

The Technical Education System in the country covers courses and programmes in engineering, technology, management, architecture, town planning, pharmacy, applied arts and crafts. The Ministry of Human Resource Development caters to programmes at undergraduate, postgraduate and research levels.

The technical education at the Central level comprises the All India Council for Technical Education (AICTE), which is the statutory body for proper planning and coordinated development of the technical education system; seven Indian Institutes of Technology (IITs) which are institutions of national importance; six Indian Institutes of Management (IIMs), five deemed-to-be-universities, namely Indian Institute of Science (IISc), Bangalore, Indian School of Mines (ISM), Dhanbad, School of Planning and Architecture (SPA), New Delhi, Indian Institute of Information Technology and Management (IIITM), Gwalior and Indian Institute of Information Technology (IIIT), Allahabad; 18 National Institutes of Technology (NITs); other technical institutes in the Central Sector, such as the National Institute of Foundry and Forge Technology (NIFFT), Ranchi, the National Institute of Industrial Engineering (NITIE), Mumbai, Sant Longowal Institute of Engineering and Technology (SLIET), Longowal, North Eastern Regional Institute of Science and Technology (NERIST), Itanagar; 4 National Institutes of Technical Teachers Training and Research (NITTTRs); and 4 Boards of Apprenticeship Training (BOATs). Other schemes at the central level include Programme for Apprenticeship Training (Scholarships and Stipends); Assistance to universities for technical education; community polytechnics; World Bank-assisted Project for Improvement of Polytechnic Education and Technical Education Quality Improvement (TEQIP), polytechnic for disabled persons; payment for professional and special services; direct Central assistance to Central institutions, namely Research and Development, Modernisation and Removal of Obsolescence of Engineering Laboratories and Workshops and Thrust Areas of Technical Education; Human Resource Development in Information Technology; Support to distance and web-based education; National Programme for Earthquake

Engineering Education (NPEEE), Indian National Digital Library for Science and Technology (INDEST) Consortium; Asian Institute of Technology, Bangkok; Expenditure on Foreign Delegations and Foreign Experts; Technology Development Missions. There also exists one Public Sector Undertaking, namely Educational Consultants India Ltd. (Ed. CIL) under the Technical Education System of the Ministry.

To leverage new information and communication technologies (ICTs) to enhance learning effectiveness and expand access to high quality education, a national programme on Technology Enhanced Learning (NPTEL) is being implemented. This provides content support in the form of digital video-based courses/enrichment programmes to technology channel on a sustained basis. This also help to create web-based courses/programmes for enhancing learning effectiveness in the entire technical education system.

*Policy Framework for Promotion of Postgraduate Education and Research in Engineering and Technology* was laid down to give special thrust to postgraduate education and to engineering and technology. Apex bodies like UGC and AICTE and education institutions have taken steps towards implementation of strategies laid down in the policy framework.

To meet the emerging need for quality manpower in IT and the related areas, necessary initiatives have been taken. Based on the recommendations of a National Task Force, a national programme of HRD in IT is being drawn up.

The Government has taken a number of steps by improving the academic environment in the country. As a part of the Government's commitment to respect the autonomy of all technical institutes of learning, in particular those which have attained excellence, such institutes, as a measure towards enhancement of their autonomy, are being empowered to take all relevant decisions and allow them to develop further. A number of measures have been initiated to strengthen the autonomy of the institutions like IITs and IIMs, Indian School of Mines, Sant Longowal Institute of Engineering and Technology, etc.



It has been decided that all admissions to the undergraduate programmes in engineering, architecture and planning in all the National Institutes of Technology (NITs), Indian Institute of Information technology (IITs), Allahabad and Gwalior, National Institute of Forge and Foundry Technology (NIFFT), Ranchi, School of Planning (SPA), New Delhi and other Institutes of Central Government as specified shall be made through the All India Entrance Examination (AIEEE) conducted by the Central Board of Secondary Education (CBSE). All the other Deemed and Central Universities will have the option to participate in the AIEEE or conduct their own entrance examinations and admit students in a fair and transparent manner. The State Governments shall continue to hold their own common entrance tests for admission in institutions within their States as before. However, States willing to participate in the AIEEE for all or a part of the total seats can participate in AIEEE by giving the option to the CBSE. A similar decision has also been taken in regard to admissions in MBA/PGDM (or equivalent) programmes in the country. The All India Master of

Computer Application Test (AIMCAT) has been dispensed with.

It is proposed to provide enhanced funding to the IITs for introducing certain new integrated programmes with multi-disciplinary orientation and for strengthening of the infrastructure. Dual degree programmes in engineering physics with specialisation in nanoscience, five-year integrated B.Tech. and MBA, M.Tech. in financial engineering are some of the courses at advanced stages of finalisation. Proposals are also underway to revive the Block Grant Scheme of non-Plan funding to IITs and IIMs. This is intended to bring about greater autonomy in these institutions and also to develop a certain degree of resilience in these institutions.

The issue of fees to be charged by the Indian Institute of Managements (IIMs) has been resolved as also has the provision of freeships for meritorious students. It has been decided that all admitted students, whose annual gross family income is Rs. 2 lakh and below, will be eligible for receiving financial assistance amounting up

to full tuition fee waiver. All the six IIMs have provided need-based financial assistance of Rs. 2.34 crore during the academic year 2004-05 to their 373 students having parental income below Rs. 2 lakh per annum. Three Indian Institutes of Management (IIMs) at Lucknow, Indore, and Kozhikode have been provided additional funding for infrastructure development.

Under National Common Minimum Programme, new polytechnics are being established in special focus districts. Existing polytechnics in the special focus districts will be assisted to strengthen their infrastructural capabilities (laboratory equipment / machinery). The special focus districts comprise areas of concentration of educationally backward minorities, Schedule V and VI areas and areas with SC female literacy of less than 10 per cent. Community Polytechnics Scheme run through 669 existing polytechnics is being revised to increase its scope of coverage, expansion, improvement in quality of training (competency based), skill development of the trainees, etc.

An Indian Institute of Information Technology, Design and Manufacturing has been set up at Jabalpur in MP. The Institute was inaugurated on February 7, 2005. This institute is expected to meet the ever increasing demand of information technology in the country.

As regards special attention to the North-Eastern States, action for opening an IIM in the North-Eastern Region is being taken. A proposal for setting up faculties of engineering and management in selected institutions in each state of NER is being considered. Also, there is proposal for setting up of Central Institute of Technology at Kokrajhar in Assam, with an estimated project cost of Rs. 25 crore. The institute is expected to start functioning from 2005-06 and will offer diploma and vocational level courses.

A Committee of CAGE has been set up on the subject of "Financing of Higher and Technical Education" under the Chairmanship of Prof. Bhalchandra Mungekar, Member, Planning Commission. It, *inter alia*, expects to address the commitment of the Government in the National Common Minimum Programme that nobody will be denied professional education because he or she is poor.

## Indian Institutes Of Technology (IITs)

The IITs Kharagpur, Bombay, Kanpur, Madras, Delhi and Guwahati were established as institutions of national importance under the Institutes of Technology Act, 1961. The University of Roorkee has also been upgraded into an IIT and integrated with the overall IIT system. The main objective of the IITs is to impart world-class training in engineering and technology; to conduct research in relevant fields, and to advance learning and dissemination of knowledge.

The IITs offer undergraduate programmes in various branches of engineering and technology; postgraduate programmes with specialisation and Ph.D. programmes in various engineering and science disciplines, interdisciplinary areas; and conducting basic applied and sponsored research. At present, the IITs offer B.Tech., M.Sc., M.Des., M.Phil., M.Tech, and Ph.D. degrees. The IITs maintain a quality of teaching and research of international standards. The Institutes are continuously evaluating and modifying curricula as per the emerging trends in industry.

In the higher technical education system in the country, the IITs play a critical role. These Institutes are responsible for:

- Producing high-quality technical manpower relevant to the needs of our country.
- Meeting the increasing demand for quality manpower in IT and related areas (IITs are enhancing their student intake in the emerging areas).
- Providing an ambience for promotion of research, development and innovation.
- Ensuring that strong industry institute interactions are developed.
- Meeting the growing needs of Indian industry for which five-year dual degree programmes have been introduced.
- Enhancing the level of activities pursued in the areas of sponsored research project and consultancy works especially through the Technology

Development Missions, resulting in successful transfer to technologies, filing of patents and execution of Memorandums of Understanding (MoUs) with a large number of industries.

- ❑ Contributing to updating the knowledge of faculty of other engineering colleges through Quality Improvement Programmes (QIPs) and as host institutions under the Early Faculty Induction Programme, IITs act as the nuclei to cater to the technical requirements of the respective regions.
- ❑ Updating continuously the knowledge base and skills of working professionals in industry through the Continuing Education Programme (CEP) and enhancing the interaction between the institute and industry.

In recent years, there has been a substantial increase in the intake of students to meet the growing demand for quality technical manpower, especially in the field of IT. Strength of students in the IITs has increased by nearly 50 per cent in the last 7-8 years. Computing and networking facilities have been upgraded. Electronic classrooms and videoconferencing are being increasingly used. There is greater use of technology in teaching-learning processes in the IITs, resulting in pedagogical transformation.

The IITs have been effective in enhancing the country's techno-economic strength and technological self-reliance. They have distinguished themselves by the excellence of their academic activities and research programmes. Sponsored research for different funding agencies in the public and private sector, industrial consultancy and continuing education programmes are also areas in which the IITs have made significant contributions.

### Indian Institute of Technology, Bombay

The Indian Institute of Technology Bombay (IITB), established in 1958, with the cooperation and participation of the then Government of USSR under UNESCO's technical assistance programme, is one of the seven institutes of technology in the country, set up to provide leadership in technological education, train

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high quality manpower for industry, and promote state-of-the-art technology application.

IITB's unending march towards its vision "To be the fountainhead of new ideas and of innovators in technology and science" and mission "to create an ambience in which new ideas, research and scholarship flourish and from which the leaders and innovators of tomorrow emerge" led to increasing its focus on research-oriented education, both at the undergraduate and postgraduate levels. The total number of projects as well as the flow of funds has been growing steadily over the years.

The institute receives impressive support from its alumni and well wishers, and IITB could mobilise a sizeable support for infrastructure, new laboratories, endowments for excellence awards, scholarships, travel fellowships, faculty development fund, research excellence awards, etc.

In keeping with national aspirations and expectations, IITB has increased the student intake over the last five years. Thus, 1,409 students were admitted during 2004 of which 152 belong to SC, 48 belong to ST and 152 are women. IITBs' total student strength has gone up

to more than 4,619. The increased emphasis on research has favourably impacted the UG to PG students' ratio, which currently stands at about 1:1.6.

Major reforms in existing programmes, new specialisations and programmes with inter-disciplinary inputs are a common feature at IIT Bombay. IITB also enhanced opportunities to the students to partake in research, encouraging them to take to business incubation and represent recent initiatives in pursuit of this strategy. The undergraduate research opportunities programme (UROP) implemented last year, exposes undergraduate students to the world of research early in their academic life.

The Institute has signed seven MoUs with foreign agencies and 21 with institutions within India. The MoU with University of Goa for providing infrastructure and academic support to distance education programme at Goa University campus has commenced operation from the second week of January 2004.

The Institute continues its technology development efforts, such as:

- Design of ATM Enclosure. It has many radical design elements that have their roots in Indian culture. It is being transferred to outside agency for manufacturing in large numbers.
- OptiLOM, an enhanced Rapid prototyping software for producing cheaper and stronger prototypes was developed in collaboration with Daimler Chrysler AG Germany and is being sold by Materialise of Belgium as an optional module of its rapid prototyping package, Magics 8.0, for use in the automobile industry.
- Superheat recovery water heater to recover heat from central chillers and refrigeration systems was developed and transferred for commercial exploitation.

Centre for Distant Engineering Education Programme (CDEEP) in the Institute is involved in National Project on Technology Enhanced Learning (NP-TEL), sponsored by the Ministry of Human Resource Development.

IIT-Bombay and Khadi and Village Industries Commission (KVIC, Government of India) are



currently working together on a variety of problems of mutual interest, so as to help employment generation in the rural sector. The objective is to enhance science and technology inputs to productive activities that utilise local resources and skills of rural people.

The Institute has produced an innovative design for wheelchairs. The 'Ascender', as the newly developed wheelchair has been named, provides higher level of operational freedom and self-reliance to the user. The new design makes transfer of persons to and from the wheelchair easier than is possible with conventional designs. Ascender also allows the user to negotiate kerbs and steps with greater ease.

The Continuing Education Programme Cell at the Institute has achieved remarkable growth. The faculty have contributed significantly to the country's growth in science and technology. Many of them have been conferred with distinctions and awards for their work/contribution in various fields.

As a further step in creating a decentralised system of governance, IITB have established two new positions at the level of Deans – Dean (Faculty) to address faculty related issues and plan development of faculty resources in a focused manner, and Dean (Alumni and International Relations) to provide more focus for alumni affairs and to strengthen linkages with overseas partner universities and agencies.

Under the Personnel Development and Training Cell, 36 training programmes were organised during the period and 307 employees attended these. The computerised employee information system, which would be available through LAN, is under progress. Also, 36 staff members in the Institute have passed the Hindi typing examination conducted by the Hindi Teaching Scheme. A computer training programme for the use of Hindi in Linux platform was organised for Hindi officers, and this was attended by 27 officers from different organisations.

### **Indian Institute of Technology, Delhi (IITD)**

Established as a College of Engineering in 1961, this

Institute was declared an Institute of National Importance under the "Institute of Technology (Amendment) Act 1961" and renamed as "Indian Institute of Technology Delhi" in 1963.

The Institute offers a wide range of academic programmes in science and engineering disciplines, both at the undergraduate and postgraduate levels. This includes a four-year B.Tech. programmes in nine disciplines of engineering and technology, five-year dual degree programmes in five areas, five-year integrated M.Tech Programme, two-year M.Sc. programme in three disciplines, 36 M.Tech. programmes in engineering technology, management, humanities and social sciences, a two-year M.Des. programme in industrial design, two MBA programmes, MS (Research) programmes in six areas. The Institute also offers opportunities for doctoral research in its 13 departments and nine research centres.

The Institute plans to take the student strength to 5,000 in next few years to meet the increasing demand of quality technical manpower.

The Institute is playing a significant role in upgrading the quality and fostering awareness among the teachers from other engineering colleges and technical personnel from industries and Government agencies, through Quality Improvement Programme (QIP) and Continuing Education Programme (CEP). During this period, several short-term (QIP/CEP) courses have been organised by the institute faculty. Students were admitted to Master's and Doctoral programmes in various departments. In order to enhance the IT skills of officials from the Ministry of Finance, college teachers and personnel from industry, the Computer Service Centre of the institute has run several courses.

Along with teaching and academic research, IIT Delhi lays great emphasis on research and development activities.

The Institute is actively involved in national/international collaborative programmes. At present, various collaborative programmes are operative. This year, the institute has signed several MoUs with institutes/industries in the country and abroad.



