



DIRECTOR'S REPORT

AT

THE 3RD CONVOCATION OF

INDIAN INSTITUTE OF TECHNOLOGY, GUWAHATI

25TH MAY, 2001

INTRODUCTION

Hon'ble Governor of Assam and Chairman of the Board of Governors of IIT Guwahati, Lt. Gen. S.K. Sinha, Principal Scientific Adviser to the Govt. of India and the Chief Guest of today's Convocation, Dr. A.P.J. Abdul Kalam, Members of the Board of Governors, Members of the Senate, graduating students, ladies and gentlemen.

It gives me great pleasure to extend a very warm welcome to all of you on the occasion of the third Convocation of the Indian Institute of Technology, Guwahati. We are indeed fortunate to have amongst us today Bharat Ratna Dr. A.P.J. Abdul Kalam, who has been one of the principal motivating factors behind India's resurgence as a scientific and technical power in recent years. For far too long, we have suffered from self doubt. As the Principal Scientific Adviser to the Govt. of India, Dr. Kalam's vision and belief in our own abilities have given courage and confidence to the scientific community of the country to try to put India in the forefront of scientific and technological development. We extend a very warm welcome to you, Sir, and we all look forward to hear from you about your vision and strategies for making our country a fully developed nation within the first two decades of the new century.

IIT Guwahati has entered the 7th year of its existence and today the third batch of B. Tech. students along with the second batch of M. Tech. students of the Institute will be receiving their degrees. The Institute is also going to award for the first time Ph. D. degrees to two research scholars today. I congratulate all the graduating students and wish them success in all their future endeavours.

I would now like to present before you a report of the activities of this Institute during the past one year.

ACADEMIC ACTIVITIES:

IIT Guwahati at present has the following academic departments :

1. Computer Science & Engineering (CSE)
2. Electronics & Communication Engineering (ECE)
3. Mechanical Engineering (ME)
4. Civil Engineering (CE)
5. Design
6. Physics
7. Chemistry
8. Mathematics
9. Humanities & Social Sciences (HSS)

The total number of students enrolled during the academic year 2000-2001 at the undergraduate, postgraduate and Ph. D. levels were :

Undergraduate Programme (B.Tech./B.Des.) :

| | | |
|----------------------|------|--|
| 4 th year | : 80 | (CSE-33, ECE-24, ME-23) |
| 3 rd year | : 99 | (CSE-34, ECE-24, ME-21, CE-8, Design-12) |

| | | |
|----------------------|-------|---------------------------------------|
| 2 nd year | : 112 | (CSE-40,ECE-32,ME-23,CE-7,Design-10) |
| 1 st year | : 134 | (CSE-35,ECE-35,ME-26,CE-20,Design-18) |

M.Sc. Programme (M. Sc.) :

| | | |
|---------------------|------|--|
| 1 st yr. | : 25 | (Physics-7,Chemistry-10,Mathematics & Computing-8) |
|---------------------|------|--|

Postgraduate Programme :

| | | |
|------------------------------|------|--|
| M. Tech. 1 st yr. | : 70 | (CSE-22, ECE-18,ME-17,CE-13) |
| M.Tech. 2 nd yr. | : 39 | (CSE-14,ECE-14,ME-11) |
| Ph.D. | : 50 | (CSE-2,ECE-3,ME-6,CE-4,Design-1,Physics-12, Chemistry-13,Maths-3,HSS-6) |

Total number of Under Graduate & Post Graduate students = 613

In keeping with the tradition of the Institute to constantly review and upgrade the curriculum, the departments introduced 15 new elective courses at the undergraduate and postgraduate levels during the academic year.

It is worth mentioning that a considerable number of undergraduate students at the third year level have been selected for summer training this year by various firms in different countries apart from those in India, offering them stipend and travel grants. These include 24 students of Computer Science & Engineering, 5 of Electronics & Communication, 3 of Mechanical and 1 of Design.

The number of successful candidates who are to receive their B.Tech., M.Tech. and Ph.D. degrees today are as follows :

B.Tech.

| | |
|---|------|
| Computer Science & Engineering | = 31 |
| Electronics & Communication Engineering | = 23 |
| Mechanical Engineering | = 22 |

M.Tech.

| | |
|---|------|
| Computer Science & Engineering | = 14 |
| Electronics & Communication Engineering | = 12 |
| Mechanical Engineering | = 08 |

Ph.D.

| | |
|--------------------------------|-----|
| Computer Science & Engineering | = 1 |
| Mechanical Engineering | = 1 |

NEW PROGRAMMES

In addition to the already existing programmes offered by various departments, the Institute has introduced M. Sc. programmes in Physics, Chemistry, and Mathematics & Computing, and M.Tech. programme in Civil Engineering with specialization in Structural Engineering for the first time in July 2000. A total number of 38 students have registered in these courses.

