

Honorable Chairman, Board of Governors of the Indian Institute of Technology Kanpur, Professor M. Anandkrishnan, Distinguished Chief Guest, Dr. E. Sreedharan, Members of the Board of Governors, Members of the Senate, all graduating students and their family members, members of faculty, staff and students, invited dignitaries, guests, and members of the media: I heartily welcome you all on this occasion of the forty-fourth convocation of the Indian Institute of Technology Kanpur.

We are particularly happy to welcome Dr. E. Sreedharan, Padma Vibhushan, former Managing Director of Delhi Metro, amongst us for today's forty - fourth convocation.

The academic year closing in May 2012 has been momentous, and I consider it a privilege to review our activities pertaining to this period.

ACADEMIC ACTIVITIES

The academic year 2011-12 has had a successful run. The number of graduating students both at the undergraduate levels, 633, and at the postgraduate levels, 401, shows a satisfactory trend. In addition, 101 Ph.D. students have graduated over the last academic year.

AWARDS AND HONOURS

This year has brought many honours to the Institute. It has been ranked No. 1 amongst engineering institutes in India by ZEE News-DNA-IPSOS survey as well as by India Today.

The Institute has also received the India Today Award for making the most innovative use of technology by offering and using it in a way that enriched life.

I am delighted to inform you that SIDBI Innovation and Incubation Center (SIIC), IIT Kanpur has been selected for the National Award for Technology Business Incubators for the year 2011 by DST's National Science and Technology Entrepreneurship Development Board.

The many prestigious scholarships and awards received by our students have been a matter of pride and pleasure for us.

Dipendra Kumar Misra, Kartikey Asthana, Massand Sagar Sunil, and Shikhar Sharma received the *O P Jindal Scholarship*. Ankit Kumar, and Ashish Gupta received the *World Quant Scholarship*. In addition, Shouvik Sachdeva, Anshul Kumar Rai, and Akash Goel, have been conferred the *Aditya Birla Scholarship*. And this year also, all 8 Japanese *TODAI scholarships* were awarded to IITK students -

Meenakshi Khosla, Anyesha Ghosh, Tanmay Gupta, Asish Mahapatra, Vishwas Aggarwal, Taun Kumar Baranwal, Siddharth Sharma, and Kartikey Asthana.

Our students' research work has also received significant recognition, both nationally and internationally. Mr. Puneet Singh and G Sriram (AE) won the American Helicopter Society student design competition for the best new entry. Mr. Rajesh Vasita (BSBE) received the Bajpai Saha Award for the best oral presentation at the Fourth Indo-Australian Conference on Biomaterials, Tissue Engineering and Regenerative Medicine. Mr. Chandra Shekhar Sharma (CHE) got the Innovative Student Projects Award 2011 from INAE, India. Mr. Ankur Verma (CHE) received the Shah-Schulman Award for the best Ph.D. thesis in the area of Colloid and Interface Sciences at the CHEMCON 2011, Bangalore. Mr. Anurag Awasthi and Ms. Avani Nandini (CSE) won the Popular Choice Award for their project, and a Gold Medal at the Intel India Embedded Challenge (IIEC), 2011. Mr. Kewal Dharamashi (ME) received the first prize in ASME's Asia Pacific Competition as well as the Best Technical Paper Award. Ms. Shail Pandey (PHY) received the Buti Young Scientist Award in the 26th National Symposium on Plasma Science and Technology. The list of other awards received by the students is given at the end of

this report. I congratulate all these students and their supervisors for these accomplishments.

Our faculty has played a significant role in pushing the frontiers of knowledge. And this has been duly recognized in the form of various awards and honours, including fellowships of professional societies and editorships of international journals.

Prof. Kalyanmoy Deb (ME) received the *Infosys Prize 2011* in the category of Engineering and Computer Science. It gives me immense pleasure to tell you that we now have three faculty members and five alumni as Infosys Prize winners. Dr. Binod Sreenivasan (ME) has been awarded the *Swarnajayanti Fellowship* by the Department of Science and Technology. Prof. Sanjay G. Dhande (CSE & ME), Director of the Institute, has been awarded the degree of *Doctor of Science (honoris causa)* in recognition of his contributions in the fields of technical education and engineering research and technology by Uttarakhand Technical University, Dehradun. Prof. Sandeep Verma (CHM) and Dr. Yogesh M. Joshi (CHE) have been awarded the *DAE-SRC Outstanding Investigator award*. Prof. S. Ganesh (BSBE) received the *Rajib Goyal Award* for Young Scientist by the Goyal Foundation, Kurukshetra University. Dr. Tarun Gupta, (CE) (2011) and Dr. Pratik Sen (CHM) (2012)

have been awarded the prestigious *Indian National Science Academy (INSA) young scientist medal*. Dr. Priyanka Ghosh (CE) received the *IEI Young Engineers Award 2011-2012* by the Institution of Engineers (India). Dr. Shalabh (MATH) has been selected for the *Prof. C. R. Rao National Award* for Young Statisticians by the Ministry of Statistics and Programme Implementation, Government of India, for significant work in the field of statistics. Prof. Avinash Kumar Agarwal (ME) has received the *INAE Silver Jubilee Young Engineer Award*. Dr. J. Ramkumar (ME) has been selected for the *IEI Young Engineers Award 2011-2012* in Production Engineering discipline. Dr. Kantesh Balani (MSE) has been selected by Elsevier as a recipient of the *Materials Science and Engineering C: Young Researcher Award* for the year 2011. Dr. Kantesh Balani (MSE) also received the Young Leader Professional Development Award, TMS, USA. Dr. Soumik Mukhopadhyay (PHY) has been honoured with the *Young Achiever Award* in the 56th DAE Solid State Symposium in Dec 2011. Prof. Satyajit Banerjee (PHY) received the NASI-Scopus Young Scientist award for Physics, 2012 by the National Academy of Sciences, Allahabad. A special invited session in the Catalysis and Reaction Engineering Division was held in honour of Prof. Santosh K. Gupta (CHE) during the Annual Meeting of American Institute of Chemical Engineering held in Minneapolis in Oct 2011. This honour is in recognition of the

outstanding work by Prof. Gupta in the area of Polymer Reaction Engineering.