**The Institute is actively developing infrastructure of distance education using modern means of communication such as television, satellite and internet technology. For the Chhatisgarh, an educational programme of teaching basic engineering courses using the satellite technology has been undertaken. An electronic classroom has been set up on the campus. The internet unicast and multicast technologies have been experimented on priority basis.**

### **Indian Institute of Technology, Kanpur (IITK)**

The launching of a new facility for the emerging discipline of biological sciences and bio-engineering was the significant event of IIT Kanpur, which has 16 research labs, two teaching labs, two classrooms, one lecture theatre and one library room. The facility also houses state-of-the-art equipment required for research and teaching in the areas of biological sciences and bio-engineering. The institute has started M.Tech and Ph.D programmes in these areas as also the B.Tech programme.

The institute has been able to increase the enrolment of postgraduate students at M.Tech. as well as Ph.D levels. A new dual degree programme (MSc-Ph.D.) has been started in the Department of Physics. A new academic programme entitled Master of Design Programme has also been started in a successful manner. The overall strength of students is now above 4,600 while the strength of faculty members stands at 350. The percentage of SC/ST and women with annual intake in the Institute is 13.6 per cent, 3 per cent and 24 per cent, respectively. The institute has developed one semester postgraduate certification programmes in the areas of

earthquake engineering, helicopter technology and aerospace manufacturing. These courses are being offered to the engineers and managers of aerospace industries, Officers of Defence Forces and Coast Guard as well as teachers of engineering colleges. The Institute has also initiated coordination of National Programme on Earthquake Engineering Education.

The Institute is actively developing infrastructure for distance education using modern means of communication such as television, satellite and internet technology. For the State of Chhatisgarh, an educational programme of teaching basic engineering courses using satellite technology has been undertaken. An electronic classroom has been set up on the campus. The internet unicast and multicast technologies have been experimented on priority basis. The institute is actively participating in developing the basic infrastructure and academic contents for the Indo-French Cyber University. All these initiatives, it is hoped, will evolve into an outreach education programme that will offer credit-based flexible courses.

IIT Kanpur has developed an anaesthesia monitor for measuring the depth of anaesthesia. This device is capable of detecting the effect of a light dose of anaesthesia on the level of consciousness and overall muscle relaxation. Under the IIT Kanpur – Sanjay Gandhi Post Graduate Institute of Medical Science (SGPGI) Lucknow collaborative project, a set of advanced numerical processing schemes have been developed to improve tissue contrast, reduce noise and for de-blurring of magnetic resonance images. A robotic device has also been developed to assist the anaesthetist during surgery.

Under a project jointly funded by Samtel Group of industries and Department of Science and Technology, two types of polymers have been successfully developed for fabricating green as well as red light emitting diodes. Efforts are underway to further improve the performance of these devices. The Department of Chemical Engineering has developed an innovative process to recover the precursors for widely used plastics and petrochemicals contained in natural gas.

In order to increase the level of research activities in the

institute and for reinforcing the research infrastructure, several new equipment have been made available to the students and faculty. A unique facility called SQUID (Super conducting Quantum Interference Detection) system has been established. SQUID is a highly sensitive instrument capable of measuring changes in a magnetic field, as small as one trillionth of a Gauss.

The institute has acquired a new all-composite, two-seater, modern trainer aircraft Hansa III. The aircraft has been designed and developed by NAL Bangalore. This aircraft will be used for conducting advanced experiments in the field of surveying. The other set of specialised instruments acquired by the Institute are as follows: Thermal analyser equipped with thermal-gravimetric analysis features; NO<sub>x</sub> and THC emission measurement system for internal combustion engines; X-ray diffraction system; spectroscopic ellipsometer for non-destructive characterisation of surfaces; a five-axis CNC machining centre as well as turning centre, a water jet abrasive machine, a non-destructive, white-light scanner for reverse engineering, an advanced version of FDM rapid prototyping machine and several state-of-the-art research equipment such as electron paramagnetic resonance (EPR) spectrometer, scanning electron microscope (SEM), single crystal X-ray diffraction system, atomic force microscope (AFM), automated DNA sequencing and fragment analysis system.

The institute continues to improve the infrastructure as well as facilities for research for students, staff and faculty.

IIT Kanpur has also completed the following construction projects and commissioned the same for use. A 480-bed hostel, Hall of Residence 7, has been completed. The construction of another hostel, Hall of Residence 8, is in progress. The first phase of this hostel consisting of 240 rooms has been completed. A modern, fully-furnished complex of 12 apartments has been completed for visiting faculty members. For promoting the activities of innovation, incubation and entrepreneurship, a facility – Small Industries Development Bank of India (SIDBI) Centre for Innovation and Incubation – has been built on campus.

A facility for industry sponsored research and design education – Samtel R&D building – has been commissioned. In order to provide a clean, hygienic mess environment, the kitchen facilities of two hostels – Hall of Residence I and II – have been modernised. These facelift efforts have given a new look to the academic as well as residential areas of IIT Kanpur.

### **Indian Institute of Technology, Kharagpur (IITKgp)**

The Indian Institute of Technology at Kharagpur (IITKgp) was set up, after independence for the purpose of nation-building through human resource development in science and technology. IIT Kharagpur, being the oldest of the IITs, has provided the necessary leadership to usher in a revolutionary change in the outlook of technical education in the country.

In order to strengthen the bondage with the alumni spread all over the globe, a new website [www.alumni.iitkgp.ernet.in](http://www.alumni.iitkgp.ernet.in) was launched to create a strong global alumni network. All the alumni of the institute are being provided with lifelong e-mail address upon registration. With generous donations from the alumni, each student of the institute has been provided with a computer (PC) and a state-of-the-art computer network internet facility has been extended to the hostels.

Over the years, significant infrastructure has been developed to facilitate high quality teaching and research. Recently, a state-of-the-art academic complex has been set up. It has one 800-capacity auditorium and six lecture halls ranging between 200 and 400-capacity, all centrally air-conditioned. It also houses programmes on computing, information technology and educational technology. Four new halls of residence for students have been constructed and new wings added to old hostels. Besides, a residential complex named after Dr Vikram Sarabhai has been built for project scientists. As part of the modernisation efforts, central research facilities have been expanded and the budget for the central library enhanced. Also, 25 km of single mode fibre optic cable have been laid in the academic complex.

In addition to the ongoing B. Tech.(Hons), B. Arch, M.Sc and M. Tech courses, the institute has introduced a three-year Programme in Master's in Medical Science and Technology from the academic sessions 2001-2002. The institute is the first in the country to introduce a three-year Master's in Medical Science and Technology (MMST) programme. The Postgraduate Programme in Information Technology (PGDIT) started from the session 1999-2000 in a hybrid mode in the extension centres of Kolkata, Bhubaneswar and at STEP, IIT Kharagpur has received encouraging reports from the IT industries as far as the quality of the programme is concerned. The one-year postgraduate diploma in Maritime Operations and Management has broken fresh ground. The entire B. Tech. Programme has been revamped with greater emphasis on electives and with a choice given to students to do a minor in a specialised area along with one's major subjects of study. The dual degree programme leading to an M. Tech degree has been further expanded. A new M. Tech curriculum has been introduced with project work occupying one full semester. The percentage of SC/ST and women with annual intake in the institute is 12.45 per cent, 3.4 per cent and 10.30 per cent, respectively.

VLSI design by the Computer Science and Engineering Department is of pioneering nature and VLSI group is designing 0.18 $\mu$ m chips, which are being cast in the foundry of National Semiconductor USA and brought here for testing. The institute emphasises on resource generation through sponsored research and collaborative research by national and international agencies. Research is being conducted on many areas of national importance such as robotics, biotechnology, cryogenics, VLSI chips, etc.

The faculty and students of the institute received laurels and distinctions, including the prestigious Shanti Swarup Bhatnagar Prize and Fellowship of National Academy of Science and Engineering. The institute received numerous sponsored research and industrial consultancy projects from India and abroad and made substantial earnings ranking top among IITs. The institute has also taken a lead in IPR protection and filing patents and copyrights.

IIT Kharagpur has led the IIT movement and set up some of the best practices over the years. It has also learnt from the new initiatives taken up in other IITs and implemented them vigorously to keep pace with the moving times. It is important that the IITs continue to think ahead and plan for the future. In view of this, several initiatives have already been taken and future programmes are being planned. Some of them are highlighted below.

IIT Kharagpur aims at attracting and nurturing the best talent available in the country. Several initiatives have been taken in this direction which include

- a) Maintaining a standing advertisement on web for faculty recruitment.
- b) Providing seed money up to Rs. 3,00,000 to new faculty to start a project in his/her area of interest.
- c) Offering Rs. 50,000 for the most industrially relevant projects to final year undergraduate students.
- d) Acting as sponsor and venture capitalist to turn out at least two B.Tech students as entrepreneurs.
- e) Providing high value Ph.D. scholarships to exceptionally brilliant students.
- f) Kalpana Chawla Fellowship for bright women researchers in space technology.

A number of academic programmes are undertaken that include M. Tech in Information Technology, M. Sc. in Biosciences and PG Diploma in Eco-tourism. The institute has identified 13 Mission Programmes that have the mandate of making a deep impact in the technological and societal progress of the country. These include mechanised food engineering, natural resources management, molecular biotechnology, disaster mitigation and management, electronic applications in human endeavours, photonics, nano science and technology, complex engineering systems, manufacturing and systems engineering, biomedical technology, VLSI design and wireless technologies, management and control of power system equipments and possibly the most important, technology transfer to villages.

In order to become one of the topmost institutions in research and development in the world, IIT Kharagpur has chalked out its priorities consisting of a set of policies and principles along with concrete, time-bound plans to translate them into action. Efforts are being made to induct excellent faculty and students, retain them and give them ample academic freedom. Along with the acquisition of state-of-the-art equipment and renovation of existing laboratories, they plan to introduce faculty exchange programmes. Publication in international journals, filing of patents and work in futuristic areas are being strongly encouraged. They are also trying to generate sufficient funds for implementing these ideas. The institute wants to involve distinguished alumni in the advisory committees of departments by organising periodic meetings of the alumni with students and faculty.

### Indian Institute of Technology, Madras(IITM)

The Indian Institute of Technology Madras (IITM) was established in 1959 by the Government of India, as an institute of national importance. Its primary objective is to promote higher technical education, research and consultancy.

IIT Madras has vigorously pursued several academic activities, which are based on the core strengths of the institute and in consonance with its stated goals. The institute offers several course-based undergraduate and postgraduate programmes as well as research-based postgraduate and doctoral programmes. The institute offers seven specially designed user-oriented M. Tech programmes. Each of these is designed and implemented through collaboration with user industries. As many as 46 new courses (subjects of study) were introduced. A cell for professional ethics and human values has been set up in order to promote these attributes in the students. The percentage of SC/ST and women students with annual intake of the Institute was 11 per cent, 3 per cent and 23 per cent, respectively.

Apart from Ph.D and M.S theses, the faculty and research scholars have published 368 research papers in refereed international and national journals and 531

papers have been presented at International and National Conferences. Faculty members have published four books during the year.

The number of active sponsored projects during the year is 225. Number of faculty members involved in these projects as Principal Investigators and Co-Principal Investigators is 196. The total value of sponsored projects sanctioned during the year is Rs. 50.36 crore. The number of active consultancy projects during the year is 636 with a total value of Rs. 6.60 crore; the number of faculty members involved in these consultancy projects is 203. The ISRO-IITM Space Technology Cell has renewed 17 projects and sanctioned seven new projects during the year. Under the IGCAR-IITM Cell, two projects were continued. ISRO-IITM Space Technology Cell and IGCAR-IITM Cell have been functioning effectively through periodic monitoring and review of these projects. The Industrial Associateship Scheme has now 241 members facilitating continuous interaction with industry. The institute has signed 28 memoranda of understanding with industries during the year.

The Centre for Continuing Education (CCE) of the institute has been very active in its professional development activities. Five short-term courses under QIP, 30 short-term courses under Continuing Education Programme (CEP) and 18 under Educational Consultancy Programme (ECP) were organised. The Institute's Educational Technology Cell has produced about 900 hours of video materials, which includes 23 semester lecture based programme, one documentary for Gyan Darshan telecast and six lecture series for Gyan Darshan. CCE also organised a one-year Certificate Course on Advanced Engineering Design for Graduate Engineers of BHEL based on the concept of a finishing school.

The institute has played a leading role in providing guidance and assistance to the other engineering institutions in the country. As many as 127 teachers of engineering colleges are currently registered for Ph.D and M.Tech programmes under QIP.

The institute has been interacting with several

international organisations for collaborative research, exchange of faculty and students. So far, the total number of MoUs signed by IIT Madras with international universities amounts to 50. During the year, eight MoUs with chosen international institutions have been processed. Four MoUs have been signed with international companies and research laboratories for collaborative R&D.

Over the past few years, the institute has created several opportunities for international student exchange. One of the major initiatives in this regard has been the Indo-German Agreement between the five IITs and six technical universities in Germany. Under this programme, 14 M. Tech and 3 M.S scholars were deputed to reputed German universities for undertaking project/thesis work last year. In turn, the institute received a few Ph.D. scholars from Germany to undertake their projects in IITM's research laboratories. The institute also deputed two M. Tech. students in industrial mathematics to the University of Kaiserslautern, Germany, for training. One B.Tech student completed one semester at EPFL.

The institute conducted 27 training programmes (189 programme-days) with 859 participants for technical and administrative staff to update and upgrade their knowledge and skills in order to enable them to perform their work more effectively.

IIT Madras has secured ISO-9001-2000 Certification for 12 units. Continuous improvement being the hallmark of a learning organisation, several 5-S programmes have been conducted. Quality Circles have been initiated in 12 administrative units covering nearly the whole of support services of IITM.

An ATM-based high-speed campus-wide network has been operational for the past five years. The network provides connectivity between the various departments, hostels and the faculty residences. The planning and implementation of Internet-2 are in advanced stage, which would provide IPv6, QoS and IP-Telephony.

The campus infrastructure has been improved in a substantial way. The old library building has been remodeled to house the CCE, the Gymkhana and the

Management division. The approval of the Council is expected on the creation of new departments of management studies and of biotechnology. Substantial deepening of the lake in the campus has been completed as a rain water harvesting activity and with the excavated soil, border roads have been formed. The campus GIS facility is being built up. Augmentation of the Lecture Hall Complex has been completed. Three additional floors in the New Millennium Library building have also been completed.

### Indian Institute of Technology, Roorkee(IITR)

The University of Roorkee was converted into the Indian Institute of Technology, Roorkee, with effect from September 21, 2001, by the Government of India. The institute has an illustrious history and a glorious past. It has its foundations in the Roorkee College, which was founded in 1847, to train technical manpower for making the Ganga Canal. It was the first engineering college in the entire British Empire at that time. Major civil works in the country like dams, canals, roads, highways, railways, bridges, etc., are the outcome of the engineering education in this college.

Out of a total of 1,469 students admitted during 2004-05 there were 487 through JEE in B. Tech./B. Arch, 842 through GATE in M. Tech./M. Arch., and other PG programmes and 140 students in Ph.D. The percentage of SC/ST and women students with annual intake during 2004-05 was 8 per cent, 3 per cent and 10 per cent, respectively. The total enrolment in the institute reached 3,913. IITR had about 640 Ph.D. scholars on rolls in July 2004, largely made possible by the doctoral fellowships offered by MHRD.