The Institute proposes to start the following departments and centers from the next year :

Departments

1. Department of Chemical Engineering
2. Department of Bio-technology

Centres

1. Agricultural and Forest Resources Technology
2. Computer Aided Design and Manufacture
3. Energy Engineering
4. Environmental Science & Eengineering
5. Electronic Design & Technology
6. Safety and Reliability Engineering and Disaster Management

Besides, the following additional **central facilities** are also proposed to be created during the year :

1. Computer and Communication Centre
2. Central Sophisticated Instruments Facility

RESEARCH & DEVELOPMENT ACTIVITIES

Research and development work forms an integral part of the curriculum of the under-graduate and post-graduate students of the Institute. Besides, a number of faculty members are involved in many sponsored research and consultancy projects funded by various agencies. Some of the new projects that have been taken up during the year include :

Sponsored Research

There are at present 34 ongoing sponsored R&D projects and two collaborative projects at IIT Guwahati. The total sanctioned funds for the ongoing R&D projects are approximately Rs.2.8 crores. The main sponsoring agencies have been DST, MHRD, CSIR and ARDB. New R&D projects which started during the last one year are:

Computer Science & Engineering Department:

1. Resource Centre for Indian Language Technology Solutions
2. Campus-wide Electronic Payment System

Civil Engg. Department:

1. Study of Delamination in FRP Composites under Low Velocity Impact using Adaptive Finite Element Method
2. Distribution, Fractionation and Deposition of phosphorus in the Flood Plain Sediments of the Brahmaputra River (India) and their Environmental Ramifications

3. Developing a Remote Sensing Laboratory for Better Water Resources Management and Flood Mitigation in the Northeastern Region of India

Chemistry Department:

1. Carbohydrate Modifications for Therapeutic Applications
2. Effect of Macromolecular Crowding on the Kinetics of Chemiluminescent Reaction
3. Metal Catalysed Oxidative Transformations of Organic Functional Groups
4. Resolution of Racemic Amino Acid Using Chiral Metal Complex as Host
5. C-Glycoside Synthesis

Electronics & Communication Engineering Department:

1. Wavelength division multiplexed (WDM) fiber optic link
2. Advanced DSP in Biomedical Engineering
3. New Techniques for Image Compression & Motion Compensation
4. Development of VLSI Architectures for Digital Signal Processing Algorithms

Mechanical Engineering Department:

1. Prediction of Job Quality and Tool Condition in Turning Process by Measurement of Cutting Forces & Vibrations
2. The Development of General Purpose CFD Design Code
3. Computer Aided analysis and Design of High Speed Ball and Roller Bearing
4. Analytical Modeling and Free Vibration of a Shear Deformable Composite Rotor Blade
5. Development of a Simulation Based Design for Axial Fan Using Computational Fluid Dynamics
6. Generalised Monte Carlo Solution Techniques for Radiative Heat Transfer Problems in General Diffuse Grey Cartesian Enclosures with Absorbing-Emitting-Scattering Media.

Physics Department:

1. Soliton Solutions and their Consequences for Super Symmetric Nonlinear Evolution Equations
2. Study of Low Dimensional Magnetic Systems
3. Development of New Technique of Nano Writing using Pulsed High Power Laser Interferometry

Design Department

1. Ergonomic Space-design Evaluation Facility Centre for Quality Assurance

Consultancy Services

The faculty of IIT Guwahati are also actively engaged in providing consultancy services to various public and private sector organizations including banks, schools, hospitals and construction companies. During the last year, consultancy services were rendered by the faculty of the Institute to the following organisations:

1. PWD, Assam, Guwahati
2. Guwahati Metropolitan Development Authority, Guwahati
3. NABARD, Guwahati
4. NBCC Ltd., Guwahati

5. Ansal Properties & Industries Ltd., Guwahati
6. Hospital Services Consultancy Corpn. Ltd. Shillong
7. Designers Plenum, Guwahati
8. L&T Ltd., Guwahati
9. Gammon India Ltd., Guwahati
10. NEFFS (IND) PVT LTD., Guwahati
11. Guwahati Tea Auction Centre, Guwahati
12. Assam State Electricity Board, Guwahati
13. Assam Valley School, Calcutta
14. HOUSEFED, Guwahati
15. Assam Co-operative Apex Bank, Guwahati
16. Jaybee Technologies, Guwahati
17. Transcendent Research, New Delhi

Laboratory and other Facilities

The Institute has been procuring latest equipment for its various laboratories both for teaching and research. Some of the equipment procured and under procurement during the year are as follows :

A PARAM -10000 Supercomputer with 8 nodes was installed at IIT Guwahati in September 2000. The installation is through a grant from the manufacturers, CDAC of Pune, as part of a nation-wide initiative for establishment of supercomputing facilities in leading educational Institutions of the country.

