# Annual Report

## 2019-2020

(April 1, 2019 - March 31, 2020)

DIAMOND JUBILEE
60 YEARS
IIT DELHI

भारतीय प्रौद्योगिकी संस्थान दिल्ली
INDIAN INSTITUTE OF TECHNOLOGY DELHI

**INDIAN INSTITUTE OF TECHNOLOGY DELHI**

www.iitd.ac.in

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# Contents

# About us

## History

The concept of the IITs was first introduced in a report in the year 1945 by Shri N.M. Sircar, then member of Education on Viceroy's Executive Council. Following his recommendations, the first Indian Institute of Technology was established in the year 1950 in Kharagpur. In his report, Shri Sircar had suggested that such Institutes should also be started in different parts of the country. The Government having accepted these recommendations of the Sircar Committee decided to establish more Institutes of Technology with the assistance of friendly countries who were prepared to help. The first offer of help came from USSR which agreed to collaborate in the establishment of an Institute through UNESCO at Bombay. This was followed by the Institutes of Technology at Madras, Kanpur and Delhi with collaborations with West Germany, USA, and UK respectively.

IIT Delhi, established as College of Engineering in 1961, was later declared an Institute of National Importance under the "Institutes of Technology (Amendment) Act, 1963", re-named as "Indian Institute of Technology Delhi", and accorded the status of a deemed university.

Presently, Indian Institute of Technology Delhi is one of twenty-three IITs for higher education, research and development in science, engineering and technology, humanities and social sciences, and in management in India. The others are at Bhilai, Varanasi, Bhubaneswar, Bombay, Dhanbad, Dharwad, Gandhinagar, Goa, Guwahati, Hyderabad, Indore, Jammu, Jodhpur, Kanpur, Kharagpur, Madras, Mandi, Palakkad, Patna, Roorkee, Ropar, and Tirupati.

## Status

Indian Institute of Technology Delhi is an autonomous statutory organisation of the Government of India, functioning within the "Institutes of Technology Act, 1961" as amended by the "Institutes of Technology (Amendment) Act, 1963". It is accorded the status of a deemed university with powers to frame its own academic policy, to conduct its own examinations, and to award its own degrees. The twenty-three Institutes of Technology are coordinated by an apex body known as IIT Council with the Minister for Education of the Government of India as its Chairperson. The Institute was declared as an "Institute of Eminence" by the Government of India in 2018.

## Campus

The Institute campus extends over an area of 320 acres. Tastefully laid out with the picturesque landscape and with numerous buildings of various types and, with clean and wide roads, the campus presents a spectacle of harmony in architecture and natural beauty. The campus area has been divided into four functional zones:



IIT Delhi Campus Map

- Residential zone for students;
- Residential zone for the faculty and other supporting staff;
- Academic zone for academic buildings and workshops; and
- Cultural-cum-social and recreational zone for students.

The site being longitudinal in shape, the academic and social-cum-cultural zones have been located mid-way between the two residential zones. The campus provides several essential amenities for community living like hospital, shopping center, banks, post office, community center, staff club, students' activities center, stadium and playing fields etc.

IIT Delhi has been extending its boundaries. One extension campus has been established in Sonepat, Haryana over 50 acres of land allocated by the Government of Haryana. A Technopark with high class facilities has been setup there. Another extension campus is planned in Jhajjar, Haryana over 50 acres of land.
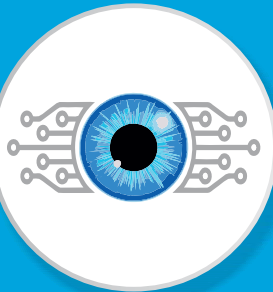
## VISION

- To contribute to India and the World through excellence in scientific and technical education and research; to serve as a valuable resource for industry and society; and to remain a source of pride for all Indians.

## MISSION

- To generate new knowledge by engaging in cutting-edge research and to promote academic growth by offering state-of-the-art undergraduate, postgraduate and doctoral programmes.
- To identify, based on an informed perception of Indian, regional and global needs, areas of specialization upon which the Institute can concentrate.
- To undertake collaborative projects which offer opportunities for long-term interaction with academia and industry.
- To develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge in a range of professions.

## VALUES

- Academic integrity and accountability.
- Respect and tolerance for the views of every individual.
- Attention to issues of national relevance as well as of global concern.
- Breadth of understanding, including knowledge of the human sciences.
- Appreciation of intellectual excellence and creativity.
- An unfettered Spirit of exploration, rationality and enterprise.

# Message from the Director

**Prof. V. Ramgopal Rao**

IIT Delhi is pleased to release its Annual Report for the year 2019-2020 and I am delighted to share with you the highlights of our major activities, achievements, initiatives and future plans.

Over the years, quietly but surely, we have also built a strong research tradition, which is easily seen in the impressive statistics that the Institute can boast of in terms of various research indicators. Specially, we have continuously improved on our credentials in research as evidenced by way of publications and citations and Ph.Ds per faculty. Our target of continuously searching for and significantly increasing the intake of quality candidates into our Ph.D programmes is on the right course and we have grown to a significant level in this direction over the last few years.

End of the last financial year brought unique challenges presented to the mankind in form of COVID-19 pandemic. The current activities and future plans have all plagued with deep uncertainty. Though, there are few realities that the nation will continue to demand quality education and research from premier institutes like Indian Institutes of Technology. And, the IIT Delhi community will continue to overcome the challenges to provide solutions that are of immediate needs. The current pandemic has changed the spectrum of research

focus for now, that is infection testing, personal protection equipment, vaccine and drug research. At the same time, we will continue to focus on research in clean energy, environment, sustainable infrastructure, healthcare, materials, Industry 4.0 and advanced computational systems (including AI). IIT Delhi has made significant contributions in many areas including academic activities, research, innovation and technology development in pursuit of its excellence.

### Ranking of IIT Delhi

It is a great pleasure and privilege for me to share that in the recently announced NIRF (National Institutional Rankings Framework), IIT Delhi has improved its rankings both in the Engineering as well as in the Overall category. In the Engineering Category, IIT Delhi is now ranked No. 2 in the country for 2019. IIT Delhi has scored highest in Research and Professional Practice parameter with a score of 96.18 among the top engineering institutions. In the rankings published by India Today, IIT Delhi has been ranked #1 in 2019. Also, in the QS world university rankings, IIT Delhi secured an overall rank of 182 in 2020 and in the Engineering category, IIT Delhi is ranked at No. 61 in the world. In the QS India rankings 2020 IIT Delhi ranks 3 in India, in 2019 IIT Delhi was ranked 4, an improvement by one rank. We

have continuously improved our ranking in the last 3 years both in NIRF as well as in the Engineering category of QS World ranking. Also, in the Research Impact category of QS World ranking, IIT Delhi scored 80.6 marks out of 100, making it to the league of top research universities across the world.

## Institution of Eminence

As you all know, IIT Delhi has been bestowed with the status of Institution of Eminence in 2018. Under the IoE status, the Institute has undertaken many new initiatives covering academic, research, administrative and infrastructural domains during the year. All these initiatives undertaken are making a good progress. Kudos to the entire faculty fraternity, students and staff for their outstanding contributions leading to the IoE recognition for the Institute. Let us realize that we stand on the shoulders of alumni, the retired faculty, the past leadership and the ex-employees of the institute, as well as our well-wishers. We have created a dedicated IoE website for information dissemination to external stake holders for the purposes of transparency and accountability. Interdisciplinary research for impactful research, Internationalization for enhanced cultural diversity and Industry connect for bringing relevance & delivery to our research form the hallmark of IIT Delhi's IoE strategy.

The Institute will continue to stress on the 3 I's – Internationalization, Interdisciplinary research and Industry Connect under the IoE umbrella. The Institute will look to increase faculty strength (including foreign faculty), increase fraction of international students (especially in PG and Ph.D. programmes) and produce research in key thrust areas that are interdisciplinary in nature and have wide societal impact. Institute will look to explore joint PG degree programmes (especially with foreign universities) and strengthen student exchange to boost internationalization and cultural diversity.

## Research and Development

The collective vision of IIT Delhi is to be a leading academic institution in the world by advancing knowledge through high impact research and impart quality education to produce technologically adept and socially conscious professionals, and by catalyzing innovation-driven entrepreneurship, thereby addressing strategic goals of the nation and needs of global society. Our endeavor is to raise the bar and set higher benchmarks for ourselves and for the rest of the country.

I must say, our efforts in all these directions are bearing fruit. We made offers to 3 International faculty (non-Indian origin) in the last few months and also admitted 7 times more international students this year compared to last year. We also started two new joint Ph.D. programmes with top universities abroad, one with the University of Queensland in Australia and another with NCTU in Taiwan. Together, in both these joint Ph.D. programmes we admitted 30 Ph.D. students in the last one year. Faculty visited various universities in the USA, Malaysia, Bangladesh, and Australia for attracting foreign students and faculty to IIT Delhi. We also launched a scheme for attracting foreign Ph.D. students to IIT Delhi by creating an International Ph.D. Fellowship Programme (IPFP) with 500 fellowships. IPFP was launched with about 65 students joining the programme in one semester this year. We also started a new M.Tech. programme in Renewable Energy Technologies & Management sponsored by the International Solar alliance. In this M.Tech. programme we have students from 18 developing countries. Thanks to IIT Delhi's efforts, a programme was also formally launched by MHRD and MEA to fund 1,000 scholars from Association of Southeast Asian Nations (ASEAN) to pursue Ph.D. in the Indian Institutes of Technology (IITs). IIT Delhi has been designated by MoE as the national coordinating IIT for the ASEAN Ph.D. fellowship programme. Our goal is to have at least 20% of our Ph.D. students as international students or as part of these international joint Ph.D. programmes over a period of time. IBM - IITD AI Horizons Network (Neuro-Symbolic Information Systems), Indo-Korea Joint Network Centre on Robotics (Human-Centered Robotics), Indo German Science and Technology Centre (Biotechnology for recovery from waste) are some of the other major research projects initiated with international partnerships.

Some of the major research initiatives undertaken by the Institute include – Faculty Interdisciplinary Research Programme to enhance interdisciplinary and collaborative research across the Institute; Faculty Innovation and Research Driven Entrepreneurship (FIRE) for promotion of entrepreneurship culture among faculty; 1-2-3-4 Discover and Learn Projects Scheme to enhance research aptitude among undergraduate students and increase the component of 'learning by research'; IRD Student Startup Action Scheme; Summer Undergraduate Research Award; IRD Early-Doc Fellowship Scheme to support Ph.D. students after the successful completion of Ph.D. viva-Voce examination to complete the manuscript writing out of thesis work; Research Excellence Travel Award to top 20% of Ph.D. students who are within five years of their registration and have completed the comprehensive examination requirements, but not submitted thesis; Village internship programme for students of IIT Delhi to give them an exposure to rural problems, multiple immersion programmes etc.

Also, thanks to the generous support of our alumni, we have 34 endowed chair positions for faculty and also created research excellence awards for our faculty who excel in research.

On the interdisciplinary research front, IIT Delhi has entered into MoUs with All India Institute of Medical Sciences (AIIMS), National Institute of Immunology (NII), Indian Council for Agricultural Research (ICAR), 5 CSIR laboratories (NPL, CEERI, AMPRI, IMMT and CSIO) and the All India Institute of Ayurveda (AIIA). 95 new funded projects under the Faculty Interdisciplinary Research Programme (FIRP) have been sanctioned between faculty within the Institute and with faculty from AIIMS, ICAR, NII etc. IIT Delhi is also taking major steps to connect with the industry. We have created a Dean (Corporate Relations) office and staffed it with professionals to give a boost to our industry interactions.

In order to jump start the research activities of newly joined faculty members, IIT Delhi provides a seed research funding to the new faculty upon joining the Institute to the tune of ₹50 lakhs or more when necessary. During the year, the Institute sanctioned the New Faculty Research Grant of a total of ₹967.58 lakhs to 57 faculty members as per their needs.

As the Research & Development activities are seeing a robust growth at IIT Delhi, our focus has also been to strengthen the "Relevance & Delivery" aspects of our research. IIT Delhi has been entrusted with the responsibility of being the nodal coordinating institution for the country by MoE for the Unnat Bharat Abhiyan (UBA) programme of Govt. of India. Till date, a network of 2244 Participating Institutions (PIs) with more than 11000 villages have been adopted under the Unnat Bharat Abhiyan. This year we have created 44 Regional Coordinating Institutions (RCIs) in the country (covering all the states) for smooth functioning/implementation of programme in effective manner. These institutes are IITs, NITs, central and state Universities. There are 11 Subject Expert Groups (SEGs) working on the subject specific problems for technical and management interventions/guidance to participating institutions in Agriculture, Water management, Rural energy, Craft and artisans, Rural Sanitation, Ethos in technical education, School education, Rural Infrastructure, Capacity Building, etc.

An MoU with DRDO for setting up a Joint Advanced Technology Centre was finalized and initially projects in 3 verticals were approved. JATC subsequently expanded to five verticals and more projects have been initiated. One set of JATC Labs have been made functional. Two sets of projects are being assessed.

15th OPEN HOUSE of IIT Delhi was held on 20th April 2019. Like in earlier years, the event received overwhelming response this year too. About 3500 students registered for the open house. In addition to invited lectures by IIT Delhi faculty for school students and a display of 300 posters by students, there were about 60 live demonstration of products and technologies. Demonstration of Glass blowing skills, robotic display, aero-modelling competitions were some of the other attractions.

IIT-Delhi has registered around 33% increase in the total number of women candidates this year through JEE. The actual number increased from 139 in 2018 to 189 in 2019. PG and Ph.D. programmes are continuously seeing an increase in number of women candidates which stands at around 28% at present

In the last financial year, a total of 280 sponsored projects were sanctioned to the Institute with a total value of ₹329.61 Crores. Industrial consultancy is another significant area of activity in the Institute. The nature and extent of the industrial consultancy projects undertaken by the Institute is an index of its credibility with the industry and other institutions. In the last financial year, a total of 345 consultancy projects were sanctioned with a total value of ₹35.95 Crores including 67 projects undertaken through FITT. Institute also received 27 high value projects valued more than ₹1 Crore each. The most prominent projects include, establishment of Sophisticated Analytical and Technical Help Institute (SATHI), DST - IITD Energy Storage Platform on Batteries (ESPOB), creation of Technology Innovation Hub (TIH) on Cobotics, Design and Demonstration of Sustainable Building Infrastructure under CoESI and Enhancing India's Policy Analysis Capabilities to Meet Energy and Environment Challenges with Children's Investment Fund Foundation, UK.

IIT Delhi has many Centers of Excellence (CoEs) carrying out cutting edge research in interdisciplinary areas. These CoEs are funded by industries, alumni and government. The CoEs are currently working on aspects such as air pollution, 5G technologies, Industry 4.0, Renewable energies etc.

Enhancing India's Science, Technology and innovation Policy Analysis Capabilities (Tata Education and Development Trust), Nanoelectronics Network for Research and Application (DST, MEITY), Building end to end 5G Test Bed (MEITY), Social Media Analytics for Security (National Security Council Secretariat) are some of the major research projects undertaken this year. Joint Advanced Technology Center, created with funding from DRDO is making rapid strides with projects in 5 verticals being supported by JATC right now. IIT Delhi is also one of the three institutions identified by DST, Govt. of India for setting up a 'Sophisticated Analytical and Technical Help Institute' (SATHI) in our Sonipat campus with

a funding of ₹125 crores. With the SATHI facilities and the Institute's close to ₹100 crore investments made in the Central Research Facilities, IIT Delhi is on its way to creating the best in class research infrastructure in the country for advanced research.

## Grants from MHRD

In the Financial Year 2019-20, the Institute received ₹611.69 Crores as grant (₹541.60 Crores for Recurring Expenditure and ₹70.00 Crores for Non-recurring Expenditure) under 0920 Scheme (Support to IITs) from MHRD. The Institute generated about 16.17% of the actual recurring expenditure through internal revenue generation from fees, sponsored research, consultancies and continuing education programmes.

## Academic Initiatives

We have also undertaken major steps to augment our educational offerings. In the last two years alone, we have created two new Departments (Department of Design & Department of Materials Science and Engineering), two new Schools (School of Public Policy & School of Interdisciplinary Research) and two new Centers (Center for Automotive Research & Center for Sensors, Instrumentation and Cyber Physical Systems Engineering). In the year 2020, IIT Delhi will be launching multiple new degree programmes, which include a B.Tech. programme in Material Engineering, a B.Des. programme in Design, a new M.Sc. programme in Economics and another M.Sc. programme in Cognitive Sciences among others which are currently in the planning stage. IIT Delhi has also announced the PG Diploma programme, through which a one year diploma will be offered by the Institute in specialized areas. Framework for Joint Diploma with a partner Institution is also approved. A new M.Tech. programme on Renewable Energy Technologies and Management for sponsored candidates was started by the Centre for Energy Studies, IIT Delhi. The programme is being sponsored by International Solar Alliance (ISA), and administered by the National Institute of Solar Energy (NISE, Delhi). A new M.Tech. programme in Energy & Environment Technologies and Management was also started by the Centre for Energy Studies. A new Master of Science (Research) programme in Materials Science and Engineering and VLSI Design Tools and Technology were initiated this year. A new M.Tech. programme in Materials Engineering was also started by the department of Materials Science and Engineering. Our Board of Educational Research and Planning has also approved a new M.Tech. programme in Artificial Intelligence & Machine Learning.

## Technology Development, Innovation and Outreach

IIT Delhi has by far the best eco-system for startups in the country. IIT Delhi alumni have created close to 600 startups, the highest in the country as compared to alumni of any other institute. Of the close to 30 unicorns created by Indians, 15 of them are by IIT Delhi alumni alone. IIT Delhi alumni led startups have created over 30 million jobs and raised USD 15 Billion in investments and have been the trend setters in the country as well as in other countries. We are further building upon this culture of innovation and wish to produce more and more job providers rather than job seekers. Institute has taken many new steps in this direction. Towards fostering innovation-led start-ups, FITT has enabled the establishment and operation of thriving incubators, namely; Technology Business Incubation Unit (TBIU), Bio-technology Business Incubation Facility (BBIF) in the IIT Delhi campus and the Sonipat Residential Incubator (SRI) at the IIT Delhi Technopark (ITEC), Sonipat. The TBIU is a flagship institute programme designed primarily to promote partnership with new technology entrepreneurs and start-up companies, and also to serve a medium of technology transfer.

IIT Delhi has launched a Platform for Harnessing Deep Technology (PHD) Startup incubator for creating an eco-system for Ph.D. graduates to start their entrepreneurship journey. This programme is designed to support innovators and entrepreneurs to carry forward a promising deep technology idea and generate proof of concept to validate the idea. With the infrastructure, mentorship and funding support, the Harnessing Deep Technology (PHD) incubator programme is designed to help entrepreneurs working in deep technology domains to take a quantum leap towards commercialization. This programme envisions to support deep technology ideas that may be high risk, but at the same time, have substantial market potential. In the first round, two deep tech startups have been incubated in the PHD incubator.

As part of our outreach activities, institute has made significant efforts in the last one year to connect with the industry. The major initiatives and the activities of the Institute for collaboration with industry include the Postgraduate Executive Programme in collaboration with NITIE, Mumbai in Visionary Leaders for Manufacturing; Common Engineering Facility Centre in collaboration with Automation Industry Association and active participation in the Uchhatar Avishkar Yojana and the IMPRINT schemes of MHRD. There are also 14 Centers of Excellence created with participation of external agencies and industries at IIT Delhi. IIT Delhi also has created a full-fledged Dean (Corporate Relations) office with professional staff managing it. The corporate relations team organized the institute's third annual flagship event, Industry Day 2019 on 21st September, 2019. Industry Day 2019 witnessed discussions and deliberations

by illustrious speakers from Thermax, Reliance Industries, SEMI and many other thought leaders on the themes - Clean Energy for Sustainable Economy and Environment; Sustainable Medical Technologies; Emerging Nano and Advanced Materials; Sustainable Environment; and Make in India. More than 25 hands-on products were demonstrated. The event also showcased over 130 industrially relevant posters by our Ph.D. students. Another special feature was a session on 'Women in Science' that discussed the need for gender parity in various science disciplines by women personalities from various fields. This was followed by a Deep Tech Panel Discussion. 'Research Café' sessions were also held on the sidelines to facilitate interaction between IITD research scholars and Chief Executive Officers of Industry.

## Faculty

Our faculty members are among the finest in the country and are recognized internationally for their quality of research, teaching and curriculum development. They also contribute greatly for the development of the nation by being associated with a large number of decision making bodies, providing crucial guidance and advice on policy matters and technical issues. 43 new faculty members and 42 Post-Doctoral Fellows have joined the Institute in the last one year.

The Institute has also created new faculty positions, viz., Professor of Practice and Adjunct Professor of Practice to induct suitable candidates as faculty with industrial background from the academic Session 2019-20 for teaching, research and development. These appointments will be on the same lines as that of the Visiting Professors and Adjunct Faculty respectively within the overall sanctioned strength of the academic/faculty positions.

Our distinguished faculty colleagues continue to make a difference to the world of Science, Engineering, Humanities and Management and continue to earn recognitions and awards which bring glory to the Institute. Many of them have been bestowed with honours, awards and elected as Fellows of several professional national and international bodies during the last one year. The awards/honours/recognitions received by the faculty members during the period have been mentioned separately.

## Infrastructure

Infrastructure becomes a key element for sustenance of the rapid progress institute is making in all of its activities. Institute has also crossed the 10,000 student enrolment mark this year in 2019. We have ongoing infrastructure projects with an investment of over ₹750 crore on the campus right now. These include one fully air-conditioned boys hostel with a capacity of 896, one fully air-conditioned girls hostel with a capacity of 320, one faculty housing complex with a total of 154 flats, one sports complex, two engineering blocks with a total area of 7,25,000 sq.ft, a 2,04,000 sq.ft. science and innovation park and one married students hostel with 103 flats. All these projects will be completed between December 2019 to August 2020. Once completed, these facilities are expected to significantly ease the space constraints on the campus. We have multiple new infrastructure projects which will be starting this year. We are also looking at a public-private partnership model for the running of our hostels this year. We believe, this will greatly enhance the efficiency of our hostel operations.

## Students' Activities

The Institute hosts a plethora of student related activities such as cultural festival, sports meet, hackathons, library events etc. The cultural event 'Rendezvous', among the largest one in the country was organized between 2 to 5 October, 2019 that saw a large participation among student fertility across the country.

Among other activities, Fit India Movement was celebrated at the institute on August 29, 2019 that saw a fitness camp and sporting competitions among faculty, staff and students of the institute. SPIC MACAY has organized events in the month of September.

The institute clinched the first runners-up trophy in the 54th Inter IIT Sports Meet held in Kharagpur and Bhubaneshwar. IIT Delhi also have the highest number of Best Player awards among all IITs. In the 26th Inter IIT Staff Sports Meet held at IIT Kharagpur, IIT Delhi staff contingent won the General Championship Trophy (Men) for the second year in a row.

In usual tradition, an Inter hostel sports competition was organized and institute's contingent continued to participate and win prizes in sports, cultural and technical events organized at other institutes.

## Training & Placement

As in the past the Training and Placement Unit continued to plan, organise and consolidate the Training and Placement activities for students. It actively interacted with various industrial, technical, management and research organisations in the country. The dual aim of establishing this rapport is to ensure that students are given adequate technical exposure/industrial training and subsequently get employment in organisations which match their aspirations and objectives. The Training & Placement Unit was rebranded to Office of Career Services (OCS) in November 2019 to reflect the expanded scope of

activities being handled by the unit. Training rules as per the new curriculum guidelines were implemented for the UG students (B.Tech. and Dual degree). A total of 370 students availed internships through T&P/OCS processes.

The vigorous drive undertaken by the OCS resulted in job requisitions being obtained from industries from 430 Companies for 602 job profiles with selections on 271 profiles. 943 students were placed while a total of 1092 job offers were received (187 Pre-Placement Offers were received by students and 60 students got multiple jobs) by the institute including DMS and T&P/OCS placements. Approximately 85.88% students who availed T&P/DMS services got placed. The remaining opted for higher studies/research or are preparing for civil services or are working on their own startup ideas or got jobs through their own contacts/efforts.