The year 2011 had been declared as the International Year of Chemistry by the UN. On this occasion, an empowered committee of DST identified the top Chemistry departments in the country and sanctioned ₹250 lakhs to each for augmentation of their facilities. It gives me great pride to tell you that our department of Chemistry was chosen for this grant.

RESEARCH & DEVELOPMENT OVERVIEW

The number of externally funded ongoing projects has reached 522 with a sanctioned amount of ₹344 crores. During 2011-2012, the Institute got sanctions for 107 sponsored projects worth ₹58.71 crore and 74 consultancy projects of value ₹7.27 crore. The major grants sanctioned by various agencies during the year are DST, ₹31.60 crore, DBT, ₹4.10 crore, MOES, ₹3.42 crore, DRDO, ₹1.89 crore, MNRE, ₹1.15 crore, and MOEF, ₹1.01 crore. Some of the major industries which have funded projects are BHEL, NABARD, Thermax, TCS, L&T, IOCL, Samsung and GE. At the international level, organizations like EATON, P&G, Chevron, and Boeing have funded our research. A list of major projects is given at the end of the report.

During the year 2011-12, 15 technologies developed at the Institute were licensed for commercialization, while we filed 13 national patents (2 design patents). In the last financial year, our earnings from intellectual property are around ₹62 lakhs. SIIC has come up with a comprehensive booklet on *Proprietary Technologies of IIT Kanpur*.

15 companies are currently being incubated at SIIC while 17 have already graduated. There are 4 current Incubate companies that have achieved a turnover of more than 100 lakhs. More than 300 people work for these incubate companies at SIIC.

The Institute exercised its first Exit Option from its Incubate Company *Geokno India Pvt. Ltd.* The reputed infrastructure corporate GMR Projects Pvt. Ltd. bought 13% equity stake of the Institute at a premium of 25%.

I am happy to inform you that the following technologies developed at the Institute have been recognized and launched at the national level.

SIMRAN, a GPS based Real Time Train Information System jointly developed by IITK and RDSO, was inaugurated by the Hon'ble Minister of Railways in October 2011.

Jugnu Micro Satellite was successfully launched with the PSLV C18 rocket on October 12, 2011 from Sriharikota.

Digital Mandi for Indian Kisan was inaugurated by Mr. Kapil Sibal, the Hon'ble Minister of Communications and Information Technology and Minister of Human Resource Development in August 2011.

Further, several softwares have been developed during the year. They include: structural dynamic analysis of helicopter rotor blades (developed and transferred to RWR & DC, HAL) (AE); a code that combines CPMD and GULP to perform QM/MM calculations of periodic solids and polymers (CHM); MTA, a Plug-In utility for quantum chemical ab initio Software, Molecular Cluster (CHM); Brihaspati-3 (EE); Brihaspati Sync (EE); EMS (EE); Strategic Innovation Game (IME); Real-time web-based simulation game to study Entrepreneurial decision Making (IME); Virtual Production Shop Simulator (IME); Web-based production shop simulation software (IME) and indigenously developed Engine Endoscopy Technique (ME).

Several Technologies have been developed during the year. They include: an arrangement for jet engine to reduce noise (AE); Low flow prototype denuder using non-selective membrane (CE); Composite reusable adhesive (CHE); Miniature lenses, systems and methods of making the same (CHE); Micro-pattern generation with pulsed laser diffraction (CHE); Cancer detection system (CHE); Integrated Bragg Gratings for CWDM communications (EE, LTP); First prototype of Electronic Fuel Injection Diesel Locomotive for Indian Railways (ME); A process for improving mobility of a pentacene based thin film transistor by field assisted deposition (MSE); Formulation and inkjet printing of TiO₂ nanoparticle incorporated organic dielectric ink (MSE); and preparation of fine grained Cu-Al-Ni shape memory strip from pre-alloyed argon gas atomized powder or elemental powder mixture, via hot densification rolling of powder performs (MSE).

Major projects sanctioned during 2011-12

I am happy to inform you that DRDO has sponsored a project on Aero-Elastic Study of Turbo-Machinery Blades under GATET Scheme. The project will involve validation and optimization of a theoretical model of turbo-machinery aero elasticity already developed at IIT Kanpur, experimental study

of forced response of a cascade, and development of a laboratory cascade model to simulate cascade flutter.

MOES India and NERC UK have sponsored a project on the structure and dynamics of groundwater systems in northwestern India under past, present and future climates. India is the largest agricultural user of groundwater in the world. In fact, northwestern India is now a hotspot of groundwater depletion, with 'the largest rate of groundwater loss in any comparable-sized region on Earth'. This project is based on the premise that we must first understand the geology and geometry of the aquifer system before we can hope to estimate the way it will respond to a complex set of future stresses.

The project titled "Generation of Solar Hydrogen" is a multi-institutional initiative, coordinated by IIT Kanpur and supported by the Technology Systems Development Program of DST, New Delhi. Participating Institutes include IIT Madras, DEI Agra, IIT Jodhpur, CECRI Karaikudi and BARC Mumbai. The project aims at developing workable designs of a solar hydrogen generation system using multiple technologies. The project aims at conducting research to develop and identify the best possible photo-electro-catalysts suitable for large scale applications. Apart from the photo-catalytic route, an

electrolyzer integrated to a PV module and a thermo-chemical approach will be developed for hydrogen generation.

DST has funded a project on Research and Development of IngaZnO₄ (IGZO) large area Electronics and its applications to Active Matrix Flat Panel displays. In contrast to the micro-electronics industry, large area electronics is still an emerging technology in which India has the capability to join the race. This project will be a step in that direction.

