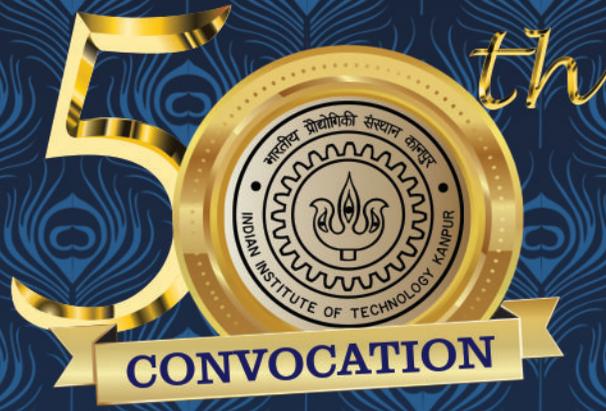


SESSION - 1
DIRECTOR'S REPORT

सत्र - १
निदेशक प्रतिवेदन



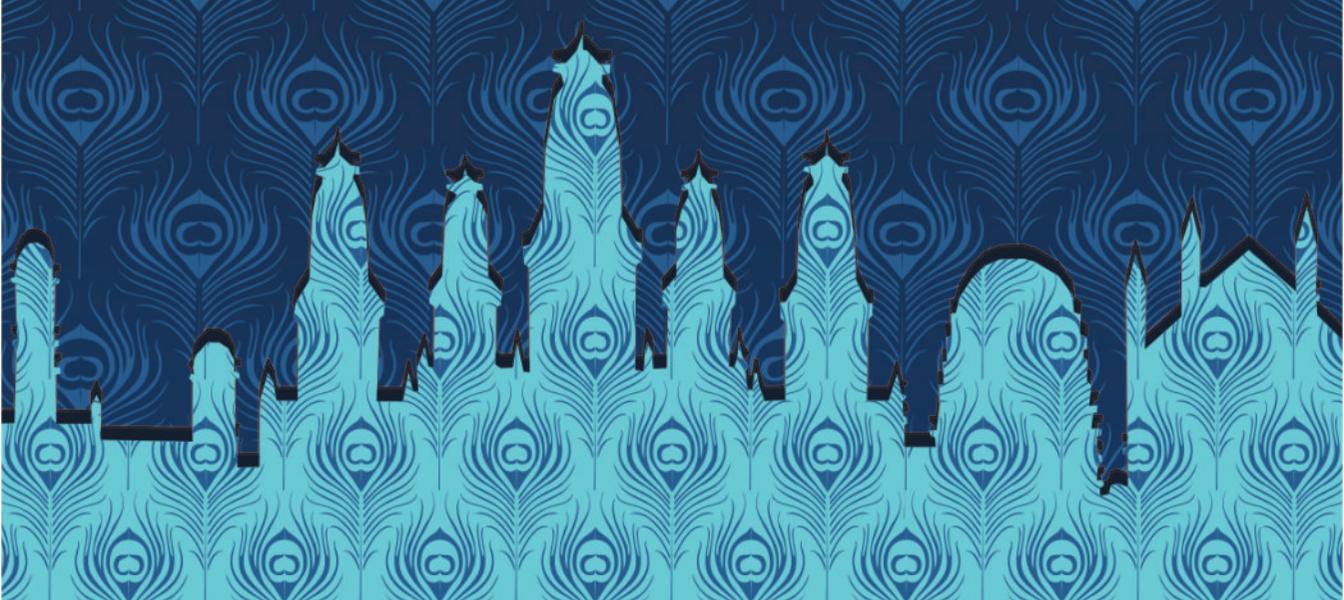
५०^{वाँ} दीक्षान्त समारोह

15th JUNE, 2017

१५ जून, २०१७

Indian Institute of Technology, Kanpur

भारतीय प्रौद्योगिकी संस्थान, कानपुर



Key Statistics

Faculty Members	398 Regular; 15 Visiting	
Currents Students	PG: 2445; UG: 3899	
Research Staff	434	
Ongoing R&D Projects	563	
2016-2017	Research Papers	1941
	Books and Book Chapters	40
	New Reaserch & Consultancy Projects	290
	Grant Sanctioned (Sponsored Research & Consultancy Projects)	269 Crores
	Patents Filed	52
	Patents Granted	10
	MoUs Signed	169
	Companies Incubated	27
	Companies Graduated	46
	MOOC Courses Offered	109
Courses offered under GIAN	17	

Director's Report

Honorable Chief Guest Shri Natarajan Chandrasekaran, Chairman, Tata Sons, Prof. P. Balaram, Honourable Chairman and member Board of Governors of Indian Institute of Technology Kanpur, other members of the Board of Governors, Members of the Academic Senate, all graduating students and their family members, members of faculty, alumni, staff and student community, invited dignitaries, guests, and members of the media: I heartily welcome you all to the fiftieth convocation of the Indian Institute of Technology, Kanpur.

Established in 1959, IIT Kanpur is the fourth oldest among the IITs which were created to set a benchmark in modern engineering education in the country. Since inception, IIT Kanpur distinguished itself as the pioneer of science-based engineering education in India, aided by a decade-long fruitful collaboration with a consortium of US Universities under the Kanpur Indo-American Program (KIAP). In the last 57 years, IIT Kanpur has developed the 'gold standard' of education and research in engineering and technology. Heralding Computer Science and Materials Science as new disciplines of interdisciplinary education as early as the 1970s, IIT Kanpur envisaged making pioneering contributions to engineering education in India. Happily for us, the tradition continues. Only recently, a new Department of Economic Sciences has been created at IIT, Kanpur, which will be the first of its kind in the entire IIT system, offering BS and MS degrees to the students entering through the JEE, in addition to the Ph.D programme in Economics. I am also happy to announce that the Academic Senate has also approved a new and unique Inter-Disciplinary Program (IDP) in Cognitive Science.

Academic Activities

The academic session ending in May 2017 has been both productive and eventful. Thus, it is my privilege to review our activities pertaining to this period. I am delighted to let you know that the total number of Ph.D degrees approved by the Senate for this convocation is 160, which thus far remains an all time high record in the history of the Institute. In addition, 785 other PG degrees (339 M.Tech; 33 MBA; 24 M.DES; 40 VLFM; 127 M.Sc. (2 Year); 2 M.Sc. (Integrated); 142 B.Tech-M.Tech (dual degree), 62 BS-MS (dual degree), 5 BT-MS (dual degree), 1 BS-MBA (dual degree) and 10 MS-PD (M.Sc. part of dual degree)) and 599 UG degrees (515 B.Tech, 72 Bachelor of Science (4 Year) and 12 Double Major) will be awarded in this convocation. It may be worth mentioning here that, out of the total of 809 graduating UG and dual degree students, 174 students have received distinction (CPI of 8.5 or more), i.e. about 12.5% of UG and dual degree students are graduating with distinction. To keep pace with the evolving knowledge in science and technology domain, 06 new Undergraduate and 59 new Postgraduate courses have been approved by the Academic Senate during 2016-17.

Academic Initiatives

The Senate has approved formation of its new standing committee "Curriculum Monitoring and Development Committee (CDMC)" to review, monitor and evaluate teaching and learning methods adopted and practised so that pedagogy at IITK maintains pace with changing times and incorporates the state of the art methodology in its courses. CDMC will guide the evolution and formulation of new structure and directions, as and when required.

The Institute has initiated steps to join the National Academic Depository designed to maintain a repository of all degrees awarded by IIT Kanpur in a digital format accessible 24x7 to the students and employers from anywhere in the world.

With increased student strength in class rooms it had become very difficult for the instructors to monitor attendance of students on a regular basis. We have recently implemented a biometric based attendance system for large classes where the lecture halls complex staff helps the instructor and circulates biometric devices to enable attendance monitoring.

The undergraduate and dual degree programmes offered at IIT Kanpur are one of the most flexible in the country. Flexibility of our academic program has led to a large number of students graduating with minors (some with multiple minors) as highlighted below:

No. of students completing one Minor: 152

No. of students completing two Minors: 17

No. of students completing three Minors: 1.

In addition, by spending one year extra, 12 UG students are graduating with a second major and 211 UG students are graduating with a master's degree along with a bachelor's degree.

National Programme on Technology Enhanced Learning (NPTEL)

IIT Kanpur is one of the major partners in the NPTEL initiative that offers online courses in various topics and awards certification to lakhs of students across the country. As part of the NPTEL Phase IV program, IITK offers massive open online courses (MOOCs) in the disciplines of Engineering, Sciences, Management, and Humanities and Social Sciences.

Since 2014, IIT Kanpur has offered over 100 MOOCs. As part of the Phase IV initiative, we have developed close to 700 local chapters with identified expert faculty members from these institutions serving as local mentors for the students enrolled in NPTEL courses. IIT Kanpur team has conducted workshops for the local chapters in Uttar Pradesh, Uttaranchal, Assam, Manipur, Tripura,

Meghalaya and Arunachal Pradesh. These workshops aim at generating awareness about the NPTEL platforms, explaining difficult concepts from the course content by the subject experts and inviting more and more institutions with a dearth of good teaching staff to become local chapters for meaningfully utilizing this platform initiated jointly by the IITs and supported by the MHRD.

Along with these Online Certification Courses, MHRD along with IITs and several other educational institutions ventured into a concept of taking education Directly to Home (DTH) through its Swayam Prabha initiative. Out of 32 Swayam Prabha DTH channels (launched early this year), 8 channels are being managed by the NPTEL Core Team. The two channels (16 & 17) are currently being managed by IIT Kanpur. These channels broadcast the NPTEL course content in Mechanical Engineering, Humanities and Social Sciences, Management and Core Sciences.

Besides NPTEL Phase IV and Swayam Prabha DTH project, we have been creating content for school education (Class XI and XII) in Physics and Biosciences to be aired through DTH PAL channel which runs courses in Physics, Chemistry, Biology for the higher secondary level.

The experiment on Flipping Classes was continued and seven courses were offered in the flipped mode- that is the lecture videos were released before hand and the face-to-face meetings were used for discussions and problem solving. The major observation from the students was that this format allows them to review the lectures multiple times at their own pace and convenience, greatly helping all sections of students. Our experience shows that many students have difficulty in following the lectures in English, especially in the first year. To help such students, for all topics covered in the course, we recorded the lectures in Hindi and made them available on an online platform. We observed that about fifty students (out of a registered four hundred) watched these Hindi lectures

regularly. These are now available on our outreach portal for access from outside IIT, Kanpur as well.

Dr. H.C. Verma conducted a MOOC on "Learning Physics through Simple Experiments". Fifty-three thousand (53,000+) students registered for the course. On an average, there were more than a hundred questions asked and answered every day in the Forums.

A set of three online courses on agriculture were conducted using the mooKIT platform in collaboration with Commonwealth of Learning, Vancouver, bringing the total courses under AgMOOCs to eight so far. The AgMOOC platform is probably the only place which has multiple MOOCs in agriculture.

Research & Development

The Institute has registered steady growth in its Research and Development activities this year. The number of externally funded ongoing projects has reached 563 with a total sanctioned amount of Rs. 645 crore. During 2016 - 2017, the Institute received sanctions for 159 sponsored projects worth Rs. 223 crore and 131 consultancy projects of value Rs. 46 crore. Some of the major grants sanctioned by various agencies during the year include Ministry of Human Resource and Development (MHRD, Rs. 110 crore), Science and Engineering Research Board (SERB, Rs. 26 crore), Department of Science and Technology (DST, Rs. 20 crore), DFID Executor Vilgro Innovation Foundation (DFIDE, Rs. 12 crore), Ministry Of Water Resources, River Development & Ganga Rejuvenation (MOWRG, Rs. 10 crore), and Ministry of Environment Forest and Climate Change (MOEFCC, Rs. 9 crore). Some of the major industries who have funded projects to IITK this year include National Thermal Power Corporation, Aeronautical Development Establishment, Aeron Systems Pvt. Ltd, Vikram Sarabhai Space Centre, Oil and Natural Gas Corporation Ltd., Unilever Industries Pvt. Ltd., Sterlite Technologies Ltd., Tata Consultancy Services Ltd., Tata Steel

Ltd., Bharat Heavy Electricals Ltd, UP State Industrial Dev. Corporation, and Mitsubishi Heavy Industries Ltd.

A list of major projects granted this year is appended at the end of the report.

IMPRINT India Initiative

In conceptualizing, launching, and implementing the unique national initiative called IMPacting Research, INnovation and Technology (IMPRINT), IIT Kanpur has played a key role as the National Coordinating Institute. IMPRINT is unique because it covers the entire engineering domain in harnessing the combined strength of all CFTIs including IITs, NITs, IISERs, IISc and also seeks to focus on translation and not just creation of knowledge into technology products and processes. IMPRINT was launched by the highest political leadership of the country from the Rashtrapati Bhawan. MHRD has released the grant for 91 projects for the financial year 2016-17 with total funding of Rs. 49.3 crore. As of now, a total of 259 projects have been sanctioned in the IMPRINT scheme, with a total funding of Rs. 595.88 crore from MHRD and partnering ministry in a 50-50 sharing mode. IIT Kanpur is implementing 27 of these projects totalling Rs.67.78 crore. Ministry of Steel, Power, Urban Development, SERB, Department of Scientific and Industrial Research, Heavy Industries, ISRO and ICMR have participated in this scheme.

