

## **Indian Institute of Technology Kanpur**

**The Indian Institute of Technology Kanpur** was established in the year 1960. The Parliament of India passed the 'Institutes of Technology Act 1961' declaring all the IITs as "Institutions of National Importance". The Parliamentary Act has given absolute autonomy to the IITs. When the foundation stone of the IIT system was laid, it was perceived that taking help from the industrially advanced western countries might be lot more effective in achieving the status of a world class technical institute. Hence, IIT Kanpur had a massive collaboration with USA through a specially created programme- KIAP (Kanpur Indo American Programme). It is said to be the largest ever academic assistance programme supported by U.S.A. Such close interaction brought fresh air, new ideas and novel thoughts into the academic programmes and academic administration. IIT Kanpur substituted the traditional annual system with semester system and also introduced the letter grade system instead of marks for evaluating the students for the first time in the country. IIT Kanpur may also take pride in introducing the concepts of term papers, unannounced quizzes etc.

The IIT Kanpur is a prestigious institute of higher learning producing meritorious students with excellent career growth and universal recognition. The students get the best of opportunities in the form of highly advanced courses, eminent faculty members, well-equipped laboratories, library, hostels and immense facilities to excel in research and development. The selection procedure for students at undergraduate, postgraduate and research level is highly stringent so that IIT gets the best brains of India. Highly scientific and innovative technology is used for teaching and carrying out research activities. Every year IIT Kanpur is enriched by the laurels brought by the faculty members and the students in the form of research publications, projects, fellowships and industrial exposure.

At the Bachelor's level, we have B.Tech. Programs in Aerospace, Biological Science & Bioengineering, Chemical, Civil, Computer Science, Electrical, Metallurgy and Mechanical Engineering. We also have integrated M.Sc. programs in Physics, Chemistry, Mathematics and Statistics. From July 2005, we have started an integrated M.Sc. program in Economics. The students for these programs are selected through JEE and usually they are the top students from various places in the country. There are programs for M. Sc. (2 years) in Physics, Chemistry, Mathematics and Statistics, where the students with B.Sc. (Hons.) background are chosen through an all-India examination known as JAM. We have M.Tech. Programs in all the Engineering Branches, mentioned above. In addition, there are M. Tech. Programs in the interdisciplinary areas, such as, Nuclear Engineering, Biological Sciences and Bioengineering, Laser Technology, Environmental Engineering, Materials Science, and Industrial and Management Engineering. The M. Tech. Students are chosen through an all-India examination, known as GATE. We have also adopted a dual degree (B.Tech.-M. Tech.) program. In this program, the students admitted through JEE, are expected to complete the M. Tech. Program in five years. At the end of five years, the student is awarded both B.Tech. and M.Tech. Degrees. Entrance

to MBA & M.Des is given through JMET and CEED respectively. We have indeed a vibrant PhD program in all the above academic areas as well as in Humanities and Social Sciences. The Department of Physics offers a M.Sc.-Ph.D. dual degree program, which allows their M.Sc. students to continue for a Ph.D. The M. Tech. and Ph.D. students receive research/ teaching assistantships.

IIT Kanpur has demonstrated its excellence in research in many areas. IIT Kanpur has a vibrant university atmosphere with a combination of strong academic and research activities. Both compliment each other and the students at all levels under the able guidance of the faculty members maintain this brilliant combination and help the Institute to reach the zenith of knowledge and innovation. To cite a few areas: Finite Element Methods Using Domain Decomposition, Flow Induced Vibrations, Wind Tunnel Testing of Large Scale Prototypes, Computational Chemistry, Nano-materials and Nano-technology, Geometric Optimization of Large Organic Systems, Genomics and Bio-Informatics, Electronic Structure Calculations, Aggregation and Etching, Molecular Dynamics, Thin Film Dynamics, Optical / EM Field Calculations, Computational Fluid Dynamics and Heat Transfer, Computer Aided Design and Rapid Prototyping, Tomography, Robotics, Multi-Body Dynamics, Geo-seismic Prospecting, Stress Analysis and Composite Materials, Vibration and Control, Semiconductor Physics, Photonics, Neural Networks and Genetic Algorithms, Earthquake Engineering, Impurities in Anti-Ferro Magnet, Raman Scattering, Particle Physics, Spin Fluctuation in Quantum Magnets and so on. The most recent initiative of IIT Kanpur has been the Formation of a Strong Research Group in the areas of Nanoscience and Nanotechnology.

Understanding basic science and having a strong grip on fundamentals is essential for the future engineers. Science-based courses are included in the curricula during the first two years of training so that the engineers follow a correct track in their innovative endeavor. Theodore von Karmann once stated: The Scientists explore what is and engineers create what has never been.

In IIT Kanpur, Science Electives have been introduced in order to enhance the science content in engineering. The following Science Electives are worth mentioning: Quantum Physics, Modern Theories of Material Design, Non-Linear Systems, Order and Chaos, Molecular Modeling, Bio-Inorganic Chemistry, Lasers in Chemistry and Biology, Digital Image Processing, Fourier Analysis, Numerical Linear Algebra, Photons, Molecules and Chemical Dynamics, Magnetic Resonance in Chemistry and Biology, Bio-informatics and Computational Biology are to name a few.

IIT Kanpur has developed a close association with the Indian Railways. A new project namely SIMRAN has been rolled out for tracking of trains and providing two directional data connectivity between a stationary server and a moving train. This project has turned out to be a great success. The Research Summit called REACH Symposium was conducted at Shimla during March 2007 and is expected to be of great importance of our Institute for bringing out new initiatives in academic and non-academic environments. National Wind Tunnel Facility (NWTF) was established as a landmark research and development

activity at IIT Kanpur. Establishment of Samtel Center for Display Technology is indeed a shining example of development of a research programme of high quality. The National Program on Earthquake Engineering Education ( NICEE) is a resource center for many aspects of earthquake engineering. A system of material processing using focused beam (FIB) has been established.

The Institute is expanding and various infrastructural developments have taken place in the recent past. The Outreach '69 and '80 has come up which houses offices of Alumni Association and Students' Placement activities. It also has a centrally air-conditioned multipurpose auditorium with the seating capacity of 218. The Institute is setting up a centre of Environmental Sciences and Engineering utilizing the MPLADS funds given by Shri Arun Shourie. The construction of a separate building is under advance stage, which will house laboratories, seminar and discussion rooms for various disciplines of the Environmental Sciences and Engineering. Many developments have already taken place and many are lined up for the future years. P. K. Kelkar Library is housed, with all modern amenities, in a magnificent three-storied, separate building covering an area of 5730 sq. m. The library has been rendering essential support to the academic, research and developmental programmes of the Institute. It remains open on 358 days of the year, from 8 a.m. to 12 midnight on all working days; 9 a.m. to 12 midnight on Saturday; 9 a.m. to 5.30 p.m. on Sundays and Gazetted holidays, and for 24 hours during the three examinations each semester.

The initiative to conceive a grand design for technical education in India and implement the concept true to its spirit, in the form of IITs is one of the greatest hallmarks of visionary development in independent India. IIT Kanpur has been ranked as the No.1 Engineering Institute of the country in the June 2007 edition of India Today. The entire system is ranked third among the top Engineering educational systems at the international level. IIT Kanpur cherishes to maintain its leadership role not only at the national but also at the international level.