IITR participated in the conduct of JMET-2002 and GATE-2003 for the first time. On the JEE pattern, the Joint Admission Test to M.Sc. (JAM) has been conducted with effect from the 2004-05 academic session for admission to all post- B.Sc. programmes in all IITs.

During the year 2002-03, the on-campus placement was 85 per cent for UG and 38 per cent for PG students having CGPA above 6.75 while in the current year 217

UG and 118 PG students have been offered placements.

Some of the important academic activities with respect to restructuring/ renaming of courses, starting of new courses etc. are summarised below:

1. Five year integrated dual degree programme B. Tech. (Chemical Engineering) and M.Tech. (Hydrocarbon Engineering) started with effect from July 2003
2. Five year integrated dual degree programme B. Tech. (Electronics and Communications) and M. Tech. (Wireless Communication) was started with effect from July 2003.
3. Five year integrated dual degree programme B. Tech. (Computer Science and Engineering) and M. Tech. (Information Technology) was started with effect from July 2003.
4. The curricular structure and syllabi for the new M. Tech programme (Advanced Chemical Analysis) in the Department of Chemistry for admission in July 2004.
5. M. Tech. (Remote Sensing and Photogrammetry Engineering) in the Department of Civil Engineering was renamed as M. Tech. (Geomatics Engineering).
6. Curricular structure and syllabi of 6 pre-Ph.D courses in the Department of Chemistry and a similar number in the Department of Physics and Humanities and Social Sciences.
7. Some of the new M. Tech. programmes to be started from 2005 are:
  - Industrial Safety and Hazards Management
  - Corrosion Engineering
  - Advanced Chemical Analysis

Of a total of 704 research publications, 367 were in refereed journals and 337 in conferences, etc. The institute received 569 new consultancy projects and 91 new sponsored research projects with outlay of Rs. 9.03 crore and Rs. 15.11 crore, respectively.

IITR is playing an important role in the development

of Uttaranchal State and the nation through various R&D, consultancy and IT related activities. Some of these are as follows:

- Implementation of a pro-poor IT initiatives for e-connectivity at community information centres under a UNDP funded project amounting to US\$ 1 million.
- Total quality of electrification and civil works for *Ardh Kumbh* 2004 held at Hardwar.
- Feasibility report for : Taj Expressway (between Greater Noida-Agra), Widening and strengthening of NH-25 (between Kanpur-Jhansi), and Widening and Strengthening of a portion of NH-2 (Bhognipur-Kanpur section) related to Expressway and National Highway Development Programme (NHDP) of the Prime Minister of India.
- Quality control and quality assurance including application of new technology for Delhi urban roads.
- Two nationally coordinated projects on *Urban Transport Environment Interaction* and *Road Traffic Safety* sanctioned by AICTE.
- State Technical Agency (STA) appointed by Ministry of Rural Development under Pradhan Mantri Gram Sadak Yojna (PMGSY).
- Ministry of Non-Conventional Energy Sources, Government of India has recognised AHEC as nodal agency for standardisation of SHP designs, technologies and equipment in the country.
- Renovation and modernisation of old small hydropower stations (Galogi, Bhola, Salawa and Chitaura) under Uttaranchal and UP Jal Viduyut Nigam.
- Conservation and management of Nainital lake and four other lakes.
- R&D and consultancy related to earthquake studies through instrumenting multi-storeyed buildings in Peninsular India for their seismic performance, network of digital accelrographs in Bihar region, strong motion studies in Himalayas and attenuation studies in a small window of Garhwal Himalayas.

It signed eight MoUs with various national and international organisations. These include Khadi and Village Industries Commission (KVIC) Mumbai; Punjab University Chandigarh; MHRD, Government of India, New Delhi; Macquarie University, Sydney, Australia; University of Waterloo, Canada; CIRT Pune; National University Singapore; Indo-Norwegian Programme of Institutional Cooperation, and a letter of intent for the creation of Indo Swiss Academic Alliance.

There were 111 foreign students in various disciplines from 16 developing countries, *viz.*, Bangladesh, Bhutan, Ethiopia, Rwanda, Indonesia, Iraq, Nepal, Philippines, Uzbek, Mongolia, Maldives, Yemen, Myanmar, Vietnam, Kenya and Egypt. Foreign students stay in the hostels along with other students.

A star topology 1000 Mbps Ethernet Switch based state-of-the-art enterprise network with data, voice and video communication capabilities was installed. The network covers 365 acre of area through 14 Km of OFC and 40 Km of UTP, connecting 24 departments/ centres providing connectivity to all the students, faculty and other supporting staff. Some of the state-of-the-art equipment installed include:

- ❑ Thermal Ionisation Mass Spectrometer
- ❑ Fully computerised satellite earth station and automatic satellite data acquisition system
- ❑ X-ray diffractometer
- ❑ Thermal Analysis System for TGA, DTA and DSC studies.

The activities related to new construction/extension of buildings, and renovation include:

- ❑ Extension of academic departments (2832 m<sup>2</sup>)
- ❑ Addition of 421 seats in boys hostel and 48 seats in girls hostel
- ❑ Construction of 24 *C* Category and 48 *D* category residences.

Several national/international conferences/seminars/workshops were organised during the year by various departments of the institute. IITR faculty received a number of awards and honours this year for their research work and professional contributions. A large number of distinguished speakers and subject experts were invited to deliver lectures on topics of wide interest. Similarly, a good number of faculty members of the institute were invited outside to give technical talks on their respective research works.

### Indian Institute of Technology, Guwahati (IITG)

The Indian Institute of Technology (IIT) Guwahati with its headquarter at Guwahati was established under the Institute of Technology Act (Amendment) 1994, an Act further to amend the Institutes of Technology Act, 1961. The IIT Guwahati started functioning with effect from September 1, 1994. With the opening of the Departments of Biotechnology and Chemical Engineering, all academic departments, as per the targets set, have been opened. The process of opening up inter-disciplinary centres has been initiated, and four such centres have already started to operate. This has given a thrust to application-oriented research and development activities.

At present IIT Guwahati has 11 academic departments running various programmes of the institute at the

undergraduate and postgraduate levels. The number of students increased to 1,317. The percentage of SC/ST and women students with annual intake in the institute was 14 per cent, 7.3 per cent and 8.3 per cent, respectively. The faculty strength was 111, while non-faculty staff increased to 205 during the year. The number of women employees increased to 51. The total number of faculty, officers and staff increased to 316.

The academic complex consists of a total area of approximately 74,000 sq.m, having 16 blocks and four core buildings. The work commenced in March 2000 and the entire complex was completed by August 2004. The construction of four hostels has also been completed and occupied by students. The construction of the administrative building with an area of 9,299 sq.m was also completed. The air-conditioning and partitioning works in the administrative building are also completed. The institute guest house and most of the residential quarters have been completed. Development work of the sports complex has also been completed. The piling works for the indoor stadium are in progress.

Twenty-one new research projects were started in 2002-2003, taking the total number of running projects to 60 in this year. Total sanctioned amount of these new projects is over Rs. 2.74 crore. Over Rs. 6.66 crore were received from various funding agencies as research funds up to the year under report.

In addition to the sponsored R&D projects, the institute also offered consultancy services to many government, public and private sector agencies during the period under report. In the year under report, the total value of the consultancy projects sanctioned is approximately Rs. 46.96 lakh, out of which Rs. 24.74 lakh was received on this head.

The institute has been procuring state-of the art equipment for its various laboratories both for teaching and research. Some of the major equipment procured during the year include: (1) Universal SMP Scanning Head SMENA for basic AFM modes in air with accessories, etc. Value: US\$ 45,366.69, (2) Laser Particle Size Analyser (Value: UK£ 29,356.45), (3) Variable Pressure Digital Scanning Electron Microscope

(Value: UK£ 114,109.00), (4) Microtest 5000 High Load Tension, Compression, Bending Modules with Accessories, etc. (Value: US\$ 72,720.00), (5) Programmable Logic Controller (Value: UK£ 26,663.04), (6) Stress Path Testing System for 38 and 100 mm Samples (Value: UK£ 27,616.31), (7) Model SPEX Fluoro Max-3 Compact Spectrofluorometer with accessories, etc. (Value: US\$ 34,350.00.)

### Indian Institute of Science, Bangalore

The Indian Institute of Science (IISc), Bangalore was set up in 1909 with the objectives of providing opportunities for advanced instruction and to conduct original investigations in all branches of science and engineering to promote the material and industrial welfare of India. At present, it has a Deemed University status. Over the years, the IISc has succeeded in encouraging creativity, nurturing excellence, boosting innovative research and development, and at the same time providing strong interfaces and support to industries and other organisations. IISc has earned a global reputation as a centre of excellence in research and development in all its areas of activity.

The activities of the institute are carried out through six divisions, viz., biological sciences, chemical sciences, electrical sciences, information sciences, mechanical sciences, and physical and mathematical sciences.

The institute admits around 450 candidates for research and course programmes in different disciplines every year. The institute has innovative programmes, viz., Young Science Fellowship Programme, to motivate talented undergraduates at the +2 level to adopt research as a career; and Young Engineering Fellowship Programme for III Year B.E./B. Tech. students. Around 1,900 students are pursuing different programmes, leading to the award of Ph.D/M.Sc (Engg) by Research and M.E./M. Tech/M.Des. degrees. In one year, the institute awards around 180 Ph.D degrees, 425 M.Sc (Engg) and 270 Master's Degrees, viz., M.E./M. Tech/M.Des. The human resource trained at the institute is in great demand in academic institutions, industrial establishments and government agencies in the country and abroad.

IISc has taken innovative steps to further enhance its relationship to business and industry by the creation and nurturing of the Society for Innovation and Development (SID). Almost 470 industrial interaction projects are being handled through the Centre for Scientific and Industrial Consultancy (CSIC) and SID. The institute has close interactions with agencies such as Department of Space (DOS), Defence Research and Development Organisations (DRDO), Department of Biotechnology (DBT), Ministry of Information Technology (MIT), Ministry of Science and Technology, etc., and contributes to several national initiatives. Faculty members have taken up many sponsored research schemes for investigation. In addition, the institute works on and supports activities of concern to application of science and technology to rural development.

### **ABV - Indian Institute of Information Technology and Management, Gwalior**

ABV - Indian Institute of Information Technology and Management, Gwalior was started by Government of India in 1997 for developing information technology and IT-enabled management for meeting the growing need of the industry in this area and also to keep pace with developments taking place world over in this fast developing field. In a short span of five years, the institute has developed facilities for education, research, consultancy and professional expertise in the area of IT and management, which has been evolved through seamless integration. The institute presently offers postgraduate programmes leading to MBA in different fields (a four-semester – two-year programme open to engineering graduates of all disciplines and MCA), and M. Tech., four-semester - two-year programme open to electronics / electrical and computer science graduates and five-year integrated postgraduate programme with provision to award a dual degree (B. Tech (IT), M. Tech (IT) or B. Tech (IT), MBA) in information technology and management for the students with 10+2 qualification with the background of science. The institute also offers management development programmes. Currently, the institute is operating from its own campus, which is coming up in 61.67 hectares

of land in Gwalior-Agra-Delhi Highway with fully networked hostels, faculty houses, academic departments and guest house equipped with all modern facilities. Two departmental blocks and lecture theatre complex are ready. Also available are two hostels. Tree plantation and campus greening is on, and the institute also initiated the effort to create facilities for games.

The admission to the five-year integrated programme from the academic session July 2003 has been through AIEEE(CBSE). The admission to M. Tech programmes is done through an all-India test conducted by the institute followed by personal interview.

The admission to MBA Programmes is conducted through JMET followed by GD and interview. The institute has earned the status of Deemed University and is currently emerging as a leading institution in the area of information technology and management.

The following new academic programmes have been initiated by the institute:

- i. A course on Quantum Computing (including Nano materials) has been offered in M. Tech.
- ii. Two specialised programmes on MBA (ITES) and MBA (IFS) are being offered.
- iii. The institute has started two specialised programme namely MBA Non formal Sector and MBA Public Service Management from the academic session July 2003.

### **Indian Institute of Information Technology, Allahabad**

The Indian Institute of Information Technology, Allahabad (IIIT-A) was established in 1999 with the objective of imparting education, training, research and development in information technology (IT) and related areas. It was conferred the status of Deemed University in August 2000. Within a short span of time, it has earned a reputation of being as an important centre for education and research in IT. Programmes being offered currently are the Undergraduate Programme (B.Tech. in IT), Post-Graduate Programme (M.Tech. in Bio-informatics, Intelligent Systems and Wireless Communication and Computing) and R&D programmes in IT related areas.

The institute has been identified as a nodal centre for development of softwares in languages by Ministry of Human Resource Development. It coordinates the project with the involvement of prestigious institutes like Indian Institute of Technology, Bombay, Indian Institute of Science, Bangalore and C-DAC, Pune. The Indo-Russian Centre for Biotechnology has been established in the institute that has undertaken research and development in various thrust areas related to the institute's interest like genomics, computer aided molecular modeling, drug design, computational neuroscience, phylogenetic tree, computer aided immunology, etc.

Currently, the institute has a number of projects from various Government of India sponsoring agencies viz., DSIR, MHRD, DST, DBT and others.

The institute has been assigned the prestigious task of working towards an E-enabled Legal Profession for which it has organised a high level workshop at the Supreme Court of India, presided over by the Chief Justice of India and participated by the Chief Justices of the various High Courts in India. Through this project, it is aimed that the dispensation of legal matters in the Indian courts would be streamlined and their working revamped to benefit the public at large as well as those who are actually engaged in dispensation of such matters.

The institute, in collaboration with Indira Gandhi National Open University (IGNOU) is organising activities to popularise various aspects of information technology, formal courses, career counseling and other related useful information to the society at large through establishment of Gyan Vani Studio with digitised facility of audio recording and transmission through FM Channel. The institute is also helping the local district authorities in the dissemination of various schemes through web, networking for the High Court and the City Corporation at Allahabad for preparing their database information and other establishments in Allahabad.

The institute has laboratories related to analog/digital signal processing, image processing, artificial intelligence, digital/data communication, data

structure, language technology, etc. The institute has an excellent computing infrastructure with 60 servers running on different operating systems and more than 500 workstations.

Internet facility is available on each desktop through 4 Mbps leased line setup using CISCO 3600 router. The institute has strong networking backbone with 9 Bay stack 450 switches along with 12/24 ports and 16 D-link 24 ports switch with 100 Mbps data transfer rate.

The permanent campus has been developed at Devghat Jhalwa in a picturesque locale in the folds of the Ganga and Yamuna at a distance of about 8 km from the Allahabad Junction Railway Station. It consists of administrative block, lecture complex, computers and other various laboratories, electronic library, residential complex, hostels, sports complex and students facility centres. The building has been designed on a geometrical pattern developed by the world-famed geometrician Prof. Roger Penrose to adopt latest understanding of nature and information.

During the year 2004-2005, Phase-II construction work of the institute is in progress.

### **Indian Institute Of Information Technology, Design And Manufacturing, Jabalpur**

The then Prime Minister, in his Independence day 2003 address to the Nation, had made an announcement of setting up of another national level institute at the Indian Institute of Information Technology, Design and Manufacturing at Jabalpur. Accordingly, necessary proposals have been finalised. This is expected to be a landmark in the evolution of technical education system in the country. This meets a very pressing need of the industry today. The industry driven adaptive management structure provides the institution the ability to respond to challenges of the future. This would provide sustainable competitive advantage to Indian industry in the area of design and manufacturing of new products in the increasingly globalised economic environment.