Major projects sanctioned

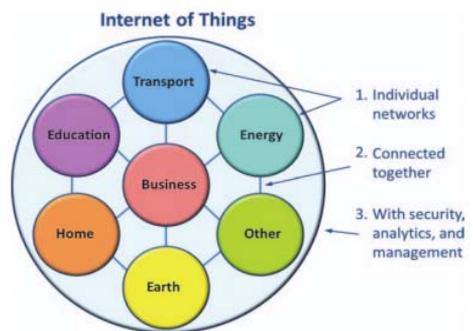
Some of the major projects sanctioned in 2016-17 are briefly described below:

Department of Atomic Energy has sanctioned a project titled *Bi-functional Approach to Small Molecule Activation: Towards Sustainable Processes and Products*. The central objective of this project is to design and develop a catalytic system for the conversion of cheap and earth-abundant molecules to value-added compounds. The concept of metal-ligand cooperativity would be exploited

magnitude and uncertainty of carbonaceous aerosols and co-emitted species from major vehicular tail pipes. In addition, an inverse modelling method will be employed with the aid of molecular markers and isotope finger printing for deducing regional atmospheric abundance of carbonaceous aerosols, measured over a two-year long period, from two North-East Himalayan sites.

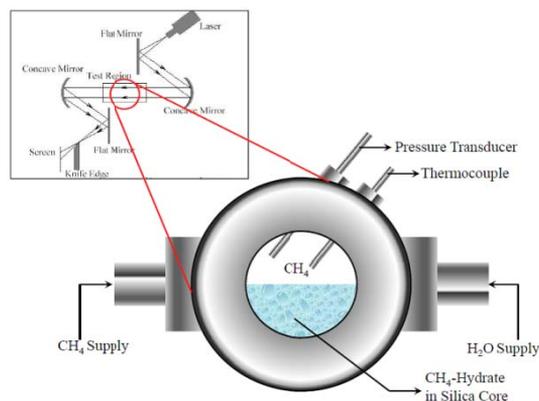
The Wellcome Trust funded the project titled *Coding of Innate Olfactory Preferences in the Mosquito Brain*. Mosquitoes detect humans using a variety of cues, including the exhaled carbon dioxide and skin odors. Presently, the understanding about how the information relayed by the sensory neurons is processed in the mosquito brain and how it results in specific behavioral preferences is lacking. In this project, an electrophysiology lab will be established and technique of in-vivo intracellular recordings for mosquitoes will be optimized. By measuring the responses of projection neurons to attractive, repulsive and neutral odorants and examining their morphologies, it will be tested whether different attractive and repulsive odors are encoded by dedicated neural pathways.

MHRD has set up a *Teaching Learning Centre for Internet-of-Things* at IIT Patna under Pandit Madan Mohan Malviya National Mission on Teachers and Teaching (PMMMNTT). IIT, Kanpur, IIT Kharagpur and IIT Indore are other partners. Smart Grid, Smart City, Smart home and assisted living, Smart Cars, Autonomous vehicles, networked systems of robots, UAVs, and unmanned cars are some of the examples of Cyber Physical Systems (CPS) that will be covered under this scheme.

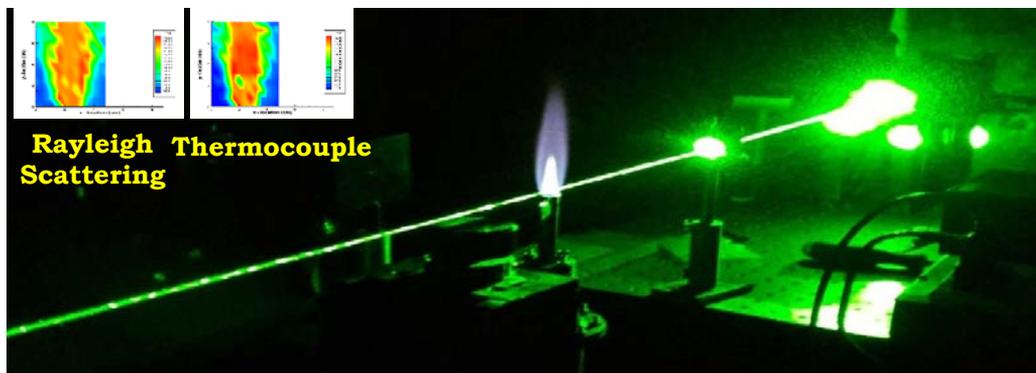


The Department of Science and Technology funded the project titled *Agarose Based Wound Dressing*. India is a developing nation where the quality of life of people is also improving. This necessitates the improvement in healthcare products. Indian wound care market is expected to reach US\$ 5.5 billion by 2020. However, the wound care market is still ruled by multinational players raising cost of the final product. In the current project, it is proposed to fabricate cost-effective agarose based materials that can be used for wound dressing as well as drug delivery patches. Different cross-linkers, reinforcements and functionalization strategies would be employed to manipulate the strength of the material, swelling percentage, water vapor transmission rate and gas permeability to suit various wound types.

A project titled *Optical Diagnostics of Transport Phenomena during Gas Hydrate Formation and Dissociation* funded by the Oil and Natural Gas Corporation proposes to deal with the laboratory-scale experiments of CH₄ extraction from the marine hydrate sediments. The idea is to visualize the physical phenomena as well as to measure the methane fluxes during formation and dissociation of CH₄ -hydrate. The proposed experimental techniques focus on concentration-field reconstruction of laser schlieren imaging and X-ray tomography. The primary objectives of the proposed research include: Laboratory-scale evaluation of Methane recovery strategies; Providing a test-bed for new technologies; Supplying benchmark results for the (computational) reservoir simulators.



The project titled *Studies of Fire Propagation, Suppression and Scavenging with Associated Thermal Hydraulic Aspects in Multiple Compartments* funded by BARC is in its second phase. In this phase, detailed studies of fire dynamics in multiple compartments is to be conducted along with the development of technologies for fire suppression and contentment. Apart from these, technologies are being developed for scavenging the compartments after a fire incidence. Furthermore, a new technology named Rayleigh Scattering based Thermal PIV (RSTPIV) is being developed for non-intrusive measurement of velocity field in and around a fire.



The project titled *Integration And Enablement Of 0.18 Micron RF-SOI Technology for Analog Mixed-Signal Applications* funded by the Department of Science and Technology envisages “Make in India” for an RF-SOI technology that will enable manufacturing of superior integrated circuits (IC) in India, especially for analog & mixed signal RF applications such as cell-phones, radars, and set-top boxes. Split lot experiments, test structure characterization, process/device simulations, and compact modeling will be carried out to achieve project objectives. It will create production level RF-SOI Analog Mixed Signal (AMS) technology for the first time in the country through collaboration between academic institute (IIT Delhi) and Govt. laboratory (SCL) and will create PDK and offer country’s first multi-project wafer (MPW) service.

An Indo-Israel joint project titled *Deciphering the Structural Role of Glycogen in Neuronal Autophagy, and Neurodegeneration* is being funded by the UGC to understand the roles of glycogen in neuronal survival. Neurons do not store glycogen, although they do have the mechanism to synthesize it. Since glycogen inclusions are seen in the degenerating neurons in the diseased condition, this project looks at the role of glycogen in proteolytic processes and their impact on neuronal survival.



The Project titled *National Interdisciplinary Center For Cyber Security And Cyber Defense Of Critical Infrastructures* has been sanctioned by the Science and Engineering Research Board. Cyber Security is one of the greatest challenges we face today as we are increasingly dependent on computing, networking, and data driven decision and control. Our critical infrastructures such as power grid, water and sewage system, railway signaling and transportation, manufacturing and process control etc are increasingly vulnerable to cyber attacks. In the recent years, cyber attack induced power grid failure in Ukraine and Israel and halted the banking system in Turkey. The DNS poisoning based attack on the domain name system in India caused loss of 3.2 million debit card data through ATM malware. Attacks on German steel plants, the New York dam and many other cases point to the possibility that wars in the future will be fought in the cyber space. The interdisciplinary center for cyber security and cyber defense of critical infrastructure at IIT Kanpur received a funding of 14.43 crore from SERB/DST recently to build India's first industry scale cyber security test bed for cyber physical infrastructure, and to carry out research on protection, detection, and cyber attack resilient design of critical infrastructures.

The project sanctioned by the Department of Science and Technology titled *Commissioning of a Pilot Plant of 10 KLD Capacity Comprising ZnO based Sensitive Photo Catalytic Filters for Visible Light Catalysis and Carbon Nano-Mat Fiber Filter based Treatment of the Effluent of CETP, Jodhpur* is about providing a solution for industrial effluents consisting of organic dyes which are harmful to environment and are not dischargeable. The solution is provided by using the soil mediated photocatalytic remediation of industrial dye present in the effluents by using ZnO nanostructures in presence of sunlight. The collaborator for this activity is CETP Jodhpur and the goal is to establish a plant of 10 KLD capacity which would be based on solar energy.

Research Infrastructure

Department of Mechanical Engineering received a FIST grant of DST to augment the post-graduate teaching and research facilities amounting to Rs 3.8 crore for establishing the following two major facilities.

Metal Additive Manufacturing Facility:

The facility based on selective Laser melting of a powder bed will be capable of creating metal parts of both reactive and non-reactive materials. The facility will be used to address thermal-material interactions in metal additive manufacturing in detail with an aim to obtain scientific understanding of the physical mechanisms involved. The facility at large can help in indigenous product and technology development and will also provide a boost to the newly evolving area of metal additive manufacturing in India.

3D Tomographic PIV Facility:

This whole-flow-field technique, based on recent developments in camera and laser technology, can provide instantaneous velocity vector measurements in the entire flow thus enabling simultaneous observation of spatial and temporal

variation of the flow. The instrument will be used in understanding locomotion of underwater creatures, flow control, bio-medical fluid mechanics etc.

The Department of Science & Technology and the Ministry of Electronics and Information Technology are jointly coordinating the National Super Computing Mission. As part of this initiative, the DST has approved the installation of 1 Petaflop supercomputing system with appropriate data centres and storage facilities for high-end computing at IIT Kanpur.

National Centre for Flexible Electronics (NCFlexE)

The National Centre for Flexible Electronics (NCFlexE) was established with the objective of carrying out application oriented research that leads to development of domestic industry in the emerging field of Flexible Electronics. A sustained effort was made in the past year to sensitize private enterprises of the opportunities offered by flexible electronics. This included round tables, workshops and short courses that were conducted with a sector-wise focus including health, packaging and anti-counterfeiting. This outreach resulted in several companies entering in a partnership with NCFlexE to jointly develop prototypes.

To move towards the vision of the centre and harness the opportunities in several application sectors, it was essential for the centre to establish a strong interdisciplinary team so that different important aspects of flexible electronics technology could be addressed in a comprehensive manner. As a result of concerted efforts, 20 engineers and scientists with relevant expertise and experience were hired in the last year, taking up the strength of the NCFlexE team to 55.

The centre is engaged in development of several prototypes and products. A team working on Organic Light Emitting Diode (OLED) lighting has demonstrated

white light panels of size 80mm x 80 mm and efficiency of 30 lm/W at brightness of 1000 cd/m². Low cost printed 7-segmented OLED displays are being developed for another company. Thin film transistors (TFTs), a key element of many array based systems including active matrix displays, imagers and artificial skin, have been built with Indium Gallium Zinc Oxide (IGZO). These TFT demonstrated on glass and flexible polyimide substrates had excellent mobility and on-off current ratio. These were supplied to Defence Research and Development Organisation (DRDO) for further characterization and system integration. Various contact based brand protection labels were developed using screen printing. One of them is being transferred to a company for potential use in products. In addition, a novel, printed low cost, Physically Unclonable Feature (PUF) and App based anti-counterfeiting technology has been developed and is ready for incubation. Sensor array based on conducting-polymer based temperature sensing element is being developed for wearable medical devices. Gas-sensing elements are also being developed in collaboration with an industry partner for food-packaging applications. Conductive inks for ink-jet and screen printing processes have been developed at the centre and a spin-off from this technological development is underway. Other functional inks are also being developed at the centre.

A list of some of the other sophisticated facilities established in the Institute during this year is listed at the end of this report.

Industrial Collaboration

IIT Kanpur is a premier technological institute in the country which engages in the state-of-the-art research in almost all fields of engineering and sciences. The focus is to generate new ideas, to create innovative solutions, and to reveal basic principles of matter with an emphasis on using this knowledge in developing practical engineering and technological applications. In this process, the Institute works closely with industry partners with the objective of adding value to their

products and services; the larger goal being to bring in novel solutions to the society at large.

Projects under UAY

IIT Kanpur has obtained approval of 4 major projects under the new scheme of Uchchar Avishkar Yojana (UAY), Ministry of Human Resource and Development. Under this scheme, 50% of the total project cost will be supported by MHRD and the rest 50% will be shared equally by the partner Industry and the ministry concerned.

S. No.	Title of the Project	Name of the Company	Summary of objective
1.	Engineering of security hardened cryptographic protocols for critical national infrastructure	Nivetti Systems	To enhance capability in the area of cyber security
2	Develop a Novel Synthesis route for a key intermediate – Noroxymorphone	Navin Saxena Research & Technology Pvt. Ltd. (NSRT)	To develop a method for producing a key intermediate in synthesis of active pharmaceutical ingredients
3	Design and Development of Adaptive Intelligent Pipe Health Monitoring Robots for Fuel Transportation Systems	Gas Authority of India Limited (GAIL, India)	To develop sophisticated structural health monitoring mechanism of network of pipelines
4	Development and Scale-up of Ultrasmall Nanocatalysts for Hydrodesulfurization	Hindustan Petroleum Corporation Ltd	To develop novel hydrodesulfurization catalyst using nano-technology

ICME National Hub at IIT Kanpur – A joint IITK-TCS initiative

The focus of Integrated Computational Materials Engineering (ICME) is an emerging and transformative discipline with large potential. The focus is on Integration of models of various processes at different length scales, design and manufacturing processes, models with experiments, software tools addressing multi-physics problems with the end objective of raising ICME to industrial scale. The vision of this joint initiative is to create a World Class Multidisciplinary Educational and Research Ecosystem for ICME at IIT, Kanpur.

IEX-IITK Energy Analytics Lab (EAL), a CSR initiative by Indian Energy Exchange Ltd, was inaugurated on the 26 April 2017. This is an industry-supported academic initiative, primarily to build a power market database and for developing learning and



visualizing tools for it. The expected outcome of the initiative is to help decision making for sale/procurement of power, optimal utilization of existing/proposed power generation assets, the design of new products for power markets and issuing renewable energy certificates.