## Human Resource Development

On the human resources front, in order to enhance the efficiency of our employees, many training programmes are regularly conducted including Executive Development programmes for the officers. To encourage the employees to work in Hindi and also in compliance with the direction of the government, special training programmes were also conducted for use of Hindi in official transactions. The Institute is in an advanced stage of implementing the ERP System for a paperless work environment to automate its operations in all the functional areas. It has already implemented some modules online. The recruitment process for staff is in full swing as per the Recruitment Rules approved by the Board of Governors which will equip the Institute with adequate manpower for efficient functioning.

The Institute extends good medical facilities to the serving and retired employees through IIT Hospital, CGHS recognized hospitals and medical insurance scheme. The Hospital is well equipped to take care of primary emergencies.

## Alumni Activities

While the Government has supported us with generous funding for infrastructure for which we are grateful, our alumni have extended significant support to the Institute. Our alumni have given donations to help us take some of our important projects forward, in addition to instituting Chairs and the Young Faculty Incentive Fellowships, both of which help us to reward our bright faculty for their outstanding performance.

Our alumni are among the most distinguished in the world. At IIT Delhi, we have put in place various structures through which they can contribute to the institute activities. Alumni engagements are managed through Dean of Alumni Affairs & International programmes. A monthly newsletter has been started covering the activities of Alumni, Faculty and Students. During this period 11 editions of the newsletters have been brought out. A number of campaigns seeking the support of the Alumni have been launched on Alumni Portal as well as on other platforms. This apart, mentorship opportunities are now available for the Institute students on the portal. A number of students have benefitted out of this. The portal is also being used by Alumni and others for advertising interesting job opportunities for students as well as Alumni. This portal is one of the most effective ways of engaging with our alumni.

The fund raising for the Institute objectives saw a major growth. The Alumni Reunions organized played an important role in further deepening the bond of mutual love and respect that has existed between the Institute and its Alumni.

Hon'ble President of India Shri Ram Nath Kovind launched the IIT Delhi Endowment fund on 31st October 2019. IIT Delhi alumni will contribute to this fund which will be operated on the lines of such funds being run by the leading universities of USA like Harvard and Stanford. The fund already has a commitment of ₹255 crores and it is expected to touch ₹1,000 crores by the end of 2020. The final goal is to set up an endowment model at IIT Delhi that will achieve the target corpus of USD 1 Billion over a period of seven years. The fund will have a transparent structure and corporate governance model that will work towards building a relation of trust and credibility with its alumni through better communication, professionally managed team structure and periodic reporting.

A governing Board of Advisors for the fund which will consist primarily of alumni and the IIT Delhi administration (Director and Dean Alumni Affairs). The earnings from the fund will be utilized under the guidance of this Governing Board of Advisors for IIT Delhi. The prominent donors are: Binny Bansal, Sachin Bansal, Sandeep Singhal and Kavita Iyer Singhal, Vikram Gupta and partners from Ivycap Ventures, Amarjit Bakshi, Saurabh Mittal, Arun Duggal, Neeraj Arora, Sujeet Kumar, Sashi Reddy, Amar Sawhney, Ranu Vohra, Surendra Jain, Gautam Kumra, Gaurav Kushwaha, Sujeet Kumar and Jassi Chadha. All of them have contributed/committed anywhere from 5 Crores to 100 crores for the Endowment fund in the two months. Institute thanks them immensely for their contributions.

## Convocation and Alumni Awards

The 50th Convocation of the Institute was held

on 2nd November, 2019. Dr. K. Sivan, Secretary, Department of Space & Chairman, Indian Space Research Organization (ISRO) was the Chief Guest.

The Institute recognizes the outstanding contributions made by the alumni in various areas by conferring the Distinguished Alumni Awards and Distinguished Alumni Service Awards each year at the Convocation to recognize their achievements and outstanding contributions to academics, business, profession and/or public service. This year Distinguished Alumni Awards were conferred on Mr. Binny Bansal, Co-founder Flipkart, B.Tech. 2005 (CSE) for his outstanding contributions in Entrepreneurship; Prof. Srinivasan Keshav, University of Waterloo, B.Tech. 1986 (CSE) for his outstanding contributions in Teaching and Research and Dr. Mohit Aron, Founder Cohesity & Co- founder Nutanix, B.Tech. 1995 (CSE), for his outstanding contributions in Entrepreneurship. The Distinguished Alumni Service Awards were conferred on Mr. Arun Duggal, Chairman ICRA, MCF Ltd, IARC, B.Tech. 1967 (Mechanical Engineering) and Mr. Amarjit Singh Bakshi, MD Central Park, Bakshi Group, B.Tech. 1967 (Civil Engineering) for their significant efforts and contributions made towards the development and progress of the Institute.

I would like to acknowledge the support received in abundant measure from the Ministry of Human Resource Development, the various sponsoring agencies, the collaborating industries, institutions and alumni. I personally acknowledge the support and encouragement I have received from the Members of the Board of Governors, and from all my colleagues, and extend my appreciation to the students for their exemplary behavior and their contributions towards enriching the campus life.

Wishing IIT Delhi to reach new heights!

Jai Hind!

Director
Indian Institute of Technology Delhi
Email: director@admin.iitd.ac.in
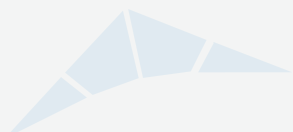
# Year in Review

(April 1, 2019 - March 31, 2020)

**1st**

**IIT DELHI** has been **Ranked** in the **First Position** by India Today and **Second Position** by NIRF amongst all the **ENGINEERING COLLEGES** in **INDIA**

Total **STUDENTS** on **ROLL**
**9700**

**PG STUDENTS** on **ROLL**
**2565**

**UG STUDENTS** on **ROLL**
**4102**

**FEMALE STUDENTS** on **ROLL**
**2085**

**RESEARCH SCHOLARS** on **ROLL**
**3033**

Total **ADMISSION**
**3054**

**POST GRADUATE ADMISSION**
**1267**

**UNDER GRADUATE ADMISSION**
**1054**

**RESEARCH SCHOLAR ADMISSION**
**733**

Total **GRADUATES**
**2042**

**PG GRADUATES**
**886**

**UG GRADUATES**
**825**

**RESEARCH SCHOLAR GRADUATES**
**331**

**FACULTY STRENGTH**
**673**

**NEW FACULTY MEMBERS JOINED**
**43**

**NON-ACADEMIC STAFF**
**650**

**FOREIGN STUDENTS** Over **31 COUNTRIES**
**110**

**NEW COURSES DEVELOPED**
**102**

**INTERNATIONAL MOUs**
**122**

**NATIONAL MOUs**
**30**

**3260 RESEARCH ARTICLES PUBLISHED**
by the faculty members and researchers of the Institute in International Journals

Titles of **E-BOOKS** added under the **CENTRAL LIBRARY COLLECTION**

**436**

**2842 ARTICLES INDEXED** in **SCOPUS**
An International Indexing Service in Science & Technology and Social Sciences

**PRINTED BOOKS** added under the **CENTRAL LIBRARY COLLECTION**

**1242**

**280**
New **SPONSORED RESEARCH PROJECTS**
with a **TOTAL FUNDING** of ₹**329.61** CRORES

**113**
**GRADUATES** received the **AWARDS/MEDALS/CASH PRIZES** at the **50th CONVOCATION**

**345 CONSULTANCY JOBS** with a **TOTAL VALUE** of ₹**35.95** CRORES

**OVER 250**
- **SEMINARS**
- **CONFERENCES**
- **WORKSHOPS**
- **LECTURES**

**21 COLLABORATIVE PROJECTS / CONSULTANCIES** with **INTERNATIONAL FUNDING**

**TOTAL PLACEMENTS 943**

**OVER 118 NEW EQUIPMNENT INSTALLED**

**UNDER GRADUATE 595**

**POST GRADUATE 348**

# Administrative Organisation

(April 1, 2019 - March 31, 2020)

## BOARD OF GOVERNORS AND ITS COMMITTEES

IIT Delhi is an autonomous organisation of the Government of India. Responsibility for the general superintendence, direction, and control of the affairs of the Institute is vested in the Board of Governors. The Board functions through its standing committees - the Finance Committee, the Buildings & Works Committee and other committees which may be constituted to consider specific issues. The composition of the Board of Governors during the period from April 1, 2019 to March 31, 2020 is as follows:

### Chairman, Board of Governors (Officiating)

V. Ramgopal Rao

### BoG Members

Sumant Sinha

Rakesh Sarwal

V.K. Tewari

U.P. Singh

Sheo Pratap Singh/
G. Narender Kumar

S.V. Veeravalli/
Sangeeta Kohli

Nalin Pant

Ashok Gupta/
T.C. Kandpal

M. Balakrishnan/
Ashok Ganguli

Sandeep Chatterjee,
(Secretary)

## ADMINISTRATION

The Director is the principal academic and executive officer of the Institute and is responsible for the proper administration of the Institute and for the imparting of instruction and maintenance of discipline therein. He is assisted in his day to day work by Deputy Director(s), Registrar, Deans, Associate Deans, and senior faculty of the Institute. The senior members of the administration during the period from April 1, 2019 to March 31, 2020 are as follows:

### Director

V. Ramgopal Rao

### Deputy Director
(Operations)*

**Ashok Gupta**
(Upto 30-06-2019)

**T.C. Kandpal**
(15-07-2019 to Present)

### Deputy Director
(Strategy & Planning)

**M. Balakrishnan**
(Upto 30-09-2019)
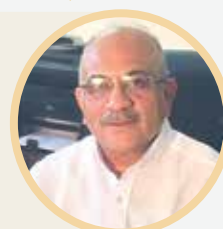
**Ashok Ganguli**
(01-10-2019 to Present)

*DD(S&P) and Dean(R&D) performed the duties of DD(O) from 1-2 July and 3-14 July 2019 respectively.

# DEANS

**Bhim Singh**
(Academics)
(Upto 31-08-2019)

**Shantanu Roy**
(Academics)
(01-09-2019 to Present)

**Sudipto Mukherjee**
(Faculty)

**B.R. Mehta**
(R&D)
(Upto 29-02-2020)

**S.K. Khare**
(R&D)
(01-03-2020 to Present)

**Anurag S. Rathore**
(Corporate Relations)
(01-09-2019 to Present)

**Rajesh Khanna**
(Student Affairs)

**K.C. Iyer**
(Infrastructure)

**Sanjeev Sanghi**
(AA & IP)

**Kanika T. Bhal**
(Planning)

## ASSOCIATE DEANS

**Joby Joseph**
Academics (Curriculum)
(Upto 31-08-2019)

**Anupam Shukla**
Academics (Curriculum)
(01-09-2019 to Present)

**Shantanu Roy**
Academics (PGR)
(Upto 31-08-2019)

**Josemon Jacob**
Academics (PGR)
(01-09-2019 to Present)

**Pritha Chandra**
Academics (ONI)

**S.K. Khare**
(R&D)
(Upto 29-02-2020)

**Sukumar Mishra**
(R&D)
(01-03-2020 to Present)

**Subrat Kar**
(Faculty)
(Upto 09-05-2019)

**Dipayan Das**
(Faculty)
(29-05-2019 to Present)

**Bishwajit Kundu**
(Student Events)

**Angelie Multani**
(Student Welfare)

**Arvind K. Nema**
(Hostel Mgmt.)

**Anurag S. Rathore**
(Corporate Relations)
(Upto 31-08-2019)

**Deepti Gupta**
Infra (Renovation)
(Upto 30-11-2019)

**J.T. Shahu**
Infra (Renovation)
(01-12-2019 to Present)

## REGISTRAR

**Abhijit R. Abhyankar**
Infra (Electrical)

**B. Premchandran**
Infra (Maintenance)

**Sandeep Chatterjee**
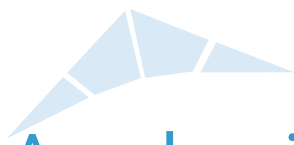
# Academic Units at IIT Delhi

(April 1, 2019 - March 31, 2020)

The various academic units are listed below:

**Departments**

- Applied Mechanics
- Biochemical Engineering and Biotechnology
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Science and Engineering
- Design
- Electrical Engineering
- Humanities and Social Sciences
- Management Studies
- Materials Science and Engineering
- Mathematics
- Mechanical Engineering
- Physics
- Textile and Fibre Engineering
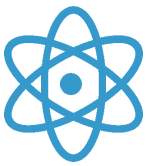
**Centres**

- Applied Research in Electronics
- Atmospheric Sciences
- Automotive Research and Tribology (Formerly ITMMEC)
- Biomedical Engineering
- Energy Studies
- National Resource Centre for Value Education in Engineering
- Rural Development and Technology
- Sensors, Instrumentation and Cyber-Physical Systems Engineering (formerly IDDC)

**Schools**

- Amar Nath and Shashi Khosla School of Information Technology
- Bharti School of Telecommunication Technology and Management
- Kusuma School of Biological Sciences
- School of Public Policy
- School of Interdisciplinary Research

An administrative head for each entity is selected for a period of two years (extendable by one more year). The Head manages the daily functions of her/his unit, after due consultation with the Professorial Committee, Faculty Board, Research Committee etc. A Department is engaged in teaching at all levels (B.Tech., M.Sc., MBA, M.Des., M.S. (R), M.Tech., PG Diploma, Pre-Ph.D.) and research activities, while a Centre/School is mainly focused on PG and Pre-PhD teaching, and on technology development and transfer in well-defined areas with group effort.

# Centres of Excellence

(April 1, 2019 - March 31, 2020)

Centre of Excellence (CoE) is a body/team/group that provides leadership, best practices, research, support, and training for a specific area or problem and it literally means – 'A place where the highest standards are maintained.'

Thus, the Centre of Excellences are powered and driven by Innovation at IIT Delhi. These are envisioned to be one stop resource Centre, establish partnership with industry, government and academia and other research organisations. The Centre of Excellences are expected not only to improve expertise in certain specific areas but also to boost productivity, address emerging skill gaps and align training & research with industry needs to benefit society at large.

At IIT Delhi, COEs are briefly categorized under verticals viz Industry Sponsored, Set up by Institute, CoEs Funded as Sponsored Projects.

As on 31st March 2020, following COEs are operational at IIT Delhi:

| Sr. No. | Name of CoE | Category (with respect to Sponsored Agency) | Sponsoring Agency |
|---|---|---|---|
| 1 | Centre of Excellence for Research on Clean Air | Industry | Mr. Arun Duggal, Alumnus IIT Delhi |
| 2 | DESMI Centre of Excellence on Waste to Wealth | Industry | DESMI, Denmark, Office of PSA, GoI and Vertiver Pvt. Ltd. India as Industry Partner |
| 3 | Renew Power Centre of Excellence on Energy & Environment | Industry | Renew Power Ventures Pvt. Ltd. |
| 4 | Yardi Centre of Excellence for Sustainable Infrastructure | Industry | Yardi Software India Private Limited |
| 5 | Industry Consortium on Artificial Intelligence | Industry | Nokia & Others |
| 6 | DRDO - IIT Delhi Joint Advanced Technology Centre | Government | Defence Research & Development Organization (DRDO) |
| 7 | ISRO Space Technology Cell (STC) | Government | Indian Space Research Organisation (ISRO) |
| 8 | Centre of Excellence on Smart Technology Enabled Manufacturing | Industry & Government | Automation Industry Association (AIA) & Department of Heavy Industry (DHI) |
| 9 | Centre of Excellence in Protective Textiles | Government | Ministry of Textiles (MoT) & Northern India Textile Research Association (NITRA) |
| 10 | Centre of Excellence in Climate Modeling | Government | Department of Science & Technology (DST) |
| 11 | Centre of Excellence in Bio-pharmaceutical Technology | Government | Department of Biotechnology (DBT) |
| 12 | International COE on Computational and Biomedical Sciences | International Research Institute | OHSL, USA |

**Centre of Excellence for Research on Clean Air** has been carrying out research in the areas related to air pollution and methodologies to improve climate with particular reference to Delhi NCR and India. And setup a leading centre and a world-class research facility that develops policy papers, scientific methodologies and technologies suited to the Indian context for addressing wide ranging issues related to pollution in Indian cities with an initial focus on Delhi NCR.

**DESMI Centre of Excellence on Waste to Wealth** intends to work in the area of Waste management and are using technological solutions to clean two urban drains in Delhi. The CoE will also be demonstrating the effectiveness of multi-stakeholder collaborations across municipal corporations and private sector solution providers. The latest project underway is to collect the floating debris at the Babarpur drain in Delhi and convert the plastics into syngas through plasma pyrolysis.

**Renew Power Centre of Excellence on Energy & Environment** is setting up a leading centre for a world class research facility that develops renewable energy applications suited to Indian Scenario and will provide support to GoI for policy decision on renewable energy matter.

**Yardi Centre of Excellence for Sustainable Infrastructure** will undertake studies and research in areas related to energy conservation in buildings and Survey of various types of buildings and collect data on their energy consumption details along with the present sources of energy. Initially the studies will cover metropolitan area of Delhi which would then be extended to other areas. Correlate energy consumption patterns depending on the type of buildings, usage, size, etc. and devise methodologies for projection of future consumption

**Industry Consortium on Artificial Intelligence** will help to solve grand challenges faced by industry and country in this area, and also to connect AI practitioners from industry and other academic institutes in the India and abroad with the Domain Experts of IIT Delhi for a common goal.

**DRDO - IIT Delhi Joint Advanced Technology Centre** has been pioneer in undertaking and facilitating multidisciplinary basic and applied research in the identified research verticals (i) Advanced Ballistics, Special Structures, and Protection Technologies; (ii) Advanced Electromagnetic Devices and Terahertz Technologies; (iii) Brain Computer Interface and Brain Machine Intelligence; (iv) Photonics Technologies, Plasmonics and Quantum Photonics, (v) Smart and Intelligent Textile Technologies and other thrust areas.

**ISRO Space Technology Cell (STC)** has been set up with a motto to continue to pursue advanced research in the areas of relevance to the future technological and programmatic needs of the Indian Space Programme and shall devote its resources including human resources to this effect. The activities of STC shall be directed to maximize the use of the research potential, infrastructure, expertise and experience already existent in ISRO and IITD.

**Centre of Excellence on Smart Technology Enabled Manufacturing** aims setting up a Common Engineering Facilities Centre (CEFC) at IIT Delhi under the Department of Heavy Industry's Scheme on "Enhancement of Competitiveness in the Indian Capital Goods Sector". It will house the infrastructure facilities (Cyber Physical Lab and Cyber Physical Factory) and CEFC will be known as a SAMARTH (Smart Advanced Manufacturing and Rapid Transformation Hubs) Udyog.

The Cyber Physical Lab for Smart Manufacturing Research and a Cyber Physical Factory will be extending services like i) Awareness Building, ii) Prototyping, Simulation and Testing Services, iii) Consulting Services, iv) Site Integration Services, v) Education and Training, vi) Skills Certification, vii) Job work, Research to promote innovation and adoption of Industry 4.0 solutions in order to make Indian industries more globally competitive in Capital Goods Sector.

**Centre of Excellence in Protective Textiles** will have designated centres for infrastructure support comprising of the following facilities for the convenience of all stake holders of PROTECH segment of technical textiles. Facilities for testing and evaluation of products of PROTECH segments, Resource centre with IT infrastructure. These facilities would additionally be employed to impart training to relevant personnel from industry, Textile Research Associations and academic institutions.

**Centre of Excellence in Climate Modeling** will develop an India-centric Climate Model (ICCM) through process improvements and region-specific customisation that will satisfactorily simulate the regional climate of India and can be used for future climate projections at district level to assess the impacts of climate change on agriculture, health, water resources, and the energy sectors. The centre also will subsequently downscale the ICCM output at ultra-high resolutions for various applications.

**Centre of Excellence in Bio-pharmaceutical Technology** has been partnering with the Indian biotech industry in implementing technology solutions. It also aims to collaborate with the Indian regulators (CDSCO) to ensure that the best practices are adopted by the manufacturers. Additionally, it will also examine and report on quality of Bio-therapeutics that is being sold in the Indian market. Professional workshops where industry, academia, and regulatory stakeholders can meet and discuss on the various issues faced by the Indian bio-pharmaceutical industry to build Brand India is also organised time to time.

**International CoE on Computational and Biomedical Sciences**, has been the latest addition to the cluster of CoEs at IIT Delhi. The OHSL, USA in partnership with IIT Delhi will work and support for setting up an International Centre of Excellence (CoE) for Computational and Biomedical Sciences at IIT Delhi for pursuing cutting edge research. This will also bring about global and national challenges in translational research through advancing knowledge in frontiers areas of supercomputing and biomedical science.

# Academic Profile

The Institute offers undergraduate and postgraduate programmes in a number of areas leading to the degrees of B.Tech., M.Sc., M.Tech., M.S.(R), M.Des., MBA, and Ph.D. in Science, Engineering & Technology, Humanities & Social Sciences, Management and Policy. The Institute also offers PG Diploma (PG DIIT) in Naval Construction for the Naval Officers. The primary objective of these teaching programmes is to offer instruction at a level comparable to the very best anywhere in the world. This is achieved through an undergraduate curriculum, which places a strong emphasis on the understanding of fundamental principles as well as specialised knowledge at the postgraduate level, distinguished by its interdisciplinary approach and emphasis on research.

## Pedagogy

Teaching at the Institute incorporates a cohesive, contextual, and nurturing environment for learning. The emphasis is on self-motivated learning by using information, experience, and practice. The teaching methodology aims at using the inputs from core functional areas to interdisciplinary issues and problem solving. Students undertake classroom and workshop assignments, conduct field observations, make presentations, and participate in group discussions and seminars and are encouraged to develop industry linkages, where applicable.

## Evaluation

The academic year consists of two semesters and a summer term. The education system is organised around a credit system, which ensures continuous evaluation of students' performance. It provides flexibility to choose courses of interest and to progress at an optimum pace suited to a student's ability or convenience. Each course is assigned a certain number of credits depending upon the class contact hours. A minimum number of credits and CGPA are to be completed satisfactorily to qualify for the award of a degree.

The medium of instruction is English.

## Curriculum Development

The Senate of the Institute is constantly engaged in reviewing and approving new courses to improve the curriculum at the undergraduate and postgraduate levels. Under a new Academic Welfare Scheme introduced by the Institute for weak students, a special student advisor is identified in each department for students who need special help, at the beginning of each semester. Extra classes are conducted for such students and the student advisor closely monitors the attendance and performance of these students.

All academic affairs of the Institute are managed by Board of Educational and Research Planning (BERP), Board of Academic Programmes (BAP), and the Senate.

## Board of Educational and Research Planning (BERP)

Board of Educational & Research Planning (BERP) is one of the Boards appointed by the Senate to carry out duties and responsibilities such as formulation of educational policy at the Institute level, academic planning with regard to new activities and review of existing Academic Units, general policy for the allocation of intra-IIT budget, and faculty development and specialised training. The composition of the BERP as on March 31, 2020 is as follows:

| Members of BERP | | |
|---|---|---|
| V. Ramgopal Rao<br>Director (Chairperson) | S.K. Khare<br>Dean (R&D) | Anurag S. Rathore<br>Dean (Corporate Relations) |
| T.C. Kandpal<br>Dy. Director (Operations) | Rajesh Khanna<br>Dean (Student Affairs) | S.D. Joshi<br>Nominee of Senate |
| Ashok Ganguli<br>Dy. Director (Strategy & Planning) | Sanjeev Sanghi<br>Dean (AA&IP) | Anup Ghosh<br>Nominee of Senate |
| Shantanu Roy<br>Dean (Academics) | K.C. Iyer<br>Dean (Infrastructure) | V.K. Vijay<br>Nominee of Senate |
| Sudipto Mukherjee<br>Dean (Faculty) | Kanika T. Bhal (Ms.)<br>Dean (Planning) | Atul Vyas<br>Secretary |

## Board of Academic Programmes (BAP)

The Board of Academic Programmes is tasked with the duty to formulate Institute-level academic policies and to co-ordinate as well as to review curricular activity including scholarships; courses; new programmes; time tabling; evaluation of academic performance of students; academic awards; practical training; PG admissions; and research activities of students. The composition of the BAP as on March 31, 2020 is as follows:

| Members of BAP | | |
|---|---|---|
| Shantanu Roy, Chairperson | Ravi P. Singh | Aaditeshwar Seth |
| Paresh Chokshi | Kamlesh Singh (Ms.) | S.P. Singh |
| Vivek V. Buwa | S.P. Singh | Upasna Sharma (Ms.) |
| Srikanta Bedathur | Smita Kashiramka (Ms.) | Siddharth Pandey |
| S. Arun Kumar | P.V. Madhusudhan Rao | B.R. Chahar |
| Shashank Bishnoi | Jyoti Kumar | S. Dharmaraja |
| R. Ayothiraman | Suresh Neelakant/ Sampa Saha (Ms.) | Josemon Jacob |
| I.N. Kar | | Pritha Chandra (Ms.) |
| Abhisek Dixit | A.D. Rao | Anupam Shukla |
| Sanjeev Jain | Neetu Singh (Ms.) | Shaikh Zia Ahammad |
| Sujeet K. Sinha | Ashu Verma (Ms.) | Majumdar Adhish Tapas |
| Santanu Ghosh | Ananjan Basu | Saurabh Subramaniam |
| Joyee Ghosh (Ms.) | J.K. Sahu | Rupesh Kumar |
| Mangala Joshi (Ms.) | Deepak Kumar | Abhishek Kumar Barnwal |
| Rajiv K. Srivastava | Gufran S. Khan | Nimish Joseph |
| S. Sivananthan | Sriram Hedge | Sarthak Kala |
| Harish Kumar | Amit Gupta | Faraz Mazhar |
| T.R. Sreekrishnan | M.R. Ravi | Suresh Kumar Gohar |
| Preeti Srivastava (Ms.) | C.S. Dey | Atul Vyas, Secretary |
| M.K. Singha | Lallan Kumar | |

## The Senate

The Senate, with the Director as its Chairperson, reviews and approves new courses, programmes, and all academic policies in the Institute. The composition of the senate is given in Appendix I.