Globalisation has created uniformity in customer

expectations world over. With opening up of the Indian economy, our manufacturing sector has to compete globally even for the domestic market. This would require strong products with leading technology / quality and compelling cost advantage. Suitably trained manpower is critical to achieve this goal. Large pool of highly trained manpower has provided India leadership position in knowledge-based industries. Efforts are now required to translate this leadership in building indigenous manufacturing capabilities. Whereas China is already a leader in low-tech build manufacturing, India could emerge as leader in brain-intensive manufacturing. Present system of technical education though huge and diverse focuses on analytical abilities. This would require skill sets appropriate for design, development and prototyping, that too – using modern tools and techniques. Accordingly, setting up an Institute of Design and Manufacturing at Jabalpur has been initiated.

The Institute has been registered at Jabalpur as a Society under M.P. Societies Registration Act, 1973 on January 24, 2005. The institute was inaugurated by the Hon'ble

Human Resource Development Minister on February 7, 2005.

### New Initiatives in Technical Education Sector

For support to technical education sector in the country, all schemes relating to improvement of quality in technical education excluding the externally aided programme namely *Technical Education Quality Improvement Programme (TEQIP)* have been clubbed together under the scheme –*Programme(s) for Quality Improvement in Technical Education (PQITE)*.

Whereas, some of the programmes namely *National Programme for Earthquake Engineering Education (NPEEE)* with an outlay of Rs. 13.76 crore under the scheme *Support to New and Emerging Technology Areas*, *National Programme for Technology Enhanced Learning (NPTEL)* with an outlay of Rs.15 crore under the scheme *Support for Distance Education and Web-based Learning*, *INDEST Consortium* and *Eklavya Technology Channel* have already been launched. Others are in approval

stages. Brief description of each of these ongoing programmes is given below:

## Ongoing Programmes

### National Programme on Earthquake Engineering Education (NPEEE)

A comprehensive National Programme on Earthquake Engineering Education (NPEEE) was launched by MHRD with the seven IITs and IISc as resource institutes. IIT Kanpur is the Coordinating Institute. The project includes the following activities:

- a) Conducting short-term (one- to four-week) and medium-term (one semester) training programmes for teachers of engineering colleges, polytechnics, and architecture colleges. These courses will also allow participation of a limited number of working professionals.
- b) Providing partial financial support to a large number of teachers to attend international conferences and hence to get an exposure on the international state-of-the-art in this subject.
- c) Inviting a few international experts to the premier institutions for teaching, research, and long-term collaborations.
- d) Developing teaching aids, course materials, textbooks, manuals, and commentaries.
- e) Developing modest teaching laboratories in about 10 engineering colleges and strengthening of more advanced teaching/research laboratories in the eight premier institutions.
- f) Providing library resources in earthquake engineering to about 100 engineering colleges.
- g) Organising workshops and conferences to share ideas and sensitise different stakeholders.

The programme is open to all recognised engineering colleges/polytechnics and schools of architecture having related academic degree or diploma programme, irrespective of whether these are government funded or privately funded. The programme has been sanctioned in 2002 initially for three years with a budget of Rs. 13.76 crore. The NPEEE is being monitored and administered

by a National Level Committee on Earthquake Engineering Education (NCEEE) under the Chairmanship of Joint Secretary (Technical). NCEEE, depending on the need and level of participation of different institutions, recommends allocation of funds to various resource institutions. A Programme Implementation Committee (PIC) has also been constituted for the purpose of ensuring timely implementation of the programme.

### EKLAVYA Technology Channel

Eklavya Technology Channel was launched on January 26, 2003. This is coordinated by IIT Delhi and supported by IGNOU. It is a channel dedicated to technical education. This telecasts programmes generated at different IITs. Details are available at IIT-Delhi Website [www.iitd.ernet.in](http://www.iitd.ernet.in). The Channel has its foot print in every nook and corner of the country through INSAT 3C Satellite on C band (74 degrees East), Down link frequency 4165 MHz., Symbol rate 26.000 SPS, FEC 1/2, Polarisation Horizontal.

This channel hopes to make a difference to the learning environment in technical institutions. It obviously does not intend to substitute the teacher or the conventional methods of learning. Nevertheless, it desires to enrich the learning environment. The vision is to share the expertise with one and all to bring about a true socialism in engineering education in the country. It aims to be useful to the students pursuing engineering education and also to those who catalyse their inquisitiveness.

The channel is currently telecasting 8 full video courses and runs for 16 hours per day for seven days a week. Sundays are reserved for special interest programmes on science and technology that are of interest to a common man. A special newsletter on Eklavya Technology channel is also brought out every three months that contains the programme schedule for the following three months and other useful and interesting information and is mailed to engineering colleges across the country with the help of AICTE and ISTE.

### INDEST Consortium

Ministry of HRD has set-up the Indian National Digital Library in Science and Technology (INDEST)

Consortium. The Ministry provides funds required for providing differential access to nine full-text electronic resources and seven bibliographic databases to 38 centrally funded Government institutions including all IITs and IISc through the consortium headquarters set-up at the IIT Delhi. The benefit of consortia-based subscription to electronic resources is not confined to these 38 institutions in the country but is also extended to all educational institutions under its open-ended proposition. As many as 64 Government / Government-aided engineering colleges are getting access to selected electronic resources with support from the AICTE and 37 other engineering colleges and institutions have already joined the consortium on their own.

The usage of these resources is being monitored regularly. The electronic resources accessible at IITs and IISc are also being shared through an interface called J-Gate Custom Content for Consortium (JCCC) that facilitates generation of automated inter-library loan requests directly by users in NITs to one of the IITs / IISc.

INDEST Consortium has also decided to take up additional activities related to content creation under a new MHRD initiative that may be named as "INDEST Extended". The need for establishing archival centres for electronic resources subscribed through the Consortium was identified as one of the most important activities. It is felt that archival centres may be established for different resources at different institutions. Further, activities like national database of theses and dissertations, web-based union catalogue of journals, other serial publications and books and cooperative cataloguing of internet-based electronic resources are planned.

### **National Programme for Technology Enhanced Learning (NPTEL)**

With the expansion of technical education in the country, there was a felt need to supply quality learning materials to the students. As the shortage of good quality teachers in the field of technical education was not likely to be met in the immediate future, the MHRD felt that technology could be utilised in the learning of the students. The National Programme for Technology Enhanced Learning (NPTEL) has been mooted to make

a coordinated effort to enhance learning effectiveness in the field of technical education by using technology. NPTEL was approved by the Standing Finance Committee on December 18, 2002, with a total outlay of Rs. 15 crore for the Tenth Five Year Plan. The programme is on the development of course materials, both video as well as web-based, to supplement the efforts of the faculty on the campuses. The main objective of the programme is to enhance the quality of engineering education in the country by developing curriculum based video courses (at least 100+100) and web-based e.course (at least 115) to be done by seven IITs and IISc, Bangalore and other premier institutions through collaborative efforts. IIT Madras is the coordinating institute.

- Under the TEL Initiative, premier institutions of science and technology would work together to build educational tools, methods, and courses to create new learning environments countrywide.
- Primary objective being to enhance learning effectiveness through Technology Enhanced Learning (TEL) to supplement classroom teaching. A high quality learning environment would be created irrespective of the institution so as to overcome acute faculty shortages.

Under the National Programme for Technology Enhanced Learning, there is a National Programme Committee headed by Joint Secretary (Technical). The National Programme Committee oversees the management of the programme and functions as a Grants-in-aid Committee to recommend release of funds under NPTEL.

Initial focus shall be on main disciplines in undergraduate engineering programmes offered in 1200 + engineering institutions in the country. The focus during Phase I, which is of a two-year duration, is on content development. The content development is in the form of video lectures, e-courses, and lecture notes. This would also provide content support in the form of digital video-based courses / enrichment programmes to the 24-hour technology channel called the Eklavya Technology Channel on a sustained basis. Joint academic programmes would be offered through distance education in Phase II.

Seven IITs and IISc are the Partner Institutions (PIs) responsible for developing course content. Some of the centrally funded and selected private institutions will be identified as Associated Partner Institutions (API). Selected faculty of these APIs would also participate in content development. Management institutions would also join in Phase II.

All Partner Institutions would be supported to have state-of-the-art production facilities for high quality digital video and web-based courses. The high quality faculty of these institutions would be responsible for content development. Partner and Associate Partner Institutions would be able to leverage technology to use their faculty resources more efficiently and effectively. This would help them to overcome shortages of quality faculty.

## All India Council for Technical Education

The All India Council for Technical Education (AICTE) was set up in 1945 later given statutory status in 1987 by an Act of Parliament to coordinate development of technical education, promotion of qualitative improvement in relation to quantitative growth, and maintenance of norms and standards. The Council performs its function in the areas of engineering and technology, architecture, town planning, management, pharmacy, hotel management and catering technology, applied arts and crafts. The AICTE has its headquarters in New Delhi and seven regional offices at Kolkata, Chennai, Kanpur, Mumbai, Chandigarh, Bhopal and Bangalore. The Council has an Executive Committee, All India Boards of Studies (AIBs), Advisory Boards and Regional Committees to assist in its activities.

The AICTE has further set up a National Board of Accreditation (NBA) a quality arm for conducting evaluation of technical programmes on the basis of prescribed guidelines, norms and standards. The NBA guidelines, parameters and indicators of accreditation have been put to test since 1995 and so far about 1,645 programmes have been considered for accreditation. The manual of accreditation was revised in January 2004 after detailed deliberations with stakeholders.

AICTE applied for provisional membership to the Washington Accord Secretariat on February 3, 2003. The proposal of AICTE was discussed in the 6<sup>th</sup> Biennial Conference of Washington Accord held at Rotorua, New Zealand on June 8, 2003. Three member-countries of the Washington Accord visited India for understanding the process of accreditation being undertaken by NBA. The committee visited three technical institutions of their choice and participated in the decision-making process.

AICTE has become the member of the International Network of Quality Assurance Agencies in Higher Education (INQAAHE) in 2004.

The year 2003-2004 was declared as the Quality Education Year by MHRD. To mark this year with specific goals, a series of comprehensive Quality Initiatives were launched by AICTE. Performance Appraisal System for assessing the performance of technical institutions, which are not yet eligible for accreditation, is one initiative in this direction.

In the undergraduate and postgraduate levels, in consultation with the concerned state government agencies the AICTE grants approvals for starting of new technical institutions, for introducing new courses or programmes, and for variation in intake capacity in technical institutions. The AICTE has delegated to the concerned state governments powers to process of approval of new institutions, starting new courses and variations in the intake capacity at diploma level technical institutions.

Process of granting approvals has been reviewed this year to make it more transparent, responsible and hustle free. The concerned agencies i.e. State governments and universities are being consulted at all important stages of decision-making. Stakeholders have been empowered to voice their views.

The process of approval for new institutions has been streamlined to minimise hardship to stakeholders.

The Research and Institutional Development (RID) Bureau is a critical wing of the Council, which financially supports technical institutions for growth in original research, industry interaction and impart the

zeal in the young teachers. To meet this huge mission, the Council has several schemes to attract stakeholders. During this year the Council received many proposals under the following categories:

- ❑ Research Promotion Scheme (RPS)
- ❑ Modernisation and Removal of Obsolescence (MODROBS)
- ❑ National Facilities in Engineering and Technology with Industrial Collaboration (NAFETIC)
- ❑ Entrepreneurship Management and Development (EMD)
- ❑ Nationally Coordinated Project (NCP)
- ❑ Industry-Institute Partnership Cell (IIPC)

To review the earlier scheme and funding strategies of IIPC and EMD, a detailed study has been carried out during the current year.

The Council further awarded Best Project Award to two projects on Technology Day.

Four Awareness Workshops on the funding schemes were conducted across the country to disseminate the information to the stakeholders.

AICTE has further spawned a set of National Initiatives around selected themes. One of the initiatives on “Institutional Competitiveness” has been launched. A working group has been constituted for the purpose and two meetings of the working group have been convened.

For upgradation of skills and for providing opportunity for exchange of knowledge, the AICTE operates a number of programmes for career development of teachers in technical education viz the Quality Improvement Programme (QIP), preparation of course material modules, short-term training programmes, career awards for young teachers, schemes for awarding travel grants and seminar grants, etc. The AICTE has now extended the QIP scheme to teachers working in other disciplines of technical education like pharmacy, architecture and town planning, management and applied arts and crafts for pursuing Masters/Ph.D degrees. Further, the scheme of QIP has been extended

to polytechnic teachers also. Under the scheme of Emeritus Fellowship, through award of a fellowship and a contingency grant, AICTE provides superannuated faculty members an opportunity to continue research work for a period of two years. AICTE is also operating a scheme of Early Faculty Induction Programme [EFIP] to attract young students towards the teaching career.

The AICTE funds a scheme of National Technical Manpower Information System (NTMIS) for estimation of short term and long term requirement of technical manpower in different fields, for assessment of anticipated gaps in demand and supply and scientific analysis for forward modeling of activities. This NTMIS Scheme presently works from 20 nodal centres all over the country.

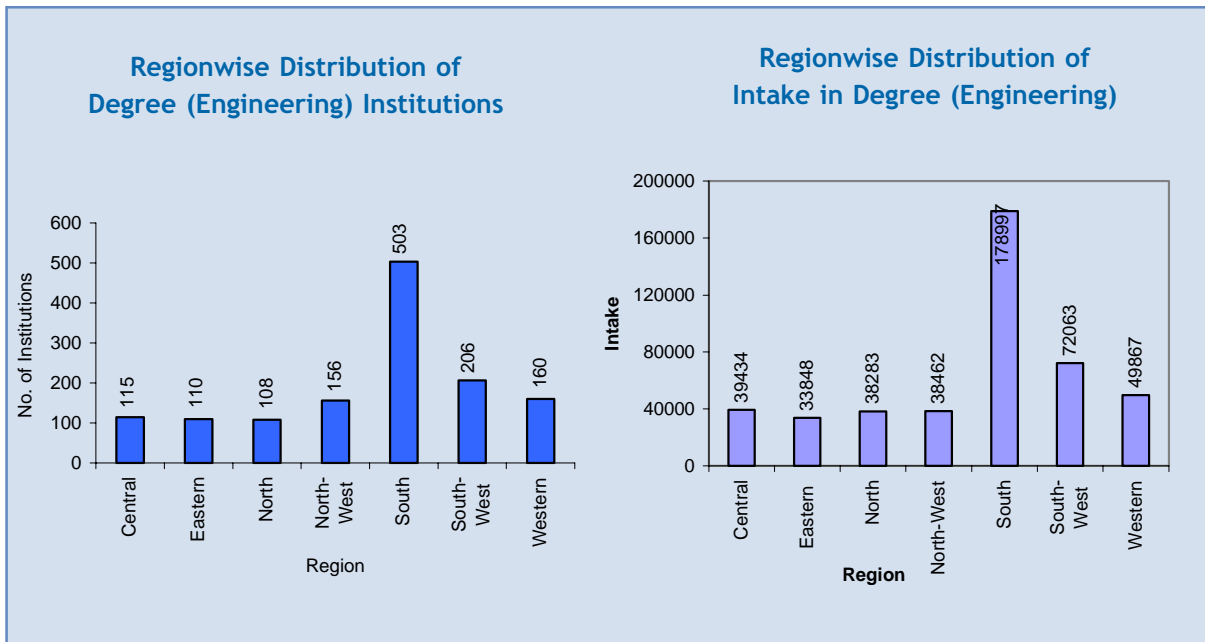
The Council has initiated to set up 100 virtual classrooms in identified technical institutions under EDUSAT scheme to share the knowledge of premier and well-established institutions to the other institutions. The scheme will be extended to some institutions in phased a manner.