DST has also funded a project Thematic Unit of Excellence on Soft Nano-fabrication with applications in Energy, Environment and Bio-platforms as a 2nd phase of the Unit on Nano-sciences. The Unit has many state-of-the-art resources for nano-fabrication and characterization (e.g., SEM, e-beam, photo-lithography, nano-imprinting, profilometers, micro-Raman, NSOM, SPMs, LB/BAM, XRD, SAXS, ellipsometer, PECVD, sputtering, imaging, etc.). The basic thrust of the Unit involving participation of around ten faculty groups spread over different departments is in developing soft materials, structures and devices within 100 nm size and exploit their applications in three areas: energy, environment and bio-applications/health.

In addition, DST has sponsored a project to set up five different PV technologies of mono-crystalline, multi-crystalline, amorphous thin film silicon, CIGS thin film and multi-junction high efficiency concentrators with trackers to monitor and collect data objectively, analyze their performance and to find Levelized Cost Of Electricity (LCOE) of each of these technologies.

RESEARCH INFRASTRUCTURE DEVELOPMENT

The Institute strives to provide state-of-the-art equipment to its faculty, students and staff to facilitate cutting edge research in the frontier areas of science and technology.

Nanoscale Imaging Facility

The Institute is in the process of setting up a facility for materials and biological science at a cost of about ₹15 crores. The facility will house a HRTEM and a cryo-TEM along with the complete infrastructure/accessories for materials and biological sample preparation. The HRTEM will be FEI make Titan G2 60-300 model, the world's most powerful commercially available STEM/TEM. The microscope will have the most advanced, most recent technology detectors, attachments and imaging system with state of the art capability for imaging at sub-Angstrom scale, and diffraction and X-ray spectroscopy at nanometer scale. The facility will be

commissioned and available for researcher by the end of 2012.

During the year, the Institute has procured the following facilities under its CARE scheme: A Distributed Fiber-Optic Strain and Temperature Sensing System, Contact Angle Goniometer, FTIR based Emission Measurement System for Air Pollutant measurement, Plasma Cleaning System: A TEM sample preparation accessory, Autoclave for curing of Polymer Matrix Composites. It also granted funds for upgradation of the old console for 400 MHz high resolution NMR Spectrometer under CARE.

In addition, to give a boost to infrastructure for research, the Institute provided a grant of ₹2.5 crore to each department. This has led to wide spread augmentation of equipments and facilities across the Institute.

Some laboratories established in the Institute are virtual instrumentation laboratory (AE), a Flame/Fire dynamics laboratory (AE), and a general purpose laboratory for Production Shop Simulation and Smart Systems and Operations Laboratory (IME).

INTERNATIONAL ACADEMIC COLLABORATIONS

For promoting scientific and academic co-operation, the Institute has entered into MoUs with the University of Rhode Island, USA, Brown University, USA, the Université libre de Bruxelles, the University of Melbourne, Australia, Pontifícia Universidade Católica do Rio de Janeiro, Ecole Centrale Nantes, University of Applied Science, and Politecnico Di Torino, Italia.

FINANCIAL RESOURCE MOBILIZATION

The year 2011-12 has continued the upward growth in financial resources of the Institute. The total Grant-in-aid received during the financial year from MHRD, Govt. of India, under non-plan was ₹186.60 crore and under Plan ₹187.00 crore.

The year was good for fund raising as well. The Institute received ₹5.83 crore from 888 donations made by 690 donors (334 donors from India and 356 donors from abroad). A total of 421 donors (164 donors from India and 257 donors from abroad) contributed ₹60.5 lakh under the Annual Gift Programme (AGP). Donations received under AGP have been utilized for providing travel support to the students for attending international conferences, rewarding students for publishing research papers in high quality journals, travel

support to international visiting faculty, filing of patents, scholarships and other activities supporting and encouraging excellence in the Institute. During the financial year 2011-12, the Institute provided travel support to 114 students for attending international conferences, and cash awards to 129 students for publication of their research papers in reputed ISI Web Journals.

The Class of 1986 has contributed their batch fund for establishing Tinkering Lab that will provide basic mechanical and electrical tooling facilities. Once the lab gets going, there is a possibility of substantial additional funding from DST to make it a national innovation lab.

Several individual and corporate donors have created chairs and awards to recognize excellence in the Institute. Mr. Jagjeet S. Bindra (BT/CHE/69), donor of Mrs. & Mr. Gian Singh Bindra Faculty Research Fellowship has converted this fellowship to Mrs. & Mr. Gian Singh Bindra Memorial Chair in the Department of Chemical Engineering. Mr. Kamallesh Dwivedi (BT/EE/79) and Mrs. Rita Dwivedi have instituted Pandit Girish Ranjan & Sushama Rani Pathak Chair. Housing and Urban Development Corporation Limited (HUDCO) has instituted HUDCO Chair.

Mr. Bogineni Chenchu Rama Naidu (MT/MSP/82) has created the Bogineni Chenchu Rama Naidu Merit Award; Mr. Khairati Lal Chaudhary has created the Lalit Kishore Chaudhary Memorial Award; Mr. Cherian Mathew (BT/CSE/08) has created the Dr. Elizabeth & Dr. Varkey Cherian Scholarship and award, and Mr. Sanjeev Narayan Khadilkar (PHD/CSE/95) has created the Gurubandhu Challenge prize.

In addition, several donors have instituted new scholarships during the financial year 2011-12. To mention only a few: AIM FOR SEVA [Mr. Arun Kapoor (BT/ME/67)] has instituted the Padma Kapoor Memorial Scholarship; Ministry of Steel has instituted 5 scholarships named Ministry of Steel Scholarship; Mr. Ashish Shukla (MSc5/MTH/97) has instituted the Giridhar Gopal Shukla Memorial Scholarship; Mr. Saibal Dutt (BT/EE/77) has instituted the Smt. Neela Dutt Scholarship; Dr. Ashok Jain (MT/CE/1971, PHD/CE/78) has instituted the Sri Babu Ram Jain Memorial Scholarship in memory of his father. Dr. Shashi M. Kuppa (BT/CE/85) has instituted a distinguished lecture series in the Department of electrical engineering in the name of his father, Prof. M. Ramamoorthy.