Other facilities include :

1. Audio-visual studio for Deptt. Of Design
2. PARAM Super-computer for Computer Centre
3. Digital Micro-hardness Tester for Mech. Deptt.
4. X-Ray Diffractometer for Physics Deptt.
5. Radio Frequency Vector Network Analyzer
6. 3-D Co-ordinate Measuring System (shapes, surface and dimension analyzer of arbitrary objects) for Mech. Deptt.
7. NMR Spectro-Photometer for Chemistry
8. Dynamic Testing Facility for Civil Deptt.

INSTITUTE PROGRAMMES

Interaction with Local Institutions

The Institute has been constantly widening the scope of interaction with other local institutions at various levels

Students from the Assam Engineering College, Guwahati, have regularly interacted with the faculty of the Department of Electronics & Communication Engineering in their coursework and project work in the areas of Image and Signal Processing.

The Department of Design has imparted training to crafts persons of the Development Commissioner (Handicrafts).

The Cane & Bamboo Technology Centre at NEDFI has been set up with active collaboration with the faculty of the Department of Design.

Faculty members of the Department of Mechanical Engineering helped in conducting the AICTE course held at the Assam Engineering Institute, Guwahati, and have also been assisting the Indira Gandhi National Open University (IGNOU) in preparing the study materials for various courses.

Students from Assam Engineering College, Jorhat Engineering College and Regional Engineering College, Silchar, have been undergoing summer training in the Computer Science, Electronics and Mechanical Engineering departments of the Institute

The Department of Humanities & Social Sciences has continued interactions with Gauhati University, Cotton College, Assam Institute of Management, Indian Institute of Entrepreneurship (IIE) and the Guwahati Stock Exchange.

Faculty from the Mathematics Department were involved in conducting a training course for students at the IASST, Guwahati, in September 2000.

Short Term Courses, Workshops and Seminars

The Department of Mathematics conducted the MTTs (Mathematics Training and Talent Search) Programme for the second consecutive year at IIT Guwahati during 5-30 June, 2000. Thirty five participants from all over the country attended the four week-long O-level programme entirely funded by the National Board for Higher Mathematics (NBHM).

A workshop on Bamboo finishes and small tools and equipment development was conducted by IDC in collaboration with the Dept. of Design IIT Guwahati, which was organized by CBTC, Guwahati during December 2000.

A one-day Workshop on Natural Language Processing was held at the Department of Computer Science & Engineering on 31 March 2001

A two-day Workshop on 'Understanding Your Computer' was conducted by the students of the Dept. of Computer Science & Engineering for the students of other colleges of the city.

A three-day Training Programme on Networking was organised by the Dept. of Computer Science & Engineering which was attended by ERNET users of the North-East from 21-23 May 2001

The department of Humanities & Social Sciences organised a series of invited lectures in the area of "Tradition and Modernity" and topics such as "Philosophical Traditions: East and West" and "Mathematics in Ancient India" were covered in this series.

Visitors & Visits by Faculty

More than 20 distinguished visitors from India and abroad visited the Institute during the year for varying lengths of time and delivered seminars, lectures and interacted with faculty and students.

A large number of the faculty members also visited several countries abroad for presenting papers in International Conferences and also on short and long term assignments and fellowships during the year.

FACULTY ACTIVITIES

The present faculty and staff strengths of the Institute are 89 and 182 respectively.

The faculty of the Institute are actively involved in formulating new courses of study, in the setting up of the research laboratories at the under-graduate and the post-graduate levels and are actively involved in undertaking research and developmental activities at the Institute. Apart from the regular teaching and research activities at the Institute, many of the faculty members have presented their works in conferences and workshops in the country and abroad and have lent their expertise in various consultancy projects.