**The following programmes are currently offered by the Institute:**

## Undergraduate Programmes*

| Bachelor of Technology (B.Tech.) | |
|---|---|
| Duration : 4 Years | |
| Biochemical Engineering & Biotechnology | Mathematics & Computing |
| Chemical Engineering | Mechanical Engineering |
| Computer Science & Engineering | Production and Industrial Engineering |
| Civil Engineering | Engineering Physics |
| Electrical Engineering | Textile Technology |
| Electrical Engineering (Power and Automation) | |

| Dual Degree Programme (B.Tech. and M.Tech.) |
|---|
| Duration : 5 Years |
| B.Tech. and M.Tech. in Chemical Engineering |
| B.Tech. and M.Tech. in Computer Science & Engineering |
| B.Tech. and M.Tech. in Mathematics & Computing |

## Postgraduate Studies & Research (Masters Programmes)

| M.Sc. | M.Tech. | M.S. (Research) | M.Des. |
|---|---|---|---|
| 2 Years | 2 Years* | 2 Years* | 2 Years |
| • Chemistry<br>• Mathematics<br>• Physics | • Engineering Analysis and Design<br>• Biomedical Engineering<br>• Chemical Engineering<br>• Molecular Engg.: Chemical Synthesis and Analysis<br>• Construction Technology and Management<br>• Geotechnical & Geoenvironmental Engineering<br>• Structural Engineering<br>• Water Resources Engineering<br>• Construction Engineering and Management<br>• Rock Engineering of Underground Structures<br>• Environmental Engineering and Management<br>• Transportation Engineering<br>• Computer Science & Engineering<br>• Control and Automation<br>• Communications Engineering<br>• Power Electronics, Electrical Machines & Drives<br>• Computer Technology<br>• Integrated Electronics & Circuits<br>• Power Systems<br>• Thermal Engineering<br>• Production Engineering<br>• Industrial Engineering<br>• Mechanical Design<br>• Materials Engineering<br>• Energy & Environment Technology and Management<br>• Renewable Energy Technologies and Management<br>• Telecommunication Technology and Management<br>• VLSI Design Tools and Technology<br>• Radio Frequency Design & Technology<br>• Solid State Materials<br>• Applied Optics<br>• Atmospheric Oceanic Science Technology<br>• Fibre Science & Technology<br>• Textile Engineering<br>• Textile Chemical Processing<br>• Energy Studies<br>• Industrial Tribology & Maintenance Engineering<br>• Polymer Science & Technology<br>• Optoelectronics & Optical Communication<br>• Instrument Technology | • Applied Mechanics<br>• Biochemical Engg. & Biotechnology<br>• Chemical Engineering<br>• Computer Science & Engineering<br>• Electrical Engineering<br>• Civil Engineering<br>• Mechanical Engineering<br>• Telecommunication Technology and Management<br>• Biological Sciences<br>• Information Technology<br>• Materials Science & Engineering<br>• VLSI Design Tools & Technology | • Industrial Design |

## Postgraduate Studies & Research (Masters Programmes)

| M.B.A. | M.B.A. | PG D.I.I.T. |
|---|---|---|
| 2 Years (Full Time) | 3 Years (Part Time) | 1½ Years |
| Management Systems | Technology Management | Naval Construction |
| Telecommunication Systems Management | | |

\*    The duration of part-time programme is 3 years.

## Doctorate Programmes

The Institute offers research opportunities for doctoral research in all its Departments/Centres/Schools. Creative and productive enquiry is the basic concept underlying the research work. In order to overcome any deficiency in the breadth of fundamental training or proper foundation for advanced work, special preliminary or pre-doctoral courses are suggested by each department/centre/school. The award of Ph.D. is in recognition of high achievements, independent research and application of scientific knowledge to the solution of technical and scientific problems. The Institute lays special emphasis on India-centric research activities.

| Departments/Centres/Schools | |
|---|---|
| Applied Mechanics | Applied Research in Electronics |
| Biochemical Engineering and Biotechnology | Atmospheric Sciences |
| Chemical Engineering | Biomedical Engineering |
| Chemistry | Energy Studies |
| Civil Engineering | Industrial Tribology, Machine Dynamics & Maintenance Engg. |
| Computer Science and Engineering | Instrument Design and Development |
| Design | Rural Development and Technology |
| Electrical Engineering | National Resource Centre for Value Education in Engineering |
| Humanities and Social Sciences | Amar Nath and Shashi Khosla School of Information Technology |
| Management Studies | |
| Materials Science and Engineering | Bharti School of Telecommunication Technology and Mgmt. |
| Mathematics | Kusuma School of Biological Sciences |
| Mechanical Engineering | School of Interdisciplinary Research |
| Physics | School of Public Policy |
| Textile Technology | Transportation Research & Injury Prevention Programme |

## Joint Doctorate Programmes

The Institute also offer Joint Ph.D. Programmes in collaboration with University of Queensland, Australia and National Chiao Tung University Guangfu Campus, Taiwan.

## Major Academic Achievements

- IIT Delhi has created two new designations to engage professionals as faculty of the Institute, namely, Professor of Practice and Adjunct Professor of Practice, either on a full-time basis or on part-time basis.

- Centre for Automotive Research and Tribology (CART), was inaugurated at IIT Delhi to promote interdisciplinary research in electric vehicles and related areas.

- IIT Delhi inaugurated the Centre for Sensors, Instrumentation and Cyber-Physical System Engineering (SeNSE) which is engaged in design and development of instruments and other industrial consumer products.

- IIT Delhi was awarded major DST mission mode projects in the areas of Coal-to-Methanol technology (in association with Thermax Limited), and on Energy Storage Platform on Batteries (ESPOB, in partnership with IISc., CFCT-ARCI, CSIR-CGCRI, CSIR-IMMT, CSIR-IICT).

- IIT Delhi has approved the PG Diploma programme, through which one-year diploma will be offered by the Institute in specialized areas and a framework for Joint Diploma with a partner Institution.

- A new M.Tech. Programme on Renewable Energy Technologies and Management for sponsored candidates was started by the Centre for Energy Studies, IIT Delhi. The programme is being sponsored by International Soler Alliance (ISA), and administered by National Institute of Soler Energy (NISE, Delhi).

- A new M. Tech. in Energy & Environment Technologies and Management was started by the Centre for Energy Studies.

- New Master of Science (Research) Programmes in Materials Science and Engineering and VLSI Design Tools and Technology were initiated this year.

- A new M. Tech. programme in Materials Engineering was started by the Department of Materials Science and Engineering.

- IIT Delhi launched International Ph.D. Fellowship Programme (IPFP) in presence of

Ambassadors of various countries in India, and their representatives. Under IPFP, up to 500 scholarships have been announced for research scholars from foreign countries. A significant number of research scholars under the IPFP programme have already started their studies at the Institute.

- The University of Queensland-IIT Delhi Joint Degree program became operational in 2019, and the first two cohorts of students have been admitted and started to pursue their Ph. D.

- IIT Delhi has initiated the industry-funded Joint Ph.D. Programme with National Chiao Tung University (NCTU), Taiwan.

- IIT Delhi has been chosen to execute as the National Coordinator, the Ph.D scheme for scholars from ASEAN countries.

- A Centre of Excellence for Promotion of Computational Fluid Dynamics (CFD) sponsored by ANSYS Software, Pune has been set up at IIT Delhi.

- New progrmmes including B.Tech. in Materials Science and Engineering, B.Des. in Design, M.Tech. and M.S.(R) in SeNSE, M.Sc. in Economics, and M.Sc. in Cognitive Sciences are planned for 2020.

- Tata Trusts join hands with IIT Delhi to scale up Institute's new School of Public Policy.

- Aiming at creating Independent Access to Digital Content for the Visually Impaired, IIT Delhi, kritiKal Solution Pvt. Ltd., Pheonix Medical Systems Pvt. Ltd. And Saksham Trust New Delhi, supported by the Welcome Trust have developed DotBook, a feature-packed, ergonomic & affordable refreshable Braille display.

- Important MoUs were signed between IIT Delhi and Jawaharlal Nehru University, New Delhi, National Institute of Immunology Delhi, five of the renowned National Laboratories of CSIR, viz CSIR-Advanced Materials and Processes Research Institute, CSIR-Central Scientific Instruments Organization, CSIR-Central Electronics Engineering Research Institute, CSIR-Institute of Minerals & Materials Technology, CSIR-National Physical Laboratory of India for academic and research collaboration.

- The Bureau of India Standards (BIS), has signed a Memorandum of Understanding (MoU) with IIT Delhi, to collaborate in the field of standardization and conformity assessment.

- To commemorate the 150th birth anniversary of Mahatma Gandhi and further augment the impact of Swachh Bharat, smart cities, and other mission mode projects of national priority, the Office of the Principal Scientific Adviser to the Government of the India and IIT Delhi have come together to bring the best of science and technology to implement waste management in India.

- Flexmotiv, a startup incubated in IIT Delhi, has launched all-terrain, slip-resistant crutches called Flexmo for the disabled and elderly.

- IIT Delhi startup Raised Lines Foundation Books launched tactile books on the 150th birth anniversary of Mahatma Gandhi.

# Student Profile and Achievements

## ADMISSIONS

Academic programmes at IITD cover a wide range of science and engineering, humanities and social sciences, management, and policy disciplines. At the UG and PG levels, the intake has steadily increased over the last few years. During the year 2019-20, 1054 UG students joined the Institute including 189 female students. The enrolment of postgraduate students during the year 2019-20 was 1267, these figures include 205 female students. 733 research scholars admitted during the period including 280 female students.

### Admissions in the Last Three Years (2017-2019)



Legend: Ph.D. | M.B.A. | M.S. Research | D.I.I.T. | M. Des. | M. Tech. | M. Sc. | B.Tech., Integrated M.Tech. & Dual Degree Programmes
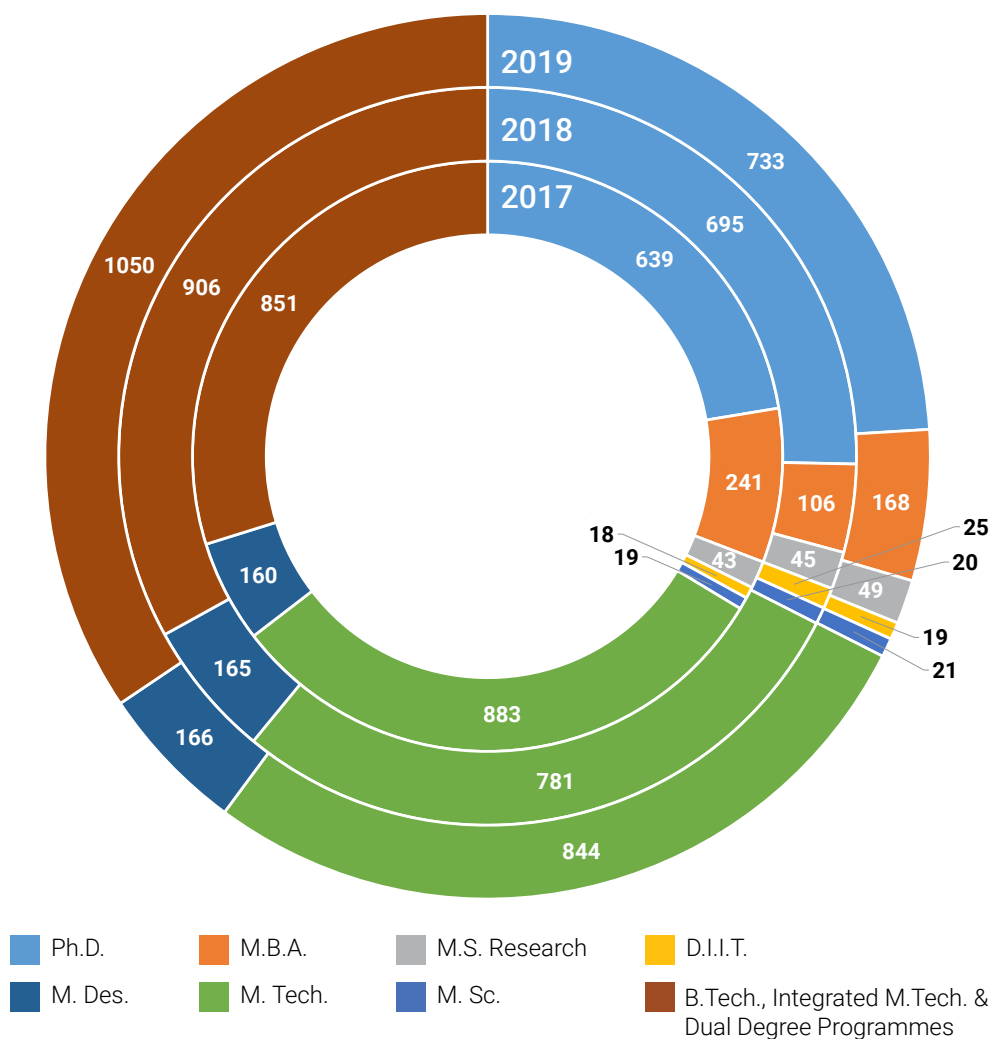
| Programmes | 2017 | 2018 | 2019 |
|---|---|---|---|
| Ph.D. | 639 | 695 | 733 |
| M.B.A. (Full-time/Part-time) | 241 | 106 | 168 |
| M.S. (Research) | 43 | 45 | 49 |
| D.I.I.T. (Naval Construction) | 18 | 25 | 19 |
| M. Des. | 19 | 20 | 21 |
| M. Tech. | 883 | 781 | 844 |
| M.Sc. | 160 | 165 | 166 |
| B.Tech., Integrated M.Tech. & Dual Degree Programmes | 851 | 906 | 1054 |
| Total | 2854 | 2735 | 3054 |

## Admission Procedure and Relaxations

### Admission Procedure

**Undergraduate:** Admission to all UG Programmes listed before are made through the Joint Entrance Examination (JEE) Advanced. The eligibility for appearing for JEE is as follows:

- The minimum academic qualification is the final examination of 10+2 system or its equivalent. The candidates belonging to the general category and OBC must secure a minimum of 60% marks in aggregate in their Qualifying Examination. Candidates belonging to SC, ST and PwD categories must secure a minimum of 55% marks in aggregate in the Qualifying Examination. If any Board awards only letter grades without providing an equivalent percentage of marks on the grade sheet, the candidate should obtain a certificate from the Board specifying equivalent marks, and submit it at the time of counselling.

- Those appearing in 10+2 final or its equivalent examination may also appear in JEE for consideration of Provisional admission. All provisional admissions stand cancelled if proof of having passed the qualifying examination (10+2 or equivalent) is not submitted before September 30th of the year in which admission is sought.

**Postgraduate:** The admission to full-time M.Tech. programmes is made on the basis of performance in the Graduate Aptitude Test in Engineering (GATE) — an All India entrance test, and/or interview at the Institute. A limited number of students are also admitted on part-time basis from amongst working professionals along with the regular full-time students, subject to their satisfying certain academic and experience requirements.

Admission to the 2-year M.Des. Programme in Industrial Design is made on the basis of Common Entrance Examination for Design (CEED).

Admission to the MBA Programme is made on the basis of Common Admission Test (CAT), and for M.Sc. Programme applicant has to come through Joint Admission Test for M.Sc. (JAM).

All applications are processed by the concerned Department /Centre/School and shortlisted applicants are called for a written test and/or interview. The date for test /interview is communicated by the Department/ Centre /School Programme. Selected candidates are given offer letters by the Departments/Centres/Schools after approval of the selection by the Dean, Academics. They are required to pay the first installment of fees by a given date, failing which their admission offer stands automatically cancelled. Seats so released are then offered to wait listed candidates.

### Relaxations

The Institute is sensitive to the needs of the students belonging to the SC/ST/OBC/EWS communities and to those who are having disabilities (PwD). Special care and attention are paid to them. The following relaxations, in broad, are given to such candidates:

- For SC, ST and PwD candidates, relaxation of 5% marks or 0.5 CGPA (on ten-point scale) in the qualifying degree is provided for admission purpose.

- Five years relaxation in age is given to SC/ST/PwD candidates for admission to UG programmes.

- All SC, ST, PwD students get 100% tuition fee exemption.

**Reservation of Seats:** At IIT Delhi, the percentage of seats reserved for SC/ST/OBC/PwD/EWS candidates is as follows:

| SC | ST | OBC | PwD | EWS* |
|----|----|-----|-----|------|
| 15 | 7.5 | 27 | 5 | 5 |

*For session 2019-20.

## Courses and Admissions

Following Tables (I, II, III) give the details regarding the admissions in the given period in different courses offered at IIT Delhi. Table IV and V show the total number of students enrolled in different Departments, Centres and Schools. Category-wise distribution of students in different programmes is given in Table VI.

**Table I :** Break-up of Admissions through Joint Entrance Examination during 2019-2020 according to the Various Disciplines

| Discipline | Sanctioned Strength | Actual Admissions |
|---|---|---|
| B.Tech. in Biochemical Engineering and Biotechnology (BB1) | 67 | 67 |
| B.Tech. in Chemical Engineering (CH1) | 81 | 78 |
| B.Tech. in Civil Engineering (CE1) | 117 | 117 |
| B.Tech. in Computer Science & Engineering (CS1) | 91 | 90 |
| B.Tech. in Electrical Engineering (EE1) | 100 | 100 |
| B. Tech. in Electrical Engineering (Power and Automation) (EE3) | 57 | 57 |
| B. Tech. in Mathematics & Computer Applications (MT1) | 69 | 69 |
| B.Tech. in Mechanical Engineering (ME1) | 89 | 89 |
| B.Tech. in Production Engineering (ME2) | 87 | 86 |
| B.Tech. in Engineering Physics (PH1) | 60 | 60 |
| B.Tech. in Textile Technology (TT1) | 120 | 116 |
| M.Tech. in Mathematics & Computer Applications (5-year Integrated) (MT6) | 31 | 31 |
| B.Tech. and M.Tech. in Computer Science & Engineering (5-year Dual Degree) (CS5) | 37 | 38 |
| B.Tech. and M.Tech. in Chemical Engineering (5-year Dual Degree) (CH7) | 55 | 56 |

**Table II :** Students Admitted to First Year of the M.Tech./M.Des./M.S.(R)/D.I.I.T./M.B.A./M.Sc. Programmes as on August 01, 2019 (the last date for late registration in Ist Semester 2019-2020)

| Programme | Students with Institute Assistantship | Others (including part-time students) | Total |
|---|---|---|---|
| **Master of Technology (M.Tech.)** | | | |
| Department of Applied Mechanics | | | |
| Engineering Analysis and Design (AMA) | 60 | 4 | 64 |
| Department of Chemical Engineering | | | |
| Chemical Engineering (CHE) | 29 | 1 | 30 |
| Department of Chemistry | | | |
| Molecular Engg.: Chemical Synthesis and Analysis (CYM) | 9 | 0 | 9 |
| Department of Civil Engineering | | | |
| Geotechnical & Geoenvironmental Engineering (CEG) | 12 | 3 | 15 |
| Structural Engineering (CES) | 19 | 9 | 28 |

Table II contd.

| | | | |
|---|---|---|---|
| Water Resources Engineering (CEW) | 11 | 0 | 11 |
| Rock Engineering & Underground Structures (CEU) | 14 | 2 | 16 |
| Construction Engineering and Management (CET) | 23 | 6 | 29 |
| Construction Technology and Management (CEC) | 0 | 30 | 30 |
| Environmental Engineering and Management (CEV) | 15 | 1 | 16 |
| Transportation Engineering (CEP) | 9 | 4 | 13 |
| **Department of Computer Science & Engineering** | | | |
| Computer Science & Engineering (MCS) | 22 | 4 | 26 |
| **Department of Electrical Engineering** | | | |
| Integrated Electronics & Circuits (EEN) | 22 | 0 | 22 |
| Communications Engineering (EEE) | 22 | 3 | 25 |
| Control & Automation (EEA) | 23 | 0 | 23 |
| Power Electronics, Electrical Machines & Drives (EEP) | 24 | 6 | 30 |
| Computer Technology (EET) | 24 | 3 | 27 |
| Power System (EES) | 16 | 3 | 19 |
| **Department of Materials Science & Engineering** | | | |
| Materials Engineering  (MSM) | 12 | 0 | 12 |
| **Department of Mechanical Engineering** | | | |
| Thermal Engineering  (MET) | 29 | 1 | 30 |
| Mechanical Design (MEM) | 35 | 1 | 36 |
| Production Engineering (MEP) | 13 | 0 | 13 |
| Industrial Engineering (MEE) | 14 | 5 | 19 |
| **Department of Physics** | | | |
| Applied Optics (PHA) | 23 | 0 | 23 |
| Solid State Materials (PHM) | 15 | 3 | 18 |
| **Department of Textile and Fibre Engineering** | | | |
| Textile Engineering (TTE) | 18 | 1 | 19 |
| Fibre Science & Technology (TTF) | 10 | 1 | 11 |
| Textile Chemical Processing (TTC) | 11 | 0 | 11 |
| **Centre for Applied Research in Electronics** | | | |
| Radio Frequency Design and Technology (CRF) | 19 | 15 | 34 |
| **Centre for Atmospheric Sciences** | | | |
| Atmospheric-Oceanic Science & Technology (AST) | 11 | 3 | 14 |
| **Centre for Biomedical Engineering** | | | |
| Biomedical Engineering (BMT) | 9 | 0 | 9 |

Table II contd.

| Centre for Energy Studies | | | |
|---|---|---|---|
| Energy & Environment Technologies & Mgmt. (ESN) | 10 | 8 | 18 |
| Renewable Energy Technologies & Management (ESR) | 0 | 22 | 22 |
| **Interdisciplinary Programmes** | | | |
| Energy Studies (JES) | 22 | 6 | 28 |
| Industrial Tribology & Maintenance Engineering (JIT) | 12 | 4 | 16 |
| Instrument Technology (JID) | 17 | 1 | 18 |
| Polymer Science & Technology (JPT) | 13 | 1 | 14 |
| Optoelectronics & Optical Communication (JOP) | 13 | 5 | 18 |
| VLSI Design Tools & Technology (JVL) | 0 | 6 | 6 |
| Telecommunication Technology and Management (JTM) | 22 | 0 | 22 |
| **Total** | **682** | **162** | **844** |
| **Master of Design** | | | |
| Industrial Design (JDS) | 21 | 0 | 21 |
| **Master of Science** | | | |
| Chemistry (CYS) | 16 | 38 | 54 |
| Mathematics (MAS) | 26 | 29 | 55 |
| Physics (PHS) | 8 | 49 | 57 |
| **Master of Science (Research)** | | | |
| Mechanical Engineering (MEY) | 6 | 0 | 6 |
| Amar Nath and Shashi Khosla School of Information Technology (SIY) | 1 | 3 | 4 |
| Bharti School of Telecommunication Technology & Management (BSY) | 1 | 4 | 5 |
| Kusuma School of Biological Sciences (BLY) | 6 | 0 | 6 |
| Applied Mechanics (AMY) | 0 | 1 | 1 |
| Computer Science & Engineering (CSY) | 1 | 0 | 1 |
| Electrical Engineering (EEY) | 11 | 10 | 21 |
| Biochemical Engineering & Biotechnology (BEY) | 5 | 0 | 5 |
| **Master of Business Administration (MBA)** | | | |
| Technology Management (SMN) | 0 | 36 | 36 |
| Management Systems (SMF) | 0 | 107 | 107 |
| Telecommunication Systems Management (SMT) | 0 | 25 | 25 |
| **PG D.I.I.T.** | | | |
| Naval Construction (AMX) | 0 | 19 | 19 |
| **Total** | **784** | **483** | **1267** |