Mrs. Asha Jadeja has donated US\$ 2.01 lakh towards the Rajeev Motwani Building for CSE department.

The 1972 batch has donated towards establishing the yoga and aerobics hall in the new students' sports complex, which has been named as the *1972 Batch Yoga and Aerobics hall*.

The SURGE program was conducted during summer 2011 with applications invited from 122 institutes. 95 students participated in the program. 72 faculty members participated from IIT Kanpur as mentors. The selection of student participants was very competitive as 2600 applications were received from various institutions in the country, which gives a clear indication of its increasing popularity.

Using the alumni donations, the Institute has created a *Scholar in Residence* program under which eminent scholars are invited to come to IIT Kanpur and interact with students and faculty. The first visitor under this program was Mr. Michael Danino, an eminent historian.

Furthermore, the Institute has created Department Excellence Funds for every department to support excellence in academics and research.

The Institute is working on an ambitious plan for raising substantial resources to increase the research and

development activities on campus and hopes to launch the drive in the year 2012-13.

STUDENTS' ACTIVITIES

IIT Kanpur continues its drive to encourage an equitable balance between academics and extra-curricular activities among its students. Our vision is to create future leaders in their fields of interest and not just technically accomplished individuals. The Institute strongly believes that an abiding social and humane engagement is the hallmark of its student body. To translate such a belief into reality, the Institute nurtures social, cultural and sporting activities pursued by Students' Gymkhana and other student groups. With a firm belief in self governance, Students' Gymkhana continues to provide a platform to all students to pursue their interest. The coming year will also witness the *Golden Jubilee of Students' Gymkhana*.

A variety of activities are pursued by various clubs coming under the broad ambit of the councils of the Students' Gymkhana. They range from clubs like *Prayas*, where students teach children coming from socially disadvantaged and economically deprived backgrounds, to the *Dramatics club* which stages thematically inspired and socially relevant plays. The *Music club* is actively working on launching a music album

of its own, a first of its kind initiative by any student group in India. It has composed three patriotic songs and is working on composing an Anthem for IIT Kanpur. *Vox Populi*, the campus newspaper provides news from every aspect of the campus community. Efforts to establish a full-fledged studio for photography are also being made. Our students' talents and achievements in such activities have received national level recognition. The Institute's quiz team secured third place (first among IITs) in *Nihilanth'12* (inter-IIT-IIM quiz competition). This year, the Institute's cultural team won the *Overall Championship* at Antaragni as well as at IIT Delhi's cultural festival.

Other technically oriented student groups as part of the Science And Technology Council are engaged throughout the year in pursuing special interests such as robotics, electronics, astronomy, aero-modeling, business, programming, HAM, Rubik's cube, etc. In this year, our students have successfully completed many challenging projects such as Microsoft Touch Table, Hexapod (six legged robot bot), and *India's first student made in house Planetarium* which is all set to enter the Limca book of records. Also, they have put up a splendid show in IIT Bombay's technical festival and in the Intel Embedded Challenge. Students have also set up the IIT Kanpur chapter of the Society of Automotive Engineers and

are all set to take part in Formula SAE 2012 which is going to be held in December.

The overriding objective of large-scale events such as *Antaragni* (the cultural festival), *Techkriti* (the technical and entrepreneurship festival) and *Udghosh* (the sports festival) is to infuse a sense of richness and purpose in the lives of students. All these social, cultural and sporting activities play a crucial role in the transformation of a student into a complete human being. These festivals have seen vastly improved participation levels, both from within the Institute and also from other national and international institutions. The revenues generated for conducting these festivals saw an impressive growth last year, which is a tribute to the managerial and logistical skills of our students.

The Institute sports teams participated in the Inter IIT Sports meet held at IIT Kharagpur this year. The Badminton men's team and the Cricket team were successful in securing Gold medals. This year our campus saw the addition of a Rock Climbing wall and an air-conditioned gymnasium to the Institute facilities.

Our students also organized several on-campus inter-Hall competitions such as *Galaxy*, *Takneek*, *Spectrum* and

Varchasva, the inter-Hall Cultural, Science & Technology, Media, and Sports championships, respectively. A *fresher Varchasva* tournament was also organized to find talent within the newly admitted students. The guiding principle behind organizing these events is to provide students a platform to compete and showcase their cultural and sports talents. Furthermore, such occasions provide a reason and a motivation for students to come out of their rooms and participate in group activities.

The students also organised a significant Energy Saving Competition amongst hostels called *Green Opus*. The results were astounding. The students, just through an internal competition, were able to markedly reduce the average energy consumption in the halls.

Results from all the five inter-Hall competitions were used to identify the winner of the *Overall Championship Trophy*.

The Counseling Service is an active wing of our students. Its activities include organizing the orientation programme for incoming UG as well as PG students; providing specific attention to students having academic, financial or personal problems; and monitoring the progress of students who need

special attention. It enjoys wide appreciation amongst faculty and students.

The Institute also continued successfully with the Career Counseling programme with almost a two-fold rise in the number of students availing the facility this year.

The campus placement programme saw active participation by several companies with many old recruiters registering their presence once again after the recession in 2007-08. Apart from an overwhelming response from the traditional sectors of consulting, FMCG and core engineering, the e-commerce sector registered a sizeable presence this year, with a total of 30 job offers from companies such as Myntra, Flipkart and Snapdeal.

785 students registered for placements this year, of which 714 received job offers from 185 companies. Thus the overall placement record stands at 91% as on 5th of May, 2012. The break-up is as follows: B.Tech 92%, BT-MT Dual 96%, M.Tech including M.Des 84%, Integrated M.Sc 90%, M.Sc 2 yr 35%, and MBA 96%. Results from some of the companies that participated in the placement process are still awaited.