Under the AICTE-INDEST Scheme, AICTE has provided a grant of Rs. 2.38 crore to IIT Delhi for subscription to electronic resources to 66 Government/ Government aided institutions having programmes in engineering and technology at postgraduate level.

As part of its endeavor for qualitative improvement of the technical education system, AICTE continues its efforts for development of model curricula too.

The AICTE has also constituted a Review Committee to review undergraduate education in engineering and technology in the country. The Review Committee has submitted its report “**Undergraduate Engineering Education: New Directions for Excellence**” in October 2004. For the promotion and welfare of women, challenged and weaker sections of the society, AICTE intends to formulate various schemes through a Committee set up for the purpose.

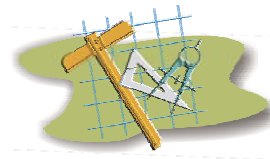
To provide information to its stakeholders, and to improve transparency in its activities, the AICTE maintains its website <http://www.aicte.ernet.in> and Information Kiosk.



### Indian School of Mines, Dhanbad

The Indian School of Mines (ISM), Dhanbad was established in 1926 by the Government of India for providing instruction and research in mining and allied fields. In 1967, ISM was converted into an autonomous institution with the deemed-to-be-university status. ISM, caters to the human resource needs of the Nation in the areas of mining, petroleum, mining machines, mineral engineering and earth sources besides training manpower in the related disciplines.

ISM offers 4-year (post 10+2) integrated B. Tech programmes in Mining Engineering, Mining Machinery Engineering, Mechanical Engineering, Petroleum Engineering, Mineral Engineering, Electronics Engineering and Computer Science and Engineering; 3 year M.Sc. Tech programmes in Applied Geology and Applied Geophysics; 2 year M.Sc. programmes in Applied Geology, and Mathematics and Computing; 2 year M.Tech programmes in Computer Applications, Drilling Engineering, Engineering Geology, Environmental Science and Engineering, Fuel Engineering, Geophysical, Instrumentation, Industrial Engineering and Management, Longwall Mines Mechanisation, Maintenance Engineering and



### Expansion of Technical Institutions

- The total number of approved engineering colleges is now 1,358 with intake capacity of 4,50,954.
- The number of institutions providing MCA courses is 967 with an intake of 54,807.
- Accreditation process of institutions was expedited by the AICTE. During 2001-2002, the number of programmes accredited by the National Board of Accreditation was 202, whereas during 2003-2004, 409 programmes were accredited.

Tribology, Mine Planning and Design, Mineral Engineering, Mining Machinery, Opencast Mining, Petroleum Engineering, Petroleum Exploration and Rock Excavation Engineering; 1 year M.Phil programme in Applied Chemistry, Applied Mathematics and Applied Physics. ISM also offers 2 year MBA programme and Ph.D programmes in all branches of Science and Engineering. Admission to 4 year programmes is made through IIT-JEE examination and all other programmes is made through All India Competitive Examination.

The institute offers its consultancy service to the industry in the areas of geological and geophysical prospecting, engineering geology, surface mining and its problems, underground mining, etc. The institute has been running a number of industry oriented programmes. It has also been conducting several research projects and programmes to develop the required technical inputs for the industry and running consultancy, testing and other field services to industry and institutional clients. It has been organising continuing education and executive development programmes which are favoured by companies and institutions especially in the mining, petroleum and related industries.

The school has been gearing up itself to meet the changing technological needs of the industries. Against this background, the school started new academic programmes in computer sciences and engineering, and electronics and instrumentation, mechanical engineering and plans to start electrical engineering from the next academic year. The school also gradually increasing its intake and has an ambitious plan to double the student strength in few years.

### **National Institutes Of Technology (NITS)**

17 Regional Engineering Colleges (RECs) were established from 1959 onwards in each of the major States to meet the country's growing requirement for trained technical manpower for various development projects. These colleges were set up as joint and cooperative enterprise of the Central Government and the State Government concerned. Subsequently, on the

recommendation of a High Powered Committee set up under the Chairmanship of Dr. R A Mashelkar, Director General, Council of Scientific and Industrial Research and an Empowered Committee set up under the Chairmanship of Union Education Secretary, these college were granted Deemed University status with a professional management structure. The RECs were rechristened as National Institutes of Technology (NITs). On May 14, 2003, all these 17 institutions were taken over as fully funded institutes of the Central Government. To add to the family of NITs, the Government had also approved taking over Bihar Engineering College, Patna, with Deemed University status. Thus, the total number of NITs has gone up to 18. These institutes are expected to be at par with other national level technical institutes like IITs, IISc, etc., and be able to fulfill the demand of high quality undergraduate and postgraduate level of education in engineering and technology. The total budget estimates for all NITs for the year 2004-2005 was Rs. 80.00 crore under Plan and Rs. 156.42 crore under Non-Plan. During the year under report, first meeting of the Council of NITs was held on August 14, 2003, in which major decisions relating to uniform service conditions, staff recruitment, career advancement, age of retirement, pension/GPF/CPF, etc., were taken. Besides, the reconstitution of the Board of Governors, setting up of various committees for improvement of academic administration in NITs including finance and building and works committees were made. Activities undertaken by the individual NITs during the year under report are as under:

### **Motilal Nehru National Institute of Technology, Allahabad**

Motilal Nehru Regional Engineering College, Allahabad, established in 1961, was converted into National Institute of Technology (NIT) on June 26, 2002. The College has eight departments. The College also offers four-year undergraduate courses in the disciplines of civil, electrical, mechanical, computer science, electronics, production and industrial engineering and information technology. The College also offers 13 M.E. programmes and Master of Computer

Application (MCA) and Master of Management Studies (MMS). The total intake in the undergraduate stream is around 469, 170 in postgraduate courses, 60 in MCA and 30 in MMS. There also exists a facility for Ph.D. programme. The website address of the Institute is [www.mnnit.ac.in](http://www.mnnit.ac.in).

### **Maulana Azad National Institute Of Technology, Bhopal**

Maulana Azad College of Technology, Bhopal established in 1960, was converted into National Institute of Technology on June 26, 2002. The college has eight departments. The college offers four years BE Courses in the disciplines of civil engineering, mechanical engineering, electrical engineering, electronics and communication engineering, computer science and engineering, information technology and a five-year B.Arch. course. The total intake in undergraduate courses is 451. The college also offers M.Tech. courses in 13 different specialisations under regular and part-time mode with an intake of 115. The college admitted 163 students in MCA, MBA and other courses during the year. The college has five boys hostels and one girls hostel. The college has established two problem-oriented research laboratories, first of their kind in India, one in fluid mechanics and hydraulic mechanics, and the other in heavy electrical mechanics to work on live problems in the industry and in the field, and to transmit the useful experience granted to the students. The college is maintaining a good library with 93,368 books. Ninety research papers were published by the staff members in various national and international journals of repute. 17 research projects are presently being carried out by the college. The website address of the Institute is [www.manit.nic.in](http://www.manit.nic.in).

### **National Institute of Technology, Calicut**

Regional Engineering College, Calicut, established in 1961, was converted into National Institute of Technology on June 26, 2002. The college has eight departments. The college offers four-year undergraduate courses in the disciplines of civil engineering, architecture (arch) engineering, electrical and

electronics engineering, electronics and communication engineering, mechanical engineering, production engineering and management, computer science and engineering and a five-year B.Arch. course. The college also offers M.Tech. degree in 11 different specialisations of one-and-half year duration. In addition, three-year (six-semester) MCA programme is also offered. The college offers Ph.D. programme in all the disciplines. The college has a well-equipped library; it has 79,160 books and 7,802 BIS specifications. It has subscribed to 261 foreign journals, 95 Indian journals and dailies. CREC Digital Library has been started as a part of the modernisation of the library. With the commissioning of NALANDA, i.e. Network of Automated Library an Archives- the library started to provide latest information of users. The latest information both at Internet and Internet are made available through NALANDA. More than 100 full-text electronics books, on engineering subjects are accessible to CREC community through NALANDA website. The website address of the institute is [www.nitc.ac.in](http://www.nitc.ac.in).

### **National Institute Of Technology, Durgapur**

Regional Engineering College, Durgapur, established in 1960, converted into NIT with Deemed University status on July 3, 2003. The institute has 15 departments. The college offers four-year undergraduate courses in the discipline of civil, electrical, mechanical, chemical, metallurgical, and electronics and communication, computer science and engineering and information technology. The college also offers M. Tech. courses. During the current year, a 120-bed boys hostel for foreign students, three 120-seater lecturer galleries, computer centre extension, electrical machine lab, head power lab were constructed. Further, two separate course were conducted by the Department of Chemistry and Metallurgical Engineering under the aegis of C-NANCE. The website address of the institute is [www.nitdgp.ac.in](http://www.nitdgp.ac.in).

### **National Institute of Technology, Hamirpur**

The Regional Engineering College, Hamirpur,

established in 1985, was converted into a National Institute of Technology, Hamirpur on June 26, 2002. The institute has five departments. It offers four-year undergraduate courses in the disciplines of civil, electrical, electronics and communication, computer science and mechanical engineering. The college has started a B.Arch. courses during 2000-2001 and has also applied for starting of postgraduate courses. There are four boys and one girls hostel. The college has a well-equipped library. The total intake is 220.

### **Malaviya National Institute Of Technology, Jaipur**

Malaviya Regional Engineering College, Jaipur, established in 1963, was converted into Malaviya National Institute of Technology, Jaipur, on June 26, 2002. The institute offers nine undergraduate courses and nine full-time and five part-time postgraduate courses. During the session 2004-2005, 559 students were admitted to B.E. courses taking the total strength of postgraduate students to 466; of them, 93 are pursuing postgraduate programme in management studies. The institute has at present 151 faculty members of which 68 possess a Ph.D. degree. The institute is on the way of Implementing Project REACH on Reverse Engineering under TIFAC-CORE assistance during the current year. The institute is implementing the Project IMPACT for manpower development in Electronics and Computer Engineering funded by the World Bank, Swiss Development Corporation and Government of India. The institute organised four summer-winter schools in the year 2002-2003. As many as 30 organisations conducted campus interviews and 95 candidates have been offered appointments, with average salary package of Rs 5.5 lakh. The central library is equipped with 1,12,000 books, 12,700 journals, more than 1,000 videocassettes with video-viewing facilities, BIS standards and CD-ROM database for its eight departments. The college offers four-year undergraduate, electrical, electronics and communication, mechanical and metallurgical engineering and a five-year B.Arch. course. The college offers three-semester full time and five-semester part-time (self-financing) postgraduate degree programmes

and postgraduate in MMS studies. An ME course in environmental engineering (under Department of Civil Engineering) has also been sanctioned by the Government of India for the sponsored employed engineers, to be nominated by the Ministry of Urban Development. The website address of the institute is [www.mnit.ac.in](http://www.mnit.ac.in).

### **Dr. B.R. Ambedkar National Institute Of Technology, Jalandhar**

Dr. B.R. Ambedkar Regional Engineering College, Jalandhar, established in 1986, was converted into Dr. B.R. Ambedkar National Institute of Technology, Jalandhar on October 17, 2002. The college has 13 departments and offers four-year undergraduate courses, in the disciplines of chemical and bio-engineering, civil engineering (structural engineering and construction management), computer science and engineering, electronics and communication engineering, industrial engineering, instrumentation and control engineering, leather technology, mechanical engineering (mechanical machine design and automation) and textile technology. The total intake in the undergraduate stream is around 1,019. There are five boys and one girls hostel. The college has a well-equipped library. The funds from Department of Science and Technology and National Science and Technology Entrepreneurship Development Cell was established in the college for promoting entrepreneurial culture among students/graduates/postgraduates by arranging various programmes. The website address of the institute is [www.nitj.ac.in](http://www.nitj.ac.in).

### **National Institute of Technology, Jamshedpur**

Regional Institute of Technology, Jamshedpur, established in 1960, was converted as NIT with Deemed University status on December 27, 2002. The college has 13 departments. The college offers four-year undergraduate courses, in the disciplines of civil, mechanical, electrical, metallurgical and computer science and engineering with an intake of 285 students. The college also offers postgraduate courses with an intake of 61 and MCA with 80 seats. There are nine boys

and one girls hostel. The college has a well-equipped library.

### **National Institute of Technology, Kurukshetra**

The Regional Engineering College, Kurukshetra, established in 1963 was converted into National Institute of Technology, Kurukshetra on June 26, 2002. The institute is running five undergraduate courses in discipline of civil engineering, electrical engineering, mechanical engineering, electronics and communication engineering and computer engineering with an annual intake of 1,010 students. The institute also runs a postgraduate course in these subjects with an annual intake of 86 students. The total students' strength of the institute at present is 1,539. An ISO-9002 certified institute, NIT-Kurukshetra has signed an MoU with IBM and got software free of cost during the year. The institute has a well developed campus with fibre optic computer networking. The website address of the institute is [www.reck.nic.in](http://www.reck.nic.in).



### **Visvesvaraya National Institute of Technology, Nagpur**

Visvesvaraya Regional Engineering College, Nagpur, established in 1960 was converted into Visvesvaraya National Institute of Technology, Nagpur on June 26, 2002. The college has 13 departments. The college offers four-years B.E. courses in the disciplines of civil, mechanical, electrical, metallurgical, mining, electronics, computer science, structural engineering and five-year B. Arch. course. The college offers 11 M. Tech. courses under part-time and regular mode. The college also offers one-year diploma in industrial management. The total intake in the undergraduate courses is 375 and that in postgraduate is 173. There are seven boys and one girls hostel. The Industry-Institute interaction Cell of the college strives to promote and nurture closer interaction with the industrial sector and to play a significant role in its growth. The website address of the institute is [www.vnitnagpur.ac.in](http://www.vnitnagpur.ac.in).

### **National Institute of Technology, Patna**

Bihar Engineering College, Patna, has been taken over as a fully funded institute of the Central Government and made the National Institute of Technology, Patna, with effect from January 28, 2004. The institute would be further strengthened during the coming years. The institute has been provided with required funding under both Plan and Non-Plan Scheme for its development. During the year 2004-05, 183 students in undergraduate and 67 in postgraduate courses have been admitted.