Several projects have been initiated with UPCST in a variety of domains, e.g., education, water treatment, surveying of forest area and so on.

Rural Technology Action Group (RuTAG) at IIT, Kanpur developed several technologies and transferred them to end users. Among them, the most prominent ones are Amla pricking machine and long-lasting horse shoes.

Several faculty members and students from IIT, Kanpur actively participated in the third Festival of Innovation organized at Rastrapati Bhavan in various capacities.

Emerson Network Power India Ltd. and the Institute entered into an MoU at Rashtrapati Bhawan with the broad objective of designing, developing products in the field of AC and DC Power and Precision Cooling solutions for Network Power India requirements.

L&T Technology Services Ltd. and the Institute have entered into an MoU to collaborate on promotion of education, research and innovation in areas such as Granular Flow Analysis; Multibody dynamics; Smart grid system; Vibration and noise control and flexible electronics. In the first phase of the engagement, a joint project has been finalized towards indigenous UAY development.

Several collaborative projects were initiated between NTPC Energy Technology Research Alliance (NETRA) and our Electrical and Aerospace Engineering departments in the areas of efficient power distribution and grid integration.

Foundation Day 2016

The 57th Institute's Foundation Day was celebrated on 2nd November 2016. Mr. Vinay Sheel Oberoi, Secretary, DHE, MHRD was the Chief Guest and Dr. Ajit Prasad, Director, IIM Lucknow was the Guest of Honour for the function. On this occasion, Mr. Arvind Pradhan



(1974 batch), Mr. Sanjiva K Lele (1980 batch), Mr. Prabhat Singh (1980 batch), Dr. Anurag Kumar (1977 batch), Mr. Vishnu Agarwal (1966 batch), Mr. Ram S Sharma (1977 batch), Dr. Uday B Desai (1974 batch) were conferred the

Distinguished Alumnus Award. Dr. Dorairajan Balasubramanian, Dr. Ranendra Narayan Biswas, Dr. Asok Kumar Mallik were conferred with the award of Institute Fellow for the year 2015 in recognition of their contributions to the growth of IIT, Kanpur. Mr. K.M. Abraham, an alumnus of the Institute, was conferred the prestigious Satyendra K Dubey Memorial Award.

Science Day 2017

National Science Day is celebrated in India every year to mark the discovery of the Raman Effect by the Indian physicist Sir C. V. Raman. As part of the National Science Day celebration, the Institute organised a thematic workshop on *Nanoscience and Nanotechnology* on March 1. The workshop was followed by an Invited Lecture on *Next Generation Nanotechnology: Balance and Sustainability* delivered by Dr. Sharmila Mukhopadhyay, Professor of Materials Science and Engineering and Director of Center for Nanoscale Multifunctional Materials at Wright State University, USA.

Technology Day 2017

National Technology Day is celebrated every year on May 11 to commemorate the history of India's technological innovations and excellence. As part of this activity, the institute organized an event on May 11, 2017 and the theme of this event was "From Tinkering to



Technology." Dr. Shailesh Nayak Distinguished Scientist from the Earth System Science Organization, Ministry of Earth Sciences, was the chief guest. The event included talks on technology and its application, talks by young entrepreneurs on their journey, and display/demonstration of technologies developed at IIT, Kanpur. Besides the institute community, the event was attended by a large number of school children.

Research Park

IIT Kanpur has received a major grant of Rs. 70 crores for setting up the Science and Technology Research Park. The Research Park seeks to enhance the Industrial and Transitional research eco-system of the Institute, in partnership with the industry and start up entrepreneurs. The aim of the initiative is to provide necessary environment, infrastructure and policy framework for collaborative research between Academia and Industry, create mechanisms for co-sharing technology and business skills of academia and industry partners, enhance industry sponsored projects to give the IITK students more opportunity to work directly on real-time problems and to create a self-sustained revenue generation model with transitional/industrial research.

The park will have an energy-efficient and environment friendly state of the art multi-storied building complex with a total constructed area of approximately 40000 m². Once fully operational, the entire eco-system will be equipped to host about 50 industrial research units/companies and 100 incubates and Research Park startups. A formal announcement on launching of the Research Park was made during the Foundation Day programme.

Innovation

During the year, 52 Indian patents including 10 design patents, 3 international patents were filed and 10 earlier filed patents were granted.

Till date, 392 Patents have been filed, out of which 58 patents have been granted so far. Altogether 56 technologies have been licensed for commercialization to date.

Incubation

A total of 27 companies are currently incubated at SIDBI Innovation and Incubation Centre (SIIC), IIT Kanpur and 46 have graduated till date.

NIDHI-EIR (Entrepreneur in Residence) Program

SIIC, IIT Kanpur was sanctioned NIDHI EIR (Entrepreneur-in-residence) in the first round of selection. SIIC, IIT Kanpur is one of the 10 incubators selected as Program Execution Partner. NIDHI EIR is a subsistence grant for potential entrepreneurs for a period of 12 months restricted to a maximum of Rs. 30000 per month. The funding agency is NSTEDB. Venture Centre, Pune is the Program Implementation Partner. The objective of EIR program under NIDHI is to encourage graduating students to take up entrepreneurship as a career option by providing fellowship support. Thus it will help to create, nurture and strengthen a pipeline of entrepreneurs for incubation. The evaluation of applications for funding is in process.

NIDHI-Prayas Program

SIIC, IIT Kanpur was sanctioned NIDHI PRomoting and Accelerating Young and ASpiring technology entrepreneurs (PRAYAS) funding from NSTEDB for setting up a PRAYAS Centre in the first round of selection. SIIC, IIT Kanpur is one of the 10 incubators selected as a Program Execution Partner. The funding has been provided for supporting potential entrepreneurs and for setting up fab lab for providing prototyping facilities to such entrepreneurs. SINE, IIT Mumbai is the Program Implementation partner. It is specifically created to support young innovators to turn their ideas into proof-of-concepts. The support will allow the innovators to translate their innovative idea into a prototype and to reach a stage where they have a ready product and are willing to approach incubators for commercialization. SIIC, IIT Kanpur will facilitate prototype funding to an innovator for a maximum amount of Rs. 10 lakh with a cap of supporting 10 such

innovators per year and will provide a dedicated fabrication lab facility on campus. The evaluation of applications for funding is in process.

NIDHI-SSS (Seed Support System) programme

SIIC, IIT Kanpur has been sanctioned Rs. 10.00 crore as seed support and management fee @ 5%. The funds for Seed support is for support of the eligible Incubate Companies to meet their seed funding needs. The funding has been sanctioned by NSTEDB under their NIDHI Seed support program. SIIC is among the four top incubators in the country, which has been chosen for a grant.

With the above grants, SIIC is set to create the S&T Research Park Eco-System so as to bring in corporate R&D bodies too into our midst.

UPL has signed an agreement with Weather Risk Management Services Pvt Ltd (WRMS), a company recently graduated from SIIC of IIT Kanpur. UPL will subscribe to 37,681 equity shares of all Rs. 10 crore to WRMS and INGEN Technologies (subsidiary of WRMS). WRMS turnover is also expected to touch Rs 15-17.5 crore this fiscal year as compared to Rs 10 crore last year.

Prosoc Innovator Pvt Ltd has been recognized as one of the top 25 emerging social enterprises in India. It participated in the Science and Technology based Social Entrepreneurship Capacity building workshop conducted by Harvard South Asia Institute, IIT Delhi and Tata Trusts.

E-Spin Nanotech Pvt. Ltd. has also been selected as the top Nanotechnology company in India by Silicon India.

IIT Kanpur has sanctioned a funding of Rs 50 lakh for Decentrik Technologies, a startup working on mobile units called Waah which dispenses clean drinking water. These units will also help in reducing plastic waste as the glasses they dispense are made from recycled food-grade paper. Waah has so far been set up in Lucknow and Varanasi.

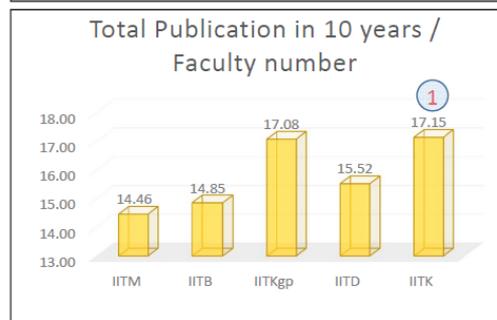
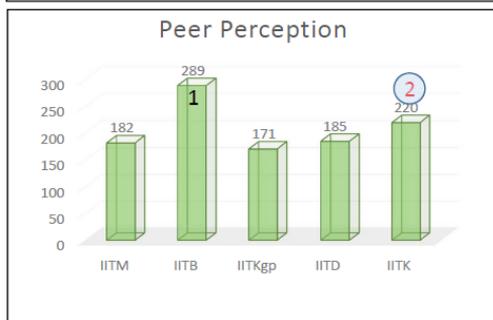
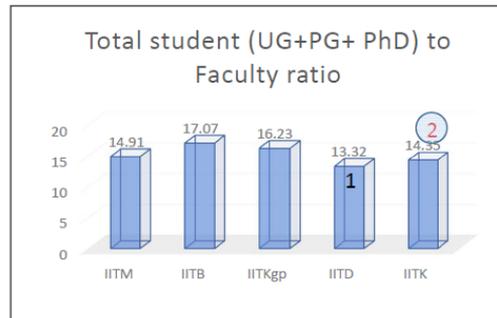
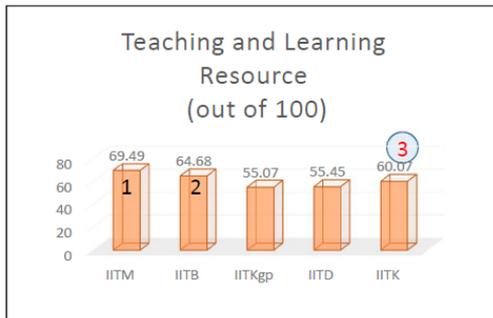


Apcegen Technologies Private Limited, an Incubate Company has been awarded the ISBA award for this year under the category of Life Sciences/Pharma/Biotechnology/Healthcare and conferred the Rising Star of the Year Award.

Rankings

Although IIT Kanpur was ranked fifth in the NIRF ranking released this year, it appears that the outcome does not reflect our much better performance on some fundamental parameters in teaching and research. IIT Kanpur is the smallest institute among the older IITs. Most NIRF ranking parameters are on an absolute rather than a relative scale, and thus IITK's relative standing gets affected when absolute values are considered for ranking. Some of the core parameters in which we have fared well include : (i) Our third ranking in teaching, learning and resource (TLR) parameter. The value in this TLR parameter suggests IIT Kanpur is doing well in its efforts at imparting quality education and nurturing young minds and talents. What however brings us down in this TLR parameter is the '*total*' number of students, '*total*' faculty strength and '*total*' number of women student and faculty and a few other socially relevant parameters. (ii) On the Peer perception score, we are ranked second. This parameters indicates our academic Peers rate us well. Despite our overall small size, our research and teaching makes an impact both nationally and internationally as compared with other overall higher ranked Institutions. (iii) Our institution also has the second lowest

total student to faculty ratio, compared with other IITs. This parameter indicates, our continued emphasis on individual student - faculty interaction. (iv) Finally, the ratio of the total number of publications from IITK over a 10 year interval (2006 – 2015) to the total number of faculty, turns out to be the highest among the older IITs. This indicates strong importance laid by our faculty on research and innovation. The same is also true for the citation per faculty which is also high for IIT Kanpur. While some of these parameters do not get significant weightage in determining the overall NIRF ranking score, our performance on some of the above fundamental parameters indicates our continued commitment towards excellence in teaching and research.



Vishwajeet

For the Viswajeet initiative, the Institute has submitted a proposal for funding drafted by stakeholders at the Institute with a commitment to finding a place in the top 100 ranked institutes in the world within the next five years. The themes identified for promoting research are Advances Materials Design and Manufacturing, Energy, Therapeutic and Translational Research, Autonomous and Intelligent Systems, Digital Governance, Sustainable Habitat and Unconventional Ideas. In order to strengthen research, systematic steps will be taken to increase faculty and graduate student strength; to boost infrastructure to cater to its researchers; to raise funds from donors, to arrange funding for research grants to high performing faculty; travel support to faculty and students; to create right ambience to attract international faculty and students; to strengthen and equip dissemination system; to organise international conferences and workshops. MHRD has approved the funding for the first year, and the institute has initiated the process to set up the virtual thematic research centres.

International Academic Collaborations

Recognizing the value of international cooperation, the Institute has signed MoUs with many foreign Institutions for collaboration in academic and research activities. The list includes the Curtin University, Australia; University of Cyprus, Republic of Cyprus; Technische Universität München, Germany; University of Applied Science, Darmstadt, Germany; University of Luxembourg, Luxembourg; École Polytechnique Fédérale de Lausanne, Switzerland; Ohio State University, USA. A memorandum for academic cooperation and exchange between Indian Institute of Technology, Kanpur (IITK) and Kyoto University was concluded on October 28, 2016.



Financial Resource Mobilization

(₹ In Lakhs)

S.No	Comparative Heads	Comparative Statement of Donations	
		01 April 15 to 31 March 16	01 April 16 to 31 March 17
A	Donations	412.70	762.51
	On the Basis of Origin		
1	Domestic	161.31	249.39
2	Foreign	251.39	513.12
	No. of Donors		
1	Domestic	461	266
2	Foreign	181	185
	No. of Donations	750	547
	Notable Contributions under different initiatives		
1	Infrastructure and Social Initiatives	126.32	439.12
2	Academic and Student Initiatives	191.96	89.45
3	Batch Contributions	62.19	88.45
B	Corporate Social Responsibility		
1	MoU Signed with No. of Companies	N.A.	7
2	Total Value of MoU Signed	N.A.	985.00
3	Funds Received during the year	Nil	145.65

SURGE is an outreach program for students from other institutions across India supported by alumni contributions. The selection of student participants is keenly competitive as thousands of applications from various institutions across India are received, which clearly attests to its increasing popularity.