**Table III** : Research Scholars Admitted in both the Semesters of the Session 2019-2020

| Department/Centre/School | Semester-I | | | Semester-II | | | Total |
|---|---|---|---|---|---|---|---|
| | Institute Supported Scholars | Other Including Part Time Students | Scholars Supported from Other Sources | Institute Supported Scholars | Other Including Part Time Students | Scholars Supported from Other Sources | |
| Applied Mechanics | 10 | 0 | 2 | 1 | 0 | 1 | 14 |
| Biochemical Engg. & Biotechnology | 4 | 0 | 1 | 1 | 0 | 2 | 8 |
| Chemical Engineering | 28 | 2 | 7 | 13 | 3 | 5 | 58 |
| Chemistry | 15 | 0 | 24 | 3 | 1 | 9 | 52 |
| Civil Engineering | 37 | 0 | 13 | 15 | 0 | 8 | 73 |
| Computer Science & Engineering | 2 | 0 | 1 | 1 | 0 | 1 | 5 |
| Design | 2 | 0 | 1 | 1 | 0 | 2 | 6 |
| Electrical Engineering | 44 | 2 | 14 | 27 | 1 | 8 | 96 |
| Humanities & Social Sciences | 14 | 0 | 7 | 8 | 0 | 1 | 30 |
| Management Studies | 9 | 0 | 8 | 11 | 2 | 12 | 42 |
| Mathematics | 10 | 0 | 4 | 2 | 1 | 6 | 23 |
| Materials Science & Engineering | 9 | 0 | 3 | 4 | 0 | 1 | 17 |
| Mechanical Engineering | 14 | 0 | 5 | 2 | 1 | 3 | 25 |
| Physics | 13 | 0 | 37 | 8 | 2 | 7 | 67 |
| Textile and Fibre Engineering | 5 | 0 | 3 | 7 | 0 | 0 | 15 |
| Applied Research in Electronics | 5 | 1 | 0 | 4 | 0 | 0 | 10 |
| Atmospheric Sciences | 7 | 0 | 7 | 2 | 0 | 1 | 17 |
| Automotive Research and Tribology | 2 | 0 | 1 | 5 | 0 | 1 | 9 |
| Biomedical Engineering | 4 | 1 | 5 | 5 | 0 | 1 | 16 |
| Energy Studies | 11 | 0 | 4 | 7 | 0 | 1 | 23 |
| Rural Development & Technology | 6 | 0 | 7 | 10 | 0 | 5 | 28 |
| Sensors, Instrumentation and Cyber-Physical Systems Engg. | 4 | 0 | 0 | 1 | 0 | 2 | 7 |
| School of Biological Sciences | 6 | 0 | 5 | 3 | 0 | 4 | 18 |
| Bharti School of Telecommunication Technology & Management | 5 | 0 | 4 | 2 | 0 | 1 | 12 |
| Transportation Research & Injury Prevention Programmes | 1 | 0 | 0 | 4 | 0 | 0 | 5 |
| National Resource Centre for Value Education in Engineering | 1 | 0 | 1 | 2 | 0 | 2 | 6 |
| Amar Nath and Shashi Khosla School of IT | 1 | 0 | 4 | 2 | 1 | 2 | 10 |
| School of Interdisciplinary Research | 3 | 0 | 4 | 1 | 3 | 4 | 15 |
| School of Public Policy | 1 | 0 | 2 | 1 | 0 | 0 | 4 |
| University of Queensland - IIT Delhi Academy | 8 | 0 | 6 | 7 | 0 | 1 | 22 |
| **Total** | **281** | **6** | **180** | **160** | **15** | **91** | **733** |

**Table IV :** Total number of M.Tech./M.S.(R)/M.Sc./M.B.A./PG D.I.I.T. Students on Rolls as on July 31, 2019 (the last date for late registration in Ist Semester, 2019-2020)

| Programme | Institute Supported Students | Students Supported from Other Sources (Including Part-time) | Total |
|---|---|---|---|
| **Master of Technology (M.Tech.)** | | | |
| **Department of Applied Mechanics** | | | |
| Engineering Analysis and Design (AMA) | 100 | 15 | 115 |
| Engineering Mechanics (AME) | 6 | 1 | 7 |
| Design Engineering (AMD) | 5 | 0 | 5 |
| **Department of Chemical Engineering** | | | |
| Chemical Engineering (CHE) | 61 | 13 | 74 |
| **Department of Chemistry** | | | |
| Molecular Engg. : Chemical Synthesis and Analysis (CYM) | 17 | 2 | 19 |
| **Department of Civil Engineering** | | | |
| Geotechnical & Geoenvironment Engineering (CEG) | 24 | 3 | 27 |
| Rock Engineering Underground Structures (CEU) | 30 | 10 | 40 |
| Structural Engineering (CES) | 37 | 33 | 70 |
| Water Resources Engineering (CEW) | 21 | 2 | 23 |
| Environmental Engineering and Management (CEV) | 34 | 8 | 42 |
| Construction Engineering and Management (CET) | 28 | 9 | 37 |
| Construction Technology and Management (CEC) | 0 | 66 | 66 |
| Transportation Engineering (CEP) | 16 | 16 | 32 |
| **Department of Computer Science & Engineering** | | | |
| Computer Science & Engineering (MCS) | 42 | 16 | 58 |
| **Department of Electrical Engineering** | | | |
| Integrated Electronics & Circuits (EEN) | 29 | 3 | 32 |
| Communications Engineering (EEE) | 34 | 9 | 43 |
| Control & Automation (EEA) | 39 | 0 | 39 |
| Power Electronics, Electrical Machines & Drives (EEP) | 35 | 9 | 44 |
| Computer Technology (EET) | 43 | 7 | 50 |
| Power Systems (EES) | 28 | 15 | 43 |
| **Department of Materials Science & Engineering** | | | |
| Materials Engineering (MSM) | 12 | 0 | 12 |
| **Department of Mechanical Engineering** | | | |
| Thermal Engineering (MET) | 57 | 10 | 67 |
| Mechanical Design (MEM) | 62 | 8 | 70 |
| Production Engineering (MEP) | 40 | 1 | 41 |
| Industrial Engineering (MEE) | 24 | 7 | 31 |
| **Department of Physics** | | | |
| Applied Optics (PHA) | 41 | 2 | 43 |
| Solid State Materials (PHM) | 37 | 7 | 44 |
| **Department of Textile and Fiber Engineering** | | | |
| Textile Chemical Processing (TTC) | 20 | 3 | 23 |
| Textile Engineering (TTE) | 37 | 1 | 38 |
| Fibre Science & Technology (TTF) | 28 | 1 | 29 |
| **Centre for Atmospheric Sciences** | | | |
| Atmospheric-Oceanic Science & Technology (AST) | 18 | 7 | 25 |

Table II contd.

| | | | |
|---|---|---|---|
| **Centre for Applied Research in Electronics** | | | |
| Radio Frequency Design and Technology (CRF) | 35 | 26 | 61 |
| **Centre for Bio-medical Engineering** | | | |
| Bio-medical Engineering (BMT) | 15 | 0 | 15 |
| **Centre for Energy Studies** | | | |
| Energy and Environment Technologies & Management (ESN) | 10 | 6 | 16 |
| Renewable Energy Technologies and Management (ESR) | 0 | 22 | 22 |
| **Interdisciplinary Programmes** | | | |
| Energy Studies (JES) | 47 | 10 | 57 |
| Instrument Technology (JID) | 33 | 4 | 37 |
| Industrial Tribology & Maintenance Engineering (JIT) | 26 | 6 | 32 |
| Polymer Science & Technology (JPT) | 27 | 5 | 32 |
| Opto Electronics & Optical Communication (JOP) | 36 | 10 | 46 |
| VLSI Design Tools and Technology (JVL) | 0 | 22 | 22 |
| Industrial Design (JDS) | 23 | 2 | 25 |
| Telecommunication Technology and Management (JTM) | 41 | 2 | 43 |
| **Total** | **1298** | **399** | **1697** |
| **Master of Design** | | | |
| Industrial Design (DDS) | 21 | 0 | 21 |
| **Master of Business Administration** | | | |
| Management Studies | 0 | 329 | 329 |
| **PG D.I.I.T.** | | | |
| Naval Construction (AMX) | 0 | 19 | 19 |
| **Master of Science** | | | |
| Chemistry (CYS) | 18 | 93 | 111 |
| Mathematics (MAS) | 28 | 81 | 109 |
| Physics (PHS) | 10 | 106 | 116 |
| **Master of Science (Research)** | | | |
| Applied Mechanics (AMY) | 7 | 2 | 9 |
| Biochemical Engineering & Biotechnology (BEY) | 10 | 1 | 11 |
| Chemical Engineering (CHY) | 1 | 4 | 5 |
| Computer Science & Engineering (CSY) | 4 | 6 | 10 |
| Civil Engineering (CEY) | 2 | 3 | 5 |
| Electrical Engineering (EEY) | 23 | 38 | 61 |
| Materials Science & Engineering (MSY) | 2 | 0 | 2 |
| Mechanical Engineering (MEY) | 13 | 6 | 19 |
| Bharti School of Telecommunication Technology & Management (BSY) | 1 | 10 | 10 |
| Kusuma School of Biological Sciences (BLY) | 11 | 2 | 13 |
| Amar Nath & Shashi Khosla School of Information Technology (SIY) | 5 | 12 | 17 |
| **Grand Total** | **1454** | **1111** | **2565** |

**Table V :** Research Scholars on the Institute Rolls as on July 31, 2019 (the last date for late registration in the 1st semester, 2019-2020)

| Department/Centre/School | Institute Scholarships | Others Scholarships | Part-Time Students | Total |
|---|---|---|---|---|
| Applied Mechanics (AMZ) | 47 | 10 | 18 | 75 |
| Biochemical Engineering & Biotechnology (BEZ) | 41 | 19 | 1 | 61 |
| Chemical Engineering (CHZ) | 119 | 59 | 34 | 212 |
| Chemistry (CYZ) | 54 | 102 | 8 | 164 |
| Civil Engineering (CEZ) | 158 | 42 | 71 | 271 |
| Computer Science & Engineering (CSZ) | 29 | 16 | 8 | 53 |
| Design (DDZ) | 7 | 6 | 3 | 16 |
| Electrical Engineering (EEZ) | 242 | 111 | 96 | 449 |
| Humanities & Social Sciences (HUZ) | 72 | 49 | 27 | 148 |
| Management Studies (SMZ) | 90 | 36 | 61 | 187 |
| Mathematics (MAZ) | 42 | 37 | 4 | 83 |
| Materials Science & Engineering (MSZ) | 35 | 9 | 3 | 47 |
| Mechanical Engineering (MEZ) | 123 | 43 | 36 | 202 |
| Physics (PHZ) | 82 | 156 | 27 | 265 |
| Textile Technology (TTZ) | 53 | 15 | 12 | 80 |
| Centre for Applied Research in Electronics (CRZ) | 32 | 16 | 13 | 61 |
| Centre for Atmospheric Sciences (ASZ) | 28 | 23 | 8 | 59 |
| Centre for Biomedical Engineering (BMZ) | 30 | 14 | 11 | 55 |
| Centre for Energy Studies (ESZ) | 52 | 11 | 17 | 80 |
| Centre for Polymer Science & Engineering (PTZ) | 14 | 6 | 2 | 22 |
| Centre for Rural Development & Technology (RDZ) | 66 | 31 | 25 | 122 |
| National Resource Centre for Value Education in Engg. (NRZ) | 3 | 0 | 8 | 11 |
| Transportation Research & Injury Prevention Prog. (TRZ) | 9 | 0 | 5 | 14 |
| Instrument Design & Development Centre (IDZ) | 11 | 0 | 7 | 18 |
| Industrial Tribology, Machine Dynamics & Maintenance Engineering Centre (ITZ) | 20 | 3 | 3 | 26 |
| Interdisciplinary Research (SRZ) | 6 | 21 | 3 | 30 |
| Kusuma School of Biological Sciences (BLZ) | 33 | 42 | 1 | 76 |
| Bharti School of Telecommunication Tech. & Mgmt. (BSZ) | 33 | 11 | 19 | 63 |
| Amar Nath and Shashi Khosla School of IT (ANZ) | 20 | 10 | 14 | 44 |
| School of Public Policy (PPZ) | 4 | 0 | 5 | 9 |
| IITD Queensland Joint Ph.D. Programme (QIZ) | 21 | 9 | 0 | 30 |
| **Total** | **1576** | **907** | **550** | **3033** |

**Table VI :** Category and Gender wise distribution of enrolled students in UG and PG courses

| Programme | General | | Gen-EWS | | OBC | | SC | | ST | | Total | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | M | F | M | F | M | F | M | F | M | F | |
| P.G. | 1340 | 318 | 30 | 3 | 504 | 70 | 187 | 30 | 64 | 19 | **2125** | **440** | **2565** |
| Ph.D. | 1372 | 933 | 11 | 2 | 364 | 151 | 102 | 56 | 29 | 13 | **1878** | **1155** | **3033** |
| **Total (a)** | **2712** | **1251** | **41** | **5** | **868** | **221** | **289** | **86** | **93** | **32** | **4003** | **1595** | **5598** |
| **B.Tech. (b)** | 1689 | 249 | 50 | 11 | 978 | 141 | 553 | 76 | 305 | 50 | **3575** | **527** | **4102** |
| **Total (a+b)** | **4401** | **1500** | **91** | **16** | **1846** | **362** | **842** | **162** | **398** | **82** | **7578** | **2122** | **9700** |

## INTERNATIONAL STUDENTS

The Indian Institute of Technology Delhi is committed to a culture of merit and excellence in the field of Academics and Research and welcomes International students to explore the various opportunities offered by the Institute. IIT Delhi acknowledges that the presence of meritorious International students brings in a wealth of diversity that creates an excellent ecosystem for pursuing this commitment. Currently, the Institute has 110 foreign students from more than 30 countries like Afghanistan, Algeria, Benin, Bhutan, Brazil, Burkina Faso, Burundi, Canada, Ethiopia, Gambia, Guinea, Guyana, Iran, Indonesia, Kenya, Liberia, Madagascar, Nigeria, Nepal, Rwanda, Republic of Korea, Sri Lanka, Somalia, Sudan, Syria, Taiwan, Turkey, USA, etc., and there has been a tremendous rise in the number of International students over the years. In addition to this every year, IIT Delhi also has International exchange students from different countries.

The Ministry of Education, Government of India, has emphasized the need to increase the admission of foreign nationals under the self-financing scheme. The Institute has taken necessary steps in this regard and it is hoped to increase the strength of the foreign nationals in the coming years.

The Alumni Affairs and International Programmes (AAIP) is the first point of contact for International students and researchers at IIT Delhi. The various activities handled by the office of International Programmes, includes issuing offer letters to our International students and providing information and help with all non-academic aspects of their stay at IIT Delhi.

The Institute bid farewell to the students through the Annual International Students Dinner, hosted by the director of IIT Delhi and this was a great opportunity for a final get together for all our International students. The dinner once again reminded them of ethnic Indian cuisine and the rich Indian culture through many performances. The International students were invited to the stage to share a glimpse of the culture of their native lands. There was also an Indian band performance. Along with the band performance, International Students also performed many cultural activities. The dinner concluded with the Director's speech, which included plans for the upcoming batch of International students.

# SCHOLARSHIPS, ASSISTANTSHIPS, AND AWARDS

The Institute believes in the maxim that no deserving student, however weak in financial backing, should be denied the opportunity of education at IIT Delhi. To encourage and to provide financial incentives to meritorious students and assistance to the needy students of the Institute, individuals, trusts and organisations have been instituting scholarships, awards, etc. at the Institute.

**Assistantships/Fellowships** are provided by IRD to the Ph.D./M.Tech./M.S.(R.) students. IRD provides support in the form of Gap Period Assistantship for both M.Tech./M.S.(R.) and Ph.D. students who are drawing their fellowship/assistantship from existing projects. These assistantships is provided to the students once the previous projects get over and there is no other project to pay their assistantship. M.Tech./M.S.(R) students can be supported for a maximum gap period of six months and Ph.D. students would be supported for a maximum gap period of one year. 11 Ph.D. students were supported in 2019-20 under this scheme.

**IRD Early-Doc Fellowships** are provided to Ph.D. students after the successful completion of Ph.D. Viva Examination. The main objective is to support the Ph.D. Scholar for completing the manuscript writing related to his/her thesis work. A monthly fellowship of ₹40,000/- per month (including HRA) is given to full time Ph.D. students of IIT Delhi for a maximum period of 3 months w.e.f. the date of his/her Ph.D. Viva. 77 IRD Early-Doc Fellowships requests were approved during Financial Year 2019-2020.

**DAAD Scholarship:** The 18th batch of 9 M.Tech. students have been sent to Germany under the DAAD Scholarship Scheme to do part of their thesis research under the Indo-German collaboration programme during the period.

**Donor Awards:** In addition to scholarships and assistantships, the Institute also offers donor awards to the deserving candidates. During the period, 67 donor awards were distributed among 91 students.

## Scholarships and Financial Assistance to SC/ST

Students are given scholarships and financial assistance as detailed below:

- All SC/ST students are exempted from payment of tuition fees.
- Free messing (basic menu) and a pocket allowance of ₹250/- is provided in lieu of the merit-cum-means scholarship for the students having annual family income upto ₹4.5 lacs. However, they are required to pay the hostel seat rent as applicable from time to time.
- SC/ST students who fail in the examination for the first time continue to receive the free messing, subject to a maximum limit of five years.
- SC/ST students are loaned books from the book bank without payment of any loan fee. The books are, however, required to be returned at the end of each semester.

A gist of data showing the scholarships and assistantships offered to UG and PG students during the session 2019-2020 are given below in the tables.

**Table I : Number of Cash Prizes Merit-cum-Means Scholarships/Freeships offered to B.Tech./Dual Degree Students during the Session 2019-2020**

| Class | Cash Prizes (SCHII028) | No. of Scholarships Awarded (SCHII035/SCHII059) | Free Mess Services (SCHII036) | Freeships for General/OBC/EWS (SCHOI305) | PG (SCHII057/SCHII058) | UG TA (SCHII060) | Sponsored Awards/Fellowships/Scholarships* |
|---|---|---|---|---|---|---|---|
| Year I | 78 | 284 | 57 | 0 | 0 | 0 | 63 |
| Year II | 57 | 151 | 32 | 0 | 0 | 0 | 17 |
| Year III | 46 | 180 | 44 | 0 | 0 | 0 | 23 |
| Year IV | 54 | 162 | 40 | 0 | 0 | 56 | 13 |
| Year V | 4 | 0 | 10 | 0 | 68 | 0 | 0 |
| Backlog | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **239** | **777** | **183** | **0** | **68** | **56** | **116** |

**Table II : Assistantships to Dual Degree and Advanced Standing Students during the Session 2019-2020**

| Course | No. of Assistantships Renewed (SCHII057/SCHII058) | No. of Assistantships Awarded (SCHII057/SCHII058) |
|---|---|---|
| Biochemical Engineering & Biotechnology (BB5) | 7 | 10 |
| Computer Science & Engineering (CS5) | 11 | 19 |
| Electrical Engineering (EE5) | 0 | 0 |
| Chemical Engineering (CH7) | 24 | 19 |
| Mathematics and Computing (MT6) | 6 | 11 |
| Advanced Standing | 6 | 9 |
| **Total** | **54** | **68** |

Students pursuing M.Tech. / M.Des. / M.S.(R) are eligible for Institute assistantship at the time of admission. However, for continuation of the assistantship they have to maintain a minimum SGPA (semester grade point average) at the end of every semester. The table below shows the assistantship awarded to 2019 entry students and renewed to the existing students. A total of 705 new students were awarded assistantship in 2019-20.

**Table III :** Assistantships Offered to the Students of M.Tech. / M.Des. / M.S.(R) Programmes during the Session 2019-2020.

| Programme | No. of Assistantships Renewed (Old) | No. of Assistantships Awarded (first year) 2019 |
|---|---|---|
| Master of Technology (M.Tech.) | | |
| Engineering Analysis & Design (AMA) | 46 | 54 |
| Chemical Engineering (CHE) | 35 | 26 |
| Molecular Engineering : Chemical Synthesis & Analysis (CYM) | 8 | 9 |
| Geotechnical and Geoenvironmental Engineering (CEG) | 16 | 8 |
| Structural Engineering (CES) | 23 | 14 |
| Construction Engineering and Management (CET) | 17 | 11 |
| Environmental Engineering and Management (CEV) | 25 | 9 |
| Rock Engineering and Underground Structures (CEU) | 18 | 12 |
| Water Resources Engineering (CEW) | 14 | 7 |
| Transportation Engineering (CEP) | 12 | 4 |
| Computer Science & Engineering (MCS) | 22 | 20 |
| Power Electronics, Electrical Machines & Drives (EEP) | 13 | 22 |
| Communications Engineering (EEE) | 14 | 20 |
| Control and Automation (EEA) | 18 | 21 |
| Computer Technology (EET) | 21 | 22 |
| Power System (EES) | 16 | 12 |
| Integrated Electronics & Circuits (EEN) | 12 | 17 |
| Thermal Engineering (MET) | 33 | 24 |
| Production Engineering (MEP) | 27 | 13 |
| Industrial Engineering (MEE) | 11 | 13 |
| Materials Engineering (MSM) | 0 | 12 |
| Mechanical Design (MEM) | 34 | 27 |
| Applied Optics (PHA) | 17 | 24 |
| Solid State Materials (PHM) | 22 | 15 |
| Textile Engineering (TTE) | 20 | 17 |
| Textile Chemical Processing (TTC) | 9 | 11 |
| Fibre Science & Technology (TTF) | 18 | 10 |
| Atmospheric-Oceanic Science & Technology (AST) | 8 | 10 |
| Radio Frequency Design and Technology (CRF) | 16 | 19 |
| Biomedical Engineering (BMT) | 6 | 9 |

Table III contd. .....

| | | |
|---|---|---|
| Energy Studies (JES) | 25 | 22 |
| Energy and Environment Technologies & Management (ESN) | 0 | 10 |
| Industrial Tribology & Maintenance Engineering (JIT) | 14 | 12 |
| Polymer Science & Technology (JPT) | 16 | 11 |
| Optoelectronics & Optical Communication (JOP) | 25 | 11 |
| Instrument Technology (JID) | 20 | 13 |
| Industrial Design (JDS) | 23 | 0 |
| Telecommunication Technology and Management (JTM) | 19 | 21 |
| **Master of Design** | | |
| Industrial Design (DDS) | 0 | 21 |
| **Master of Science** | | |
| Chemistry (CYS) | 3 | 15 |
| Mathematics (MAS) | 7 | 21 |
| Physics (PHS) | 3 | 7 |
| **Master of Science (Research)** | | |
| Biochemical Engineering & Biotechnology (BEY) | 5 | 5 |
| Bharti School of Telecommunication Technology & Management (BSY) | 0 | 2 |
| Amar Nath & Shashi Khosla School of Information Technology (SIY) | 2 | 3 |
| Computer Science & Engineering (CSY) | 2 | 2 |
| Civil Engineering (CEY) | 2 | 0 |
| Electrical Engineering (EEY) | 5 | 18 |
| Chemical Engineering (CHY) | 1 | 0 |
| Materials Science & Engineering (MSY) | 0 | 2 |
| Mechanical Engineering (MEY) | 6 | 8 |
| Applied Mechanical (AMY) | 5 | 2 |
| Biological Sciences (BLY) | 4 | 7 |
| **Total** | **738** | **705** |

List of the merit-cum-means scholarships awarded for M.Sc. is as follows:

### Table IV : Merit-cum-means Scholarships Awarded to M.Sc. Students

| | | 2018 | 2019 |
|---|---|---|---|
| Chemistry | Year I | 14 | 09 |
| | Year II | 14 | 14 |
| Mathematics | Year I | 14 | 12 |
| | Year II | 13 | 13 |
| Physics | Year I | 14 | 14 |
| | Year II | 14 | 14 |
| | **Total** | **83** | **76** |

The students pursuing Ph.D. are also eligible for assistantships. This year, additional 441 students were awarded assistantships. Assistantship to existing students continues provided, they show satisfactory progress. The table below gives a discipline wise break-up of assistantships awarded during the period.