### **National Institute of Technology, Rourkela**

Regional Engineering College, Rourkela, started in 1961, was converted into National Institute of Technology, Rourkela, on June 26, 2002. The college has 15 departments and offers four-year undergraduate course in the disciplines of chemical, civil, electrical, mechanical, metallurgical, mining, applied electronics and instrumentations engineering, computer science and engineering and ceramic engineering. The total

intake in the undergraduate stream is around 348 at the four-year B.E. level. The college also offers six postgraduate courses and a three-year MCA. There are six boys and one girls hostel. NIT Rourkela is the nodal centre for the National Technical Manpower Information System in Orissa. The institute has produced in the year, five Ph.Ds in engineering and 3 Ph.Ds in basic science and has published 106 original research papers in national and international journals. During 2004-05, 1,384 students were admitted in undergraduate courses and 217 in postgraduate courses.

The institute after being upgraded to the National Institute of Technology has adopted academic and evaluation processes similar to that followed in IITs from the 1st semester students admitted in 2004-2005. The institute is revising the regulation accordingly. New regulation for Ph.D. programmes is also being prepared. The website address of the institute is [www.nitrkl.ac.in](http://www.nitrkl.ac.in).

### **National Institute of Technology, Silchar**

Regional Engineering College, Silchar, established in 1976, was converted into National Institute of Technology, Silchar, on June 28, 2002. After transformation into National Institute of Technology, the institute is reorganising itself on the pattern of the IITs. As a part of this reorganisation the Senate, Board of Undergraduate Studies and Department Undergraduate Programme Committees have been constituted.

The institute is offering undergraduate courses leading to B.E./B.Tech. degree in various engineering disciplines like civil, electrical, mechanical, electronics and telecommunication and computer science and engineering, etc. During this year, the institute admitted 209 fresh students. With new admission, the total student strength of the institute is around 900.

### **National Institute of Technology, Srinagar**

Regional Engineering College, Srinagar, established in 1960, was converted as NIT with Deemed University status on August 7, 2003. The institute has 11

departments and offers four-year undergraduate courses in the disciplines of civil engineering, electrical, electronic and communication engineering, mechanical engineering, chemical and metallurgical engineering and M.E. course in water resource engineering. The college offers M.Phil. and Ph.D. programmes in all science departments and some engineering departments. The total intake for undergraduate courses is 242. Various departments, including library and administration have been networked together after individual LANs were set up in each block under Novell Netware.

Faculty members from various disciplines were deputed for higher studies under QIP to the reputed institutions like IISc, Bangalore, University of Roorkee and IITs.

The consultancy in various departments has picked up despite the unfavourable conditions and meagre industrial base in the State. The T&P Department was able to attract reputed government and private sector enterprises, like DRDO, WIPRO, Future System, Quark Media House, ITI, PCS Systems Ltd, Future Techno Design Pvt. Ltd., Global Tech. Ltd and a good number of students are being selected.

### **Sardar Vallabhbhai National Institute of Technology, Surat**

Sardar Vallabhbhai Regional Engineering College, Surat, established in 1961, was converted into Sardar Vallabhbhai National Institute of Technology, Surat, on October 4, 2002. The college has seven departments and offers four year B.E. course in the disciplines of civil, electrical, mechanical, electronics engineering, production engineering, computer engineering and chemical engineering. The total intake in undergraduate courses is 428. The college also offers M.E. courses in seven different specialisations with an intake of 10 each. All departments have facilities for Ph.D. programmes. The college has six boys hostels and one girls hostel. During the year 1997-98, the college was chosen as the host institution for the establishment of an Entrepreneurship Development Cell by the National Science and Technology Entrepreneurship Development Board, Department of Science and



Technology, Government of India, New Delhi. The website address of the institute is [www.svnit.ac.in](http://www.svnit.ac.in).

### National Institute of Technology Karnataka, Surathkal

Karnataka Regional Engineering College, Surathkal, established in 1960, was converted into National Institute of Technology Karnataka, Surathkal, on June 26, 2002. The college has eight departments and offers four-year undergraduate courses in the disciplines of civil, mechanical, electrical, metallurgical, mining, computer engineering and information technology. A total number of 457 students were admitted to the first semester out of which 42 were girls. A total number of 60 candidates were admitted to the MCA programme, 48 from Karnataka State and 12 from outside the State. Those candidates who applied for admission for MCA had undergone the entrance test and as per the merit, the candidates were admitted to the MCA course and 18 students were admitted in the Ph.D programme. The college has a 1,00,000 books in a library.

There are 15 M.Tech. courses running in the institute. A total number of 213 candidates were admitted to the M.Tech courses. The students of this institute have performed exceedingly well in their university examinations. Most of the ranks were secured by our students in university examinations, both in undergraduate and postgraduate degree courses and 432 students were placed in different companies. The website address of the institute is [www.nitk.ac.in](http://www.nitk.ac.in).

### National Institute of Technology, Tiruchirappalli

Regional Engineering College, Tiruchirappalli, established in 1964, was converted as NIT with Deemed University status on July 28, 2003. The college has 13 departments offering four-year undergraduate courses in the disciplines of civil, computer science and engineering, electrical and electronics, mechanical, electronics and communication, metallurgical production, chemical engineering, instrumentation and control engineering and a five-year B.Arch. course. The total intake in the undergraduate stream is 464, and 382

in postgraduate courses. This institution has also been recognised for taking teachers from other educational institutions for the various postgraduate courses and doctoral programmes under the Quality Improvement Programme (QIP) Scheme of AICTE. Apart from this, the AICTE has also included this institution as host institution for their Early Faculty Induction programme. Final year undergraduate students have secured more than 80 per cent placement so far through the campus interview programme. With many more companies yet to visit the campus, the institute hopes to achieve more than 90 per cent placement for all the branches as in the earlier years. In recognition of the achievements of the students, General Electric Company of India is offering scholarship to two postgraduate students to the tune of more than Rs. 3.0 lakh. The Institute Interaction Scheme entailed a one-week orientation. The website address of the institute is [www.rect.edu](http://www.rect.edu).

### National Institute Of Technology, Warangal

Regional Engineering College, Warangal, established in 1959 was converted into National Institute of Technology, Warangal, on September 10, 2002. The institute was the first among the chain of RECs. The institute offers seven undergraduate programmes in engineering and 24 postgraduate programmes and Ph.D. programmes in all branches of engineering, sciences and humanities. The institute has so far produced about 10,000 undergraduates 4,200 postgraduates and 240 Ph.Ds. Majority of the students of this institution are absorbed in medium-scale public and private industries. This year 60 companies from different parts of the countries are registered for placement.

Alumni chapters are in existence in most of the major cities in India as well as in a few cities in USA. The quality of graduates is well appreciated by number of multinational companies and higher academic institutions. Majority of the students get their placement through campus interviews. The central library of this institute set up at a cost of Rs. 2.5 crore is considered to be one of the best among the technical libraries in Andhra Pradesh. The World Bank has granted Rs. 11.41 crore for TEQIP this year.

The institute campus is networked and internet facilities are available for all staff and students. Residential accommodation is provided to all the students and to the majority of the staff on the campus. The website address of the institute is [www.nitw.ernet.nic](http://www.nitw.ernet.nic).

### Scheme of Community Polytechnics

The polytechnic, as an institution, is well equipped with physical facilities (lecture rooms, workshops, hostels, equipments) which could be used for linking rural communities with centres of knowledge and skills development. It has qualified and trained faculty with the capability to scientifically formulate, implement and monitor rural oriented programmes and projects for skill development and rapid adoption of the latest technology by the community. The large body of student community can also be of tremendous help in making meaningful contributions to rural development, given proper leadership.

The *Scheme of Community Polytechnics* was started during the year 1978-79 as a Direct Central Assistance Scheme of the Government of India (Ministry of Human Resource Development) with the aim of harnessing the scientific/technical knowledge available with polytechnics to secure community/rural development.

*A Community Polytechnic* is not a separate institution. It is a wing of an existing AICTE approved polytechnic, entrusted to undertake rural/community development activities in its proximity through the application of science and technology, making use of infrastructure available in polytechnics. Under the existing norms of the scheme, a one time Non-recurring Grants-in-aid of Rs. 7.25 lakh and annual Recurring Grants-in-aid up to a maximum of Rs. 7.00 lakh is released to the selected AICTE approved diploma level institutions.

As on date, **669 diploma level** Institutions are implementing the *Scheme of Community Polytechnics*. The region-wise distribution of *Community Polytechnics* is given below:

Northern Region	:	187
Eastern Region	:	97
Western Region	:	145
Southern Region	:	240
<b>Total</b>	:	<b>669</b>

The scheme was reviewed twice by a national level committee in 1987 and 1996. Both the committees opined that the scheme is cost effective in imparting qualitative and need based training to the deprived section of the society in employable, job oriented skills and recommended further expansion and continuation of the scheme.

The main activities of *Community Polytechnics* are:

- a) To provide manpower training in need based, non-formal skills/trades to unemployed youth, women, SCs/STs, minorities, school dropouts and other disadvantaged sections of the community to enable them to obtain gainful self/wage employment ;
  - b) To develop and implement innovative and economical ideas for rapid adoption of the latest technology by the community in and around the community polytechnic (*Technology Transfer*);
  - c) To provide technical/support services to the rural community;
  - d) To disseminate information and create awareness regarding latest technology and its applications among the community; and
  - e) To undertake survey for ascertaining the felt needs of the community with regard to manpower training and adoption of affordable technology by the community.;
7. A *Community Polytechnic* works through its *five (05) Extension Centres* established in the villages and *one Main Centre* in the premises of the polytechnic. Each Extension Centre covers 10-12 villages in its surroundings. Each *Community Polytechnic* trains about 500 trainees on an average, in different need based non-formal skills/trades. There is no age and qualification bar for the trainees under the scheme. The skill development under manpower training is

imparted through short term training courses of 3-6 months duration. However, no course fees are charged from the trainees.

The coverage of the scheme has been extended to 364 districts in the country. Out of this, 156 community polytechnics have been established in 79 (out of the 91 identified) Educationally Backward Minority Concentration Districts in the country. During the Ninth Plan period about 11 lakh persons were trained in various job oriented non-formal skills/trades. In the first two years of the Tenth Plan (i.e.2002-03 and 2003-04), 2.94 lakh and 3.31 lakh persons, respectively, availed of training programmes under the scheme. On an average, some 36 per cent of the trainees have obtained self/wage employment. The beneficiaries under manpower training include 15 per cent SCs, 06 per cent STs and 16 per cent minorities. Overall, women beneficiaries are about 52.10 per cent. About 25,000 villages have been covered under various activities of the scheme.

### Scheme for Upgrading Existing Polytechnics to Integrate the Physically Disabled in the Mainstream of Technical and Vocational Education

This scheme has been formulated with the aim of integrating the physically disabled into the mainstream of technical and vocational education in the country.

Under the Scheme, 50 existing polytechnics at different locations in the country have been selected for upgradation so as to enable them to introduce technical /vocational and continuing educational programmes for the persons with disabilities. The scheme is targeted to benefit around 1,250 disabled students every year in the formal diploma level courses and 5,000 students in short duration technical / vocational courses. The selected polytechnics also conduct research and tracer studies relating to education and training, utilisation, employability, etc. of students with disabilities and develop institutional environment which gradually reduces discrimination and disparities and integrates the students with disabilities with the mainstream of technical and vocational education. At initial stages, the polytechnics had some problems in running the formal

and non-formal courses. However, with great persuasion by resource institutions (four National Institutes of Technical Teachers Training and Research located at Chandigarh, Bhopal, Chennai and Kolkata) and Ministry of Human Resource Development, all the institutions are fully operational now and are expected to achieve the desired targets fixed as per norms and guidelines of the scheme.

Since inception, 2,187 students and 4,400 persons of disabled category have been enrolled in formal and non-formal programmes of the scheme.

### **National Institutes of Technical Teachers' Training and Research (NITTTRs)**

The four National Institute of Technical Teachers Training and Research (NITTTRs - earlier TTTIs) at Bhopal, Calcutta, Chandigarh and Chennai were established during the mid-1960s as key catalyst institutions for ensuring quality in technical education in their respective regions. These institutes are fully funded by the Government of India and registered under Societies Registration Act 1860.

The mandate of the institutes during the initial stages was to take initiatives to offer need based HRD programmes through appropriate modes and to develop curricula and institutional resources for technicians' education system. The emphasis, however, had gradually changed to assisting the state governments and polytechnics in their region towards improving their educational processes and products.

The institutes are actively involved in planning, designing, organising quality education and training programmes, research studies and learning packages for polytechnics, industries and community. The institutes have been extending support and also sharing their experiences and expertise to the state governments in implementing the World Bank Assisted Technician's Education Project. NITTTRs have developed strong linkages with the business and industries, and also professional relationship with educational institutions to work in areas of common interest.

The scheme of NITTTRs has been reviewed by a High Powered Committee under the Chairmanship of Prof. P.V. Indiresan. In its report, the committee recommended that besides training teachers of polytechnics, NITTTRs should coordinate training of teachers of engineering degree colleges, architecture and management institutions. For this purpose, NITTTRs will be developed as national centres for training in technology for teachers. These institutions will also focus in providing their services to the industry by training their staff and undertaking consultancy services.

### **Sant Longowal Institute of Engineering and Technology (SLIET), Longowal, Sangrur, Punjab.**

The Sant Longowal Institute of Engineering and Technology (SLIET), Village Longowal, District Sangrur, Punjab, was established in 1989 and is registered under the Societies Registration Act 1860 to work as a model institution to generate skilled manpower in the field of engineering and technology as well as applied sciences streams. The courses provided are modular and terminal in nature and of two years duration each and have bridge courses at appropriate levels. The institute is fully funded by the Department of Secondary and Higher Education (MHRD).

The institute offers 12 certificate courses, 10 diploma courses and 8 degree courses. Provision for vertical mobility and lateral entry is available at different levels namely certificate, diploma and degree in an integrated manner. The educational programmes are non-conventional, cost-effective, flexible, modular and credit based having built in entrepreneurship with stress on self employment and continuity of education at various levels with provision for multi-point entry.

Since its inception, the institute has trained approximately 28,150 students in the various disciplines of technical education.

### **North Eastern Regional Institute of Science and Technology Itanagar, Arunachal Pradesh**

The North Eastern Regional Institute of Science and Technology (NERIST), Itanagar was established in 1986 to generate skilled manpower, in the field of engineering and technology as well as in the field of applied sciences, for the development of the North-Eastern Region. The institute is registered under Societies Registration Act 1860. While the Department of Secondary Education and Higher Education is giving the necessary technical guidance to NERIST, it was earlier being funded through the North Eastern Council. With effect from 1994-95, the institute is being fully funded by the Department of Secondary and Higher Education. NERIST is a unique institute offering a sequence of modular programmes, each of two years duration leading to six certificate, seven diploma and seven degree courses in technology and applied sciences. The modular programmes provide linkage with occupational levels i.e. technicians, supervisors and engineers. The base and diploma modules provide entry into next higher module, subject to required performance of the students in lower modules and with the provision to undergo certain bridge courses. Thus a certain percentage of students get siphoned out either voluntarily or compulsorily at the end of each module. The thrust of this modular approach enables innovative students to go for higher studies while permitting others to go for jobs or to develop their entrepreneurial skills.

The institute has been accorded provisional affiliation by the North Eastern Hill University (NEHU), Shillong. During last 16 years the institute has trained more than 19,000 students in various disciplines.