#	Particulars	Surge 2015	Surge 2016
01.	No. of Applications Received	2200	1600
02.	No. of Participations	64	92
03.	No. of Faculty members from IIT Kanpur mentoring	55	64

Alumni Impact

Notable Achievements in the Field of Science and Technology by Our Alumni

Some of our distinguished and respectable alumni members have been proud recipients of various honors and awards during F.Y. 2016-17.

To name, a few of them are:-

Name of the Alumni	Award	Award relates to
Dr. N.R. Narayana Murthy (MT/EE/1969)	The Thomas Jefferson Foundation Medal 2017 in Global Innovations	This honor for his exemplary contributions and leadership in creating a global software and services industry in India.
Dr. B.V.R. Mohan Reddy (MT/ME/1974)	conferred with the 4th highest civilian honor of the country 'Padma Shri' by the Government of India.	He receives this prestigious award for his outstanding contributions to the IT-enabled engineering services industry which have earned him the reputation of one of the founding fathers of ITES industry in India. He is a founder and executive chairman of Cyient Limited.
Dr. Veena Sahajwalla (BT/MME/1986)	Awarded with Jubilee Professorship by the Indian Academy of Sciences.	-

Dr. Manindra Agrawal (BT/PhD/CSE/1986/1991)	Honored with the Goyal Prize 2017 by Kurukshetra University	Contributions in the field of applied sciences by researching on connections between polynomial identity testing.
Dr. Rakesh Agrawal (BT/CHE/1975)	Honored with the ACS Award 2017 in Separations Science & Technology	He receives this prestigious award for providing novel and fundamental insights into the synthesis of energy efficient distillation and membranes based separation processes and their application in numerous industrial plants.
Dr. Shiraz Naval Minwalla (MSC5/PHY/1995)	Chosen for The World Academy of Sciences (TWAS) Prize 2016 at the Academy's 27th General Meeting	He receives this prestigious award for the advancement of science in developing countries in the field of Physics.
Dr. Ambuj Tewari (BT/CSE/2002)	Selected for the Sloan Research Fellowship 2017 in Computer Science category by the Alfred P. Sloan Foundation.	He is an Assistant Professor at the University of Michigan.
Dr. Amitabha Chattopadhyay (MSC2/CHM/1980)	Chosen for 'The World Academy of Sciences (TWAS) Prize 2016 at the Academy's 27th General Meeting	He will receive this prestigious award for the advancement of science in developing countries in the field of Biology.
Dr. Subramanian Anantha Ramakrishna (MSC5/PHY/1995)	Chosen for the prestigious Shanti Swarup Bhatnagar Award 2016	Awarded for Physical Sciences category by the Ministry of Science and Technology, Govt. of India.

Dr. Sanjay Mittal (BT/AE/1988)	Awarded the twenty-fifth GD Birla Award for Scientific Research	He has been bestowed with this award for his significant contributions in the area of Mechanics.
Dr. Dinesh Bharadia (BT/EE/2010)	Chosen for the Paul Baran Young Scholar Award 2016 by the Marconi Society	Awarded for his contribution to send and receive radio (wireless) signals, including mobile telephony and data on the same channel.
Dr. Manu Prakash (BT/CSE/2002)	wins prestigious MacArthur grant	This fellowship, popularly known as "genius grants," is awarded to scholars (citizens or residents of the United States.) working in any field, who have shown "extraordinary originality and dedication in their creative pursuits and a marked capacity for self-direction".

Notable Entrepreneurial Endeavours by Our Alumni

Some Entrepreneurial endeavors by our alumni members include:

Name of the Alumni	Entrepreneur in the field of
Mr. Alope Bajpai (BT/EE/2001) and Mr. Rajnish Kumar (BT/CSE/2001)	Co-founders of IXIGO, an online travel search marketplace. The company has raised \$15 million Series B round funding from venture capital firm Sequoia Capital India. It has evolved from being a travel search engine to a travel marketplace where a customer can avail hotel deals, real-time fares, book cabs and gain access to travel content across travel sites.
Mr. Farid Ahsan (BT/MME/2014), Mr. Ankush Sachdeva (BT/CSE/2015) and Mr. Bhanu Singh (BT/EE/2014)	Co-founders of ShareChat, a social media platform in local languages. They make it to Forbes 30 Under 30 List 2017.

Mr. Varun Khaitan (BT/EE/2009)	Co-Founder of Urban Clap, an online marketplace that connects customers to service professionals. He makes it to Forbes 30 Under 30 List 2017.
Mr. Suhail Abidi (BT/CHE/2006)	Co-Founder of Tinystep, a Bengaluru-based parenting social network site. The company has received \$2 million funding from Flipkart.
Mr. Amit Kumar Agarwal (BT/CE/2000)	Co-Founder of Bengaluru based 'No Broker', a peer-to-peer, broker-free listing portal for home rentals. The company has raised \$7.4 million (Rs. 50 crore) as an extension of its Series B round. It currently operates across Bengaluru, Mumbai, Chennai and Pune.
Mr. Dheeraj Pandey (BT/CSE/1997)	Co-founders of Cloud Platform Company 'Nutanix'. The company has been named a leader by Gartner Inc. for Integrated Systems for the second straight year.
Mr. Vipin Agarwal (BT/CHE/2003) and Mr. Bholu Ram Meena (BT/CSE/2004)	Co-founders of OnlineTyari, a test preparation platform. The company has raised Rs. 20 crore from Michael & Susan Dell Foundation. It offers a mobile application that allows highly customized, curated and vernacular test preparation content for public sector units, government jobs and higher education institutes delivered through very low internet bandwidths.
Dr. Sandip Patil (PhD/CHE/2012)	Co-founders of E-Spin Nanotech Pvt. Ltd. (Incubatee company at IITK). He has been named the Young Entrepreneur Award by TiE-UP and as one of the top ten outstanding young persons in the city of Kanpur. He becomes the first person from IIT Kanpur to be recognized and awarded by JCI. The award is a recognition of his technology innovation and his contribution to the economic growth of the city.
Mr. Deepak Garg (BT/ME/2003)	Founder of Rivigo, a Logistics company. The company has raised funding worth USD 75 million (about Rs. 500 crore) from Warburg Pincus for a minority stake. It currently owns and operates over 2,000 trucks and has a Pan-India network across 150 locations.

Faculty Recruitment

In the past one year, institute has offered 55 faculty positions selecting rigorously from 1344 applicants. Out of this 18 new faculty members have joined the institute. These appointments are in Aerospace Engineering (03), Chemical Engineering (01), Civil Engineering (01), Computer Sciences & Engineering (03) Earth Sciences (01) Electrical Engineering (03), Mathematics and Statistics (04), and Physics (02). A few more appointees will be joining soon.

The incoming faculty is highly qualified with strong international exposure. The institute has high expectations from them and we offer them a hearty welcome to our campus.

During this period, we have also made 15 offers of postdoctoral fellowships, 12 visiting faculty, 11 adjunct faculty and one as a Distinguished Visiting Professor. 20 Inspire scholars have joined us for pursuing their research.

The following faculty members have been offered chair positions by the institute in 2017.

Dr. S. Ganesh, Biological Sciences and Bioengineering

Dr. Jayant K. Singh, Chemical Engineering

Dr. S. P. Rath, Chemistry

Dr. Javed N. Malik, Earth Sciences

Dr. Satyajit Banerjee, Physics

Dr. Shalabh, Mathematics & Statistics

Dr. J. Ramkumar, Mechanical Engineering

Dr. Sameer Khandekar, Mechanical Engineering

Dr. Subrata Sarkar, Mechanical Engineering

Dr. Sudeep Bhattacharjee, Physics

In addition, the following faculty members are offered young faculty research fellowship 2017.

Class of 1979 Research Fellowship

Dr. Abhishek, Aerospace Engineering

Dr. Debayan Pakrashi, Humanities & Social Sciences

Prof. Arakare Vasudev Faculty Research Fellowship

Dr. Naveen Tiwari, Chemical Engineering

Dr. Shukla Faculty Research Fellowship

Dr. Kumar Vaibhav Srivastava, Electrical Engineering

Sir M. Visvesaraya Research Fellowship

Dr. Prishati Raychowdhury, Civil Engineering

P. K. Kelkar Research Fellowship

Dr. Bushra Ateeq, Biological Sciences and Bioengineering

Dr. Arun K. Shukla, Biological Sciences and Bioengineering

Dr. Basker Sundararaju, Chemistry

Dr. Sameer Chavan, Mathematics & Statistics

Dr. Anurag Gupta, Mechanical Engineering

Dr. Amit Agrawal, Physics

Awards and Honors

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

It gives me immense pride to share with you that Dr. Avinash Kumar Agarwal (ME) and Dr. S. Anantha Ramakrishna (PHY) have been conferred the Shanti Swarup Bhatnagar Prize.

Dr. Indranil Manna, Director, received D.Sc. (honoris causa) from Kazi Nazrul University, Asansol, West Bengal. He has been also awarded MRSI Distinguished Lecture prize 2017 at the MRSI-AGM at IIT Bombay. Dr. Jayandharan G Rao (BSBE) received Senior Fellowship, Wellcome Trust-DBT by the Wellcome Trust-DBT India Alliance. Dr. Raghunath Tewari (CSE), Dr. Piyush Rai (CSE), Dr. Thiruvancheril G. Gopakumar (CHM) and Dr. Manabendra Chandra (CHM) have been elected Visvesvaraya Young Faculty Research Fellowships by the Ministry of Electronics and Information Technology. Dr. Yogesh Joshi (CHE) has been elected Fellow of the Indian National Academy of Engineering. Dr. Vinod K Singh (CHM) has been elected a Fellow of The World Academy of Sciences (TWAS). Dr. Sri Niwas Singh (EE) has been elected a Fellow of The Institution of Electrical and Electronics Engineers- (FIEEE), USA. Dr. Santanu Misra (ES) has been awarded the Swarna Jayanti Fellowship of DST for the year 2015-16. Dr. Rajiv Sinha (ES) has been elected Fellow of the National Academy of Sciences, India, for the year 2016. Dr. Anindya Chatterjee (ME) has been elected Fellow of the National Academy of Sciences, India, for the year 2016. Dr. Anish Upadhyaya (MSE) has been elected Fellow of the Indian Institute of Metals. Dr. Sagar Chakraborty (PHY) has been conferred the Associateship of the Indian Academy of Sciences, Bangalore.

Dr. Sanjay Mittal (AE) has been honored with G.D. Birla Award by K K Birla Foundation. Dr. M. Saravanan (BSBE) has been selected for the Innovative Young Biotechnologist Award (IYBA) for the year 2016 by Department of Biotechnology, Govt of India. Dr. Jayandharan G. Rao (BSBE) has been selected for the 2017 CDRI Award for Excellence in Drug Research in the Life Sciences category. Dr. Arun Shukla (BSBE) has been awarded the NASI-Young Scientist Platinum Jubilee Award in Biological Sciences for the year 2016. Dr. Raju Gupta (CHE) has been awarded the International Association of Advanced Materials Scientist Medal for the year 2017. Dr. Sandeep Verma (CHM) has been

selected for the Chemical Research Society of India (CRSI) Silver Medal. Dr. Manindra Agrawal (CSE) has been selected for the Goyal Prize of Kurukshetra University in the senior category this year. Dr. Sandeep Shukla (CSE) has been selected an IEEE Computer Society Distinguished Visitor for a period of 3 years. Dr. Sri Niwas Singh (EE) received the Outstanding Teacher Award 2016 by INAE, New Delhi. Dr. Javed H. N. Malik (ES) has been conferred the 2016 National Geosciences Award given by the Ministry of Mines. Dr. G. Santhanam (M&S), has been selected for the INSA Teachers Award, 2016. Dr. Kamal Kar (ME) has been awarded the Tenth Foundation Polymer Award, given by Dr. Sukumar Maiti Polymer Award Foundation, for his outstanding contributions in Polymer Science and Technology for the year 2015. Dr. Kantesh Balani (MSE) has been selected for the Metallurgist of the Year Award (2016) in the Metal Science category by the Ministry of Steel and Mines. Dr. Sandeep Sangal (MSE) has been awarded the Distinguished Educator Award by the Indian Institute of Metals (IIM). Dr. Mahendra Verma (PHY) has been selected for the INSA Teachers Award, 2016. Dr. Sagar Chakraborty (PHY) has been selected for the NASI-Young Scientist Platinum Jubilee Award (2016).

The many prestigious scholarships and awards received by our students have been a matter of pride and pleasure for us. Gargi Singh, Arihant Jain, Shruti Agrawal and Saksham Sharma received the Aditya Birla Scholarship. Manraj Singh Bevli, Md. Wasim Alam and Aditya Srivastava received the O P JEMS Scholarship. Abhineet Singh Rajput and Karttikeya Mangalam received Honda Yes scholarship. Deval Purohit, Kuntalika Das and Vishakha Bargotra received Pratibha Eaton Awards.

The full lists of awards received by the faculty and students are given at the end of the report.

Students' Activities

IIT Kanpur continues its efforts to encourage an equitable balance between academics and extra curricular activities among its students. Our vision is to create future leaders in their field of interest and not just technically accomplished individuals. The Institute strongly believes that an abiding social and humane engagement is the hallmark of the empowered youth. To realize this lofty goal, the Institute nurtures social, cultural and sporting activities pursued by the Students' Gymkhana, which itself is a self-governed body of the students.