The Institute has put in place the entire infrastructure necessary to meet the requirements of the enhanced student strength. As of now, there are eleven halls of residence, nine for boys and two for girls. The total capacity in these halls is over five thousand.

CLOSING REMARKS

Dear graduates, on this occasion of the forty-fourth convocation, I extend my heartiest congratulations and best wishes to the Class of 2012 passing out today. This hard-earned success is a major milestone in your career. I also take this opportunity to salute your parents who have ensured your success and glory in all you have chosen to do through their constant quiet support.

As individuals you will choose the profession that excites you, that generates intellectual passion within yourself, engages your mind in the best possible way. I fervently hope that you are successful in your endeavors. Today, you will be leaving the protected environment of the Institute to find your place in the larger order of society. Prepare yourselves to evaluate the needs of others and respond to the call for action. It is people like you who keep our flag flying high.

I admire you for your fine accomplishments during your stay at IIT Kanpur. Given your intellectual attainments and breadth of understanding, you are destined to bring cheer, hope, joy and luck in all the lives you touch. Each of you in your own way has internalized the spirit of IIT Kanpur that imbibes commitment, excellence, fellowship, and, importantly, service. No matter where you are, continue to dream and dream big! My sincere, good wishes for the productive work you aspire to do in the future.

Jai Hind.

Books published

1. Gas Turbine Propulsion, D. P. Misra (AE), Annamaya Publisher, New Delhi.
2. Engineering Thermodynamics, D. P. Mishra (AE), Cengage Learning India Pvt. Ltd, India.
3. Advanced Control of Aircraft, Spacecraft and Rockets, Ashish Tewari (AE), John Wiley & Sons, Chichester, U.K.
4. Automatic Control of Atmospheric and Space Flight Vehicles, A. Tewari (AE), Springer (Birkhauser), USA.
5. Introduction to Integral Calculus - A systematic study with engineering applications for beginners, U. L. Rohde, G. C. Jain, Ajay K. Poddar and A. K. Ghosh (AE), Wiley, USA.
6. Introduction to Differential Calculus - A systematic study with engineering applications for beginners, U. L. Rohde, G. C. Jain, A. K. Poddar and A. K. Ghosh (AE), Wiley, USA.
7. SI adaptation Solid Waste Engineering and Solution Manual, Worrell, Vesilind and Tarun Gupta (CE), Cengage Learning, CT, USA.
8. Psychological Model of Illness, Rajbala Singh, former PhD student (HSS), Cambridge Scholars Publishing, UK, 2011. This book is published based on her PhD work.
9. Economics of Nuclear Power: Modeling and Scenario Analysis for Light Water Reactors in India, Saurabh Sharma, Anoop Singh (IME) and M. S. Kalra (ME), LAP LAMBERT Academic Publishing, Saarbrucken.

10. Optimality conditions in convex optimization: A finite-dimensional view, Anulekha Dhara and Joydeep Dutta (MATH), CRC Press, Taylor and Francis, USA.
11. Heat Transfer (Second Edition), P. S. Ghoshdastidar (ME), Oxford University Press.
12. Multi-Objective Evolutionary Optimisation for Product Design and Manufacturing, L. Wang, A. Ng, and K. Deb (ME), Springer-Verlag, UK.
13. Advanced Structural Ceramics, Bikramjit Basu (MSE) and Kantesh Balani (MSE), John Wiley & Sons, USA.
14. Tribology of Ceramics and Composites: Materials Science Perspective, Bikramjit Basu (MSE) and Mitjan Kalin, John Wiley & Sons, USA.
15. The Science and Engineering of Materials, Donald R. Askeland et al (Book Adaptation), Kantesh Balani (MSE), Cengage Learning, USA.

Fellowships

1. Prof. C. Venkatesan (AE) has been elected as Associate Fellow of American Institute of Aeronautics and Astronautics (AIAA).
2. Prof. R. P. Chhabra (CHE) has been elected to the Fellowship of the Indian Academy of Sciences, Bangalore.

3. Dr. Jayant K. Singh (CHE) has received Alexander von Humboldt Research Fellowship, Alexander von Humboldt Foundation.
4. Prof. Ashutosh Sharma (CHE) received J. C. Bose National Fellowship.
5. Prof. Faiz A. Khan (CHM) has been elected as a Fellow of the National Academy of Sciences, Allahabad.
6. Prof. Faiz A. Khan (CHM) has been elected to the Fellowship of the Indian Academy of Sciences, Bangalore.
7. Dr. S. P. Rath (CHM) has received Alexander von Humboldt Research Fellowship, Alexander von Humboldt Foundation.
8. Prof. S. Sarkar (CHM) received Ramanna Fellowship of the Department of Science and Technology.
9. Dr. S. P. Rath (CHM) received AvH Research Fellowship for Experienced Researcher by AvH Foundation.
10. Prof. S. R. Gadre (CHM) received Prof. B. D. Tilak Visiting Fellowship by ICT, Mumbai.
11. Prof. S. N. Singh (EE) became Fellow of the Institution of Engineering and Technology, UK.
12. Dr. Prashant Bagad (HSS) has been awarded the Endeavour Research Fellowship by Australian Government.
13. Prof. P. Chandra (MATH) has been elected as President, 2012, Indian Society of Theoretical and Applied Mechanics.

14. Prof. Kalyanmoy Deb (ME) has been awarded the National J. C. Bose Fellowship by the Department of Science and Technology.
15. Prof. Kalyanmoy Deb (ME) has been elected as an IEEE Fellow.
16. Dr. Binod Sreenivasan (ME) has been awarded the Swarnajayanti Fellowship for the year 2010-11 by the Department of Science and Technology.

