizations in different IITs for his initiative in rural sector. 160 teams from various institutions including all the IITs took part in the competition. The prize money includes a memento and a cash prize.

## **TRAINING AND PLACEMENT**

The placement scenario at IIT Guwahati for the year 2007-2008 has remained very good. 80 companies from various sectors participated in the recruitment of 442

students (BTech: 199, BDes: 19, MTech: 165, MSc: 59) registered with the placement cell.

The overall placement of the BTech branches and BDes has been very good with 100% placement in Civil, Chemical and Biotechnology. In the remaining branches too, the percentage of placement is above 95%. The highest package offered to BTech students is Rs.30.12 Lakhs per annum with an average package of Rs.6.74 Lakhs per annum.

The percentage of placement for most of the MTech branches has been above 90%. For MTech, 152 jobs were offered whereas 165 students were registered. The highest package offered to MTech students is Rs.12 Lakh\$ per annum with an average package of Rs.4.99 Lakhs per annum. For MSc programmes, 14 students have been placed out of the 59 registered candidates. Companies from different sectors have participated in the campus placement process. The percentages of participation from different sectors are 39% in Core Engineering, 32% in IT, 16% in Consulting and Technological Service and 13% in PSU.

The branch-wise placement details are:

Dept.	UG				PG (MTech)			
	No. of Student Reg.	Total No. of jobs	No. of Student Placed	% of Student Placed	No. of Students Reg.	Total No. of jobs	No. of Student Placed	% of Student Placed
CSE	46	53	45	98	36	34	33	92
ECE	47	55	46	98	36	35	33	92
ME	45	57	44	98	40	42	38	95
CE	23	27	23	100	30	28	28	93
CL	21	25	21	100	23	13	13	57
BT	17	17	17	100	--	--	--	--
DD	19	20	18	95	--	--	--	--
PH (MSc)	18	3	3	17	--	--	--	--
CH (MSc)	21	1	1	5	--	--	--	--
MA (MSc)	20	10	10	50	--	--	--	--

## CLOSING REMARKS

The Institute has seen healthy growth this year. To sustain our momentum, we are going to focus on four main directions in the coming year: increase in student strength and consequent expansion of facilities, establishment and growth of incubation centres and other entrepreneurial activities, increase in extra-mural research activities, and attracting quality faculty and PhD students to the Institute.

### *Expansion Plans*

Rs. 68 crores was spent during the year in construction activities. The plan of activities for the 11<sup>th</sup> Plan period has been worked out. This plan has taken into

account the expansion of student strength that will be required to implement reservations for OBC students. By the end of the 11<sup>th</sup> Plan there will be 3800 students on campus (currently there are about 2100). Along with expansion of student strength, faculty and staff strength will also increase. The major types of constructions that are planned are hostels, faculty and staff residences, and expansion of the academic complex for more laboratory space and more classroom space.

#### *Entrepreneurial Activities*

We plan to develop the transit complex, where institute activities began, into a space for entrepreneurial activities. It has now been renamed the technology complex. A number of projects connected with entrepreneurs such as RUTAG and GIAN-NE are already functioning from the complex. Space has been given to TCS in this complex. Although this is not connected to entrepreneurial activities of the Institute, the hope is that TCS will establish a development centre near the IIT campus and this will enable a lot of entrepreneurial activity in the IT area. We are at an advanced stage of discussion with the Guwahati Biotech Park to lease out space to them to establish an incubation centre of the Park. With time, this centre will move out, hopefully to an area nearby, but it will give a boost to activity in Biotechnology. A number of Govt. Departments have schemes for funding incubation centres. We have already received feelers from the Ministry of Micro, Small and Medium Enterprises, and the Department of Information Technology. Other Departments such as DSIR and DBT also have schemes which we will try to take advantage of.

#### *Extra-Mural Research*

R&D activities have increased in the last year. We need to keep the momentum going. Our aim will be to get funding for one or two large, inter-disciplinary projects. We hope to start new areas of research through these projects. We also plan to review the functioning of the academic centres and to try and put in place enablers that will get researchers from different departments to work together and that will get the support of all other faculty.

#### *Attracting Quality Faculty and Research Scholars*

The announcement of the establishment of 8 more IITs with three of them starting operations this year, signals a major expansion in technical education. In fact, this Institute has been entrusted the task of mentoring IIT Patna in its formative years. The existing IITs are also going to expand by at least one and a half times, with a few having a threefold growth plan. This is going to generate a big demand for faculty and for PhD students. As against this, the booming Indian economy is offering attractive openings in the corporate sector so that the number of students opting for higher studies is going down, and those that do complete a PhD have many alternatives other than a career in teaching and R&D, to choose from. How do we attract bright students into our PhD programme? How do we ensure that the faculty expansion continues without any compromise in quality? Do we need to find new avenues of funding to supplement the incomes of our faculty and research scholars? Do we need to engage professionals to market our Institute? What else needs to be done? We are going to try and find answers so that our plans for growth continues without any compromise on quality.

Finally, I would like to wish the graduating students a bright and exciting future. Please excel in what you do, but please do not compromise on your integrity. You must always be able to answer to yourself that you have done the right thing and that you have put in your best. That is the IITG way.

Jai Hind.

Gautam Barua  
Director  
Indian Institute of Technology Guwahati