The Inter-Hall cultural (Galaxy), science and technology (Takneek), films and media (Spectrum) and sports (Inferno) competitions this year were keenly contested and thoroughly enjoyed events as usual. Fresher Inferno tournament allowed spotting new talents from the fresher's batch. The General Championship of 2016-17 witnessed a new competition called Mélange to inculcate the spirit of leadership and community welfare among the students. Further, there were two new Intra-Campus festivals: CultX, which showcased performances from the various clubs of the Cultural Council and Montage, which witnessed screening of movies of International acclaim.

The Female students are a quintessential part of the Students' Community. In order to give them equal opportunity to build their own leadership prowess and general competence, a new pool called *Veeras* was introduced in the General Championship 2016-17, making the total number of pools to 5. Students' Gymkhana underwent a major restructuring with introduction of new entities called Cells, who would conduct specific tasks and report to the Students' Senate.

Science and Technology Council

The Science and Technology council participated and won in many national and international competitions like:

- The 5th Inter-IIT Tech Meet was organized by SnT Council. IIT Kanpur emerged as the Overall Champions of this edition winning 3 gold, 3 silver and 1 bronze.
- NIOT SAVe - IIT Kanpur AUV Team, for their robot named *Varun*, won the second position in their debut at the 5 National Student Autonomous Vehicle (SAVe) organized by the National Institute of Technology (NIOT), under the Ministry of Earth Science at Chennai, India.

The S&T Council also organized various lectures and workshops in programming, robotics, and aeromodelling. CAD modeling workshop was organized during the Summer Camp by Autodesk.



Cultural Council

Some of the new initiatives of this year were organization of Hindi and Urdu learning classes and literary discussion sessions.

Major Achievements of council members are:

- One member of IITK was invited to adjudicate the 6th NALSAR British Parliamentary Debate, the biggest British Parliamentary Debate in Asia;
- A three member team including two fresher students secured first position in the Antargani Parliamentary Debate 2016;
- A member of the DebSoc won the first position in Mood Indigo, annual cultural festival of IIT Bombay in the event Socratic Circle;
- Our team won the Dance trophy securing 1st position in Duo and 2nd position in the Group dance competition in the first ever Inter IIT Cult Meet;
- A 3 member team participated in the 4th Ram Manohar Lohiya Parliamentary Debate in February. This team secured a record 4 wins out of 5, the best performance of any IITK contingent.

Films and Media Council

The Council aspires to convey information to the people through various means of communication. It intends to create a platform where people can voice their needs and express their views with freedom. The Films and Media council organized a large number of workshops in photography, designing, animation etc. throughout the year. This year, the Animation Club organized a workshop on Stop Motion with the aim of making the first year students publish a stop-motion video for the Freshers' Night.

New Initiatives of the council are:

- The Online Polling system has been started on the FB group;
- The FB group also serves the purpose of an online forum where active discussions on movies have started;
- Distribution of DVD's among Campus Junta to enrich their experience;

Major achievements of the council members are:

- Nishant Shukla participated in intercollegiate photography competition of Lady Sri Ram College, Delhi and won the first prize;
- Montage'17 was organised from 26th to 29th January 2017 where a whole plethora of movies spread across various countries, genres and languages was screened to cater to the tastes of everyone on campus;
- This year montage saw its special edition, thanks to Films Division, Lucknow, Ministry of Information and Broadcasting for providing us an opportunity to look at some of the best movies submitted to the "Mumbai International Film Festival" under the head "Best of MIFF."

Games and Sports Council

Diverse activities aimed at broadening the outreach of 'sporting activities' among various segments of campus community were organized during the year. Some

of the new initiatives are aquabuddies, fencing workshop, Tour de force, basic mountaineering workshop, and self defence workshop.

IIT Kanpur sports contingent participated in Spardha, 2016, the sport festival of IIT BHU and was awarded the second best outstation team after NIT Trichy. Our team won gold in Hockey, Squash, Volleyball (Girls) and silver in Athletics and Basketball.

IIT Kanpur hosted the 32 Inter-IIT Aquatics Meet. Team won 4 Silver and 2 Bronze medals in swimming events and secured 2nd place in Men's water polo.

IIT Kanpur hosted the 51 Inter IIT Sports Meet during December 11-19, 2016 and emerged and emerged General Champion third time in a row, making a history. IITK was the overall champion by a huge margin of 33 points from the runner up in the final points tally. IIT Kanpur also won men's general championship trophy with a lead of 42 points.



The win was adorned by the Overall Championship in Weightlifting, Badminton (Men), Cricket, Football, Lawn Tennis (Men), Squash and Volleyball (Men); Silver in Badminton (Women), Hockey and Water Polo; and Bronze in Basketball (women), Lawn Tennis (women) and Volleyball (women). The Weightlifting team of IIT Kanpur got the Overall Championship, breaking 5 Inter IIT Meet Records.

The athletics team was runner up in the men category, with a new Inter IIT Record in the Pole Vault event.

IIT Kanpur also emerged General Champion in Inter IIT Staff Sports meet.

Festivals

The overriding objective of large-scale events of the Institute 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. The revenues generated for conducting these festivals saw an impressive growth last year which reflects the managerial and logistic skills of our students.

Antaragni

Antaragni successfully completed its 51 edition from 20th to 23rd October 2016 with befitting grandeur, witnessing the highest and most diverse participation till date. And "Hues of Bliss" was the theme of the event.

Roadtrips, the nationwide cultural expedition by Antaragni was organised in 12 cities (including Kathmandu), where competitions like Synchronicity, Nukkad Natak-Dramatics, Street Dance, Quiz events, Antaragni Idol, Jitterbug, Fine Arts, etc took place. Prodigy, the cultural talent hunt for school students, which started last year was continued and successfully conducted in three cities. First time in the history of Antaragni, a DJ War was organised this year, to bring out the DJs in the public. This ended with a color run, something in line with the theme. MUN was organised during 7-9 October 2016, which witnessed a participation of over 100 contestants. Mr. Amitabh Thakur was invited as the guest of honor for the event. Kavi Sammelan witnessed the performance of Mr. Rupesh Saxena, Mr. Sunil Jogi, Ms. Padmini Sharma and Mr. Ansar Kambri, taking the event to great heights. Keeping the cultural heritage of India alive, the Bhutte Khan Group and the Thang ta Group graced the stage with their performance.

Mr. Madhup Mudgal, Mrs. Jyoti Hegde, Ms. Sanjana Tewari, and Mrs. Anupriya Deotale mesmerized the crowd with their classical performances. Apart from these, Antaragni'16 also organised an Independence Day March, a blood camp and a flash mob as a part of their social initiative.

Techkriti

Techkriti, the annual inter-collegiate technology and entrepreneurship festival, was organized in March 2017 with its theme – FACTUALISING FICTIONS. Dr. A S Kiran Kumar, Chairman ISRO, inaugurated the festival with his talk held in a grand ceremony in the main Auditorium. Apart from this, other speakers were Dr. K.C. Nicolaou - Cypriot-American chemist known for his research in the area of natural products total synthesis, Dr. Richard A. Muller - American physicist and professor of physics at the University of California, Berkeley, Dr. Meinolf Sellmann, computer scientist, best known for algorithmic research with a special focus on self-improving algorithms, Henry “Fritz” Schaefer, computational and theoretical chemist, Dr. Devika Sirohi, an Indian scientist and the youngest member of the team, who successfully decoded the Zika virus, and Dr. Vijay Prasad Dimri, Creative Indian geophysical scientist, known for his contributions in opening up a new research area in Earth sciences by establishing a parallelism between deconvolution and inversion, the two vital geophysical signal processing tools deployed in minerals and oil and gas exploration. Some of the major exhibitions for this edition of Techkriti were Automated Chess, Smart Technologies, Smart Vehicle Expo, Gesture Controlled Gaming, Golf Simulator, and Urban Flow.

Techkriti also witnessed fierce competitions in events like International Autonomous Robotics Challenge (IARC), International Robots Got Talent (IRGT), Techkriti Grand Prix (TGP), Techkriti Innovation Challenge (TIC), Multitor, Sky Sparks, Embedded, IOT, Business and Entrepreneurial Events to name a few.

Adding to it, the third edition of Techkriti Open School Championship was held in 22 cities in 3 rounds.

This time Technocruise, the zonal round of Techkriti, was conducted in 8 cities.

Counselling Service

The Counselling Service (CS) is an organisation that strives to ensure the welfare of the students by providing them emotional, academic and financial assistance and sensitizing the campus community towards key campus issues. By looking after their well-being, the body tries to ensure that IITK is not just an institute, but a home away from home. The CS consists of a team of professional counsellors, psychiatrists and a group of student volunteers dedicated to the welfare of the student community.

There were about 1450 counselling sessions held in academic year 2016-17. Psychiatrists visit the campus every week and whenever there is an emergency, the student is directly sent to the psychiatrist's clinic.

Financial Assistance

The CS grants scholarship to students requiring financial assistance through Students Benevolence Fund (SBF). This is for students who demonstrate financial need, but could not acquire finance from the institute or any other means. About 100 students are provided SBF scholarship of Rs. 1,500 per month for a period of 9 months. Apart from this, SBF Loans are also given to those who are in need.

Academic Assistance

Academic assistance is provided to students facing difficulty in coping with the academic load. Remedial Classes, Study Hours, Technical Terminology Classes are organised at individual as well as for groups and is free of cost.

Support to Students under Academic Probation

One of the most important responsibilities of the Counselling Service is to provide emotional as well as academic support to the students during academic probation/warning. This year, the students in AP/WR were allotted a guide from the operations or guidance team, whose responsibility was to look after his/her allotted counselee and also to act as a link between the student and the counsellor. A session for the first year students in probation/warning was conducted by the counsellors.

Orientation Programme

Each year, an Orientation Programme is organized for the freshmen before the start of the session to acquaint them with the facilities, services, personnel, rules and regulations of the institute to facilitate a smooth transition into life at the Institute.

Gymkhana Presentations, Session by counsellors, group activities and wing competitions were organised as part of the Orientation Programme. A talk delivered by IIT Kanpur alumnus, Dr. Anil Rajvanshi gave the freshers a holistic feel of what their life would be like during their stay at IITK.

An Open House Session was conducted to discuss the problems faced by students from Hindi medium background. The effectiveness of current measures and other feasible steps that could be taken up were discussed.

Other Activities

English Conversation Classes are organized free of cost during the semesters for the students who face difficulty in understanding and communicating in English.

A three day fun-event series, named 'Hakuna Matata' was organised to engage the students in positive gainful activities, to help reduce their worries and stress levels. The activities included Capture the Flag, Session by Professors (Kyunki Professors Bhi Kabhi Bachche The) and Zumba night.

Sessions on other broad issues like Explore Your Department, Session on Study Techniques, Intern Gyan, ESO/SO Awareness Session, What can one Do in Summers? were also organized.

Boeing organized a two-day workshop at IIT Kanpur aimed at providing an opportunity to students to develop new ideas, manage a full scale engineering project, and implement it as per their design. The teams fabricated an acrobatics plane and an RC trainer which was tested at the campus airstrip.

PG Education at IIT, Kanpur

The Senate recently approved MS by Research program in Aerospace Engineering and Industrial and Management Engineering. Now eight departments offer MS by research, CHE, CE, EE, ME, CSE, PSE, AE and IME. The first batch of MS by research is likely to graduate in 2017.

The Senate of IIT Kanpur recently approved that the students who join for PhD directly after B.Tech. degrees in Engineering disciplines would be eligible for award of a M.Tech. degree along with their PhD degrees.

The stipend of Ph.D. students for the first six months in the sixth year has been enhanced to Rs.10000 pm and for the next six months the stipend stands revised to Rs. 5000 p.m. This will ensure that students can take of themselves financially with the increased cost of living. The stipend was earlier revised more than ten years back.

Students Placement at PG Level

About 275 companies actively participated in the Campus Placement Program. Some of the major companies that took part in recruitment drive were Goldman Sachs, Intel, American Express, PWC-Diamond, Tower Research, EXL Services, Bank of America, ITC etc.

Among 504 PG students registered for placements this year, 340 students were placed through SPO till date. Amongst the various programs, the MBA Degree had the highest percentage of placement at 91%, followed by DUAL degree at 78%, M.Des at 69%, M.Tech at 65%, and M.Sc. (2yr) at 36%. Apart from regular placement offers, other 9 Pre-Placement Offers (PPOs) were also made to our PG students.

UG Education at IIT, Kanpur

An Undergraduate programme, i.e. Bachelor of Science, has been introduced in Earth Sciences from 2016 batch onwards.

Based on the encouraging feedback on technology based learning models, the Senate approved a few of the highly sought courses in Flipped Class Model in the academic year 2016-2017.

Students Placement at UG Level

Among 448 UG students registered for placements this year, 290 students were placed through SPO till date. 65% of the B.Tech and BS students were placed through SPO during the Placement Recruitment drive. Apart from regular placement offers, another 96 Pre-Placement Offers (PPOs) were also made to our UG students.

Green Cell

Green Cell of IIT Kanpur is responsible for maintaining an environmentally sustainable campus. The Cell has over the last few years realized the following:

1. Started transplantation instead of removal of the trees affected by construction activities.
2. Marked a "Pristine Zone," covering 25% area of the campus through physical pillars. All attempts will be made to keep the Pristine Zone free of any activity and undisturbed.
3. Prepared baseline data regarding IIT Kanpur environments.
4. Involved Women's Association of IIT Kanpur in community awareness and education program.

Safety

Safety cell carries out periodic safety audits of laboratory, construction sites, utilities and other areas to identify the safety hazards and unsafe conditions related to electrical, fire, mechanical, civil, construction, chemical safety; conducts the accident/incident investigation of all major and minor incidences and suggests corrective measures for non-recurrence. This year approximately 105 such audits were carried out. The Safety Training on laboratory safety practices, fire safety, electrical safety were conducted. Approximately 180 persons participated in these programmes. All modifications and new facilities are taken up after the clearance from Safety cell.