Awards and honours

1. Prof. C Venkatesan (AE) became Member of National Board on Micro-Air Vehicle Program, DRDO-DST National Program.
2. Prof. S. Ganesh (BSBE) received Rajib Goyal Award for Young Scientist of Goyal Foundation, Kurukshetra University, Kurukshetra.
3. Prof. S. Ganesh (BSBE) received CDRI Award for Excellence in Drug Research for the year 2012 of Central Drug Research Institute, CSIR, Lucknow.
4. Dr. Priyanka Ghosh (CE) received the IEI Young Engineers Award 2011-2012 of the Institution of Engineers.
5. Dr. Tarun Gupta (CE) received the Indian National Science Academy (INSA) young scientist medal in their Atmospheric Sciences and Earth Sciences Division for the year 2011.

6. Dr. Rajesh Sathiyamoorthy (CE) received IGS-Prof. G.A. Leonards Prize for the Best Doctoral Dissertation in Geotechnical Engineering for 2009-2010 of Indian Geotechnical Society.
7. Dr. Yogesh Joshi (CHE) received a prestigious DAE-SRC Outstanding Investigator Award of Department of Atomic Energy.
8. A special invited session in the Catalysis and Reaction Engineering Division was held in honour of Prof. Santosh K Gupta (CHE) during the Annual Meeting of American Institution of Chemical Engineering held in Minneapolis in Oct 2011. This honour is in recognition of his outstanding work by in the area of Polymer Reaction Engineering.
9. Dr. Jayant K. Singh (CHE) selected for the membership of the National Academy of Sciences India, Allahabad.
10. Prof. Ashutosh Sharma (CHE) elected as INAE Chair Professor of INAE.
11. Prof. Sandeep Verma (CHM) received a prestigious DAE-SRC Outstanding Investigator Award of Department of Atomic Energy.
12. Dr. Pratik Sen (CHM) has been selected for the Indian National Science Academy Young Scientist Medal for the year 2012.
13. Prof. J. K. Bera (CHM) received the Chemical Research Society of India (CRSI) Bronze Medal in recognition of his

- outstanding contributions to Organ Metallic Chemistry of Transition Metals and its application to Catalysis.
14. Prof. D. Goswami (CHM) received Bharat Jyoti Award of India International Friendship Society, New Delhi.
 15. Prof. R. N. Mukherjee (CHM) received Priyadarajan Ray Memorial Award of Indian Chemical Society, Kolkata.
 16. Prof. Manindra Agrawal (CSE) has been awarded the H. K. Firodia award for excellence in Science and Technology.
 17. Dr. Arnab Bhattacharya (CSE) received Yahoo faculty research and engagement award.
 18. Prof. S. C. Srivastava (EE) received Outstanding Engineer Award 2012 of PES/IAS Chapter, UP.
 19. Dr. R. S. Anand, Principal Research Engineer (EE) has been awarded the Indira Gandhi Shiromani Award for Outstanding Individual Achievements & Distinguished services to the Nation.
 20. Dr. Vimal Kumar (HSS) has been selected as one of the winners of the Founders Award honouring Peri Arnold for the Best paper given at the 2010 American Political Science Association [APSA] conference.
 21. Dr. Prashant Bagad (HSS) has been awarded the Erasmus Mundus Academic Scholarship of European Commission.
 22. Dr. P. M. Prasad (HSS) has been awarded the Erasmus Mundus Academic Staff Scholarship of European Commission.

23. Prof. A. K. Sinha (HSS) and Dr. S. K. Ray (MATH) have been awarded the Distinguished Teacher Award-2011.
24. Prof. A. K. Mittal (IME) has been conferred with the M. C. Puri Memorial award for the year 2010 of the Operational Research Society of India.
25. Prof. A. K. Mittal (IME) was honoured by IIT Kanpur as an Institute Fellow.
26. Prof. R. R. K. Sharma (IME) has been selected as AIMS (All India Management Scholars) International Fellow at FLAME (Foundation of Liberal Arts and Management Education), Pune.
27. Prof. Anoop Singh (IME) has been invited to join the Working Group on Power for the 12th Five Year Plan (Subgroup on Legislative and Policy Issues) of the Planning Commission.
28. Prof. P. Chandra (MATH) received Distinguished Service Award of Vijnana Parishad of India, 2012.
29. Dr. Shalabh (MATH) received Prof. C. R. Rao National Award for Young Statisticians, 2011, Ministry of Planning and Programme Implementation, Government of India.
30. Prof. Kalyanmoy Deb (ME) has been selected for the Distinguished Alumnus Award 2011 of IIT Kharagpur.
31. Dr. J. Ramkumar (ME) has been selected for the IEI Young Engineers Award 2011-2012 in Production Engineering discipline.

32. Prof. Kalyanmoy Deb (ME) has been awarded Infosys Prize 2011 in Engineering and Computer Science.
33. Prof. Kalyanmoy Deb (ME) has been awarded the V. Cajastur Mamdani Prize for Soft Computing of the European Centre for Soft Computing, Spain.
34. Prof. S. G. Dhande (CSE & ME) has been awarded the Degree of Doctor of Science (Honoris Causa) in recognition of his contributions in the fields of Technical Education and Engineering Research and Technology.
35. Prof. A. K. Agarwal (ME) received the INAE Silver Jubilee Young Engineer Award of Indian National Academy of Engineers, India.
36. Prof. A. K. Agarwal (ME) received Dr. C. V. Raman Young Teachers Award: 2011 for Excellence in the field of Engineering Education, IES, Bhopal.
37. Prof. Bikramjit Basu (MSE) received the MRSI Medal for 2012 of the Materials Research Society of India.
38. Dr. Kantesh Balani (MSE) has been selected by Elsevier as a recipient of Materials Science and Engineering C: Young Researcher Award for the year 2011.
39. Dr. Kantesh Balani (MSE) received Young Leader Professional Development Award, TMS, USA.
40. Dr. Vivek Verma (MSE) received Shri Ram Arora Award.