### **Scheme of Apprenticeship Training**

Implementation of the Scheme of Apprenticeship Training is a statutory requirement under Apprentices Act 1961. The Scheme of Apprenticeship Training provides opportunities for practical training to graduate engineers, diploma holders (technicians) and 10+2 vocational passouts in about 8,000 industrial establishments/organisations as per the policies and guidelines laid down by the Central Apprenticeship Council (CAC) a Statutory Body.

The four Regional Boards of Apprenticeship/Practical

Training located at Mumbai, Calcutta, Kanpur and Chennai which are fully funded autonomous organisations of Ministry of Human Resource Development (Department of Secondary and Higher Education) have been authorised in their respective regions to implement the Scheme of Apprenticeship Training under Apprentices Act, 1961 as amended from time to time.

The period of Apprenticeship Training under the Act is one year. The apprentices are paid monthly stipend, which is shared between the Central Government and the employer on 50:50 basis. The existing rates of stipend payable to engineering graduates, technicians and 10+2 vocational passouts as apprentices is Rs. 1,970, Rs. 1,400 and Rs. 1,090 per month, respectively. These rates are effective from May 18, 2001.

The Board of Apprenticeship Training make special efforts to provide training facilities to all the applicants belonging to SC/ST even in excess of the quota earmarked for these communities. The candidates under the Apprenticeship Training Scheme are selected by the industrial organisations/establishments and necessary instructions are given to them to ensure selection of all the SC/ST candidates who apply for training under the scheme.

Under the Scheme during Ninth Five Year Plan, about 1,92,000 apprentices were trained against the target of 1,80,000 apprentices. The target fixed for the Tenth Five Year Plan is to train about 3,00,000 apprentices. During the first two years of the Tenth Plan, about 1,01,000 apprentices were trained in different establishments all over the country. During the current financial year 2004-05 (as on December 31, 2004) about 52,000 apprentices are undergoing apprenticeship training in different industries/establishments.

### **Indian Institutes Of Management (IIMs)**

Indian Institutes of Management (IIMs) located at Ahmedabad, Kolkata, Bangalore, Lucknow, Indore and Kozhikode are institutions of excellence, established with the objectives of imparting high quality

management education and training, conducting research and providing consultancy services in the field of management to various sectors of the Indian economy.

The IIMs conduct postgraduate diploma programmes in management (equivalent of MBA), fellowship programmes in management (equivalent to Ph.D.), short-term management development and organisation based programmes as well as carry out research and consultancy for the industry.

These institutes conduct research to cater to the needs of non-corporate and under-managed sectors, viz. agriculture, rural development, public systems management, energy, health education, habitat, etc.

IIMs play a leadership role in the nation's managerial manpower development and carry out research in emerging areas. These institutes are recognised as premier management institutions, comparable to the best in the world for teaching, research and interaction with industries. IIMs being role models have shared knowledge and skills with other institutions to improve their quality and standards in management education. IIMs have earned an international reputation for the quality of their alumni.

### Indian Institute of Management, Ahmedabad

Indian Institute of Management, Ahmedabad, was established in 1961, with the objectives of developing manpower needed by the private and public sector enterprises, for assisting in the solution of management problems of the industry and for contributing to indigenous literature on management.

The institute offers Postgraduate Programme in Management (PGP), Postgraduate Programme in Agri-business Management (PGP-ABM), Fellowship Programme in Management (FPM) and Faculty Development Programme (FDP). The institute also undertakes research and consultancy projects.

The Postgraduate Programme in Agri-Business Management (PGP-ABM) is an innovative programme to prepare managers, decision-makers, leaders, and

entrepreneurs in the food and agri-business sector. The area offers a new market research course with emphasis on data analysis for strategic decisions. During the year 2004-05, the intake in the institute has been as under:

Courses	Intake 2004-2005
PGP	250
PGP-ABM	30
FPM	15
FDP	30

### Indian Institute of Management, Calcutta

Indian Institute of Management, Calcutta, was set up in 1961 to fulfill the growing needs of private and public sector enterprises for managerial manpower through the provision of well-designed programmes of professional management through research, consultancy and publications.

The institute offers Postgraduate Programme in Management (PGP), Postgraduate Programme in Computer Aided Management (PGDCM) and Post Graduate Diploma in Business Management (PGDBM). The institute also conducts management development programmes, extension programmes, in-company training programmes, and training programmes sponsored by Government. The institute also undertakes research and consultancy projects.

The institute has various activity centres such as Centre for Rural Development Management, Centre for Development and Environment Policy, Centre for Project Management, Centre for Studies and Research in Environment Management and Management Centre for Human Values.

The institute is equipped with state-of-the-art hardware and software resources capable of providing support for diverse computing requirements.

During the year 2004-05, the Intake in the Institute has been as under:

Courses	Intake 2004-2005
PGDM	215
PGDCM	50
PGDBM 3 Year	45
Part Time evening programme	
FPM	19

During the year 2004-05, the intake in the institute has been as under:

Courses	Intake 2004-2005
PGP	180
PGSEM	120
FPM	15
PGPPM	30

### Indian Institute of Management, Bangalore

Indian Institute of Management, Bangalore, was established by the Government of India in 1973, with the objectives to augment the management resources of the nation through programmes of teaching, training, consultancy and other professional services.

The institute offers Fellowship Programme in Management (FPM), Postgraduate Programme in Management (PGP), Postgraduate Programme in Software Enterprise Management (PGSM), executive education programmes, research and consultancy services. The curriculum of the flagship programme-PGP is being constantly updated to make it more relevant to the changing environment. Under the Students' Exchange Programme, PGP students are sent to reputed business schools outside India and in turn, students from overseas business schools also attend a term at the institute.

Under the executive education programmes, different types of programmes like open programmes, customised programmes and international programmes, are organised for practising managers. Computer facilities are available round the clock at the institute

Indian Institute of Management, Bangalore, has five centres of specialisations, namely Centre for Public Policy (CPP), Centre for Insurance Research and Education (CIRE), NS Raghavan Centre for Entrepreneurial Learning (NSRCEL), Centre for Development of Cases and Teaching Aids (C-DOCTA) and Centre for Software Management (CSM).

### Indian Institute of Management, Lucknow

The Indian Institute of Management, Lucknow, was set up in 1984. The main objectives of the institute are to develop managerial manpower through professional education and assist institutions in solving their management problems through training, research and consultancy.

The institute witnessed an all-round growth in all its activities, viz. teaching, research, consulting and training. It is heartening to note that a study, based on a survey of management education institutions of the country, and published under the title 'India's Best B-Schools', in the Nov. 12-25, 2001 issue of *Business India*, ranked IIM, Lucknow at No. 1, among the Indian business schools.

The institute offers Postgraduate Programme (PGP), Management Development Programme, Fellow Programme in Management (FPM), Research Programme and International Exchange Programme.

An information technology and software management laboratory has been established to provide the state-of-the-art software development methodologies, including net-based application to the students. This laboratory comprises RS/6000 (AIX UNIX) with 5 Pentium nodes with Internet connectivity.

During the year 2004-05, the intake in the institute has been as under:

Courses	Intake 2004-2005
PGP	240
PGP-ABM	30
FPM	10

### Indian Institute of Management, Kozhikode

Indian Institute of Management, Kozhikode, is the fifth of its kind established by the the Government of India. The institute came into existence in September 1997.

The institute offers Postgraduate Diploma in Management (PGP – equivalent to MBA). In addition, the institute is conducting executive education programmes, undertaking consulting assignments and research projects.

The institute is equipped with state-of-the-art hardware and software resources, capable of providing support for diverse computing requirements. The library and information centre of the institute has already earned recognition as one of the best-equipped information resource centres in the country.

During the year 2004-05, the intake in the institute has been as under:

Courses	Intake 2004-2005
PGP	120

### Indian Institute of Management, Indore

Indian Institute of Management, Indore, came into existence in September 1997. It primarily offers two years Postgraduate Programme in Management (equivalent to MBA), apart from orientation programmes.

The institute is equipped with a campus wide local area network (LAN). Each student has been provided with a PC (Pentium-II) in his/her room. Faculty and administration staff is also connected to LAN.

The institute started conducting Management Development Programmes (PGP) in 2000-2001.

To promote entrepreneurship, the institute has set up a Business Incubator Unit (BIU) on its campus, the aim of which is to provide the necessary infrastructure facilities to enable conversion of new business ideas into viable business ventures.

During the year 2004-05, the intake in the institute has been as under:

Courses	Intake 2004-2005
PGP	120
Executive PGP	20

### Technology Development Mission

A need was felt that institutions of excellence like IITs and IISc Bangalore need to concentrate on technology assessment and forecast so that futuristic approaches could be reoriented to take up the development of emerging science and technology in the country. Sequel to this, the following seven generic areas of strategic significance were approved:

- Food Processing Engineering
- Integrated Design and Competitive Manufacturing
- Photonic Devices and Technologies
- Energy Efficient Technologies
- Communication Networking and Intelligent Automation
- New Materials
- Genetic Engineering and Biotechnology

One Indian Institute of Technology/Indian Institute of Science, Bangalore was the lead institute for each of the seven generic areas. There will be up to three participating institutes, apart from the participation of industries.

The first phase of the Technology Development Mission has been completed and reviewed by the National Steering Committee. A large number of projects with direct involvement of industry were undertaken under

the different mission programmes. The various technologies developed under various missions have been transferred to the industry. Based on the experience gained in the Phase I, action is afoot to launch Phase II.

### Modernisation and Removal of Obsolescence

High priority has been accorded to modernisation and removal of obsolescence in library /laboratories/ workshops/computing facilities in engineering and technological, management, pharmacy, architecture institutions in the country. Modernisation is undertaken to enhance functional efficiency of these institutes for teaching, training and research purposes.

- ❑ Removal of obsolescence in working machinery and equipment of laboratories for engineering and technological, management, pharmacy, architecture courses in Central institutions including Regional Engineering Colleges.
- ❑ Modernisation of laboratories and workshops by addition of new equipment;
- ❑ Augmentation of the library facilities;
- p Support Projects involving new innovations in classroom technology, laboratory instructions, instructional material and charts, development of appropriate technology;
- ❑ Training and retraining for the teaching and supporting technical staff; and
- ❑ Upgradation of computing and networking facilities.

During the 2004-2005, 46 projects of the value of Rs. 500 lakh are being funded which include five projects of the value of Rs. 50 lakh pertaining to institutes falling under the North Eastern Region.

### Thrust Areas of Technical Education

The scheme provides for project based financial support for creation of infrastructural facilities in terms of labs and quality manpower in the emerging areas with the following objectives:

- ❑ To develop the infrastructure in terms of modern laboratories in the thrust areas;
- ❑ To develop a strong base for advance level work by identifying programmes and courses by institutions, taking into account the vastness of the country and regional needs with special attention to the rural society and disadvantaged sections; and
- ❑ To develop horizontal and vertical linkages with other institutions, research laboratories, industry and user agencies through multiplicity of programmes including consultancy.

During the 2004-2005, 42 projects of the value of Rs. 500 lakh are being funded which include five projects of the value of Rs. 50 lakh pertaining to institutes falling under the North Eastern Region.

### Research and Development

R&D activities have been considered as an essential component to higher education because of their role in creating new knowledge and insight and imparting excitement and dynamism to the educational process. The Ministry of Human Resource Development provides project based financial support with the following objectives:

- ❑ Creating and updating the infrastructure for R&D effort.
- ❑ Supporting sponsored/joint research projects in engineering and technology, pharmacy, architecture and management. Joint research projects with other technological institutions, research laboratories and industries of repute would be valuable.

During the 2004-2005, 169 projects of the value of Rs. 2,345.50 lakh are being funded which include nine projects of the value of Rs. 195.50 lakh pertaining to institutes falling under the North Eastern Region.

### National Institute of Industrial Engineering (NITIE), Mumbai

National Institute of Industrial Engineering (NITIE), Mumbai is a national institute set up by the Government of India in 1963 with the assistance of United Nations

### Activities of the current year (2004-2005):

Current year intake and fees received from the students in the following diploma/ programmes are as under:

#### Name of the Programme Intake / programmes

Two year Postgraduate Diploma in Industrial Engineering (PGDIE)	66 students
Two year Postgraduate Diploma in Industrial Management (PGDIM)	101 students
Two year Postgraduate Diploma in Industrial Safety and Environmental Management (PGDISEM)	4 students
Fellowship Programmes on Industrial Engineering	5 students
Short term Programmes known as Management Development Programmes (MDPs)	58 programmes
Unit Based Programmes (UBPs)	9 programmes
Consultancy Assignments	5 assignments
Seminars /Workshops for the benefit of Senior Level Executives	3 workshops

Development Programme (UNDP) through the International Labour Organisation (ILO). Fully funded by the Government of India and registered as a society under the Societies Registration Act 1860, NITIE is an autonomous body and is governed by a Board of Governors comprising of eminent personalities from the government, industry and academics. Since its inception in 1963, National Institute of Industrial Engineering (NITIE), has been providing solutions to the complex problems of industry and business.

NITIE, Mumbai conducts postgraduate programme in Industrial Engineering(PGDIE), Postgraduate Diploma in Industrial Safety and Environmental Management(PGDISEM), Post-graduate Diploma In Industrial Management(PGDIM) and also a large

number of Management Development Programmes (MDPs) in Productivity Science and Management for the benefits of senior and middle level executives drawn from the Government, public and private sector organisations. It also conducts a fellowship programme equivalent to Ph.D.) in the area of industrial engineering and management. The institute is also engaged in applied research in various fields of industrial engineering, energy, safety, environment, marketing, computers, behavioural science, etc. The institute conducts Unit-Based Programmes (UBPs) tailor-made to suit the specific requirements of the industry either at their premises or in the institute.

### National Institute of Foundry and Forge Technology (NIFFT), Ranchi

The National Institute of Foundry and Forge Technology (NIFFT), Ranchi was established in the year 1966 in collaboration with UNESCO-UNDP, taking into cognisance the pivotal role of foundry and forge industries in the development of the core sector in the country. NIFFT is an autonomous body, fully funded by the Government of India and registered as a society under the Societies Registration Act 1860. The institute's mission is to provide highly specialised training to personnel for operation and management of the industries. The institute offers courses at different levels to achieve this goal. These are M. Tech. course in Foundry and Forge Technology and Manufacturing Engineering; B. Tech. Course in Manufacturing Engineering and Metallurgy and Material Engineering; Advanced Diploma Courses in Foundry and Forge Technology; Short Term Refresher Courses in specified areas for participants sponsored by the Industries and Unit Based Programme of short duration on request from industries, R&D organisations and institutions.

The NIFFT also offers consultancy services to the industry in the form of preparation of feasibility report; evaluation of equipment and machinery; testing of raw materials and quality control products.

### Activities of the current year (2004-2005):

- Permanent affiliation of B. Tech. and M. Tech. Programmes with Ranchi University,

- ❑ All courses -B. Tech., M. Tech, A.D.C. -were accredited by AICTE,
- ❑ Campus-wide networking established,
- ❑ The institute obtained lead category under TEQIP
- ❑ International research collaboration and high quality research papers published in peer reviewed journals.
- ❑ Institute-industry interactions has taken a good shape leading to 100 per cent placement and,
- ❑ Research and development programmes are continued.