The Office of Dean of Infrastructure and Planning (DOIP)

The Office of DOIP is responsible for all infrastructure planning, creation and maintenance of the campus. It coordinates activities of various units/sections related to physical and digital infrastructure such as Computer Centre, Institute Works Department (IWD), Office Automation, Visitors Hostel and Allied Facilities. The DOIP office has introduced a structured program to handle all requests

related to renovation of office space, labs/new space request/request new construction, etc. and has developed mechanisms for the overall monitoring of all construction (Planned/Ongoing/Maintenance of existing structures) activities and other infrastructure units. Other important activities include archiving of infrastructure and planning documents, creation of a geo-referenced plan for all buildings and structures, handling and dumping of construction and demolition waste, and establishing a geospatial database, maintenance of better distribution and allocation of work space among various departments based on space audits by IWD, which are compiled and analyzed at DOIP office. A few noteworthy projects, which are under progress and will be completed by July 2017, include Construction of hall of residences XII and XIII for boys, Construction of 48 nos. multi-storied residential apartment, Construction of 56 Nos. Type-II multistoried apartments, Construction of hall of residence for girls, GH Tower (Phase-II), Construction of International students housing facilities, Construction of Animal house, National AEROSOL facility building, Construction of building for National Centre for large area Flexible Electronics (NCFlexE). A few upcoming projects are Retrofitting of Aerospace Building, Engineering Core Lab, Research Complex Phase-I, and Extension of Old Core Lab.

Rajbhasha Prakoshta

Rajbhasha Prakoshta (Hindi Cell) was established as per Article 343 (1) of the Constitution of India to promote and disseminate Hindi Language in the Institute. It is making various efforts for promoting use of Hindi for administrative purposes and creating awareness of Hindi Language among the Institute employees/students. The major activities of the Prakoshta include disseminating Hindi Language in the Institute, Organizing Hindi fortnight followed by Hindi Divas celebrations, Hindi workshops/seminars for officers and other employees, and publication of a Hindi Quarterly Newsletter, and a six-monthly Hindi Magazine, named Antas.

NMD-ATM 2016

The National Metallurgists' Day (NMD) celebration on November 14 each year and the associated Annual Technical Meeting (ATM) mark the most important and prominent event in the annual calendar of the Indian Institute of Metals (IIM). The 70th ATM along with the 54th NMD was held at the Institute during November 2016. The theme for NMD-ATM 2016 was *Metal, Materials and Manufacturing for a Self-Reliant India*. 403 Technical Oral Presentations; 375 Technical Posters; 96 Participants in Metallography Contest; 40 exhibition stalls were held. Around 1000 number of delegates attended the Conference.

International conference on Materials Engineering (ICME-2017)

Metal Science Division of the Indian Institute of Metals (IIM) is launching a new platform to deliberate and promote the subject domain of Materials Engineering through an International Conference in Materials Engineering (ICME) and held the first such event at the Institute as a joint effort of the IIM Kanpur Chapter and IIT Kanpur during June 2-4, 2017. The conference was designed to address specific themes and topics to be presented by chosen experts and only invited participants. The program comprised 2 plenary talks, 40 invited talks and about 100 posters by Ph.D. scholars from various institutions across the country.

Health Center

To make better healthcare accessible to the campus community, Institute's Health Centre has recently undertaken several initiatives. A number of specialty clinics by reputed doctors from the city, including dental and ophthalmology, have been introduced along with cashless pharmacy and cashless pathology. A Forty-Plus Health Assessment Programme along with Comprehensive Women's Healthcare Programme has also been launched besides regular awareness campaigns.

A new digital X-Ray machine has also been procured and a new emergency room has been constructed. Complete automation of OPD services is currently

underway, while dedicated OPD services for students are available every evening. Referral services have also been strengthened through empanelment of more hospitals, specialty OPD consultants, and diagnostic centres.

The Health Center will soon have a separate homeopathy clinic and also expand the physiotherapy services available.

Information Cell

The Information Cell at IIT Kanpur is responsible for the maintenance and hygiene of the institute website and regularly updates it to apprise website visitors of what is happening in the Institute. The Cell mediates between the Institute and the media, handles all media queries, organizes press conferences and regularly puts out press releases for important events at IIT Kanpur. News from the Institute has been covered in prestigious national dailies like Hindustan Times, The Times of India, The Indian Express and local dailies like Hindustan, Dainik Jagran and Amar Ujala. It also releases the bi-monthly institute newsletter called IITK Chronicle.

Gender Parity

The Institute endeavors to create a sustainable, equal-opportunity environment conducive to an all-round development of women members of the campus community, both professionally and personally. It constantly strives to ensure that women from all walks of life, residing in or visiting the campus, are treated with respect and dignity. It is committed to making the campus-environment safe for women – free from exploitation, harassment, and violence of any kind.

The "Women Cell" of the Institutes is mandated to achieve above objectives. Cell's mandate includes sensitizing the community towards gender-related issues, organizing orientation programs for students and employees, and conducting workshops and open houses.

Epilogue

Dear Students, in this august assembly of the fiftieth convocation, I congratulate and commend each one of you on your praiseworthy achievements and extend my best wishes to the entire class of 2017 graduating today. I also admire your parents for their patience and for being a source of inspiration to you to scale supreme heights. Today, you have distinguished yourself from the millions of students aspiring for a coveted degree from this citadel of learning by your intelligence, perseverance and a vision of a purpose to your life. Now as you are about to embark on your journey towards the real world, I would like to share some of my thoughts with you.

During your stay at IIT Kanpur, in pursuing science and truth, you were able to contribute your bit to the larger domain of knowledge and thereby aid the march of civilization. In the words of S. Chandrashekhar:

“Beauty is experienced in the context of great ideas and by great minds. They are, indeed, accesible to each one of us provided we are attuned to the perception of starngeness in the proportion and the conformity of the parts to one another and to the whole. And there is satisfaction also to be gained from harmoniously organizing a domain of science with order, pattern and coherence”.

The greatest thinkers of our country have always maintained that the final goal of education consists not in a certificate or a recognized standardization, but in the power of freedom from ignorance, prejudice and vanity it brings about. I would like to recollect these few lines from “The Master as I saw him” as narrated by Sister Nivedita on a small discourse after a class in London in 1896 taken by Swami Vivekananda. He uttered with great force:

“What the world wants today, is twenty men and women who can dare to stand in the street yonder and say that they possess nothing but God. Who will go? What

the world wants today is character. The world is in need of those whose life is one burning love-selfless. The love will make every word tell like a thunderbolt.”

Let the flame of knowledge culminating in self-realization kindle your spirit to the higher and higher domains of Purity and let the world enjoy the fragrance of this vibrant soul.

Your sheltered days at IIT Kanpur will soon give way to the challenges and pressures of the professional world. The love of your parents and the training you received at your alma mater will stand you in good stead in the years to come. I am sure the education you received at IIT Kanpur and the memories of your stay here will remain a source of strength for the life that lies outside the portals of this lovely campus.

Jai Hind!

Books published

- Basic Flight Mechanics, Ashish Tewari (AE), Springer, Basel, Switzerland.
- Methods in Enzymology Volume 585: Proteomics in Biology – PART A, Arun K. Shukla (BSBE), ELSEVIER, International publisher.
- Methods in Enzymology Volume 586: Proteomics in Biology – PART B, Arun K. Shukla (BSBE), ELSEVIER, International publisher.
- Chemical Engineering Fluid Mechanics, R Darby & R P Chhabra (CHE), CRC Press, Boca Raton, FL.
- Structured interferometry features in femtosecond supercontinuum: towards better understanding of supercontinuum for bio applications, D. Goswami (CHM), S. Dindha and S. N. Bandyopadhyay, SPIE Proc.
- In situ temperature control and measurement with femtosecond optical tweezers: offering biomedical application, D. Mondal and D. Goswami (CHM).
- Steric and stereo electronic effect in organic chemistry, Veejendra Yadav (CHM), Springer, Singapore.
- Soft Computing Approaches for Two-Dimensional Beam forming, R. Kiran, P. Sircar and Nishchal. K. Verma (EE), Springer, USA.
- Object Matching Using Speeded Up Robust Features, Nishchal K. Verma (EE), Ankit Goyal, A. Harsha Vardhan, Rahul Kumar Sevakula, and Al Salour, Springer, USA.
- Law and Economics: Breaking New Grounds, Ranita Nagar, Dr. P Murali Prasad (HSS), and Pavan Mamidi, Eastern Book Company, Lucknow.
- English for Technical Communication, N. P. Sudharshana (HSS), Cambridge University Press, India.
- Innovation and IPRs in China and India: Myths, Realities and Opportunities, Uday S. Racherla (IME), Springer.
- Decision Sciences: Theory and Practice R. N. Sengupta (IME), Aparna Gupta and Joydeep Dutta (HSS), CRC Press (Taylor and Francis).
- Analysis of Step-Stress Model, Debasis Kundu (M&S) and Ayon Ganguly, Academic Press/Elsevier, 2017.

- Introduction to Statistics and Data Analysis - With Exercises, Solutions and Applications in R, Authors: Christian Heumann, Michael Schomaker and Shalabh (M&S), Springer, 2016.
- Algebra, G. Santhanam (M&S), Narosa Publishers, 2017.
- Combustion for Power Generation and Transportation: Technology, Challenges and Prospects, Avinash Kumar Agarwal (ME), Santanu De, Ashok Pandey, Akhilendra Pratap Singh, Springer, New Delhi.
- Locomotives and Rail Road Transportation: Technology, Challenges and Prospects, Avinash Kumar Agarwal (ME), Atul Dhar, Anirudh Gautam, Ashok Pandey, Springer, New Delhi.
- The proceedings of the 17th International Heat Pipe Conference published as Science and Technology of Heat Pipes: Historical Perspective to Contemporary Developments, edited by Sameer Khandekar (ME), Begell House.
- Biofuels: Technology, Challenges and Prospects, Avinash Kumar Agarwal (ME), Rashmi Avinash Agarwal, Tarun Gupta, Bhola Ram Gurjar, Springer, New Delhi.
- Technology Vision 2015: Technology Roadmap Transportation, Avinash Kumar Agarwal (ME), S S Thipse, Akhilendra P Singh, Gautam Goswami, Mukti Prasad, TIFAC, New Delhi.
- Computational Fluid Dynamics and Heat Transfer, P.S. Ghoshdastidar (ME), Cengage Learning India Pvt. Ltd., New Delhi.
- Composite materials: processing, application, characterizations, Kamal K. Kar (ME) Berlin – Heidelberg.
- Introduction to Mechanics, M. K. Verma (PHY), Universities Press, Hyderabad.

Fellowships

1. Dr. Arun K. Shukla (BSBE) has been elected Fellow of Society for Applied Biotechnology.
2. Dr. Jayandharan G Rao (BSBE) received Senior Fellowship, Wellcome Trust-DBT by Wellcome Trust-DBT India Alliance.
3. Dr. Debabrata Goswami (CELT) has been elected a Fellow of the Optical Society of America.
4. Dr. Raghunath Tewari (CSE) received Visvesvaraya Young Faculty Research Fellowship by Ministry of Electronics and Information Technology.
5. Dr. Piyush Rai (CSE) received Visvesvaraya Young Faculty Research Fellowship by Ministry of Electronics and Information Technology.
6. Dr. Yogesh Joshi (CHE) has been elected Fellow of the Indian National Academy of Engineering.
7. Dr. Thiruvancheril G. Gopakumar (CHM) has been elected Vsvesvaraya Young Faculty Research Fellow by Department of Electronics and Information Technology.
8. Dr. Vinod K Singh (CHM) has been elected Fellow of The World Academy of Sciences (TWAS).
9. Dr. Manabendra Chandra (CHM) has been elected Vsvesvaraya Young Faculty Research Fellow by Department of Electronics and Information Technology.
10. Dr. Manas K Ghorai (CHM) has been elected to the fellowship of West Bengal Academy of sciences and Technology.
11. Dr. Sri Niwas Singh (EE) has been elected Fellow of The Institution of Electrical and Electronics Engineers- (FIEEE), USA.
12. Dr. Santanu Misra (ES) has been awarded the SwarnaJayanti Fellowship of DST for the year 2015-16.
13. Dr. Rajiv Sinha (ES) has been elected Fellow of the National Academy of Sciences, India, for the year 2016.

14. Dr. Ritwij Bhowmick (HSS) received DAAD Research Stays Fellowship for University Academics and Scientists 2017 by DAAD, Germany.
15. Dr. Bishakh Bhattacharya (ME) received Sakura Fellowship by Japan Science & Technology Agency (JST).
16. Dr. Anindya Chatterjee (ME) has been elected Fellow of the National Academy of Sciences, India, for the year 2016.
17. Dr. Anish Upadhyaya (MSE) has been elected Fellow of the Indian Institute of Metals.
18. Dr. Sagar Chakraborty (PHY) has been conferred the Associateship of the Indian Academy of Sciences, Bangalore.

Awards and Honors

1. Dr. Sanjay Mittal (AE) has been selected for the Dr. A. P. J. Abdul Kalam HPC award – 2017 and G.D. Birla Award by K K Birla Foundation.
2. Dr. Debopam Das (AE) has received Excellence in Aerospace Education Award of The Aeronautical Society of India for the year 2015.
3. Dr. M. Saravanan (BSBE) has been selected for the Innovative Young Biotechnologist Award (IYBA) for the year 2016 by Department of Biotechnology, Govt of India.
4. Dr. S. Ganesh (BSBE) has been selected for the Basanti Devi Amir Chand Prize, given by the Indian Council of Medical Research (ICMR), for the year 2014 and also has been awarded the OPPI Scientist Award 2016 by the Organisation of Pharmaceutical Producers of India.
5. Dr. Jayandharan G. Rao (BSBE) has been selected for the 2017 CDRI Award for Excellence in Drug Research in the Life Sciences category.
6. Dr. Arun Shukla (BSBE) has been awarded the NASI-Young Scientist Platinum Jubilee Award in Biological Sciences for the year 2016.
7. Dr. Ashok Kumar (BSBE) has been conferred the Finnish Academy Research Award by Academy of Finland.