41. Dr. Soumik Mukhopadhyay (PHY) has been honoured with the Young Achiever Award in the 56th DAE Solid State Symposium in Dec 2011.
42. Prof. Satyajit Banerjee (PHY) received NASI-Scopus Young Scientist award for Physics, 2012 of National Academy of Sciences, Allahabad.

Editorships

1. Prof. C Venkatesan (AE), Member, Journal of Aerospace Sciences and Technologies published by Aeronautical Society of India.
2. Prof. Balaji Prakash (BSBE), Member, Guha Research Conference (GRC).
3. Prof. S. Ganesh (BSBE), Review Editor, Frontiers in Evolutionary and Population Genetics published by Frontiers Research Foundation, Lausanne, Switzerland.
4. Prof. Mukesh Sharma (CE), Member, Editorial Board, Journal of Human and Ecological Risk Assessment (HERA) published by Taylor and Francis Group.
5. Dr. Tarun Gupta (CE), Member, Editorial Board of Journal of Civil & Environmental Engineering published by OMICS Publishing Group.
6. Prof. Ashu Jain (CE), Member, Editorial Board of ISH Journal of Hydraulic Engineering published by Taylor and Francis.

7. Dr. Debajyoti Paul (CE), Member, Editorial Board of Chemical geology published by Elsevier.
8. Prof. Ashutosh Sharma (CHE), Member, Editorial Board, ASME Journal of Micro- and Nano-Manufacturing published by American Society of Mechanical Engineers.
9. Prof. Ashutosh Sharma (CHE), Member, Editorial Board, Nanomaterials and Energy, published by ICE Publishing, UK.
10. Prof. Ashutosh Sharma (CHE), Member, Editorial Board, Chemical Engineering Science, published by Elsevier.
11. Prof. Sandeep Verma (CHM), Editorial Board of the Journal of Chemical Sciences published by the Indian Academy of Sciences, Bangalore.
12. Prof. R. N. Mukherjee (CHM), Member of the Dalton Transactions Advisory Board published by the Royal Society of Chemistry, Cambridge, England.
13. Dr. Mainak Chaudhury (CSE), Associate Editor (Computer Architecture), ACM Computing Surveys, published by Association for Computing Machinery (ACM).
14. Prof. S. N. Singh (EE), Editorial Advisory Board of the International Journal of Energy Sector Management (IJESM) published by Emerald Publication, UK.
15. Dr. Praveen Kulshreshtha (HSS), Member, Editorial Board, Journal of Microeconomics published by Mind Reader Publications, New Delhi.

16. Prof. M. Gupta (MATH), Member, Editorial Board, of Proceedings of the National academy of Sciences, India, (Section A - Physical Sciences) published by Springer.
17. Prof. P. Chandra (MATH), Member, Editorial Board, of Proc. National Academy of Science, India, Ser-A published by Springer.
18. Prof. P. Chandra (MATH), Member, Editorial Board of Differential Equations and Dynamical Systems published by Springer.
19. Prof. D. Kundu (MATH), Member, Editorial Board of Statistical Theory and Practice published by Taylor and Francis.
20. Prof. V. K. Jain (ME), Member, Editorial Board of Journal of Engineering Manufacture (Proceedings of IMechE - Part B) published by Professional Engineering Publishing Ltd., London (U.K.).
21. Prof. Ghoshdastidar (ME), Associate Editor of Heat Transfer Research published by Begell House, USA.
22. Prof. Avinash Kumar Agarwal (ME), Member, Editorial Board of International Journal of Oil, Gas and Coal Technology, published by Inderscience Publishers, Switzerland.
23. Prof. Bikramjit Basu (MSE), Member, Editorial Board of Materials Technology: Advanced Performance Materials published by the Institute of Materials, UK.

24. Dr. Krishanu Biswas (MSE), Member, Editorial Board of Journal of Materials and Metallurgical Engineering published by STM Journals.
25. Prof. Bikramjit Basu (MSE), Member, Editorial Board of Journal of Biomedical Materials Research: Part B published by Wiley Journal.
26. Prof. Bikramjit Basu (MSE), Associate Editor of Biomaterials and Biodevices published by VBRI Press.
27. Dr. Tapobrata Sarkar (PHY), Editorial board of the ISRN High Energy Physics published by Hindawi.
28. Dr. Dipankar Chakrabarti (PHY), Member, Editorial Board of ISRN High Energy Physics journal.
29. Prof. Satyajit Banerjee (PHY), Member, Editorial Board of Superconducting Science and Technology published by Institute of Physics, UK.

Students' awards

1. Mr. Puneet Singh and G Sriram (AE) won the American Helicopter Society student design competition for best new entry.
2. Mr. Ravi Kant Pandey, Research Scholar (BSBE), received the Best Paper presentation by young scientists (poster session) in the XXXV All India Cell Biology Conference held at NISER Bhubaneswar.

3. Mr. Rajesh Vasita (BSBE) received the Bajpai Saha Award for best oral presentation at the 4th Indo-Australian Conf. on Biomaterials, Tissue Engineering and Regenerative Medicine, Sardar Patel University, Gujarat, Feb. 2011.
4. Mr. Ravi Kumar Verma, Research Scholar, (BSBE) received International Travel Award at the 56th Annual Biophysical Society Meeting held in Feb. 2012 in San Diego, USA.
5. Ms. Ujjwala (CE) received the Best Poster Award in SURGE 2011.
6. Ganti Ravikumar (CE) awarded financial assistance for meritorious students to attend AGU 2011, USA.
7. Mr. Ankur Verma (CHE) received Shah-Schulman Award for the Best Ph.D. thesis in the area of Colloid and Interface Sciences, at CHEMCON 2011.
8. Mr. Ankur Verma (CHE) received Malhotra-Weikfield Foundation Nanoscience Fellowship 2011 at 4th Bangalore Nano 2011.
9. Mr. Chandra Shekhar Sharma (CHE) got Innovative Student Projects Award 2011 – INAE, India.
10. Mr. Shashwat Shivam (CHE) and Mr. Rohit Gupta (EE) emerged as North Zone Winner and National 2nd Runner-Ups at Mahindra AQ Quizzing event.
11. Ms. Amritha Rammohan, Mr. Sumit Barthwal (CHE) received best Poster Award for Cantilever arrays for biochemical sensing at ICONSAT 2010.