**Table V : Institute Assistantships Awarded to Research Scholars during the Session 2019-2020**

| Department/Centre/School | No. of Assistantships Renewed | No. of Assistantship Awarded (2019 entry) |
|---|---|---|
| Applied Mechanics (AMZ) | 36 | 11 |
| Biochemical Engineering & Biotechnology (BEZ) | 35 | 5 |
| Biochemical Engineering & Biotechnology (BEY) | 1 | 0 |
| Chemical Engineering (CHZ) | 78 | 41 |
| Chemistry (CYZ) | 36 | 18 |
| Civil Engineering (CEZ) | 107 | 51 |
| Computer Science & Engineering (CSZ) | 26 | 3 |
| Design (DDZ) | 4 | 3 |
| Electrical Engineering (EEZ) | 169 | 73 |
| Humanities & Social Sciences (HUZ) | 51 | 21 |
| Management Studies (SMZ) | 70 | 20 |
| Mathematics (MAZ) | 30 | 12 |
| Material Science & Engineering (MSZ) | 21 | 14 |
| Mechanical Engineering (MEZ) | 107 | 16 |
| Physics (PHZ) | 61 | 21 |
| Textile and Fibre Engineering (TTZ) | 41 | 13 |
| Centre for Applied Research in Electronics (CRZ) | 23 | 9 |
| Centre for Atmospheric Sciences (ASZ) | 19 | 9 |
| Centre for Biomedical Engineering (BMZ) | 20 | 10 |
| Centre for Energy Studies (ESZ) | 34 | 18 |
| Automotive Research and Tribology (ITZ) | 14 | 6 |
| Sensors, Instrumentation and Cyber-physical System Engg. (IDZ) | 6 | 5 |
| Centre for Polymer Science & Engineering (PTZ) | 14 | 0 |
| Centre for Rural Development & Technology (RDZ) | 49 | 17 |
| Kusuma School of Biological Sciences (BLZ) | 24 | 9 |
| Amar Nath and Shashi Khosla School of Information Technology (ANZ) | 17 | 3 |
| Bharti School of Telecommunication Technology & Management (BSZ) | 26 | 7 |
| School of Public Policy (PPZ) | 2 | 2 |
| Interdisciplinary Research (SRZ) | 2 | 3 |
| Transport Res. & Injury Prevention Programme (TRZ) | 4 | 5 |
| National Resource Centre for Value Education in Engg. (NRZ) | 1 | 2 |
| IITD Queensland Joint Ph.D. Programme (QIZ) | 7 | 14 |
| **Total** | **1135** | **441** |

# ACADEMIC PERFORMANCE

IT Delhi follows the credit system of performance evaluation, with proportional weighting of courses based on their importance. The total marks (usually out of 100) form the basis of grades, with a grade value (out of 10) assigned to a range of marks. Sometimes, relative grading is done considering the overall performance of the whole class.

2042 candidates awarded of various degrees and diplomas of the Institute at the 50th Annual Convocation held on 2nd November, 2019. Details of the same are given below:

## Degrees Awarded in the 50th Convocation (2019)
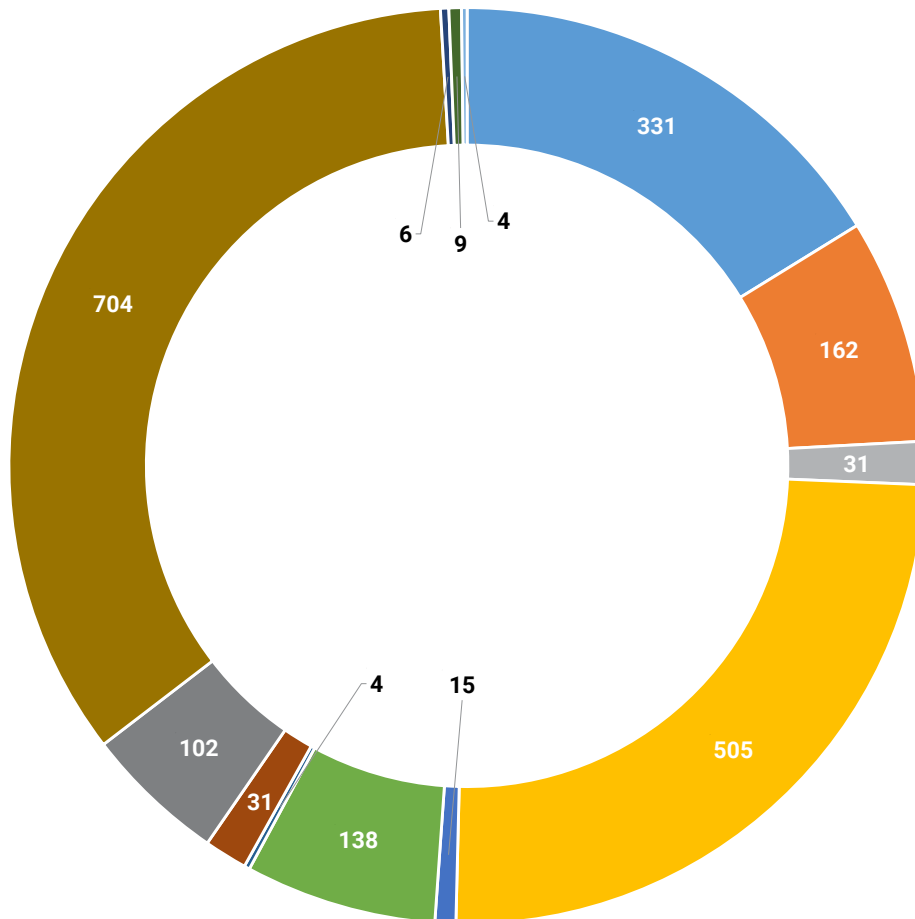


| Programmes | 2019 |
|---|---|
| Ph.D. | 331 |
| M.B.A. (Full-time/Part-time) | 162 |
| M.S. (Research) | 31 |
| M. Tech. | 505 |
| M. Des. | 15 |
| M. Sc. | 138 |
| P.G. Diploma | 4 |
| D.I.I.T. (Naval Construction) | 31 |
| Dual Degree (B.Tech. & M.Tech.) | 102 |
| B.Tech. | 704 |
| U.G. Diploma | 6 |
| Advanced Standing (B.Tech. & M.Tech.) | 9 |
| Integrated M.Tech. (Math & Computing) | 4 |
| Total | 2042 |

**Students received Medals in the 50th Convocations, held on 2nd November, 2019.**

## MEDALS AND PRIZES

### President's Gold Medal

**Kacham Praneeth**
B.Tech. in
Computer Science & Engg.

### Director's Gold Medal

**Mallika Singla**
B.Tech. in
Biochemical Engg. & Biotechnology

### Dr. Shankar Dayal Sharma Gold Medal

**Himakshi Barsiwal**
M.Tech. in
Chemical Engineering

## PERFECT TEN GOLD MEDALS

**Arka Mukherjee**
M.S.(R) in
Bharti School of Telecommunication
Technology & Management

**Deepesh Kumar Gautam**
M.Tech in
Industrial Tribology &
Maintenance Engineering

**Ankita Pramanick**
M.Tech. in
Fibre Science & Technology

**Diksha Gupta**
M.Tech. in
Water Resources Engineering

## SILVER MEDALISTS

**Utkarsh Sinha**
B.Tech. & M.Tech. in
Chemical Engineering

**Abhinav Kumar Shukla**
B.Tech. & M.Tech. in Biochemical
Engineering & Biotechnology

**Vaibhav Bhagee**
B.Tech. & M.Tech. in Computer
Science & Engineering

**Raunak Lohiya**
B.Tech. & M.Tech. in
Mathematics & Computing

**Rahul Khetan**
B.Tech. in Biochemical Engg. &
Biotechnology

**Harman Singh**
B.Tech. in Civil Engineering

**Urvashi Gupta**
B.Tech. in Chemical Engineering

**Narayani Bhatia**
B.Tech. in Electrical Engineering

**Prakhar Agrawal**
B.Tech. in Electrical Engg.,
Power Automation

**Paras Gupta**
B.Tech. in Mechanical Engg.

**Krishaanu Syal**
B.Tech. in Production &
Industrial Engineering

**Sumeet Khandelwal**
B.Tech. in Mathematics &
Computing

**Vishnu Raghuraman**
B.Tech. in Engineering Physics

**Jessica**
B.Tech. in Textile Technology

For each semester, the students are graded on a scale of 0 to 10 based on their performance, by taking a weighted average of the grade points from all the courses, with their respective credit points. Each semester evaluation is done independently and then the weighted average over all semesters is used to calculate the cumulative grade point average (CGPA). The following table gives the Discipline-wise break-up of CGPA for the two Academic Semesters:

**Table I:** Discipline-wise break-up of CGPA for the two Academic Semesters (Undergraduate Courses) [Academic Session 2018-2019 (2015 Entry Students)]

| Discipline | 10.00-9.00 | 8.99-8.00 | 7.99-7.00 | 6.99-6.00 | 5.99-5.00 | 4.99-4.00 | 3.99-3.00 | 2.99-2.00 | Less than 2.00 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **First Semester** | | | | | | | | | | |
| Dual-Degree in Biochemical Engineering & Biotechnology (BB5) | 0 | 1 | 6 | 3 | 1 | 0 | 0 | 0 | 0 | 11 |
| Biochemical Engg. & Biotechnology (BB1) | 2 | 6 | 11 | 10 | 4 | 0 | 0 | 0 | 0 | 33 |
| Civil Engineering (CE1) | 2 | 10 | 43 | 22 | 6 | 0 | 0 | 0 | 0 | 83 |
| Chemical Engineering (CH1) | 6 | 19 | 19 | 16 | 3 | 0 | 0 | 0 | 0 | 63 |
| Dual Degree in Chemical Engg. (CH7) | 1 | 14 | 8 | 3 | 10 | 0 | 0 | 0 | 0 | 36 |
| Computer Science & Engg. (CS1) | 16 | 21 | 16 | 6 | 0 | 0 | 0 | 0 | 0 | 59 |
| Dual-Degree in Computer Science & Engineering (CS5) | 4 | 5 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 19 |
| Electrical Engineering (EE1) | 14 | 22 | 29 | 8 | 0 | 0 | 0 | 0 | 0 | 73 |
| Electrical Engg. (Power) & Automation (EE3) | 3 | 15 | 8 | 14 | 4 | 0 | 0 | 0 | 0 | 44 |
| Mechanical Engineering (ME1) | 8 | 18 | 23 | 11 | 2 | 0 | 0 | 0 | 0 | 62 |
| Production & Industrial Engg. (ME2) | 0 | 12 | 20 | 13 | 5 | 1 | 0 | 0 | 0 | 51 |
| Mathematics & Computing (MT1) | 7 | 13 | 3 | 10 | 2 | 0 | 0 | 0 | 0 | 35 |
| Dual-Degree in Mathematics & Computing (MT6) | 1 | 6 | 4 | 6 | 1 | 0 | 0 | 0 | 0 | 18 |
| Engineering Physics (PH1) | 4 | 7 | 18 | 9 | 4 | 0 | 0 | 0 | 0 | 42 |
| Textile Engineering (TT1) | 2 | 18 | 29 | 18 | 11 | 0 | 0 | 0 | 0 | 78 |
| **Total** | 70 | 187 | 244 | 152 | 53 | 1 | 0 | 0 | 0 | 707 |
| **Second Semester** | | | | | | | | | | |
| Dual-Degree in Biochemical Engineering & Biotechnology (BB5) | 0 | 1 | 6 | 3 | 1 | 0 | 0 | 0 | 0 | 11 |
| Biochemical Engg. & Biotechnology (BB1) | 2 | 7 | 10 | 9 | 5 | 0 | 0 | 0 | 0 | 33 |
| Civil Engineering (CE1) | 3 | 8 | 42 | 25 | 5 | 0 | 0 | 0 | 0 | 83 |
| Chemical Engineering (CH1) | 8 | 18 | 19 | 14 | 4 | 0 | 0 | 0 | 0 | 63 |
| Dual-Degree in Chemical Engg. (CH7) | 1 | 14 | 8 | 5 | 8 | 0 | 0 | 0 | 0 | 36 |
| Computer Science & Engg. (CS1) | 17 | 20 | 16 | 6 | 0 | 0 | 0 | 0 | 0 | 59 |
| Dual-Degree in Computer Science & Engineering (CS5) | 4 | 7 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 19 |
| Electrical Engineering (EE1) | 15 | 22 | 29 | 7 | 0 | 0 | 0 | 0 | 0 | 73 |
| Electrical Engg. (Power & Automation) (EE3) | 3 | 15 | 8 | 13 | 5 | 0 | 0 | 0 | 0 | 44 |
| Mechanical Engineering (ME1) | 8 | 20 | 21 | 11 | 2 | 0 | 0 | 0 | 0 | 62 |
| Production & Industrial Engineering (ME2) | 0 | 13 | 19 | 13 | 6 | 0 | 0 | 0 | 0 | 51 |
| Mathematics & Computing (MT1) | 7 | 12 | 4 | 9 | 3 | 0 | 0 | 0 | 0 | 35 |
| Dual-Degree in Mathematics & Computing (MT6) | 1 | 6 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 18 |
| Engineering Physics (PH1) | 4 | 8 | 17 | 10 | 3 | 0 | 0 | 0 | 0 | 42 |
| Textile Engineering (TT1) | 2 | 15 | 30 | 19 | 12 | 0 | 0 | 0 | 0 | 78 |
| **Total** | 75 | 186 | 237 | 155 | 54 | 0 | 0 | 0 | 0 | 707 |

**Table II : Academic Performance of 1st year Students of Postgraduate Programmes**

| Department/Centre/School | Programme | No. of students admitted (2019) | No. of students qualified to continue* |
|---|---|---|---|
| **Master of Technology** | | | |
| Applied Mechanics | Engineering Analysis and Design (AMA) | 64 | 58 |
| Chemical Engineering | Chemical Engineering (CHE) | 30 | 24 |
| Chemistry | Molecular Engineering: Chemical Synthesis and Analysis (CYM) | 9 | 8 |
| Civil Engineering | Construction Technology and Management (CEC) | 30 | 30 |
| | Geotechnical & Geoenvironmental Engineering (CEG) | 15 | 11 |
| | Structural Engineering (CES) | 28 | 22 |
| | Water Resources Engineering (CEW) | 11 | 8 |
| | Construction Engineering and Management (CET) | 29 | 17 |
| | Rock Engineering of Underground Structures (CEU) | 16 | 14 |
| | Environmental Engineering and Management (CEV) | 16 | 10 |
| | Transportation Engineering (CEP) | 13 | 8 |
| Computer Science & Engineering | Computer Science & Engineering (MCS) | 26 | 23 |
| Electrical Engineering | Control and Automation (EEA) | 23 | 19 |
| | Communications Engineering (EEE) | 25 | 23 |
| | Power Electronics, Electrical Machines & Drives (EEP) | 30 | 28 |
| | Computer Technology (EET) | 27 | 24 |
| | Integrated Electronics & Circuits (EEN) | 22 | 18 |
| | Power Systems (EES) | 19 | 14 |
| Materials Science & Engineering | Materials Engineering (MSM) | 12 | 11 |
| Mechanical Engineering | Thermal Engineering (MET) | 30 | 22 |
| | Production Engineering (MEP) | 13 | 12 |
| | Industrial Engineering (MEE) | 19 | 16 |
| | Mechanical Design (MEM) | 36 | 25 |
| Physics | Solid State Materials (PHM) | 18 | 13 |
| | Applied Optics (PHA) | 23 | 20 |
| Bharti School of Telecomm. Technology and Mgmt. | Telecommunication Technology and Management (JTM) | 22 | 22 |
| Applied Research in Electronics | Radio Frequency Design & Technology (CRF) | 34 | 29 |
| Atmospheric Sciences | Atmospheric Oceanic Science & Technology (AST) | 14 | 12 |

Table II contd. .....

| | | | |
|---|---|---|---|
| Biomedical Engineering | Biomedical Engineering (BMT) | 9 | 8 |
| Textile and Fibre Engineering | Fibre Science & Technology (TTF) | 11 | 11 |
| | Textile Engineering (TTE) | 19 | 19 |
| | Textile Chemical Processing (TTC) | 11 | 11 |
| Energy Studies | Energy and Environment Technologies & Mgmt. (ESN) | 18 | 17 |
| | Renewable Energy Technologies and Mgmt. (ESR) | 22 | 21 |
| Interdisciplinary Programme | Energy Studies (JES) | 28 | 25 |
| | Industrial Tribology & Maintenance Engg. (JIT) | 16 | 16 |
| | Polymer Science & Technology (JPT) | 14 | 12 |
| | Optoelectronics & Optical Communication (JOP) | 18 | 14 |
| | Instrument Technology (JID) | 18 | 15 |
| | VLSI Design Tools and Technology (JVL) | 6 | 6 |
| **Master of Science (Research)** | | | |
| | Applied Mechanics (AMY) | 1 | 1 |
| | Amar Nath & Shashi Khosla School of Information Technology (SIY) | 4 | 4 |
| | Computer Science & Engineering (CSY) | 1 | 1 |
| | Biochemical Engineering & Biotechnology (BEY) | 5 | 5 |
| | Bharti School of Telecommunication Technology & Management (BSY) | 5 | 3 |
| | Kusuma School of Biological Sciences (BLY) | 6 | 6 |
| | Mechanical Engineering (MEY) | 6 | 5 |
| | Electrical Engineering (EEY) | 21 | 18 |
| **Master of Design** | | | |
| | Industrial Design (DDS) | 21 | 20 |
| **PG D.I.I.T. (2 Year)** | | | |
| | Naval Construction (AMX) | 19 | 19 |
| **Master of Science** | | | |
| | Chemistry (CYS) | 54 | 52 |
| | Mathematics (MAS) | 55 | 53 |
| | Physics (PHS) | 57 | 52 |
| **Master of Business Administration** | | | |
| | Technology Management (SMN) | 36 | 35 |
| | Management Systems (SMF) | 107 | 102 |
| | Telecommunication Systems Mgmt. (SMT) | 25 | 25 |
| | **Total** | **1267** | **1117** |

* The remaining students either left the Institute or failed to meet the minimum C.G.P.A. requirements to continue in the next semester.

## STUDENTS' RECOGNITIONS

IIT Delhi students regularly receive awards and recognitions in national and international forums. This year too, the students have performed immensely well. A department-wise distribution of these accolades is provided below.

### Applied Mechanics

- Sagar Saroha, "High Performance Computing Research Excellence Award", High Performance Computing Center IIT Delhi, 2019, Guide: Prof. Sawan S. Sinha.

- Sagar Saroha, "American Physical Society Travel Grant", American Physical Society, 2019. Guide: Prof. Sawan S. Sinha.

- Lt. Prerna Sharma, "Best Student Paper Award", FICCI-Indian Navy International seminar on 'Nation Building through Shipbuilding', 2019. Guide: Lt. Cdr. R.V. Shashank Shankar.

- Cdr. B. Praveen, "FITT Award for the Best Industry Relevant Ph.D. Thesis", Indian Institute of Technology, Delhi, Guide: Prof. S.N. Singh, Prof. V. Seshadri, Prof. R. Vijay Kumar.

- Sandeep, "FITT Award for the Best Industry Relevant M.Tech. Project", Indian Institute of Technology, Delhi, 2019. Guide: Prof. S.V. Veeravalli

- Krishnendu Chakraborty, "Lt. Arpan Banerjee Award", Indian Institute of Technology, Delhi, 2019. Guide: Prof. Sawan S. Sinha.

- Anjali Dubey, "Prof. B. Karunes Memorial Award", Indian Institute of Technology, Delhi, 2019. Guide: Prof. Puneet Mahajan.

- Anjali Dubey, "Mrs. Malti Singh and Ram Rishi Memorial Postgraduate Award", Indian Institute of Technology, Delhi, 2019. Guide: Prof. Puneet Mahajan.

### Chemical Engineering

- Manshu Kapoor, "Second Best Poster Award", Technological Advancement of Redox Flow Battery at Sustainable Environergy Research Lab the clean energy theme, Industry day, IIT Delhi, 2019. Guide: Prof. Anil Verma.

- Prashant Jadhao, "Best Poster Award", Self-Sustainable E-waste Recycling: Generating Wealth from Waste, Industry Day, IIT Delhi, 2019. Guide: Prof. K.K. Pant.

- Prashant Jadhao, "Awarded special prize for presentation", Sustainable E-waste Recycling: Generating Wealth from Waste, 3rd INAE Youth Conclave, IIT Delhi. Guide: Ramdayal Panda and Prof. K.K. Pant

- Ashish Pandey, Mohit Anand, and Paritosh Raj, "Special prize in Innovative ideas and POC for project", Enhanced Concrete Aggregates from steel slag and atmospheric $CO_2$, 3rd INAE Youth Conclave, IIT Delhi. Guide: Prof. K.K. Pant.

- Ashish Pandey, "China Inno Tour for Indian young scientists". Guide: Prof. K.K. Pant.

- Sonit Balyan, "First prize in poster presentation", Effect of Cr over Mo/HMCM-22 catalyst for methane dehydro-aromatization reaction, APCAT-8, Bangkok, Thailand. Guide: Prof. K.K. Pant.

- Uma Dwivedi, "First Prize in poster presentation", Experimental Investigation on Two-step Approach for Fuel Range Liquid Hydrocarbons from Waste Plastic, 9th World Petrocoal Congress. Guide: Prof. K.K. Pant.

- Uma Dwivedi, "First Prize in poster presentation", Turning Wastes into Wealth: Producing Fuel from Waste Plastic, Open House, IIT Delhi. Guide: Prof. K.K. Pant.

- Uma Dwivedi, "Gandhian Young Technological Innovation Award", Utilization of Real-World Plastic for the Production of Fuel Range Liquid Hydrocarbons using Two-Setp Approach, Society for Research and Initiatives for Sustainable Technologies and Institutions. Guide: Prof. K.K. Pant.
- Kaushal Parmar, "Special Prize for poster presentation", IIT Delhi Alumni Association, Open House IIT Delhi. Guide: Prof. K.K. Pant.
- Kaushal Parmar, "Selection for Global Manufacturing and Industrialization Summit (GMIS)", Yekaterinburg, Russia. Guide: Prof. K.K. Pant.
- Shireen Quereshi, "Best Oral Presentation Award", International Conference on Advances in Catalysis: Industrial Outlook – 2019, Hyderabad, India. Guide: Prof. K.K. Pant.
- Ejaz Ahmad, "Best Industry relevant Ph.D. Thesis Award", FITT, IIT Delhi. Guide: Prof. K.K. Pant.
- Sonal, Dr. A.V. Rama Rao Foundations, "Best Ph.D. Thesis and Research Award", Guide: Prof. K.K. Pant, Prof. Sreedevi U.
- Gul Afreen, "Best Oral Presentation Award for the paper entitled", Conversion of biomass-derived phenolics into C10-C13 fuel precursors and value-added chemicals over green heterogeneous catalysts, 22nd International Conference on Green Chemistry and Technology, 2019, Paris, France. Guide: Prof. Sreedevi U.
- Gul Afreen, "Best Paper Award for the paper entitled", TiO2 Nanowires as Efficient Heterogeneous Photocatalysts for Waste-Water Treatment, 13th International Conference on Chemistry and Heterogeneous Catalysis, 2019, Paris, France. Guide: Prof. Sreedevi U.
- Rohini Singh, "Gandhian Young Technology Innovation (GYTI)", the Society of Research and Initiatives for Sustainable Technologies and Institutions (SRISTI). Guide: Prof. Shalini Gupta.

## Design
- Shubhrima Ghosh, "Research Excellence Best Poster Award", Bio-Innovation for Environmental and Health Sustainable Developments.

## Electrical Engineering
- Nishant Kumar, "FITT Award for Best Industry Relevant Project", Guide: Prof. Bhim Singh.
- Sayan Chakraborty, "Prof. J. Nanda Cash Award". Guide: Prof. N. Senroy.