8. Dr. Sudib Kumar Mishra (CE), has been conferred the INAE Young Engineer Award of 2016.
9. Dr. Raju Gupta (CHE) has been awarded the International Association of Advanced Materials Scientist Medal for the year 2017.
10. Dr. Sandeep Verma (CHM) has been selected for the National Prize for Research on Interface of Chemistry and Biology by CNR Education Foundation, JNCASR, Bangalore and also for the Chemical Research Society of India (CRSI) Silver Medal.
11. Dr. Piyush Rai (CSE) has been awarded the IBM Research Faculty Award for this year by IBM.
12. Dr. Sandeep Shukla (CSE) has been chosen ACM Distinguished speaker for 3 years and an IEEE Computer Society Distinguished Visitor for a period of 3 years.
13. Dr. Manindra Agrawal (CSE) has been selected for the Goyal Prize of Kurukshetra University in the senior category this year.
14. Dr. Sri Niwas Singh (EE) received the Outstanding Teacher Award 2016 by INAE, New Delhi.
15. Dr. Adrish Banerjee (EE) received IETE-Prof. K. Sreenivasan Memorial Award, 2016 by IETE, New Delhi.
16. Dr. Javed H. N. Malik (ES) has been conferred the 2016 National Geosciences Award given by the Ministry of Mines.
17. Dr. Santanu Misra (ES) received Sera Ajeyo Samman by ABP & Indian Oil.
18. Dr. G. Santhanam (M&S) has been selected for the INSA Teachers Award, 2016.
19. Dr. Avinash K Agarwal (ME) has been honoured with Shanti Swarup Bhatnagar Prize for Science and Technology - 2016 in Engineering Sciences by CSIR, Government of India and also has been selected for the Rajib Goyal Prize for young scientists in Physical Sciences by Kurukshetra University.

20. Dr. J. Ramkumar (ME) has been honoured with Young Alumni Achievement award for excellence in academics, research, and innovation by National Institute of Technology, Trichy, Tamil Nadu.
21. Dr. Kamal Kar (ME) has been awarded the Tenth Foundation Polymer Award given by Prof. Sukumar Maiti Polymer Award Foundation, for his outstanding contributions in Polymer Science and Technology for the year 2015.
22. Dr. Gautam Biswas (ME) has been honored with the Distinguished Alumnus Award of IIT Kharagpur.
23. Dr. Kantesh Balani (MSE) has been selected for the Metallurgist of the Year Award (2016) in the Metal Science category by the Ministry of Steel and Mines.
24. Dr. Sandeep Sangal (MSE) has been awarded the Distinguished Educator Award by the Indian Institute of Metals (IIM).
25. Dr. Deepak Gupta (MSE) received Indian Electronic and Semiconductor Association Technomenter Award by Indian Electronic and Semiconductor Association.
26. Dr. S. Anantha Ramakrishna (PHY) has been honoured with Shanti Swarup Bhatnagar Prize for Science and Technology - 2016 by CSIR, Government of India.
27. Dr. Mahendra Verma (PHY) has been selected for the INSA Teachers Award, 2016.
28. Dr. Saurav Mani Tripathi (PHY) has been elevated to the grade of Senior Member in IEEE.
29. Dr. Sagar Chakraborty (PHY) has been selected for the NASI-Young Scientist Platinum Jubilee Award (2016).
30. Dr. Indranil Manna, Director has been honored with the Distinguished Alumnus Award-2016 of IIT Kharagpur.

Appointments

1. Dr. Mukesh Sharma (CE) has been nominated on the governing council of the CII-NITI Aayog Initiative for Cleaner Air- Better Life.
2. Dr. Rajat Moona (CSE) has been appointed Director of IIT Bhilai.
3. Dr. Ajit Kumar Chaturvedi (EE) has been appointed Director of IIT Roorkee.
4. Dr. Animesh Biswas (EE) has been appointed Director of NIT, Rourkela (NITR).
5. Dr. Sri Niwas Singh (EE) has been appointed Vice Chancellor of Madan Mohan Malaviya University of Technology, Gorakhpur.
6. Dr. Manjul Gupta (M&S) has been appointed the President of the Indian Mathematical Society for the year 2017-18.
7. Dr. Satyaki Roy (HSS) has been invited to join the CII National Committee on Design (2016-17) as a member.

Editorships

1. Dr. Ashok Kumar (BSBE), Executive Board Member, Asian Federation Of Biotechnology.
2. Dr. Arun K. Shukla (BSBE), Editor of the Journal of Cellular Biochemistry, Wiley.
3. Dr. Arun K. Shukla (BSBE), Member of the Editorial Board, Journal of Cellular Biochemistry.
4. Dr. Saravanan Matheshwaran (BSBE), Member of Editorial Board, Journal of Practical Biochemistry and Biophysics, Red Flower Publication.
5. Dr. Ashok Kumar (BSBE), Member of Editorial Board, Journal of Biosciences and Bioengineering, Elsevier.
6. Dr. S. N. Tripathi (CE), Member of Editorial Board, Journal of Aerosol Sciences.
7. Dr. S. N. Tripathi (CE), Member of Advisory Board, environmental Science: process & Impacts, Royal Society of Chemistry Publication.

8. Dr. Raju Kumar Gupta (CHE), Member of Editorial Board, IET Nanodielectrics, The Institution of Engineering and Technology.
9. Dr. Jayant Singh (CHE), Associate Editor, Journal Chemical engineering Communicattions (Taylor & Francis).
10. Dr. Jitendra K Bera (CHM), Member of Editorial Advisory Board, Organometallics, American Chemical Society.
11. Dr. Vinod K Singh (CHM), Regional Editor, Tetrahedron Letters, Elsevier Ltd.
12. Dr. Sandeep Verma (CHM), Member of Editorial Advisory Board, Royal Society of Chemistry.
13. Dr. Sandeep Verma (CHM), Member of Editorial Advisory Board, Cell Chemical Biology, Cell Press.
14. Dr. Sandeep Verma (CHM), Member of Editorial Advisory Board, Journal of Peptide Science, Wiley.
15. Dr. Sandeep Verma (CHM), Member of Editorial Advisory Board, Indian Journal of Chemistry, NISCAIR, CSIR.
16. Dr. Amalendu Chandra (CHM), Editorial Advisory Board, Journal of Physical Chemistry.
17. Dr. Jitendra K Bera (CHM), Editorial Advisory Board, Organometallics.
18. Dr. Sandeep Shukla (CSE), Editor-in-Chief, ACM TECS.
19. Dr. Satyadev Nandakumar (CSE), Guest Editor, Special Issue on Theory of Computing Systems, CCR.
20. Dr. Javed N Malik (ES), Member Editorial Board - Fast Track Articles, Journal of the Geological Society of India, JGSI/Springer: Bangalore.
21. Dr. G Neelakantan (HSS), Reviewer, IIMB Management Review, Elsevier Journal.
22. Dr. Avinash K Agarwal (ME), Board Member, International Journal of Engine Research, SAE International and IMechE, London, UK.
23. Dr. Avinash K Agarwal (ME), Associate Editor, Journal of the Institution of Engineers (India): Series C, Springer.

24. Dr. Avinash K Agarwal (ME), Associate Editor (Reappointed in 2017), Journal of Energy Resource Technology, Transactions of ASME, American Society of Mechanical Engineers.
25. Dr. J. Ramkumar (ME), Board member, IJP Tech, Inderscience Publisher.
26. Dr. Bishakh Bhattacharya (ME), Associate Editor, ISSS Journal of Micro and Smart Systems, Springer.
27. Dr. Anurag Gupta (ME), Board Member, Journal of Mathematics and Mechanics of Solids, SAGE Publications.
28. Dr. Anindya Chatterjee (ME) has been appointed Associate Editor of ASME Journal of Computational & Nonlinear Dynamics for 3 years.
29. Dr. Anindya Chatterjee (ME), Associate Editor, Journal of Computational and Non-linear dynamics, Transactions of ASME, American Society of Mechanical Engineers.
30. Dr. P. Venkitanarayanan (ME), Associate Editor, Journal of Dynamic Behavior of Materials, Society for Experimental Mechanics and Springer.
31. Dr. Mohua Banerjee (M&S), Member of the editorial board, Transactions on Rough Sets, LNCS journal sub-line, Springer.
32. Dr. Mohua Banerjee (M&S), Member of the editorial board, Fuzzy Sets and Systems, Elsevier.
33. Dr. Mohua Banerjee (M&S), Member of the steering committee, Indo-European Research and Training Network in Logic, IERTNiL.
34. Dr. Mohua Banerjee (M&S), Member of the council of the Association for Logic in India, ALI.
35. Dr. D Kundu (M&S), Member of the editorial board, IEEE Transactions on Reliability.
36. Dr. D Kundu (M&S), Member of the editorial board, Sankhya, Ser. B.
37. Dr. D Kundu (M&S), Member of the editorial board, Communications in Statistics - Theory and Methods.
38. Dr. D Kundu (M&S), Member of the editorial board, Communications in Statistics - Simulation and Computation.
39. Dr. Amit Dutta (PHY) Member of Editorial Board, European Physical Journal B.

Students' Awards

1. Mr. K. Subramanian (AE) won the best paper award for his paper titled *Optimum Design of Realistic Helicopter Rotor Blade with Variable Properties* at 5th Asian/Australian Rotorcraft Forum at Singapore.
2. Mr. Praveen Honhar and Mr. Satish Kumar (AE) have won Project Proficiency Award.
3. Mr. Ran Vijay Singh, Ms. Namrata Gupta, Charms Charly Punnoose, Makkapati Venkata Ramana and Rahul Ajay Deshpande (AE) have won Cadence Gold/Silver Award Medal.
4. Mr. Salil Goel (CE) won the best student paper award for his paper entitled *A Distributed Cooperative UAV Swarm Localization System: Development and Analysis* by the Institute of Navigation, USA.
5. Mr. Geet George and Mr. Chandan Sarangi (CE) received the Best Oral Presentation award at the International Conference on Aerosol Climate Change Connection (AC3) held in Bose Institute, Darjeeling.
6. Ms. Pradhi Rajeev (CE) received the Best Poster Presentation Award in the International Conference on Aerosol Climate Change Connection (AC3) held in Bose Institute, Darjeeling.
7. Ms. Shally Gupta (CHE) received Ambuja's Young Researcher's Award.
8. Mr. V Veeraswamy (CHM) has been selected for ICOS 21 Best Poster award for his poster entitled *Memory of Chirality (MOC) Concept: Stereoselective Synthesis of α,β -Diamino Ester, Aziridines, Cyclic 2-Oxo-Oxazolidines and Cyclic Urea Derivatives* in 21st International Conference on Organic Synthesis (ICOS21) held at IIT Bombay.
9. Mr. R. Parasuraman (CHM) has been selected for the Best Poster award for his presentation *Diastereoselective Overman Rearrangement of an L-Ascorbic-Acid-Derived Allylic Alcohol: Application in the Synthesis of (+)-1,2-Di-epi-swainsonine and a Tetrahydroxypyrrolizidine* in a recently organized INDO-GERMAN WORKSHOP on Recent Applications of Carbohydrates in Chemistry and Biology (RACCB-2017) held at IIT(BHU) Varanasi.

10. Mr. Anas Ansari (CHM) was selected for Michael C. Pirrung Best Poster award for his poster entitled *Diastereoselective synthesis of Sugar amino acids and Polyhydroxy amino acids via α -amination of aldehyde using proline as an Organocatalyst* in 21st International Conference on Organic Synthesis (ICOS 21) held at IIT BOMBAY.
11. Mr. Prithwidip Saha (CHM) has won the best poster award in theme *Scanning Probe Microscopy and Electron Microscopy* during the International Conference of Young Researchers on Advanced Materials (IUMRS-ICYRAM 2016) at IISc Bangalore.
12. Ms. Gagandeep Kaur and Mr. Nagaraju Barsu (CHM) are selected for the 67th Lindau Nobel Laureate Meeting, to be held in Lindau, Germany.
13. Mr. Rohit Gurjar (CSE) has been named the winner of the ACM India Dissertation Award, 2017 for his PhD thesis *Derandomizing PIT for ROABP and Isolation Lemma for Special Graphs*.
14. Mr. Sachin N P (Design Programme) won the Gandhian Young Technological Innovation Award from Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) for his M. Des. work entitled Anubhav- An efficient Braille Writing Tool.
15. Ms. Ekta Surender (Design Programme) has won the Bronze award in the STEM category of the Re-imagine Education Awards in 2016 Re-imagine Education Conference, organized by The Wharton School – SEI Center at the University of Philadelphia, and QS Quacquarelli Symonds, compiler of the QS World University Rankings.
16. Mr. C. Vimal (Design Programme) has won a Bronze award under Lighting Design category for IRILLA – TASK LAMP.
17. Mr. Mrityunjay Kumar and Swati Mittal (Design Programme) have been selected for the best paper award for their paper titled *Comparing the incubation effect between various age group of students during the creative problem-solving* at the International Conference on creativity and cognition in

art and design organized by NIMHANS and NID at NIMHANS convention center Bengaluru.