12. Ms. Avani Nandini, Ms. Parul Agarwal, Ms. Kritika Singh (CSE) won the 2012 Google India Anita Borg Award. They were amongst the 9 winners from among 377 applicants.
13. Mr. Anurag Awasthi, Ms. Avani Nandini (CSE) won Popular Choice Award for their project and Gold Medal at Intel India Embedded Challenge (IIEC), 2011.
14. Ms. Avani Nandini (CSE) won best student Poster Award for Embedded Eyes for Blind at Grace Hopper Celebration for Women in Computing, 2011.
15. Ms. Avani Nandini (CSE) stood at third place in undergraduate category in ACM student research competition for What if Application Demands Phonetic Similarity, 2011.
16. Ms. Avani Nandini (CSE) won Grace Hopper Scholarship of Facebook, 2011.
17. Mr. Varunesh Mishra (CSE) won Best Poster in IBM Collaborative Academia Research Exchange (I-CARE) on Fourier Domain Scoring based Bug Report Summarization, 2011.
18. Mr. Purushottam Kar (CSE) got honourable mention at Yahoo Key Scientific Challenges Global Competition.
19. Ms. Parul Agarwal's (CSE) paper was accepted for Grace Hopper Celebration for Women in Computing, 2011.
20. Mr. Shubhadip Mitra, Ashish Agrawal, Rohit Gurjar (CSE) were awarded the TCS Research Scholarship.

21. Mr. Ranjith Nair (EE) received 2nd Best Student paper Award in ACDOS 2012 at IISc Bangalore.
22. Mr. Tathagata Bhowmick (EE) has received the best Poster Award at XVI IWPSD 2011 Workshop.
23. Mr. Raghvendra Kumar Chaudhary (EE) has been awarded the Best Paper Award in session at 5th Antenna Test and Measurement Society (ATMS).
24. Mr. T. Bhowmick (EE) got the Best Poster in Optoelectronics in the International Workshop on Physics of Semiconductor Devices held at IIT Kanpur.
25. Mr. Kewal Dharmashi (ME) was declared as one of the three winners of the Inaugural version of ASME ICED Undergraduate Presentation Competition.
26. Mr. Kewal Dharamashi (ME) received the First Prize in ASME's Asia Pacific Competition apart from the Best Technical Paper Award. The award is for his work on laser ignition of natural gas air mixtures carried out in our Engine Research Laboratory.
27. A group of students (ME) won the first prize at the USID Gurukul for designing an educational board game for high school children.
28. Ms. Shail Pandey (PHY) received the Buti Young Scientist Award for her paper titled *Observation of electron plasma waves inside large amplitude electromagnetic pulses in a*

temporally growing plasma in the 26th National Symposium on Plasma Science and Technology.

29. Mr. Samit Paul (PHY) received the PSSI Poster Award for his poster titled *Physics of capillary guiding of focussed ion beams* in the 26th National Symposium on Plasma Science and Technology.
30. Ms. Seema Devi (PHY) received a cash prize and a certificate of excellence in a poster presentation titled *Elastic scattering normalized synchronous fluorescence spectroscopy for multicomponents extraction from human cervical tissues*, in The XXXVI Optical Society of India Symposium on Frontiers in Optics and Photonics.

Major projects sanctioned

- Aero-Elastic Study Of Turbo-Machinery Blades (DRDO-GTRS);
- Musculoskeletal Stem Cells In Tissue Regeneration (DBT);
- Using A Unique Tool Genetic Tool To Study The Role Of Bmp Ligands In Neurogenesis And Gliogenesis In The Developing Cortex (DBT);
- Indo-Max Planck Centre For Computer Science (IMPECS) (DBT);
- Engaging Farmers, Enriching Knowledge: Agropedia Phase II (NAIP);

- Thematic Unit Of Excellence On Soft Nanofabrication With Applications In Energy, Environment And Bioplatfoms (DST);
- Stand-Off Detection Of Explosives Based On Immunochemical Techniques (PSA);
- The Structure And Dynamic Of Groundwater System In Northwestern India Under Past, Present And Future Climates (MOES);
- Hydrometeorological Feedback And Changes In Water Storage And Fluxes In Northern Indian Basins (MOES);
- Cosmic Rays-Cloud-Climate Conundrum: Can Ion-Aerosol Near Cloud Mechanism Explain The Observed Correlations (MOES);
- Top Chemistry Departments In The Country (DST);
- Stability And Performance Of Photovoltaic (STAPP) (DST);
- A 1mw Re-Synchronizable Autonomous Grid: Dc-Ac Inversion & Grid Size Paralleling (DST);
- Miniaturized Polymaric Fluidic Pumps Based On Principle Of Peristalsis (ADA);
- Development Of Non-Contact Ultrasonic NDT Based On LBU And EMAT Technique For Defect Detection In Panels (ARDB);
- Experimental Investigations On Combustion Characteristics And Emission Reductions Of A Laser Fired Hydrogen Engine (MNRE);

- Fuel Spray And Combustion Visualization Using Endoscope In Biodiesel Fuelled Direct Injection Engine For Optimal Fuel Injection Strategy And Emission Reduction (DST);
- Lithographic Approach To Assemble And Manipulate Spindle And Asters: Understanding Cell Division Through Experiment And Modeling (DBT);
- Comprehensive Water Modeling Facility For Steelmaking Process Analysis And Design (MOS);
- First Principle Studies On Ferroic Oxides (DST);
- Research And Development Of Inga₂ZnO₄ (IGZO) Large Area Electronics And Its Applications To Active Matrix Flat Panel Displays (DST).