## Humanities and Social Sciences
- Satheesha B., "Robert S. McNamara Fellowship", World Bank, from November 2019 to May 2020. Guide: Prof. Jayan Jose Thomas.
- Angarika Rakshit, "Fulbright Foreign Student Programme fellowship", US India Education Foundation, 2019. Guide: Prof. Jayan Jose Thomas.

## Materials Science and Engineering
- Lukkumanul Hakkim N., "Prime Minister's Fellowship Doctoral Research", sponsored by SERB and FICCI,

2019. Guide: Prof. Leena Nebhani.
- Smrutirekha Mishra, "Elite Internship", sponsored by National Chiao Tung University, Taiwan, 2019. Guide: Prof. Leena Nebhani.
- Smrutirekha Mishra, "3rd Award in Oral Presentation", category at Young Researchers Symposium, IIT Delhi, 2019. Guide: Prof. Leena Nebhani.
- Amit Kumar, "Consolation Prize in Oral Presentation", category Young Researchers Symposium, IIT Delhi, 2019. Guide: Prof. Leena Nebhani.
- Agni Kumar Biswal, "Research Excellence Travel Award (RETA)", IIT Delhi, 2019. Guide: Prof. Sampa Saha.
- Agni Kumar Biswal, "CSIR Travel Grant Scheme", Council of Scientific & Industrial Research (CSIR), 2019. Guide: Prof. Sampa Saha.
- Shaifali Dhingra, "Best Poster Award", JMU, Delhi, 2019. Guide: Prof. Sampa Saha.

## Mechanical Engineering
- Shanmukhi Sripada, "1st Prize (oral short) in Best Presentation (Academic)", India Trib, Tenth International Conference on Industrial Tribology, Indian Institute of Science, Bangalore, 2019. Guide: Prof. Sujeet Kumar Sinha.

## Physics
- Pooja Basera, "Kawazoe Best Poster Award", Asian Consortium of Computational Materials Science, ACCMS 10, Hongkong, 2019. Guide: Prof. Saswata Bhattacharya.
- Gazal Gupta (M.Tech. SSM), "Best Poster Award", NCAMST, Jaipur, 2020. Guide: Prof. Rajendra S. Dhaka.
- Guru Dutt Gupt, "Best Poster Award", 64th DAE-SSPS, IIT Jodhpur, 2019. Guide: Prof. Rajendra S. Dhaka.
- Jayjit Mukherjee, "Memorial Award for Best Poster", IWPSD, 2019. Guide: Prof. Rajendra S. Dhaka, Prof. S.K. Agarwal.
- Rita Majumdar, "Sandwich Training and Education programme (STEP)", Abdus Salam International center for theoretical physics (ICTP), Trieste, Italy, from 2019 to 2021. Guide: Prof. Rahul Marathe.
- Konark Bisht, "One of figures in our recent publication has been selected", for Phys. Rev. E. Kaleidoscope, Phy. Rev. E, 2020. Guide: Prof. Rahul Marathe.
- Naina, "Best Poster Award", NCAMST, Jaipur, 2020. Guide: Prof. Sujeet Chaudhary.
- Parul Raturi, "Best Poster Presentation Award", ZnO Nano wire based superhydrophilic adsorbent for lead removal from water, SNAIA-2019, Paris, France, 2019. Guide: Prof. J.P. Singh.
- Mr. Shashank Gahlaut, "Visiting Research Scholarship", University of Georgia Athens, USA, from 1 October, 2019 to 30 March, 2020. Guide: Prof. J.P. Singh.
- Mr. Subhajit Karmakar, "Best Poster Award", ICOL-2019 Dehradun, 2019. Guide: Prof. R.K. Varshney.
- Khushboo Singh, "Visiting Research Fellow", University of Queensland, Australia, 2019. Guide: Prof. Amartya Sengupta.

- Parswajit Kalita, "Best Researcher Award", EMRS, France, 2019. Guide: Prof. Amartya Sengupta.

## Textile and Fibre Engineering

- Sanchi Arora, "Best Oral Paper Presentation Award", on International Conference on Emerging Trends in Traditional and Technical Textiles organised by NIT Jalandhar, 2019. Guide: Prof. Abhijit Majumdar, Prof. B.S. Butola.
- Shubhadeep Paul, "3rd Prize Award in Poster Presentation", at Industry Day- 2019 in the theme Emerging Nano and Advanced Material, IIT Delhi, 2019. Guide: Prof. Wazed Ali.
- Yogesh Yadav, "Boss Award for securing highest marks in B.Tech. Project", IIT Delhi, 2019. Guide: Prof. Javed Nabibaksha Sheikh.
- Sajan Singh, "Overseas Visiting Doctoral Fellowship", carrying out research at Leibniz Institute for Polymer Research Dresden, Germany, DST, India 2019-20. Guide: Prof. Bhanu Nandan.
- Sumana Bandopadhayay, "Best Poster Award", Frontiers in Materials Processing Applications, Research and Technology, 2019. Guide: Prof. Bhanu Nandan.
- Sanchayan Pal, "Best Poster Award", International Conference on Functional Materials, 2020. Guide: Prof. Bhanu Nandan.
- Yatee Gupta, "BOSS Award with BIG Grant", DBT, 2020. Guide: Prof. Samrat Mukhopadhyay.
- Yatee Gupta, "Pfizer Patent Award", Pfizer, 2020. Guide: Prof. Samrat Mukhopadhyay.
- Rashi Agarwal, "Best poster presentation", Bengaluru, India, 2020. Guide: Prof. Ashwini K. Agrawal.
- Ankita Pramanik, "2nd prize in Poster presentation", 3rd Young Researchers Symposium 2019, IIT-Delhi, 2019. Guide: Prof. Ashwini K. Agrawal.
- Anasuya Roy, "BIG Start up Grant (Biotechnology Ignition Grant)", BIRAC, DBT, Govt of India, from March 2019 to October 2020. Guide: Prof. Mangala Joshi.
- Siddhant Varshney, "UQ-IITD Research Academy Fellowship", Under UQIADR, University of Queensland, Australia & IITD Collaboration. Guide: Prof. Mangala Joshi.
- Shivam Gupta, "FITT, IIT Delhi", 2020. Guide: Prof. Deepti Gupta, Prof. Abhijit Majumdar.

- Swati Varshney, "Raman Charpak Fellowship for Doctoral students", for carrying out research at Lille University, France, Department of Science and Technology, 2019. Guide: Prof. Deepti Gupta, Prof. Shipli Sharma.

## Applied Research in Electronics

- Kartikeya GL, "International Travel Award to participate in IEEE APS-URSI 2019", DST, 2019. Guide: Prof. Shiban K. Koul, Prof. Mahesh Abegoankar.
- Zamir Wani, "Certificate of Achievement for top 10% of downloads for the research paper published in RF and Microwave Computer Aided Engineering Journal", John Wiley, USA, 2019. Guide: Prof. Shiban K. Koul, Prof. Mahesh Abegoankar.
- Alka Jakhar, "Research Excellence Best Poster Award", XXth International Workshop on Physics of Semiconductor Devices (IWPSD), Kolkata, 2019. Guide: Prof. Samaresh Das.
- Dhairya Singh, "Best Paper (Shortlisted) Award", IEEE MEMS, Vancouver, Canada, 2020. Guide: Prof. Pushpapraj Singh.
- Bipin Kumar, "Sir C.V. Raman Award 2019", Acoustical Society of India, 2019. Guide: Prof. Arun Kumar, Prof. R. Bahl.

## Biomedical Engineering

- Rupsa, "Magna Cum Laude". Guide: Prof. Anup Singh.
- Rafeek, "Magna Cum Laude". Guide: Prof. Anup Singh.
- Veena Arora, "Young Researcher Award" by IIT Delhi, NASI-SCOPUS Young scientist awardee, 2019. Guide: Prof. Neetu Singh.

## Energy Studies

- Rajat Saxena, "First Position in Poster Presentation under the Thematic Session Make in India on Industry Day", IIT Delhi, 2019. Guide: Prof. Dibakar Rakshit, Prof. S.C. Kaushik.
- Mahreen, "First Prize in exam conducted by the Plasma School", SERB DST School on "Plasma Materials Processing", 2019. Guide: Prof. Satyananda Kar, Prof. Debaprasad Sahu.
- Anshu Verma, "National BUTI Award for best Research student research work presentation", 34th National Symposium on Plasma Science and Technology, VIT Chennai, 2019. Guide: Prof. Ashish Ganguli, Prof. Ramesh Narayanan.

- Vipin Dhyani, "Early-Doc fellowship", IIT Delhi, 2019.
- Vipin Dhyani, "Best Paper Award", 11th International Energy, Energy and Environment Symposium (IEEES-11), SRM-IST, Chennai, 2019.
- Vipin Dhyani, "Research Excellence Travel Award", IIT Delhi, 2019.
- Vipin Dhyani, "Research Scholar Travel Award", IIT Delhi, 2019.
- Vipin Dhyani, "IIT Delhi Alumni Association Annual Research & Innovation Award", IIT Delhi Alumni Association, 2019.
- Anil Kumar Shere, "Award Certificate Corporate Relations", IIT Delhi, 2019.
- Sumedha Sharma, "Research Excellence Travel Award", IIT Delhi, 2020. Guide: Prof. Ashu Verma, Prof. B.K. Panigrahi.
- Sumedha Sharma, "AWSAR (Augmenting Writing Skills for Articulating Research) Award", Department of Science and Technology, 2020. Guide: Prof. Ashu Verma, Prof. B.K. Panigrahi.
- Diksha Kumari, "POSOCO Power System Award", Power System Operation Corporation Limited, 2020. Guide: Prof. Ashu Verma, Prof. Sumit Chattopadhyay.
- Diksha Kumari, "Shrimati Jwala Devi-Sitaram Kaushik Award", IIT Delhi, 2019. Guide: Prof. Ashu Verma, Prof. Sumit Chattopadhyay.
- Diksha Kumari, "Bhagirathi-Vashisht Award", IIT Delhi, 2019. Guide: Prof. Ashu Verma, Prof. Sumit Chattopadhyay.
- Diksha Kumari, "Prof. O.P. Gupta Award", IIT Delhi, 2019. Guide: Prof. Ashu Verma, Prof. Sumit Chattopadhyay.
- Evaneet Kaur, "Shrimati Jwala Devi-Sitaram Kaushik Award", IIT Delhi, 2019. Guide: Prof. Ashu Verma, Ramesh Narayanan.

### Rural Development and Technology

- Farah Naaz, "Young Researcher Award in Algal Biomass Summit'19", Algal Biomass Organisation (ABO) in Orlando, Florida, US, 2019. Guide: Prof. Anushree Malik.
- Dr. Sumit Pal, "Student Incentive Award (Ph.D.) 2018" and "Gold Medal with Cash Prize for Best Ph.D. Research Work", By Soil Conservation Society of India at International conference on Soil and Water Resources Management for Climate Smart Agriculture, Global Food and Livelihood Security at NASC Complex, New Delhi , 2019. Guide: Anushree Malik, Prof. Neelam Patel.
- S.S.M. Sathheskanth, "Best Poster Award", Indian Convention of Food Scientists & Technologists held at Tezpur University, 2020. Guide: Prof. Jatindra K. Sahu.
- Mohd. Aamir Khan, "Best young Scientist Oral Presentation Award", International Conference on Environmental Sustainability: Innovations, Translational Dimensions and Way Forward at BBAU University, Lucknow, 2020. Guide: Prof. Satyawati Sharma.
- Monika Jangir, "Prof. Mira Madan Memorial Excellence Award", Indian Institute of Technology, Delhi. Guide: Prof. Satyawati Sharma.

- Dr. Pratibha Yadav, "International Best researcher of the Year Award", International Journal for Research Under Literal Access (IJRULA). Guide: Prof. Satyawati Sharma.
- Dr. Pratibha Yadav, "Women Researcher Award", VD GOOD Society. Guide: Prof. Satyawati Sharma.
- Dr. Pratibha Yadav, "Best Scientist Award", VD GOOD Society. Guide: Prof. Satyawati Sharma.
- Ajay Kumar, "First Position in Oral Presentation", National Conference on Food Safety, Nutritional Security and Sustainability, Organised by Shyama Prasad Mukherji College for Women (University of Delhi), 2020. Guide: Prof. Satyawati Sharma.
- Uma Diwedi, "GYTI Award", National Innovation Foundation DST. Guide: Prof. S.N. Naik, Prof. K.K. Pant.
- Falguni Pattanaik, "Visiting Student Fellowship", University of Saskatchewan Canada. Guide by S.N. Naik, Prof. Vivek Kumar.
- Vidhi Vimajiani, "Visiting Student Fellowship", University of Saskatchewan Canada. Guide: Prof. S.N. Naik, Prof. A.K. Dalai.
- Pooja, "Visiting Student Fellowship", University of Toronto. Guide: Vivek Kumar.
- Abhijeet Anand, "AWSAR Award", DST. Guide: Prof. P. Kaushal.
- Dr. Megha Mathur, "AWSAR Award (POST DOC CATEGORY)", DST. Guide: Prof. Anushree Malik.

### Bharti School of Telecommunication Technology and Management

- Bhawna Kamra, "Bharti Merit Award (1st Rank) and Best Women Graduate Award", Ms. Mamta Sakia (CEO, Bharti Foundation), 2019.
- Shefali Gupta, "Bharti Merit Award (2nd Rank)", Ms. Mamta Sakia (CEO, Bharti Foundation), 2019.
- Ankita Gupta, "Bharti Merit Award (3rd Rank)", Ms. Mamta Sakia (CEO, Bharti Foundation), 2019.
- Kishalaya Kr. Tiwary, "Bharti Merit Award (1st Rank)", Ms. Mamta Sakia (CEO, Bharti Foundation), 2019.
- Naushi Khare, "Bharti Merit Award (2nd Rank)" and "Best Women Graduate Award", Ms. Mamta Sakia (CEO, Bharti Foundation), on 24 April, 2019.
- Praneeth Kumar Reddy, "Bharti Merit Award (3rd Rank)", Ms. Mamta Sakia (CEO, Bharti Foundation), 2019.
- Sarath Murali, "Bharti Merit Award (4th Rank)", Ms. Mamta Sakia (CEO, Bharti Foundation), 2019.
- Snigdha Saran, "Bharti Merit Award (5th Rank)", Ms. Mamta Sakia (CEO, Bharti Foundation), 2019.
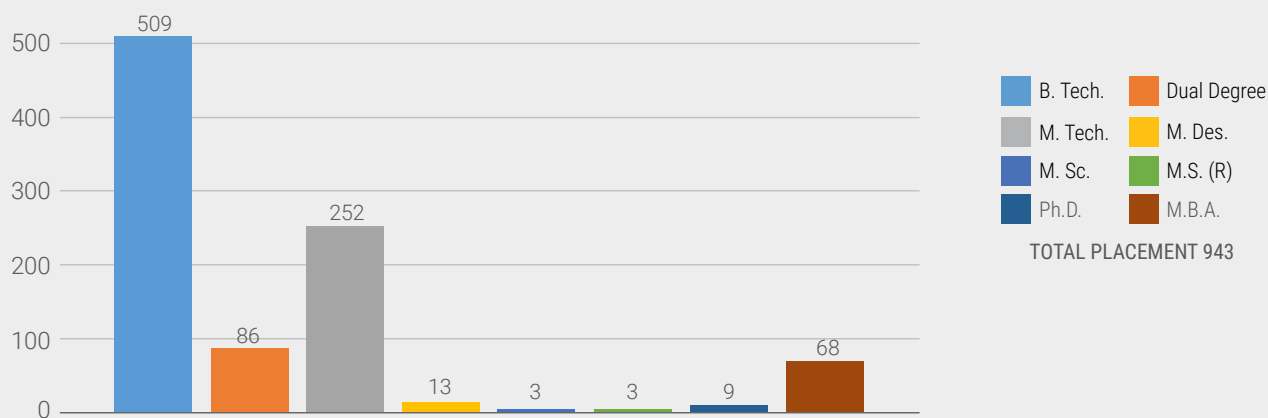
### Amar Nath and Shashi Khosla School of Information Technology

- Anshul Mittal, "Google Fellowship Award", Google Ireland Limited, Dublin, 2019. Guide: Prof. Sumeet Agarwal, Prof. Manik Varma.
- Pranshu Jain, "Best Paper Runner-up", The 6th ACM International Conference on Systems for Energy Efficient Buildings, Cities, and Transportation, 2019. Guide: Prof. Manik Varma.

## PLACEMENT 2019-20



Legend: B. Tech. | Dual Degree | M. Tech. | M. Des. | M. Sc. | M.S. (R) | Ph.D. | M.B.A.

Values: 509, 86, 252, 13, 3, 3, 9, 68

TOTAL PLACEMENT 943

## TRAINING AND PLACEMENT

Career Services / Training & Placement activities are guided by an Institute Level Committee consisting of Faculty members and students. The student committees, i.e. Central Committee at the Institute level as well as Nucleus Committees at departmental level, actively participated in the Training & Placement activities.

As in the past, the Training and Placement Unit continued to plan, organise and consolidate the Training and Placement activities for students. It actively interacted with various industrial, technical, management and research organisations in the country. The dual aim of establishing this rapport is to ensure that students are given adequate technical exposure or industrial training and subsequently get employment in organisations which match their aspirations and objectives. As in previous years, web-based placement services were provided using the internal T&P server this year as well. This considerably reduced the conventional pre-placement talks on the campus.

The Training & Placement Unit was rebranded to Office of Career Services (OCS) in November 2019 to reflect the expanded scope of activities being handled by the unit.

### Training / Internship

A personal dialogue with top executives of a large number of industries resulted in better understanding of their functional requirements and training activities. This effort also helped the T&P Unit in the effective planning of summer practical training for 2nd, 3rd and 4th year B.Tech./ Dual degree/Integrated M.Tech. students as well as M.Des. students, besides obtaining a good number of stipends and other facilities such as transport, accommodation, etc. Department of Management Studies arranged internships for their students at the departmental level.

Training rules as per the new curriculum guidelines were implemented for the UG students (B.Tech. and Dual degree). Detailed instructions to students were also issued prior to the commencement of the training programme. It was also clarified to students that DPE norms would apply for availing NGU credits for internships. A total of 370 students availed internships through T&P/OCS processes. A gist of data regarding the summer practical training (Industrial training) is given in Table I & II.

**Table I:** B.Tech./Dual Degree 2nd, 3rd, and 4th year Students Summer Training - 2020.

| B.Tech./Dual Degree | Seats-Obtained |
|---|---|
| 2nd Year Students | 15 |
| 3rd Year Students | 294 |
| 4th Year Students | 55 |

**Table II:** Master of Design Students Summer Training - 2020

| Discipline | Seats-Obtained |
|---|---|
| M. Des. | 6 |

### Placement

A letter of invitation for Campus Interviews was sent to a large number of public and private sector organisations especially to those which visited the Institute for campus interviews during the last three years. A large number of them gave electronic copies of their job profiles which were made available to the students through the internal web server. This vigorous drive resulted in job requisitions being obtained from industries from 430 Companies for 602 job profiles with selections on 271 profiles. 943 students were placed while a total of 1092 job offers were received (187 Pre-Placement Offers were received by students and 60 students got multiple jobs) by the institute including DMS and T&P/OCS placements. Approximately 85.88% students who availed T&P/DMS services got placed. The remaining opted for higher studies / research or are preparing for civil services or are working on their own startup ideas or got jobs through their own contacts / efforts. The sector-wise distribution of Student Placements is given in Table III.

**Table III:** Sector-wise distribution of Student Placements

| Sector | Students Placed |
|---|---|
| Analytics | 127 |
| Consulting | 83 |
| Core (Technical) | 292 |
| Finance | 25 |
| Information Technology | 217 |
| Teaching & Research | 8 |
| Management | 68 |
| Other | 123 |
| **Total** | **943** |

Ground rules for placement evolved in consultation with the students and faculty members led to a just and equitable distribution of job opportunities amongst the student community.

The discipline wise beak-up of the campus placement position is shown in Table IV and V.

**Table IV:** Discipline-wise break-up of On-Campus Placement Position of B.Tech./Dual degree and 5-year integrated M.Tech. Students during 2019-20.

| Discipline | No. of Students Registered | No. of Effective Placements* | No. of Students with more than one job** |
|---|---|---|---|
| **(a) B.Tech.** | | | |
| Biochemical Engineering & Biotechnology | 27 | 25 | 1 |
| Civil Engineering | 50 | 40 | 1 |
| Chemical Engineering | 56 | 53 | 7 |
| Computer Science & Engineering | 74 | 72 | 6 |
| Electrical Engineering | 64 | 60 | 3 |
| Electrical Engineering (Power and Automation) | 42 | 39 | 3 |
| Mechanical Engineering | 60 | 52 | 8 |
| Production & Industrial Engineering | 49 | 47 | 4 |
| Mathematics & Computing | 32 | 30 | 2 |
| Engineering Physics | 31 | 28 | 3 |
| Textile Engineering | 70 | 63 | 1 |
| **(b) Dual / 5-Year Integrated M.Tech. Programmes** | | | |
| B.Tech. and M.Tech. in Biochemical Engg & Biotechnology | 9 | 8 | 0 |
| B.Tech. and M.Tech. in Chemical Engineering | 32 | 31 | 4 |
| B.Tech. and M.Tech. in Computer Science & Engineering | 24 | 23 | 1 |
| B.Tech. and M.Tech. in Mathematics & Computing | 20 | 16 | 0 |
| B.Tech. in Production & Industrial Engineering and M.Tech. in Production Engineering | 0 | 0 | 0 |
| B.Tech. in Mechanical Engineering and M.Tech. in Mechanical Design | 2 | 2 | 0 |
| B.Tech. in Mechanical Engineering and M.Tech. in Applied Mechanics | 0 | 0 | 0 |
| B.Tech. in Production & Industrial Engineering and M.Tech. in Mechanical Design | 1 | 1 | 0 |
| B.Tech. in Textile Engg. and M.Tech. in Computer Science & Engineering | 1 | 1 | 0 |
| B.Tech. in Chemical Engineering and M.Tech. in Computer Science & Engineering | 0 | 0 | 0 |
| B.Tech. in Production & Industrial Engineering and M.Tech. in Computer Science & Engineering | 1 | 1 | 0 |
| B.Tech. in Civil Engg. and M.Tech. in Structural Engineering | 0 | 0 | 0 |
| B.Tech. in Civil Engineering and M.Tech. in Construction Engineering & Management | 0 | 0 | 0 |
| B.Tech. in Engineering Physics and M.Tech. in Computer Science & Engineering | 1 | 1 | 0 |
| B.Tech. in Mechanical Engg. and M.Tech. in Thermal Engg. | 1 | 1 | 0 |
| B.Tech. in Mechanical Engineering and M.Tech. in Computer Science & Engineering | 1 | 1 | 0 |
| **Total** | **648** | **595** | **44** |

\* Others got placement via off-campus mode. (Some would have gone for higher studies/research or for Civil Services or are working on their own startup ideas or got jobs through their own contacts/efforts.)

\*\* This is because more than one company declared the results on the same day.

**Table V:** On-campus Placement Position of M.Tech. Students during 2019-20.

| Programme | No. of  Students Registered | No. of Effective Placements* | No. of Students with More than one job** |
|---|---|---|---|
| Chemical Engineering | 16 | 12 | 1 |
| Molecular Engineering: Chemical Synthesis & Analysis | 4 | 1 | 0 |
| Geotechnical and Geoenvironmental Engineering | 0 | 0 | 0 |
| Rock Engineering & Underground Structures | 2 | 1 | 0 |
| Structure Engineering | 7 | 3 | 1 |
| Water Resources Engineering | 1 | 0 | 0 |
| Construction Engineering & Management | 1 | 0 | 0 |
| Environmental Engineering & Management | 5 | 0 | 0 |
| Transportation Engineering | 0 | 0 | 0 |
| Computer Science & Engineering | 20 | 20 | 2 |
| Applied Optics | 2 | 1 | 0 |
| Solid State Materials | 4 | 0 | 0 |
| Fibre Science & Technology | 12 | 9 | 0 |
| Textile Engineering | 14 | 13 | 1 |
| Textile Chemical Processing | 8 | 7 | 0 |
| Atmospheric-Oceanic Science and Technology | 4 | 3 | 0 |
| Biomedical Engineering | 6 | 4 | 0 |
| Communications Engineering | 8 | 8 | 0 |
| Computer Technology | 17 | 17 | 3 |
| Control & Automation | 11 | 8 | 0 |
| Integrated Electronics & Circuits | 9 | 8 | 0 |
| Power Electronics, Electrical Machines & Drives | 3 | 2 | 0 |
| Power Systems | 4 | 4 | 0 |
| Radio Frequency Design & Technology | 13 | 13 | 0 |
| Mechanical Design | 18 | 17 | 1 |
| Industrial Engineering | 6 | 5 | 1 |
| Production Engineering | 13 | 10 | 0 |
| Thermal Engineering | 12 | 8 | 0 |
| Engineering Analysis & Design | 26 | 23 | 1 |
| Industrial Tribology & Maintenance Engineering | 5 | 0 | 0 |
| Energy Studies | 14 | 10 | 0 |
| Instrument Technology | 10 | 9 | 0 |
| Optoelectronics & Optical Communication | 11 | 9 | 0 |
| Polymer Science & Technology | 10 | 7 | 0 |
| Telecommunication Technology & Management | 10 | 10 | 3 |
| VLSI Design Tools & Technology | 10 | 10 | 2 |
| **Total** | **316** | **252** | **16** |

\*    Others have got placement  via  off-campus mode. (Some would have gone for higher studies/research or for Civil Services or  are working on their own startup ideas or got jobs through their own contacts/efforts.)