18. Mr. Eshan Sadasivan (Design Programme) received the 1st prize for his exhibit on *Design and development of a study companion for rural students in India* in HTC 2016 conference.
19. Ms. Priyanka Bharti (Design Programme) won the best poster award at the 6th International Conference on Research into Design (ICoRD'17) held at IIT Guwahati for her poster titled *Semiotic Analysis of Digital Medium of Education*.
20. Mr. Vineel Kumar Veludandi (EE) has been chosen the best presenter for presenting his paper titled *Noncoherent detection of DQPSK in OFDM systems using Predictive VA* at the 2016 International Conference on Communication, Image and Signal Processing (CCISP 2016), Dubai, UAE.
21. Mr. Soumitra Bhowmick (EE) received the best paper award for his paper titled *A New Coarse Timing Estimation Method for OFDM Signals*, at ICWMC 2016, Barcelona, Spain.
22. Dr. Anup Shukla (EE) received POSOCO award 2017 for his PhD thesis on Evolutionary Technique Based Solution to the Unit Commitment Problem including Renewable Energy Sources.
23. Ms. Anju Meghwani (EE) received POSOCO award 2017 for his Ph.D. thesis titled *DC Microgrid Protection: Challenges and Solutions*.
24. Ms. Anju Meghwani (EE) received Dr. Ramamoorthy best paper Award in Power Electronics and Drives for her paper entitled *A Fast Scheme for Fault Detection in DC Microgrid Based on Voltage Prediction* in the 19th National power Systems Conference (NPSC 2016).
25. Mr. Saurav Roy Choudhury (EE) received POSOCO award 2017 for MTech thesis on Dynamic voltage restorer with adaptive active filtering.
26. Ms. Nandini Negi (EE) received POSOCO award 2017 for her MTech thesis on Decentralized Adaptive Primary and Distributed Secondary Control for Radial AC Microgrid.

27. Ms. Debasmita Panda (EE) won the first prize for her work entitled as *Risk Based Optimal genco's Self* in M V Chauhan All India Student Paper Contest 2016.
28. Mr. Vivek Kumar Pandit (EE) received the award, the best poster across all the tracks of INDICON 2016 for his paper titled *Design of Dual-Band CPW-Fed Monopole Antenna with Dual Band AMC Surface for WLAN* at 13th International IEEE India Conference (INDICON 2016) at Bangalore.
29. Mr. Debdeep Sarkar, Ms. Yashika Sharma and Mr. Kushmanda Saurav (EE) have been awarded the first prize for oral presentation of their paper titled *A Compact Two Element MIMO Antenna System for Pattern and Polarization Diversity* in the Microwave Engineering and Antenna track of 3rd IEEE Uttar Pradesh Section International Conference on Electrical, Computer and Electronics (IEEE UPCON 2016).
30. Ms. Gaurangi Gupta (EE) has won the Best Paper in the Microwave Technology Track for her paper titled *Baluns for Dipole with Reflector* at the 13th International IEEE India Conference (INDICON 2016) at Bangalore.
31. Ms. Prama Bhattacharya (HSS) has been awarded the best paper award for her poster titled *Personal Recovery Amidst the Challenges of Social Suffering in Homeless Individuals with Severe Mental Illness: A Qualitative Inquiry* in the Poster session titled *Understanding Psychopathology and recovery* at the International Conference on Contemporary Trends in Clinical Psychology: Training, Research and Practice organized by the Department of Clinical Psychology, National Institute of Mental Health and Neuro Sciences NIMHANS, Bengaluru.
32. Mr. Tamerat Kebede (IME) has received the Best Paper Award for his paper entitled *Impact of information sharing in a non-serial supply chain with stochastic lead time* in the 20th Conference of Society of Operations Management, held in IIIT Gwalior.
33. Mr. Somen Dey (IME) won the Best Track Paper Award for Research Paper entitled *Relating flexibility of information systems to different planning process*

- styles, information systems architecture and strategy of the organization*. In Operations Management Track for 2017 at International Conference on Industrial Engineering and Operations Management Rabat, Morocco.
34. Mr. Mukesh Adlak (ME) received the best oral presentation award for *Large eddy simulation of mixing and combustion in a hydrogen fuelled scramjet computer with parallel strut injectors* at International Conference on Sustainable Energy and Environmental Challenges 2017 at Mohali.
35. Ms. Shweta Sharma (ME) received Raman Charpak Fellowship (Indo-French).
36. Dr. Akhilendra Pratap Singh and Dr. Chetan Patel (ME) received the Best Ph.D. Thesis Award at 1st ISEES International Conference on *Sustainable Energy and Environmental Challenges (SEEC-2017)* at Center of Innovative and Applied Bioprocessing (CIAB), Mohali, India.
37. Mr. Ayush Jain and Mr. Krishna Chandra (ME) received the Best M.Tech Thesis Award at the 1st ISEES International Conference on *Sustainable Energy and Environmental Challenges (SEEC-2017)* at Center of Innovative and Applied Bioprocessing (CIAB), Mohali, India.
38. Mr. Akhilendra Pratap Singh, Nikhil Sharma and Vikram Kumar (ME) received the best Oral Presentation Award in Track for their individual papers at 1st ISEES International Conference on Sustainable Energy and Environmental Challenges (SEEC-2017) at Center of Innovative and Applied Bioprocessing (CIAB), Mohali, India.
39. Ms. Ambreen Nisar (MSE) has won the IBM Best Ph.D Thesis Award 2017.
40. Mr. Akash Bajaj (MSE) received 2016 IIM Vidyabharati Prize.
41. Ms. Y. Pushpalatha Devi (MSE) won the second best poster award in EMSI 2016 (at IIT BHU) – *Microstructural and textural evolution during deformation in Zirconium-Oxygen dilute alloys*.
42. Mr. Subhasis Sinha (MSE) won the second best poster presentation award in ICoTMMB 2017 (at IISc, Bangalore) - *Effect of twinning on monotonic and cyclic deformation behaviour of hexagonal close packed titanium*.

43. Mr. Vikrant Kumar (MSE) received the best presentation award in the symposium Advance in Manufacturing in NMD-ATM2016 held at IIT Kanpur.
44. Mr. Sumeet Mishra (MSE) received the second best poster presentation award in ICoTMMB 2017 (at IISc, Bangalore) Effect of temper condition on rolling texture development in age hardenable Al-Mg-Si alloy.
45. Research paper authored by Mr. Abhinav Varsheney (MSE) received IIM SAIL GOLD MEDAL.
46. Mr. Prabhat Rai (MSE) received the best presentation award in the symposium Railway Materials & Processing.
47. Mr. Nitin Sharma (MSE) awarded Student Research Award at International conference on Recrystallization and Grain Growth held at Pittsburgh, USA.
48. Ms. Rita Maurya and Mr. Abdul Siddiqui (MSE) won the second prize for oral presentation in An Environmental Friendly Phosphate Chemical Conversion Coating on Novel Mg-9Li-7Al-1Sn and Mg-9Li-5Al-3Sn1Zn Alloys for Corrosion Protection.
49. Ms. Kalpana Rathore (MSE) won the Best poster award in NMD 2016 at IIT Kanpur – *Agar-based bio-composites for wound dressing applications with antibacterial properties.*
50. Mr. Sankalp Verma (MSE) received the Best oral presentation award in ICSM 2016 at MNIT, Jaipur – *Single step patterning of proteins: an effective approach for developing protein based sensors.*
51. Mr. Vinod Kumar Dwivedi (MSP) has been selected for the Best Poster Award for presenting the paper titled *Study of Optical Properties of Polycrystalline Yttrium Iridate (Y₂Ir₂O₇)* at the 61st DAE Solid State Physics Symposium (DAE SSPS 2016), held in KIIT University, Bhubaneswar, Odisha.
52. Mr. Jitendra K Pradhan (PHY) has been awarded the first prize in the Student Paper Competition in the URSI Regional Conference on Radio Science for his paper entitled *Wavelength selective dual-band mid-infrared metamaterial absorber/emitter.*

53. Mr. Sagar Paul (PHY) received the best paper award for his paper titled *Fabrication and characterization of micron size superconducting quantum interference devices (μ -SQUIDs) of lead (Pb)* presented at 26th National Symposium on Cryogenics & Superconductivity (NSCS26) at VECC, Kolkata.
54. Ms. Ritu Gupta (PHY) has been awarded the Raman-Charpak Fellowship-2016.

Major Projects sanctioned

1. Bifunctional approach to Small Molecule Activation: towards Sustainable Processes and Products (DAE).
2. Centre for Ganga River Basin Management (MOWRG).
3. PPP Mode Industry Project (Prototype Development Fund) (SEPL).
4. Coding of Innate Olfactory Preferences in the Mosquito Brain (WT).
5. National Carbonaceous Aerosols Programme (NCAP) Working Group-III Project (MOEFCC).
6. PPP Mode Industry Projects (Prototype Development Fund) (MMC).
7. Agarose Based Wound Dressing (DST).
8. Teaching Learning Centre for Internet-Of-Things (MHRD).
9. Optical Diagnostics of Transport Phenomena during Gas Hydrate Formation and Dissociation (ONGC).
10. Integration and Enablement of 0.18 micron RF-SOI Technology for Analog Mixed-Signal Applications (DST).
11. Rustam-II (Ver 4.0 Configuration) Wind Tunnel Model, Design, Fabrication & Testing (ADE).
12. Installation of a Pilot Plant of 10 KLD Capacity comprising ZnO-Graphene Based sensitive Photo Catalytic Filter For Visible Light Catalysis And Carbon Nano-Mat Fiber Filter For The Treatment Of Effluent Of CELP, Jodhpur As A Replacement Of Their Secondary Treatment Unit And Developemnt Of An

Alternative Low Cost Process For Dye Adsorption On Acid Modified Soil (DST).

13. Studies of Fire Propagation, Suppression and Scavenging with Associated Thermal Hydraulic Aspects in Multiple Compartments (BARC).
14. Deciphering the Structural Role of Glycogen in Neuronal Autophagy, and Neurodegeneration (UGC).
15. National Interdisciplinary Center for Cyber Security and Cyber Defense of Critical Infrastructures (SERB).

Labs/ Facilities developed

- Advanced Combustion & Acoustics Laboratory (AE).
- Bruker Micro-CT Model: SKYSCAN-1172 (BSBE).
- Lipidic Cubic Phase (LCP) Nanolitre Drop-dispenser for Crystallization (BSBE).
- SCADA Cyber Security Laboratory, Institute Initiation Grant (CSE).
- Computer Organization Laboratory (CSE).
- Transducers and Instrumentation Virtual Laboratory (202.3.77.143/virtuallab/): Transducers and Instrumentation Virtual Laboratory is developed under the project MHRD/EE/20100082 at IIT Kanpur. This lab caters mainly to students of UG level for conducting the experiments online and offline to have a feel of working of various transducers and related experiments (EE).
- Automatic Guided Vehicle Prototype: Automated Guided Vehicle Prototype has been developed under the project BOEING/EE/20100220. For navigation purpose, computer vision based machine learning algorithms has been used. Prototype is useful for the testing of various control strategies as well as vision based machine learning based algorithms (EE).

Software developed

1. Multi-species compressible flow solver for ISRO (AE).
2. NAAVIK (Navigation for Autonomous Aerial Vehicles by IIT Kanpur) (AE).
3. CARMA (Comprehensive Advanced Rotorcraft Modelling and Analysis) (AE).
4. Vertical Axis Wind Turbine (VAWT) (AE).
5. TASS: Temperature Accelerated Sliced Sampling Program (CHM).
6. QM/MM using CPMD/GULP Interface: A Module for CPMD program (CHM).
7. MATLAB Toolbox on Bicustering (EE).
8. BIDEAL Toolbox on Bicustering and Gene Pattern Analysis (EE).
9. Desktop Application for Sensitive Position Finding (EE).
10. Condition Based Monitoring using Smart phones/Tablets (EE).
11. Vision Based for Inventory Management (EE).
12. Pseudo spectral code TARANG that scales up to 196608 processors of Cray XC40 (PHY).

Technologies developed

1. Modeling and analysis of horizontal stabilizer with corrosion of a light transport aircraft (AE).
2. Design and Development of Solar UAV having span of around 5.35 m, weight around 16 kg and endurance of about 10-14 hrs (AE).
3. Design and development of both battery powered (endurance 2 hrs) and IC engine powered UAV (endurance 6 hrs) (AE).
4. Medicament and Diagnosis for SPINK1 Positive Cancer (BSBE).
5. Integrated Bio-Artificial Liver (BAL) for treatment of acute liver failure (BSBE).
6. Nano Hydroxyapatite based bone substitutes for clinical applications (BSBE).
7. Technology for cell storage and transportation (BSBE).
8. Improved method for extraction of lipopolysaccharide (BSBE).
9. Growth factor binding preformed injectable scaffolds with shape memory properties for cartilage tissue engineering (BSBE).

10. Enzymatically cross linked injectable hydrogel for growth factor delivery for in situ chondrogenesis (BSBE).
11. High speed SWIR Photodiode Arrays (EE).
12. Nonlinear Optical Embedded Ring high speed switches (EE).
13. Intelligent CBM through Smart phones and Tablets: Intelligent Condition Based Monitoring System is developed at IIT Kanpur under the project BOEING/EE/20100220. It is used for detection of various faults in industrial reciprocating air compressors using smart applications developed on various platforms i.e. Smart phones and Tablets (EE).
14. Sensitive Position finder for Sensor Data Acquisition: Sensitive position finder is an application developed at IIT Kanpur under the project BOEING/EE/20100220. It is a ranking based system that detects the most sensitive position around the machine for positioning a sensor (EE).
15. Amla Grating machine by RuTAG (ME).
16. Bela Slicing machine by RuTAG (ME).

Graduation Data

Programme	Number of Students
Ph.D.	160
M. Tech	339
MBA	33
M. DES	24
VLFM	40
M. Sc (2 Year)	127
M. Sc. (Integrated)	2
B. Tech-M. Tech (Dual Degree)	142
B. Tech	515
BS	72
Double Major	12
BS-MS	62
BT-MS	5
BS-MBA	1
MS-PD (for the award of MS-2Yr. degree)	10
Total	1544

- No. of UG and dual degree students graduating with 1 minor : 152
- No. of UG and dual degree students graduating with 2 minors : 17
- No. of UG and dual degree students graduating with 3 minors : 1
- No. of UG and dual degree students graduating with distinction : 174
- % of UG and dual degree students graduating with distinction : 21.5%



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