### School of Planning and Architecture

The institute was established by the Government of India in 1955 in the name of School of Town and Country Planning to provide facilities in education and training in the field of rural, urban and regional planning. The institute was renamed as the School of Planning and Architecture (SPA), New Delhi, in 1959 after the Department of Architecture was included. The institute was conferred the status of Deemed University in 1979.

SPA provides undergraduate and postgraduate education and training in the fields of architecture, planning, design and management of different aspects of human habitat and environment. SPA offer two undergraduate courses, namely Bachelor of Architecture and Bachelors of Planning; and 10 postgraduate courses, namely (i) Architecture Conservation; (ii) Urban Design; (iii) Industrial Design; (iv) Landscape Architecture; (v) Environmental Planning; (vi) Housing; (vii) Regional Planning; (viii) Transport Planning; (ix) Urban Planning; and (x) Building Engineering and Management. Doctoral programmes are also offered leading to Ph.D. degree in disciplines available at the school.

The faculty of the school participated in a number of national and international conferences/seminars, etc. and presented papers. The school collaborated with national and international institutions in the field of architecture and planning in conducting seminars, workshops, exhibitions, etc. As a premier institute in the

SAARC region, the SPA has 10 per cent of its seats reserved for foreign students from the developing countries. Apart from its regular educational programmes, the school is conducting continuing education programme and is the national nodal centre for conducting Quality Improvement Programmes for teachers and professionals.

The faculty of the School also undertook professional/institutional consultancy projects entrusted by various Government departments. In order to promote research, various Centres of Research and Advanced Studies have been set up in the school. The school organised short-term courses, seminars, workshops, specialised programmes and exhibitions on areas of current interest and the academic thrust areas of the school.

#### Activities of the current year (2004-2005):

- ❑ One of the faculty members of the school participated in the Landscape Design Competition of Construction of Botanical Garden of Indian Republic at NOIDA. The competition was organised by the Ministry of Environment and Forests, Government of India. The Board of Assessors has adjudged his entry as the First Prize winning entry and has therefore, recommended his name for appointment as Landscape Architect for the project. He has also won a prize of Rs. 6.00 lakh.
- ❑ Prof. Subir Saha, Director and Head of the Department of Housing, was presented the 'Life Time Achievement Award' by the World Institution Building Programme for his contribution in the field of tertiary education in a ceremony held in the Indian International Centre on December 31, 2004.

### Asian Institute of Technology (AIT), Bangkok

The Asian Institute of Technology (AIT) was established in 1959 as the SEATO Graduate School of Engineering with the objective of meeting the advanced technical education need of SEATO Member States. In 1967, SEATO relinquished its control and the institute was renamed Asian Institute of Technology and became

an autonomous institute with the management being entrusted to an International Board of Trustees. At present India's Ambassador in Bangkok is a member of the Board of Trustees of AIT, Bangkok.

Budget provision of Rs. 25.00 lakh exists under the scheme. Out of this amount the Government of India contributes Rs. 3 lakh annually to the AIT, Bangkok, for purchase of Indian equipment, books, journals, etc. The balance amount of Rs. 22.00 lakh is for secondment of Indian faculty to AIT, Bangkok.

### Technician Education Project - III

#### Payment for professional and special services

As a follow-up of the National Policy on Education, the Government of India initiated a massive effort for strengthening technician education and improving the quality of polytechnic passouts in the country. The project was launched with the assistance of the World Bank as a State Sector Project in two phases. The first Technician Education Project (Tech. Ed.I) commenced from December 1990 and ended in September 1998. The Second Technician Education Project Tech. Ed.II commenced in January 1992 and ended in October 1999. The two projects benefited 532 polytechnics in 19 States and Union Territories and have been rated 'highly satisfactory' by the World Bank.

For sustaining the gains made under these two projects and also to cover the States left out, the Government formulated another project called Third Technician Education Project (Tech. Ed.III) with the assistance of the World Bank in order to cover 12 existing and seven new polytechnics in the states of Arunachal Pradesh, Jammu and Kashmir, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Union Territory of Andaman and Nicobar Islands. The project became effective from January 17, 2001 for duration of five and a half years.

#### Capacity expansion

- Establishing seven new polytechnics, revamping all existing courses, starting new diploma and post diploma courses, increasing enrolment capacity of

students and establishing hostel seats for men and women.

- Introducing continuing education, transfer of technology and community service in every project institution to benefit about 8,000 rural unemployed youth.

#### Quality improvement

- The training of all teachers in the project polytechnics for at least four weeks each year in the new technologies, education technology and industry. A batch of 39 polytechnic faculties was sent to Germany on foreign fellowship training for a period of three months from September to December 2004.
- The setting up of learning resources utilisation centres in all polytechnics and the use of media in teaching.
- Computer education for all students.
- The introduction of hi-tech courses and subjects specially in information technology, computer sciences, production technology, textile and garment technology and automobile maintenance.
- Introduction of course flexibility through MPECS.
- Industrial training provisions for every regular student.

#### Efficiency Improvement

- Enabling institutions to improve cost recovery.
- Providing a reasonable degree of academic, administrative and financial autonomy to each project institution
- Setting up or strengthening Directorates and Boards of Technical Education in each state.
- Encouraging industries and community to cooperate in institutional governance, academic activities and resources mobilisation.

#### Educational Consultants India Limited (Ed.CIL)

Educational Consultants India Limited (Ed.CIL) was established as a Government of India enterprise in 1981

to undertake various educational projects with focus on technical assistance activities such as preparation of detailed project reports for establishment of educational institutions, development of curricula, assessment of manpower requirement, carrying out surveys, etc. The focus was subsequently broadened to include activities related to promotion of Indian education abroad, placement of foreign students in Indian institutions and secondment/recruitment of experts in various fields for Ed.CIL clients abroad as well as in India. During the last few years Ed.CIL has further widened its areas of operation and taken up turnkey construction and procurement projects (with a focus on educational institutions) and also testing activities for admission to educational institutions and recruitment.

Ed.CIL has been a profit making public sector undertaking for the last 15 years and has been regularly paying dividend to the Government of India.

### Technical Education Quality Improvement Programme of Government of India

Technical Education Quality Improvement Programme of Government of India (TEQIP) has been conceived in pursuance of the NPE, 1986 (as revised in 1992). The programme aims to upscale and support ongoing efforts of the Government of India in improving the quality of technical education and enhancing existing capacities of the institutions to become dynamic, demand-driven, quality conscious, efficient forward looking and responsive to rapid economic and technological developments occurring at national and international levels.

The broad objectives of the TEQIP are given below:

- ❑ To create an environment in which engineering institutions selected under the programme can achieve their own set targets for excellence and sustain the same with autonomy and accountability.
- ❑ To support development plans including synergistic networking and services to community and economy of competitively selected institutions for achieving higher standards.
- ❑ To improve the efficiency and effectiveness of the technical education management system in the States and institutions selected under the programme.

The TEQIP is being implemented as a centrally coordinated, multi-state, long term programme in overlapping phases. Under each phase, there will be 2 to 3 cycles of selection of well performing institutions in a competitive manner.

The negotiation of the programme with International Development Agency (IDA) for the First Phase was held in September 2002. The programme became effective from March 12, 2003.

For the First Cycle of the First Phase, six States, namely Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra and Uttar Pradesh have been selected to participate in the programme based on their commitment and preparedness. From among these States, 12 lead institutions, including five Centrally-funded institutions (NITs), and 26 network institutions have been selected. During the Second Cycle of the First Phase, seven states, namely Andhra Pradesh, Gujarat, Jharkhand, Karnataka, Tamil Nadu, Uttaranchal and West Bengal have been selected. From these States, 81 institutions -17 lead and 64 network institutions- have been selected, Further, in the Second Cycle, 11 Centrally-funded institutions -10 lead and 1 network- have been selected.

### Canada-India Institute Industry Linkage Project (CIILP)

- ❑ The Canada-India Institute Industry Linkage Project was a bilateral technical education project supported by the Government of Canada and India, with funding from the Canadian International Development Agency (CIDA). The executing agency was the Association of Canadian Community Colleges (ACCC). On the Indian side, the major stakeholders were the Union Ministry of HRD and Directorate of Technical Education of the project states.
- ❑ The project was implemented in five States -

Madhya Pradesh, Maharashtra, Goa, Gujarat and Chhatisgarh.

- ❑ The project was designed to enhance the efficiency and effectiveness of the technical education system in the project states by means of - (i) developing sustainable models for effective interaction and linkages between technical institutions and industries, (ii) ensuring sustainability and promoting replication of the project initiatives and (iii) promoting private sector participation in human resource development issues.
- ❑ The project goal was to assist the Government of India in its efforts to make the technical education system more responsive to the changing socio-economic environment.
- ❑ The project was implemented in two phases – the start-up phase and the implementation phase. The start-up phase began in May 1999 and was completed in December 1999. The implementation phase commenced in January 2000 and the project concluded on December 31, 2004.
- ❑ The project was implemented under the overall guidance and supervision of Joint Project Steering Committee (JPSC) under the Chairmanship of Joint Secretary (T) in the Ministry of Human Resource Development, Department of Secondary and Higher Education, Government of India. The National Project Directorate (NPD) and In-India Working Group (IIWG) was responsible for the monitoring of day-to-day activities of project implementation. Joint Secretary (T) in the Ministry of Human Resource Development, Department of Secondary and Higher Education was designated as the National Project Director, as well as the Chairman of the In-India Working Group. The project implementation office was located in Pune, Maharashtra.
- ❑ The project was implemented in 20 institutions and replicated in 25 institutions of the five States under the project.
- ❑ The 3<sup>rd</sup> Showcase Conference to focus on Industry Linkage activities was held at Goa from October 8-10, 2004. In addition, the Joint Project Steering

Committee meeting was held on October 9, 2004, at Goa.

### Colombo Plan Staff College for Technician Education (CPSC)

The Colombo Plan Staff College for Technician Education (CPSC) is a specialised agency of the Colombo Plan. It was established on December 5, 1973, at the 23<sup>rd</sup> Consultative Committee Meeting of the Colombo Plan held in Wellington, New Zealand, to assist the member-countries of the Colombo Plan in developing and enhancing their technician education systems. It became operational in 1974 with the Republic of Singapore serving as the first host government for 12 years. In 1986, the CPSC moved to Manila, Philippines.

The Colombo Plan Staff College is a unique organisation, being the only regional institution addressing issues related to quality improvement in technician education and training in the Asia-Pacific region. The objective of the staff college is to improve the quality of technician education and training in the Colombo Plan region by meeting the need for technician teacher educators and trainers and senior staff in technician education who can play a more active part in in-service training and staff development programmes.

Besides regional programmes, in-country programmes are also carried out by CPSC, Manila. Some programmes undertaken in 2004-2005 are as given table below

### International Technical Cooperation

India has the largest scientific and technical manpower in the world. It has a huge educational infrastructure. A number of institutions like IITs, IIMs, IISc., ISM and universities like JNU, Delhi University, IGNOU, BHU are world famous. These can have collaboration on equal basis with institutions in advanced countries. India has indigenously developed infrastructures for development of education, planning and administration (like UGC, AICTE, NCERT, NIEPA, TTTIs, NCTE and Ed.CIL). Their facilities can be shared with other developing countries. Fifteen per cent of seats over and

above normal intake in our professional institutions are reserved for foreign students. There is no limit in the general education side for admission of foreign students. These are to be effectively utilised.

The bilateral technical cooperation models, of late, involve more than one institution for the Indian side. Besides, the normal funding obligations would be not only to meet the local hospitality of visits from abroad but also to meet international airfare for Indian delegations visiting abroad for this purpose. As no individual institution is involved, the expenditure has to be met by this Ministry.

It is also felt that international collaboration in technical education can be promoted more effectively if joint projects are funded on equal basis with the external partners.

A Memorandum of Understanding (MoU) between Ministry of Human Resource Development and the Ministry for Youth, National Education and for Research for the Government of the French Republic on establishing a Cyber University has been signed. The activities carried out at the Indian Institute of Science, Bangalore, in applied mathematics, etc., and Toulouse University Network, France, will be treated as activities of the Cyber University.

The main objectives are that the Cyber University will be devoted to information exchanges between India and France in the fields of education, training, transfer to

technology and research and the learning resource material will be developed jointly by Indian and French institutions. The parties shall mutually decide the question of ownership of copyrights of the above-said material and its publication.

During the current financial year, the Indian Institute of Science, Bangalore, would be offering four additional Cyber University courses which are as follows:

- a. Combustion and shock waves
- b. Homogenisation
- c. Cryptography
- d. Variation Methods

In addition, research seminars between India and France have also been organised

The budget provision titled “ International Technical Cooperation “ would also enable to consider reciprocal funding of Indian obligations of joint collaboration projects in technical education.

Assistance to technical institutions in approved cultural exchange programme/educational exchange S&T programme with science cooperation, expenditure on visit of foreign delegation, for sending delegations abroad, organising international seminar/conference on collaboration in technical assistance.

The following aspects of International Technical Cooperation are to be implemented: -

Regional Programme	Month/Year	Venue
Business Process Reengineering (BPR) and TQM in TET System	22.11.2004 to 3.12.2004	SIVAT Rep. Of Korea
<b>In-Country Programme</b>		
Information Technology Based Education & Training	12.4.2004 to 13.4.2004	NITTTR, Chennai
Knowledge Management System for Teaching & Learning	13.9.2004 to 24.9.2004	NITTTR, Kolkata

To organise international conferences, seminars and workshops for propagation of Indian system abroad and on educational issues concerning India and other nations together.

To initiate such other activities as may be decided by the Government from time to time

To establish India Education Centres in developing countries for facilitating flow of foreign students from those countries to Indian institutions.

### Vocational Education

The Vocationalisation of Secondary Education provides for diversification of educational opportunities so as to enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and it provides an alternative for those pursuing higher education.

The Centrally sponsored scheme of vocationalisation of secondary education at + 2 level is being implemented since 1988. The revised scheme is in operation since 1992-93. The scheme provides for financial assistance to the States to set up administrative structure, area-vocational surveys, preparation of curriculum, text books, work books, curriculum guides, training manual, teacher training programme, strengthening technical support system for research and development, training and evaluation, etc. It also provides financial assistance

to NGOs and voluntary organisations for implementation of specific innovative projects for conducting short-term courses. However, the performance of some of the NGOs in implementation of the scheme has not been found satisfactory and necessary action such as blacklisting has been initiated against. As such, no further grants are being released to NGOs without the receipt of UCs. A list of NGOs against whom the UCs are pending for the last three years is enclosed in Appendix. A list of NGOs which have been released grants-in-aid of more than Rs. 1 lakh during 2002-2003 is also enclosed. The scheme so far has created a massive infrastructure of 20,600 sections in 7,300 schools thus providing for diversion of about 10 lakh of student at + 2 level and the grants so far released has been to the tune of Rs. 700 crore.

The scheme has been evaluated/reviewed by various agencies such as Informal Group set up by the Ministry of Human Resource Development in 1993; the Synergy Group in 1995, the Operations Research Group (ORG) in 1996; National Council for Educational Research and Training (NCERT) Working Group in 1998 and Center for Research Planning and Action (CERPA) in 1999. Based on the recommendations of the various review groups/ committees, the existing scheme of Vocationalisation of Secondary Education at +2 level is being considered for further revision and amplification.