\*\*   This is because more than one company declared the results on the same day.

1. This data is for students who opted for placement through T&P/OCS and DMS. DMS runs its placement process separately.

2. Data on students finally joining the jobs opted on campus not available with T&P.

3. Ph.D. placements were also facilitated by T&P/OCS. PhD profiles were made available to organisations through T&P/OCS and scholars were subsequently contacted directly by organisations for further processes.
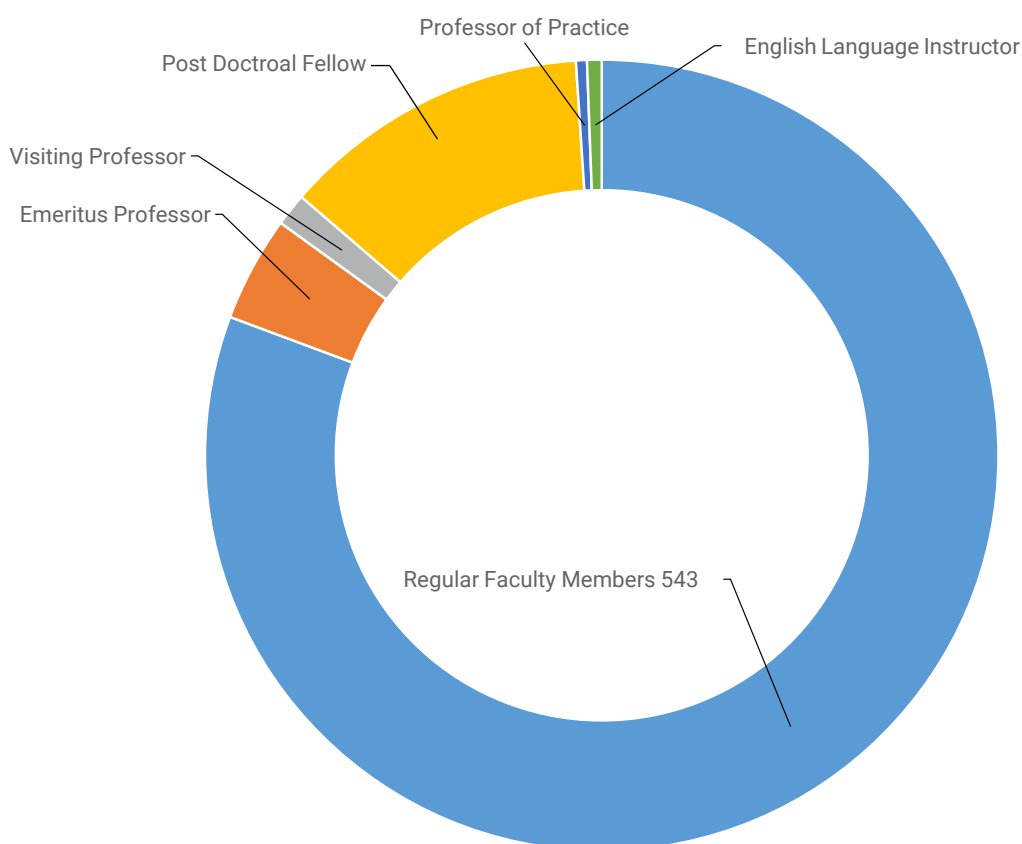
# Faculty Profile and Achievements

(April 1, 2019 - March 31, 2020)

The quality of an academic institution primarily depends on its faculty. IIT Delhi faculty is one of the finest in the country and is recognized internationally for their quality of research, teaching and curriculum development. They also contribute greatly for the development of the nation by being associated with a large number of decision making bodies, providing crucial guidance and advice on policy matters and technical issues. Many of the faculty members serve on the editorial Boards of reputed journals, peer-review papers for publications, serve on committees for recruitment of professionals, and are on the boards of many institutions and organisations. 43 new faculty members have joined the Institute this year, which has enhanced our competence in several emerging areas, while bringing new energy into our academic endeavours.

Recruitment of bright faculty members is one of the most important missions, since therein lies the future of the Institute. Board of Governors (BoG) has played a very positive and constructive role in approving policies, which empower the faculty to deliver their best in both teaching and research. The Institute is continuously trying to reach out to the potential faculty members through a variety of means, including round-the-year search and recruitment and online submission and processing of applications.

## Faculty Strength



Professor of Practice

Post Doctroal Fellow

English Language Instructor

Visiting Professor

Emeritus Professor

Regular Faculty Members 543

| Faculty Strength | Nos. |
| --- | --- |
| Regular Faculty Members | 543 |
| Emeritus Professor | 29 |
| Visiting Professor | 9 |
| Post Doctroal Fellow | 85 |
| Professor of Practice | 3 |
| English Language Instructor | 4 |
| Total | 673 |

### Department of Applied Mechanics

**Professor and Head**

Puneet Mahajan, Ph.D.

**Professors**

S.V. Veeravalli, Ph.D.

Sanjeev Sanghi, Ph.D.

Santosh Kapuria, Ph.D.

Maloy Kumar Singha, Ph.D.

Badri Prasad Patel, Ph.D.

Anupam Dewan, Ph.D.

**Associate Professors**

Murali Raman Cholemari, Ph.D.

Balaji Srinivasan, Ph.D.

S. Pradyumna, Ph.D.

Sitikantha Roy, Ph.D.

Sawan Suman Sinha, Ph.D.

Ajeet Kumar, Ph.D.

Anurag Gupta, Ph.D.

Amitabh Bhattacharya, Ph.D.

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Vikrant Tiwari, Ph.D.

Arjun Sharma, Ph.D.

Sushma Santapuri (Ms.), Ph.D.

Arghya Samanta, Ph.D.

Gaurav Singh, Ph.D.

Vamsi Krishna Chalamalla, Ph.D.

**Emeritus Professors**

Suhail Ahmad, Ph.D.

S.N. Singh, Ph.D.

**Adjunct Professor of Practice**

Yunus Patel, MS

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Atul Narang, Ph.D.

**Professors**

Saroj Mishra (Ms.), Ph.D.

Sunil Nath, Ph.D.

Ashok Kumar Srivastava, Ph.D.

Prashant Mishra, Ph.D.

T.R. Sreekrishnan, Ph.D.

D. Sundar, Ph.D.

Shilpi Sharma (Ms.), Ph.D.

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Preeti Srivastava (Ms.), Ph.D.

Ravi Krishnan Elangovan, Ph.D.

Shaikh Z. Ahammad, Ph.D.

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Rohan Jain, Ph.D.

Lucinda Elizabeth Doyle (Ms.), Ph.D.

Ishaan Gupta, Ph.D.

**Emeritus Professor**

G.P. Agarwal, Ph.D.

### Department of Chemical Engineering

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**Professors**

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A.N. Bhaskarwar, Ph.D.

Suddhasatwa Basu, Ph.D.

Rajesh Khanna, Ph.D.

Anil Kumar Saroha, Ph.D.

Shantanu Roy, Ph.D.

Anupam Shukla, Ph.D.

Sreedevi Upadhyayula (Ms.), Ph.D.

Vivek Vitthal Buwa, Ph.D.

Sudip Kumar Pattanayek, Ph.D.

Anurag Singh Rathore, Ph.D.

Anil Verma, Ph.D.

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Gaurav Goel, Ph.D.

Paresh Pravinchandra Chokshi, Ph.D.

Jyoti Phirani (Ms.), Ph.D.

Mohammad Ali Haider, Ph.D.

Manojkumar Charandas Ramteke, Ph.D.

Divesh Bhatia, Ph.D.

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Hariprasad Kodamana, Ph.D.

Manjesh Kumar, Ph.D.

Mohan Kumar Singh Verma, Ph.D.

**Visiting Professor**

Ratan Mohan, Ph.D.

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D.K. Bandyopadhyay, Ph.D.

Nalin Pant, Ph.D.

Ashok Kumar Ganguli, Ph.D.

Jai Deo Singh, Ph.D.

Narayanan D.Kurur, Ph.D.

Ravi Shankar, Ph.D.

Sunil Kumar Khare, Ph.D.

N.G. Ramesh, Ph.D.

Anil Jacob Elias, Ph.D.

Siddharth Pandey, Ph.D.

V. Haridas, Ph.D.

Shashank Deep, Ph.D.

S. Nagendran, Ph.D.

Sameer Sapra, Ph.D.

Pramit Kumar Chowdhury, Ph.D.

Nidhi Jain (Ms.), Ph.D.

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Hemant Kumar Kashyap, Ph.D.

Pravin Popinand Ingole, Ph.D.

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Gholap Shivajirao Lahu, Ph.D.

Tanmay Dutta, Ph.D.

Kuntal Manna, Ph.D.

Sayantan Paria, Ph.D.

Sudipta Raha Roy, Ph.D.

Chinmoy Kumar Hazra, Ph.D.

Muntha Ramu Yadav, Ph.D.

Soumik Siddhanta, Ph.D.

Subrata Kundu, Ph.D.

Janakiram Vaitla, Ph.D.

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B. Jayaram, Ph.D.

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Ramakrishna Ramaswamy, Ph.D.

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Gurmail S. Benipal, Ph.D.

K.S. Rao, Ph.D.

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| | | | |
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| Aravind Krishna Swamy, Ph.D. | Sorav Bansal, Ph.D. | Bijaya Ketan Panigrahi, Ph.D. | Amol Choudhary, Ph.D. |
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| Nezamuddin, Ph.D. | Rahul Narain, Ph.D. | Abhijit Ramchandra Abhyankar, Ph.D. | **Department of Humanities & Social Sciences** |
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| Arya V. (Ms.), Ph.D. | Rijurekha Sen (Ms.), Ph.D. | **Associate Professors** | **Professors** |
| Prashanth Vangla, Ph.D. | Ashish Chiplunkar, Ph.D. | Mashuq-Un-Nabi, Ph.D. | Sanil V., Ph.D. |
| Arnab Banerjee, Ph.D. | Soham Sundar Chakraborty, Ph.D. | S. Janardhanan, Ph.D. | Ravinder Kaur (Ms), Ph.D. |
| Sahil Bansal, Ph.D. | Rohan Paul, Ph.D. | Anuj Dhawan, Ph.D. | Angelie Multani (Ms.), Ph.D. |
| Manabendra Saharia, Ph.D. | **Emeritus Professor** | Shubhendu Bhasin, Ph.D. | Purnima Singh (Ms.), Ph.D. |
| **Emeritus Professors** | Anshul Kumar, Ph.D. | Mukul Sarkar, Ph.D. | Pritha Chandra (Ms.), Ph.D. |
| A.K. Gosain, Ph.D. | **Department of Design** | Shaunak Sen, Ph.D. | C.A. Tomy, Ph.D. |
| Shashi Mathur, Ph.D. | **Professor and Head** | Amit Kumar Jain, Ph.D. | **Associate Professors** |
| B. Bhattacharjee, Ph.D. | P.V. Madhusudan Rao, Ph.D. | Sumeet Agarwal, Ph.D. | Kamlesh Singh (Ms.), Ph.D. |
| **Department of Computer Science & Engineering** | **Assistant Professors** | Saif Khan Mohammed, Ph.D. | Vibha Arora (Ms.), Ph.D. |
| **Professor and Head** | Srinivasan Venkataraman, Ph.D. | Madhusudan Singh, Ph.D. | Bharati Puri (Ms), Ph.D. |
| Sanjiva Prasad, Ph.D. | Jyoti Kumar, Ph.D. | Abhisek Dixit, Ph.D. | Stuti Khanna (Ms.), Ph.D. |
| **Professors** | Sumer Singh, M.Tech. | Ramkrishan Maheshwari, Ph.D. | Farhana Ibrahim (Ms.), Ph.D. |
| M. Balakrishna, Ph.D. | Jay Dhariwal, Ph.D. | Tapan Kumar Gandhi, Ph.D. | Jayan Jose Thomas, Ph.D. |
| S. Arun Kumar, Ph.D. | Subir Dey, Ph.D. | **Assistant Professors** | Sarbeswar Sahoo, Ph.D. |
| Subhashis Banerjee, Ph.D. | **Visiting Professor** | Bhaskar Mitra, Ph.D. | Debasis Mondal, Ph.D. |
| Huzur Saran, Ph.D. | Sabyasachi Paldas, Ph.D. | Manan Suri, Ph.D. | Richa Kumar (Ms.), Ph.D. |
| Sandeep Sen, Ph.D. | **Department of Electrical Engineering** | Anandarup Das, Ph.D. | Arjun Ghosh, Ph.D. |
| Prem Kumar Kalra, Ph.D. | **Professor and Head** | Seshan Srirangarajan, Ph.D. | Reetika Khera (Ms.), Ph.D. |
| Naveen Garg, Ph.D. | S.D. Joshi, Ph.D. | | |

Varsha Singh (Ms.), Ph.D.

Simona Sawhney (Ms.), Ph.D.

Milind Wakankar, Ph.D.

Saptarshi Mukherjee, Ph.D.

Mahuya Bandyopadhyay (Ms.)

## Assistant Professors

Divya Dwivedi (Ms.), Ph.D.

Paroma Sanyal (Ms.), Ph.D.

Sourabh Bikas Paul, Ph.D.

Arudra Venkata Burra, Ph.D.

Naveen Thayyil Kamaluddin, Ph.D.

Ankush Agrawal, Ph.D.

Samar Husain, Ph.D.

Yashpal Ashokrao Jogdand, Ph.D.

Ashwini J. Vaidya, Ph.D.

Sumitava Mukherjee, Ph.D.

Sisir Debnath, Ph.D.

## Emeritus Professor

Rukmini B. Nair (Ms.), Ph.D.

## English Language Instructors

Anuradha Vashisth (Ms.), M.A., M.Phill.

Ambika Sharma (Ms.), Ph.D.

Jenie Christbol Alex (Ms.), M.Ed.

Ajith Kuruvilla Cherian, Ph.D.

## Department of Management Studies

### Professor and Head

M.P. Gupta, Ph.D.

### Professors

Sushil, Ph.D.

Kanika Tandon Bhal (Ms.), Ph.D.

M.P. Gupta, Ph.D.

Surendra Singh Yadav, Ph.D.

Ravi Shankar, Ph.D.

P. Vigneswara Ilavarasan, Ph.D.

Seema Sharma (Ms), Ph.D.

Mahim Sagar, Ph.D.

Surya Prakash Singh, Ph.D.

### Associate Professors

Harish Chaudhry, Ph.D.

---

Shveta Singh (Ms.), Ph.D.

Jitendra Madaan, Ph.D.

Arpan Kumar Kar, Ph.D.

Amlendu Kumar Dubey, Ph.D.

Smita Kashiramka, (Ms.) Ph.D.

## Assistant Professors

Shuchi Sinha (Ms.), Ph.D.

Sanjay Dhir, Ph.D.

Neeru Chaudhry, Ph.D.

Manish Kumar Singh, Ph.D.

Agam Gupta, Ph.D.

Manoj Balakrishna Menon, Ph.D.

Biswajita Parida (Ms.), Ph.D.

Sonali Jain (Ms.), Ph.D.

Prasanna R., Ph.D.

Gourav Dwivedi, Ph.D.

Eri Ikeda (Ms.), Ph.D.

## Emeritus Professor

Pramod Kumar Jain, Ph.D.

## Visiting Professors

Venkat Ram Reddy, Ph.D.

Harsh Vardhan Mishra, Ph.D.

## Department of Materials Science & Engineering

### Professor and Head

A.K. Ghosh, Ph.D.

### Professors

Josemon Jacob, Ph.D.

Rajesh Prasad, Ph.D.

Bhabani Kr. Satapathy, Ph.D.

### Associate Professor

Jayant Jain, Ph.D.

### Assistant Professors

Leena Nebhani (Ms.), Ph.D.

Sampa Saha (Ms.), Ph.D.

Suresh Neelakantan, Ph.D.

Nitya Nand Gosvami, Ph.D.

Bijay Prakash Tripathi, Ph.D.

Nirat Ray (Ms.), Ph.D.

---

Ankur Goswami, Ph.D.

L.N. Ramasubramania, Ph.D.

Sangeeta Santra (Ms.), Ph.D.

## Visiting Professor

Rajesh Kumar Sharma, Ph.D.

## Department of Mathematics

### Professor and Head

K. Sreenadh, Ph.D.

### Professors

A. Tripathi, Ph.D.

Subiman Kundu, Ph.D.

S. Chandra Sekhara Rao, Ph.D.

Niladri Chatterjee, Ph.D.

Bhawani Sankar Panda, Ph.D.

Rajendra Kumar Sharma, Ph.D.

S. Dharmaraja, Ph.D.

Aparna Mehra (Ms.), Ph.D.

### Associate Professors

Anima Nagar (Ms.), Ph.D.

Mani Mehra (Ms.), Ph.D.

Ritumoni Sarma, Ph.D.

Sivananthan Sampath, Ph.D.

Harish Kumar, Ph.D.

N. Shravan Kumar, Ph.D.

### Assistant Professors

Amit Priyadarshi, Ph.D.

V.V.K. Srinivas Kumar, Ph.D.

Viswanathan Puthan Veedu, Ph.D.

Vikas Vikram Singh, Ph.D.

Kamana Porwal (Ms.), Ph.D.

Punit Sharma, Ph.D.

Minati De (Ms.), Ph.D.

Surjeet Kour (Ms.), Ph.D.

Shiv Prakash Patel, Ph.D.

Ananta Kumar Majee, Ph.D.

Aparajita Dasgupta (Ms.), Ph.D.

Biplab Basak, Ph.D.

Ekata Saha (Ms.), Ph.D.

Debdip Ganguly, Ph.D.

---

## Department of Mechanical Engineering

### Professor and Head

P. Venkateswara Rao, Ph.D.

### Professors

S.R. Kale, Ph.D.

S.G. Deshmukh, Ph.D.

Anoop Chawla, Ph.D.

M.R. Ravi, Ph.D.

Subir Kumar Saha, Ph.D.

Satinder Paul Singh, Ph.D.

Sanjeev Jain, Ph.D.

Anjan Ray, Ph.D.

Sudipto Mukherjee, Ph.D.

Digavalli Ravi Kumar, Ph.D.

Naresh Bhatnagar, Ph.D.

Sangeeta Kohli (Ms.), Ph.D.

R.K. Pandey, Ph.D.

Pulak Mohan Pandey, Ph.D.

Ashish Kamalakar Darpe, Ph.D.

Subodh Vasant Modak, Ph.D.

Sivanandam Aravindan, Ph.D.

Jayanta Kumar Dutt, Ph.D.

Prabal Talukdar, Ph.D.

Sunil Jha, Ph.D.

Sudarsan Ghosh, Ph.D.

B. Premachandran, Ph.D.

Harish Hirani, Ph.D.

Nomesh Bhojkumar Bolia, Ph.D.

Sujeet Kumar Sinha, Ph.D.

### Associate Professors

Subhra Datta, Ph.D.

Amit Gupta, Ph.D.

Naresh Varma Datla, Ph.D.

### Assistant Professors

Supreet Singh Bahga, Ph.D.

Devendra Kumar Dubey, Ph.D.

Jitendra Prasad Khatait, Ph.D.

Mayank Kumar, Ph.D.

Debabrata Dasgupta, Ph.D.

Bahni Ray (Ms.), Ph.D.

Varun Ramamohan, Ph.D.

Rama Krishna K, Ph.D.

Krishna Kant Agrawal, Ph.D.

Kaushik Mukherjee, Ph.D.

Arnob Ghosh, Ph.D.

Shaurya Shriyam, Ph.D.

Emeritus Professor

Kshitij Gupta, Ph.D.

Professor of Practice

Bhupinder Godara, M.Tech.

### Department of Physics

Professor and Head

Anurag Sharma, Ph.D.

Professors

Mukesh Chander, Ph.D.

R.K. Soni, Ph.D.

Bodh Raj, Ph.D.

M.R. Shenoy, Ph.D.

R.K. Varshney, Ph.D.

A.K. Shukla, Ph.D.

Ratanamala Chatterjee (Ms.), Ph.D.

Joby Joseph, Ph.D.

Varsha Banerjee (Ms.), Ph.D.

Pankaj Srivastava, Ph.D.

Sujeet Chaudhary, Ph.D.

Dalip Singh Mehta, Ph.D.

Hitendra Kumar Malik, Ph.D.

P. Senthilkumaran, Ph.D.

Amruta Mishra (Ms.), Ph.D.

Aloka Sinha (Ms.), Ph.D.

Santanu Ghosh, Ph.D.

Gaddam Vijaya Prakash, Ph.D.

Jitendra Pratap Singh, Ph.D.

Neeraj Khare, Ph.D.

Sankalpa Ghosh, Ph.D.

Rajendra Singh, Ph.D.

V. Ravishankar, Ph.D.

Amita Das (Ms.), Ph.D.

Associate Professors

Kedar Bhalchandra Khare, Ph.D.

Pranaba Kishor Muduli, Ph.D.

Rajendra Singh Dhaka, Ph.D.

Assistant Professors

Amartya Sengupta, Ph.D.

Joyee Ghosh (Ms.), Ph.D.

Pintu Das, Ph.D.

Sujin B. Babu, Ph.D.

Rahul Suresh Marathe, Ph.D.

Saswata Bhattacharya, Ph.D.

Sunil Kumar, Ph.D.

Bhaskar Kanseri, Ph.D.

Rohit Narula, Ph.D.

Brajesh Kumar Mani, Ph.D.

Vikrant Saxena, Ph.D.

Pradipta Ghosh, Ph.D.

Aditya Narain Agnihotri, Ph.D.

Folke Tobias Florus Toll, Ph.D.

Sujit Manna, Ph.D.

Vishal Kumar Vaibhav, Ph.D.

Bodhaditya Santra, Ph.D.

Emeritus Professors

B.D. Gupta, Ph.D.

Ajit Kumar, Ph.D.

Arun Kumar, Ph.D.

G.B. Reddy, Ph.D.

Visiting Professors

H.C. Gupta, Ph.D.

A.K. Tyagi, Ph.D.

Pradeep Kumar Gupta, Ph.D.

### Department of Textile and Fibre Engineering

Professor and Head

Ashwini K. Agrawal, Ph.D.

Professors

Kushal Sen, Ph.D.

R. Chattopadhyay, Ph.D.

B.K. Behera, Ph.D.

Bhuvanesh Gupta, Ph.D.

Deepti Gupta (Ms.), Ph.D.

R.S. Rengasamy, Ph.D.

R. Alagirusamy, Ph.D.

Manjeet Jassal (Ms.), Ph.D.

Mangala Joshi (Ms.), Ph.D.

Apurba Das, Ph.D.

Bhupendra Singh Butola, Ph.D.

Abhijit Majumdar, Ph.D.

Amit Rawal, Ph.D.

Sourabh Ghosh, Ph.D.

Dipayan Das, Ph.D.

Associate Professors

Samrat Mukhopadhyay, Ph.D.

Bhanu Nandan, Ph.D.

Rajiv K. Srivastava, Ph.D.

Assistant Professors

Md. S. Wazid Ali, Ph.D.

Javed Nabibaksha Sheikh, Ph.D.

Bipin Kumar, Ph.D.

Vijaykumar Narayandas Baheti, Ph.D.

Emeritus Professor

S.M. Ishtiaque, Ph.D.

### Centre for Applied Research in Electronics

Professor and Head

Ananjan Basu, Ph.D.