Publications

The faculty of the Institute have been publishing their research findings in various national and international journals and conference proceedings. The total number of publications during the year under report include:

| | |
|-------------------|------|
| Journal Papers | : 51 |
| Conference Papers | : 63 |

LIBRARY FACILITIES

The Central Library, one of the important central facilities of the Institute, currently has over 50,000 volumes, including textbooks, reference books, conference proceedings, back volumes, standards, and non-book materials such as CD-ROMs, audio tapes, video tapes, slides, etc. The Library also subscribes to about 650 current periodicals.

The Library has increased its working hours from 8 hours to 13 hours on weekdays and opens for 8 hours on Saturdays & Sundays. All operations of the Library are automated with the help of an integrated library software package called LIBSYS. The database for the entire collection has been created which is available through On-Line Public Access Catalogue (OPAC) to the users via campus network. The Library has planned to bar-code its collection to expedite issue-returning process.

At present the Library has one workstation providing the search facilities on CD-ROM abstracting services on Engineering Index (COMPENDEX), Science Abstracts (INSPEC ON DISC), Psychological Abstracts (PsycLit) and Current Content on Diskette (CCOD). In addition to this, the Library has acquired IEEE/IEE Electronic

Library, contains data since 1988, covering full text images from more than 4,000 publications.

The Central Library has designed its web page as a part of IIT Guwahati Home Page, which provides information about the library services, e-journals and recent arrivals of current periodicals to the academic community of the Institute.

INFRASTRUCTURE

New Campus

A major event for the Institute at the beginning of the academic year has been the shifting of all the activities of the Institute, including offices, students' hostels and faculty residences, to the permanent campus at North Guwahati in July, 2000.

All functions – teaching and administrative-- of IIT Guwahati are now carried out in its permanent Campus. Although the institute is now operating from its Academic Complex – Phase I, some parts of the institute's functions will be shifted from the coming academic year to its new Academic Complex which is under construction.

There are two hostels for male students with a capacity of 300 each. A third hostel for boys is ready for occupation for the next academic year. The Hostel for female students houses 37 students.

Faculty residential flats number 61 (D-type), 18 (C-type), and the Director's residence, all of which are under occupation. The Institute Guest House functions from two F-type quarters with 6 air-conditioned rooms with double beds. Additional 4 F-type quarters and 12 E-type quarters will be occupied within the next couple of months.

Construction Programme

119 B-type quarters for supporting staff are currently under construction. 42 of these quarters are expected to be ready for occupation from August 2001 and the rest from January 2002.

Work on additional 66 faculty quarters and 24 supporting staff quarters are in progress.

The main Administrative Complex having a floor area of about 9000 sqm will be ready by the end of the year.

The main Academic Complex having a floor area of about 67,000 sqm will be fully ready only towards the end of 2002. But about 40 percent of the space will be ready for occupation during this year and classes from the coming academic year will be conducted in the new complex.

The Institute Guest House with 72 rooms and a conference hall is nearing completion and will be ready for occupation in November 2001.

Work on a Ladies Hostel, a fourth boys' hostel, Institute Hospital, the Library-cum-Computer Centre-cum-Communication Centre, and a Commercial Complex will start shortly. A small market complex has already been constructed and this will start functioning from next month.

Apart from these buildings, the Institute is opening from this academic year a Creche, a Kinder Garten school and a primary school for the benefit of the Institute employees.

Since the main road network of the campus is almost ready now, a massive tree plantation and gardening programme together with grading and turfing hill slopes has been undertaken. This also includes creation and preservation of natural water bodies, and children's parks and gardens.

Plans for permanent water supply system with intake from the Brahmaputra and the sewerage and sewage disposal system of the Institute have been finalised during the year and work on these will start shortly.

Medical Facilities

The IIT hospital is currently housed in one wing of one of the boys' hostels. Dispensary medical facilities comprises of OPD consultations. It also has facilities for monitoring ECG and Blood Sugar and emergency services are provided round-the-clock. The medical gynecological and surgical emergencies are managed amongst the Institute medical officers and patients are referred to specialists in the panel hospitals whenever the need arises. The Dispensary has two beds for patients requiring observation during dispensary hours and has a room for patients requiring immobilization due to fractures and spinal disorders.

Some more equipment like semi auto-analyser, echo cardiography, cardiac monitor, cardiac defibrillator, will be available shortly.

STUDENTS ACTIVITIES

Scholarships/Medals/Prizes

The following awards are given to outstanding students in academic as well as extra-curricular fields.

1. The President of India (Gold) Medal is awarded to the scorer of the highest C.P.I. among all graduating students.
2. Institute Silver Medals are awarded to the highest C.P.I. scorers among the graduating B. Tech. students of the departments other than that of the President of India (Gold) Medal Awardee.
3. The Dr. Shankar Dayal Sharma Gold Medal is awarded to the best B. Tech. student in terms of general proficiency including character, conduct, excellence in academic performance, extra-curricular activities and social service.

Merit-cum-means Scholarships were awarded to 53 under-graduate students and the Institute Merit Scholarship to 5 under-graduate students during the 2000-2001 session.

Cultural Activities

Alcheringa – 2001, the annual cultural mega festival of IIT Guwahati was celebrated with a three-day programme during 2- 4 February, 2001. This year, an unprecedented number of students (6000 approx.) representing 28 colleges and universities from different parts of the North-Eastern region, participated in various cultural and literary events of the festival. Apart from the scheduled events, a couple of nationally renowned vocalists, viz., Raajan Mishra and Saajan Mishra and the famous indipop group Euphoria also enthralled the audience during the festival.

Techniche-2K, the IIT Guwahati technical festival was held during 8 –10 September 2000, in which students from 20 colleges from all over the country participated. Techniche is now undoubtedly the most popular rendezvous for technological exchange amongst the student community in the North-Eastern Region. About 500 school children from 5 major schools of Guwahati got a close look at "technology at work" during their visit to Techniche 2K. The first ever Technical Book Fair of the region was held during Techniche 2K with the participation of some leading book publishers from all over the country and abroad. Leading public sector organizations including BARC, APRO, CDAC, ASTEC etc. displayed their recent developments in the Technical Exhibition. Events included (i) Business Workshop by eminent personalities from Calbuzz.com, STPI, Guwahati and AGM, IFCI Venture Capitalist, New Delhi; (ii) Hacking Workshop; (iii) Photography Workshop by Zoom Colour Prints; (iv) Film Appreciation Workshop; (v) Psychology Workshop; (vi) Technical Paper Presentation from which best three papers were forwarded to Institute of Engineers (India) Journals; (vii) predefined problems and on the spot problems. A newsletter 'TechXpress' was also brought out on the occasion.

The students' Gymkhana also has a number of societies and clubs, which help in imbibing and developing the extra-curricular activities of the students. These include: the Literary Society (AILERON), the Fine Arts Society, the Environmental Society, the Movie Club, the Music Club, the Dramatic Club, the Photographic Club and the Hobbies Club.

Sports Activities

A contingent of 43 students accompanied by two Physical Training Instructors represented the Institute in the inter-IIT Sports Meet held at IIT Kanpur during 13-18 December, 2000. Our students participated in five events and bagged two silver medals and one bronze medal. Besides, the sports section of the Institute held a series of friendly volleyball, football and cricket matches with the local colleges of Guwahati. Inter-batch sports events were also organized during the last semester. Each hostel of the Institute has been provided with gymnasium facility.

Placement

Campus placement activities for the year 2000-2001 began on August 12, 2000 and were concluded on April 04, 2001. As many as 28 organizations including multi-

national companies and public sector organizations took part in the exercise and recruited all the 77 B. Tech. and 33 M. Tech. students that were available for placement, thus accounting for a record hundred percentage placement of the graduating students.

CONCLUDING REMARKS

Before I conclude I would like to draw the attention of all, particularly the passing out students, to the changes that are taking place all around us today, in science and technology, in our social fabric and in our family traditions. In the past, we could afford to wait for the evolutions to take place and then adapt ourselves to the changing needs. Because the changes were slow, we adapted to the changes mostly unconsciously. With the rapidity at which the developments are taking place today, - with the power to alter the genes, to create new species and bio-engineered products and to alter the face of the earth itself - unconscious adaptation is no longer possible. If you can anticipate the changes, you can design the future. You will also see unlimited opportunities coming your way, because you have been able to anticipate what the society will need tomorrow and work towards it.

Before I end, I would like to impress upon you the fact that society is what we ourselves make of it. We also must recognize the fact that whatever we are today, it is because of our parents, our family and friends, everybody that we have come into contact with, and the society we live in. If we are not satisfied with any aspect of our society, then we ourselves are to blame for it. You, with your background, will have the opportunity to shape attitudes and work culture in your workplace. A collective effort towards change for the better can give us a society that we all dream of becoming a part of. Events in the recent past have proved that we in India can achieve what we aim at if only we have the determination and confidence in our own abilities. I hope that you will always maintain your self-confidence and be ready to face any challenge and success will be yours. Once again I take this opportunity to congratulate you and wish you all success.

Thank you and Jai Hind.