Professor

Arun Kumar, Ph.D.

Associate Professors

Mahesh P. Abegaonkar, Ph.D.

Monika Aggarwal (Ms), Ph.D.

Samaresh Das, Ph.D.

Assistant Professors

Prabhu Babu, Ph.D.

Ankur Gupta, Ph.D.

Pushpraj Singh, Ph.D.

Emeritus Professors

R. Bahl, Ph.D.

S.K. Koul, Ph.D.

### Centre for Atmospheric Sciences

Professor and Head

Manju Mohan (Ms.), Ph.D.

Professors

A.D. Rao, Ph.D.

Krishna M. Achutarao, Ph.D.

Associate Professors

Sagnik Dey, Ph.D.

Vimlesh Pant, Ph.D.

Saroj Kanta Mishra, Ph.D.

Dilip Ganguly, Ph.D.

Somnath Baidya Roy, Ph.D.

Assistant Professors

Sandeep Sahnay, Ph.D.

Sandeep Sukumaran

Ravi Kumar Kunchala, Ph.D.

Sarvesh Kumar Dubey, Ph.D.

Emeritus Professor

Maithili Sharan, Ph.D.

### Centre for Automotive Research and Tribology

Professor and Head

Jayashree Bijwe (Ms.), Ph.D.

Professors

Naresh Tandon, Ph.D.

V.K. Agarwal, Ph.D.

Associate Professor

Deepak Kumar, Ph.D.

Assistant Professor

Shahab Fatima (Ms.), Ph.D.

### Centre for Biomedical Engineering

Professor and Head

Harpal Singh, Ph.D.

Professor

Veena Koul (Ms.), Ph.D.

Associate Professors

Sandeep Kumar Jha, Ph.D.

Dinesh Kalyanasundaram, Ph.D.

Neetu Singh (Ms.), Ph.D.

Assistant Professors

S.M.K. Rahman, M.Tech.

Anup Singh, Ph.D.

Amit Mehndiratta, Ph.D.

Deepak Joshi, Ph.D.

Jayanta Bhattacharyya, Ph.D.

Arnab Chanda, Ph.D.

Biswarup Mukherjee, Ph.D.

### Emeritus Professor

Veena Koul (Ms.), Ph.D.

### Computer Services Centre

### Professor and Head

Prem Kalra, Ph.D.

### Senior System Managers

K. Narayanan, M.Sc.

Pravanjan Kumar Baboo, Ph.D.

Sriram Hegde, Ph.D.

Pardeep Kumar Gupta, M.Tech.

### System Managers

Pragya Jain (Ms.), Ph.D.

Sunil Kak, M.Tech.

Ram Lal, Ph.D.

Rajesh Bhatt, Ph.D.

Gopal Krishan, B.Tech.

M. Mallikharjuna Rao, Ph.D.

Raj Kumar Chauhan, M.C.A.

Ajay Guleria, Ph.D.

### System Architects

Manish Agarwal, Ph.D.

Gaurav Munjal, B.Tech.

Jaya (Ms.), M.Tech.

### Senior Manager

N.C. Kalra, M.Tech.

### Educational Technology Services Centre

### Professor and Head

Shouribrata Chatterjee, Ph.D.

### Centre for Energy Studies

### Professor and Head

K.A. Subramanian, Ph.D.

### Professors

T.C. Kandpal, Ph.D.

Vamsi Krishna Komarala, Ph.D.

### Associate Professors

Ramesh Narayanan, Ph.D.

S.K. Tyagi, Ph.D.

R. Uma (Ms.), Ph.D.

Ashu Verma (Ms.), Ph.D.

Dibakar Rakshit, Ph.D.

### Assistant Professors

Sandeep Kumar Pathak, Ph.D.

Satyananda Kar, Ph.D.

Supravat Karak, Ph.D.

K. Ravi Kumar, Ph.D.

Kaushik Saha, Ph.D.

Sumit Kumar Chattopa, Ph.D.

Rahul Goyal, Ph.D.

Debaprasad Sahu, Ph.D.

### Emeritus Professors

A. Ganguli, Ph.D.

S.C. Kaushik, Ph.D.

T.S. Bhatti, Ph.D.

Viresh Dutta, Ph.D.

Sahab Fatima (Ms.), Ph.D.

### Centre for Rural Development & Technology

### Professor and Head

V.K. Vijay, Ph.D.

### Professors

S.N. Naik, Ph.D.

Satyawati Sharma (Ms.), Ph.D.

Anushree Malik (Ms.), Ph.D.

Vijayaraghavan M. Chariar, Ph.D.

Vivek Kumar, Ph.D.

Ram Chandra, Ph.D.

### Associate Professors

Jatindra Kumar Sahu, Ph.D.

Priyanka Kaushal (Ms.), Ph.D.

### Assistant Professors

Hariprasad P., Ph.D.

Kavya Dashona (Ms.), Ph.D.

Ajay Saini, Ph.D.

### Emeritus Professor

Santosh Satya (Ms.), Ph.D.

### Centre for Sensors, Instrumentation and Cyber-physical System Engineering (SeNSE)

### Professor and Head

Subrat Kar, Ph.D.

### Associate Professor

Gurfan Sayeed, Ph.D.

### Assistant Professor

Satish Kumar Dubey, Ph.D.

### Emeritus Professors

D.T. Shahani, Ph.D.

Chandra Shakher, Ph.D.

### National Resource Centre for Value Education in Engineering

### Professor and Coordinator

Rahul Garg, Ph.D.

### Bharti School of Telecommunication Technology and Management

### Professor and Coordinator

Brejesh Lall, Ph.D.

### Amar Nath and Shashi Khosla School of Information Technology

### Professor and Coordinator

Preeti Ranjan Panda, Ph.D.

### School of Biological Sciences

### Professor and Coordinator

James Gomes, Ph.D.

### Professors

Tapan Kumar Chaudhuri, Ph.D.

Aditya Mittal, Ph.D.

Chinmoy Sankar Dey, Ph.D.

Amitabha Mukhopadhyay, Ph.D.

### Associate Professors

Bishwajit Kundu, Ph.D.

Vivekanandan Perumal, Ph.D.

Archana Chugh (Ms.), Ph.D.

Manidipa Banerjee (Ms.), Ph.D.

### Assistant Professors

Ashok Kumar Patel, Ph.D.

Tapan Kumar Nayak, Ph.D.

Shilpi Minocha (Ms), Ph.D.

Anita Roy (Ms.), Ph.D.

### School of Public Policy

### Professor and Coordinator

Ambuj D. Sagar, Ph.D.

### Assistant Professors

Upasana Sharma (Ms.), Ph.D.

Soutrik Basu, Ph.D.

Nandana Sengupta (Ms.), Ph.D.

### Professor of Practice

Sanjay Mitra, Master in Public Administration

### School of Interdisciplinary Research (SIRe)

### Professor and Coordinator

S.R. Kale, Ph.D.

### Interdisciplinary / Transportation Research and Injury Prevention Programme (TRIPP)

### Professor and Coordinator

Anoop Chawla, Ph.D.

### Central Workshop

### Professor and Head

P.V.M. Rao, Ph.D.

### Interdisciplinary Opto-Electronics & Optical Communication Research Programme

### Professor and Coordinator

R.K. Varshney/
V. Venkataraman, Ph.D.

### Central Library

### Librarian & Head

Nabi Hasan, Ph.D.

### Deputy Librarian

Neeraj Kumar Chaurasia, Ph.D.

# NEW APPOINTMENTS

43 new faculty members have joined the Institute during the period from April 1, 2019 to March 31, 2020. These new additions to the faculty have enhanced the competence in several emerging areas, while bringing new energy into academic endeavours.

| New Faculty Joined | |
|---|---|
| Amitabh Bhattacharya,<br>Applied Mechanics | Prasanna R.,<br>Management Studies |
| Lucinda Elizabeth Doyle (Ms.),<br>Biochemical Engineering & Biotechnology | Gourav Dwivedi,<br>Management Studies |
| Ishaan Gupta,<br>Biochemical Engineering & Biotechnology | Eri Ikeda (Ms.),<br>Management Studies |
| Manjesh Kumar,<br>Chemical Engineering | Lakshmi Narayan Ramasubramania,<br>Materials Science & Engineering |
| Mohan Kumar Singh Verma,<br>Chemical Engineering | Sangeeta Santra (Ms.),<br>Materials Science & Engineering |
| Muntha Ramu Yadav,<br>Chemistry | Ekata Saha (Ms.),<br>Mathematics |
| Soumik Siddhanta,<br>Chemistry | Debdip Ganguly,<br>Mathematics |
| Subrata Kundu,<br>Chemistry | Kaushik Mukherjee,<br>Mechanical Engineering |
| Janakiram Vaitla,<br>Chemistry | Arnob Ghosh,<br>Mechanical Engineering |
| Arnab Banerjee,<br>Civil Engineering | Shaurya Shriyam,<br>Mechanical Engineering |
| Sahil Bansal,<br>Civil Engineering | Vishal Kumar Vaibhav,<br>Physics |
| Manabendra Saharia,<br>Civil Engineering | Bodhaditya Santra,<br>Physics |
| Ashish Chiplunkar,<br>Computer Science & Engineering | Vijaykumar Narayandas Baheti,<br>Textile & Fibre Engineering |
| Soham Sundar Chakraborty,<br>Computer Science & Engineering | Sarvesh Kumar Dubey,<br>Atmospheric Sciences |
| Rohan Paul,<br>Computer Science & Engineering | Arnab Chanda,<br>Biomedical Engineering |
| Subir Dey,<br>Design | Biswarup Mukherjee,<br>Biomedical Engineering |
| Rakesh Kumar Palani,<br>Electrical Engineering | Rahul Goyal,<br>Energy Studies |
| Sisir Debnath,<br>Humanities & Social Sciences | Ajay Saini,<br>Rural Development and Technology |
| Agam Gupta,<br>Management Studies | Shilpi Minocha (Ms.),<br>School of Biological Sciences |
| Manoj Balakrishna Menon,<br>Management Studies | Anita Roy (Ms.),<br>School of Biological Sciences |
| Biswajita Parida (Ms.),<br>Management Studies | Nandana Sengupta (Ms.),<br>School of Public Policy |
| Sonali Jain (Ms.),<br>Management Studies | |

# FACULTY AWARDS AND RECOGNITIONS

IIT Delhi distinguished faculty colleagues continue to make a difference to the world of Science, Engineering, Humanities and Management, and continue to earn recognition and awards, which bring glory to the Institute. Their achievements are regularly recognized by national and international bodies. A department wise distribution of faculty awards and recognitions for the last year is given below.

## Chemical Engineering

- Prof. Sreedevi Upadhyayula, *'Innovation Award 2018-2019, K-Model: Quick and Accurate Prediction of Crude Oil Blend Compatibility and Blend Optimization of N-Number of Crude Oils',* Ministry of Petroleum & Natural Gas, India, 2019.

- Prof. Sreedevi Upadhyayula, *'Top Downloaded Paper, 2018-2019 for Greenhouse gas $CO_2$ hydrogenation to fuels: A thermodynamic analysis has been recognized as one of the most read in Environmental Progress & Sustainable Energy',* WILEY, New York, 2020.

- Prof. Sreedevi Upadhyayula, *'Associate Editor,* Journal of the Institution of Engineers (India): Series E, 2019', Institute of Engineers, 2019-2020.

- Prof. Sreedevi Upadhyayula, *'Member of Domain Expert Group (DEG),* CSIR Mission Mode Project under Green Petrochemicals and Fuels Theme 2019', CSIR, 2019.

- Prof. Shalini Gupta, *'DST National Award,* Young Women Showing Excellence in S&T', DST.

- Prof. M. Ali Haider, *'Teaching Excellence Award,* the Academic Year 2018-19', IIT Delhi.

- Prof. M. Ali Haider, *'FITT, IIT Delhi Award*, Best Industry Relevant Ph.D. Thesis Supervision of Dr. Shelaka Gupta.

- Prof. M. Ali Haider, 'FITT, IIT Delhi Award for Best Industry Relevant Ph.D. Thesis Supervision of Dr. Ejaz Ahmad'.

- Prof. Anil Verma, *'Member,* Basic Electrotechnical Standards Sectional Committee of Bureau of Indian Standards 2019-2020', Bureau of Indian Standards (BIS).

- Prof. K.K. Pant, *'Fellow,* Biotech Research Society of India (BRSI)'.

- Prof. K.K. Pant, 'CSIR-ICT-Avon's, *Padmashri Dr. G.S. Sindhu CHEMCON Distinguished Speaker Award,* IIChE'.

- Prof. K.K. Pant, *'Dr. A.V. Rama Rao Foundations* Best Ph.D. Thesis Supervision and Research Award of Dr. Sonal in Chemical Engineering /Technology, IIChE'.

- Prof. K.K. Pant, *'FITT, IIT Delhi Award,* Best Industry Relevant Ph.D. Thesis Supervision of Dr. Ejaz Ahmad, IIT Delhi'.

- Prof. K.K. Pant, '*Chair Professor*, Federation of Indian Petroleum Industries (FIPI)'.

- Prof. K.K. Pant, *'Member,* CPCB Technical Expert Committee (TEC), to review trial run protocols'.

- Prof. K.K. Pant, *'Member,* Apex Committee of IOCL R&D'.

- Prof. K.K. Pant, *'Chairman and Expert Member,* committee to review recycle of effluents nominated by of Ministry of Environment and Forest and climate change'.

- Prof. K.K. Pant, *'Expert Member,* SERB startup Review Committee'.

- Prof. K.K. Pant, *'Expert Member,* SERB Women Scientist Scheme and NPDF'.

- Prof. K.K. Pant, *'Expert Member,* CSIR Industrial Project Review Committee'.

- Prof. K.K. Pant, *'Honorary Faculty,* at University of Queensland, Australia'.

- Prof. K.K. Pant, *'Member of Board of Studies,* NIT Bhopal, MNIT Jaipur, HBTU Kanpur, Academic Council of AKTU Lucknow13'.

- Prof. K.K. Pant, *'Expert Member,* DST, PAC, WT Division'.

- Prof. K.K. Pant, *'Expert* Committee to rate and recommend CSIR FBR/NCP projects under Energy Theme'.

## Design

- Prof. P.V.M. Rao, *'Fellow, ASME',* American Society of Mechanical Engineers, USA.

## Electrical Engineering

- Prof. Abhisek Dixit, *'Distinguished Lecturer,* IEEE Electron Devices Society'.

- Prof. Sukumar Mishra, *'IETE-Bimal Bose Award,* 2019'.

- Prof. Swades De, *'IETE-Ram Lal Wadhwa Award,* 2019'.

- Prof. Sukumar Mishra, *'Mission Innovation National Champion',* Mission Innovation Secretariat, GoI.

- Prof. Sukumar Mishra, *'NASI-Reliance Industries Platinum Jubilee Award,* Application Oriented Innovation in Physical Sciences', the National Academy of Sciences (NASI), 2019.

- Prof. Sukumar Mishra, *'Distinguished Investigator Award',* Science & Energy Research Board (SERB), 2019.

- Prof. G. Bhuvaneswari, *'Associate Editor,* IEEE Journal of Emerging and Selected Topics in Industrial Electronics'.

- Prof. G. Bhuvaneswari, *'Associate Editor,* Transactions of the INAE'.

## Humanities and Social Sciences

- Prof. Kamlesh Singh, *'Rajbhasha Gaurav Award',* Government of India, 2019.

- Prof. Kamlesh Singh, *'Shane J. Lopez Award',* American Psychological Association, 2019.

- Prof. Arudra Burra, *'Anil Divan Visiting fellowship',* School of Law, Governance and Citizenship, Ambedkar University Delhi, 2019.

- Prof. Jayan Jose Thomas, *'China-India Visiting Scholars Fellowship 2020',* Ashoka University and China-India Foundation, 2020.

- Prof. Jayan Jose Thomas, *'Member-in-charge,* preparation of Government of Kerala's Economic Review 2019', Kerala State Planning Board, 2019-2020.

- Prof. Divya Dwivedi, *'Invited Speaker',* in the special

panel "Contemporary Narrative Theory" of the Annual Conference of the International Society for the Study of Narrative held in Pamplona, SPAIN', 2019.

- Prof. Divya Dwivedi, *'Invited Festival Address,* Through the Great Isolation: Sans Colonial', National Autonomous University Mexico, 2020.
- Prof. Divya Dwivedi, *'Invited Public Address on COVID19'*, UNESCO, 2020.
- Prof. Sumitava Mukherjee, *'Young Psychologist Award'*, National Academy of Psychology, India, 2020.
- Prof. Saptarshi Mukherjee, *'Japan Society for Promotion of Science Invitational Fellowship in Economics'*, Ministry of Education, Culture and Sports; Government of Japan, 2019-20.
- Prof. Saptarshi Mukherjee, *'Mathematical Research Impact Centric Support (MATRICS) in Quantitative Social Sciences'*, Sciences and Engineering Research Board (SERB), DST, Government of India, 2020.
- Prof. Purnima Singh, *'Editor-in-Chief,* Psychological Studies (Springer)'.
- Prof. Purnima Singh, 'International Union of Psychological Sciences (IUPsyS) - *National Member from India'*.
- Prof. Purnima Singh, *'Fellow,* National Academy of Psychology'.

## Management Studies

- Prof. Vigneswara I.P, *'Visiting Research Fellow'*, School of Management, Curtin University, Perth, 2019.
- Prof. Shveta Singh, '*Honored with the "Literati" award'*, 2019, Emerald Publishing Inc. UK, 2019.
- Prof. Arpan K. Kar, *'B.K. Birla Distinguished Research Scholar Awards'*, Social Science and Management 2019', Birla Institute of Management Technology, 2019.
- Prof. Arpan K. Kar, *'Factors influencing integration of Artificial Intelligence and Robotics'*, AGBA 16th World Congress, Delhi, 2019.
- Prof. Vigneswara I.P, *'Senior Research Fellow'*, LIRNEasia, Sri Lanka, 2019.
- Prof. S.P Singh, *'DUO-INDIA Fellowship'*, ASEM, South Korea.
- Prof. S.P Singh, *'Best Paper Award,* Conference, IIT Kanpur, 2019'.

## Materials Science and Engineering

- Prof. Jayant Jain, *'India-Birmingham fellowship'*, University of Birmingham, 2019.
- Prof. Suresh Neelakantan, *'Teaching Excellence Award'*, IIT Delhi, 2019.
- Prof. Jayant Jain, *'Teaching Excellence Award'*, IIT Delhi, 2019.

## Mechanical Engineering

- Prof. Amit Kumar, *'Swarup Bhatnagar Award'*, Government of India, 2018.

## Physics

- Prof. Rajendra S. Dhaka, *'Veena Arora Faculty Early Career Research Award'*, IIT Delhi, 2020.
- Prof. Rajendra S. Dhaka, *'INSA-DFG Fellowship,* under International Exchange of Scientists Programme', INSA, India and DFG, Germany, 2019.
- Prof. Saswata Bhattacharya, *'Guest Editorial Position'*, Frontiers in Physics, 2020.
- Prof. Anurag Sharma, *'J.C. Bose Fellowship'*, SERB, Government of India, 2019.
- Prof. Anurag Sharma, *'O.P. Bhasin Prize'*, O.P. Bhasin Foundation, 2019.
- Prof. Anurag Sharma, *'Associate Editor,* Photonics Journal', IEEE, USA, 2019.
- Prof. Ratnamala Chatterjee, *'Member,* Aerospace Resources Panel', Government of India, 2020.
- Prof. Ratnamala Chatterjee, *'Institute Chair Professor'*, IIT Delhi, 2019.
- Prof. J.P. Singh, *'Associate Editor',* Advanced Materials Letters, 2019.
- Prof. J.P. Singh, *'Research Advisor'*, Nan Yang Academy of Sciences, Singapore, 2019.
- Prof. Amartya Sengupta, *'Board of Editors',* International Journal of Infrared and Millimeter waves, from 2019 to 2022.
- Prof. Amartya Sengupta, *'Technical Programme Committee Member',* Environmental Sensing, OSA, from 2017 to 2020.
- Prof. Amartya Sengupta, *'Technical Programme Committee Chair'*, Applied Spectroscopy, OSA, from 2018 to 2021.
- Prof. Amartya Sengupta, 'Associate Professor of EE (Honorary)', University of Queensland, Australia, from 2019 to 2022.

## Textile and Fibre Engineering

- Prof. Javed Nabibaksha Sheikh, *'INAE Young Engineer Award'*, Indian National Academy of Engineering (INAE), 2019.
- Prof. Javed Nabibaksha Sheikh, *'Chartered Colourist'*, Society of Dyers and Colourists, UK, 2019.
- Prof. Javed Nabibaksha Sheikh, *'Young Associate of INAE'*, Indian National Academy of Engineering (INAE), 2019.
- Prof. Ashwini Agrawal, *'Eminent Engineering Personality'*, 33rd National Convention of Textile Engineers held at Ahmedabad, 2020.
- Prof. Ashwini Agrawal, *'Professor K.L. Chopra Faculty Research Award'*, Indian Institute of Technology Delhi, 2020.
- Prof. Ashwini Agrawal, *'Institute Chair Professor',* Indian Institute of Technology Delhi, 2019.
- Prof. Ashwini Agrawal, *'Abdul Kalam Technology Innovation National Fellowship'*, INAE, 2019.
- Prof. Manjeet Jassal, *'Dr. Rita Duggal Chair Professor'*, Indian Institute of Technology Delhi, 2019.

- Prof. Manjeet Jassal, *'Best Presentation Award'*, International Conference on Water Pollution, Recycle and Waste Water (ICWPRW 2019), London, UK, 2019.
- Prof. Mangala Joshi, *'Coopted Expert Member,* Engineering Sciences of SERB'*, SERB, 2019.
- Prof. Mangala Joshi, *'Expert Member, Committee on "Optimal water use in Industrial Sector"* by Technology Mission Division DST'*, Government of India, DST.
- Prof. Mangala Joshi, *'Member,* Committee constituted to give recommendations to GOI on how to give boost to Technical Textiles in India under chairmanship of Principal Scientific Advisor to Government of India Dr. V.K. Saraswat, NITI Aayog as Co-chairman'.

### Applied Research in Electronics
- Prof. Shiban Kishen Koul, *'Life Fellow',* IEEE, USA.
- Prof. Samaresh Das, *'ISSS Young Scientist Award'*, Institute for Smart Structures and Systems (ISSS) of India, 2019.
- Prof. Samaresh Das, *'Veena Arora Faculty Research Award, the Category of Early Career',* Indian Institute of Technology Delhi, 2020.
- Prof. Arun Kumar, *'Sir C.V. Raman Award 2019'*, Acoustical Society of India, 2019.
- Prof. Rajendar Bahl, *'Sir C.V. Raman Award 2019'*, Acoustical Society of India, 2019.

### Atmospheric Sciences
- Prof. Sagnik Dey, *'Associate Editor, of Atmospheric Environment'*.
- Prof. Sagnik Dey, *'Institute Chair Professor',* IIT Delhi.
- Prof. Sagnik Dey, *'Expert Member, of WHO Southeast Asia Regional Technical Advisory Group for non-communicable Diseases'*.

### Biomedical Engineering
- Prof. Amit Mehndiratta, *'E.K. Zavoisky Award'*, 27th Proceeding of International Society of Magnetic Resonance in Medicine (ISMRM), Montreal, Canada, 2019.
- Prof. Arnab Chanda, *'Inno China Tour'*, Department of International cooperation, Ministry of Science and Technology of China and Indian Embassy.
- Prof. Arnab Chanda, *'Visited Prominent Universities in Singapore and Brunei'*, Institute of Eminence (IOE) delegation from India.

### Energy Studies
- Prof. Dibakar Rakshit, *'Honorary Associate Professor'*, University of Queensland, Australia, 2019.
- Prof. Dibakar Rakshit, *'Best Poster Award'*, IIT Delhi Industry Day, 2019.
- Prof. Ashu Verma, *'Honorary Associate Professor'*, University of Queensland, Australia, 2019.

### Rural Development and Technology
- Prof. Hariprasad. P., *'P.P. Singhal Memorial PI Industries Award-2019* (II Prize), ISMPP 40th Annual Conference and Symposium 2019'*, Indian Society of Mycology and Plant Pathology, 2019.

- Prof. Anushree Malik, *'BRSI Award* as Fellow, the society for the year 2019 for outstanding contribution in Environmental Biotechnology'*, BRSI, 2019.
- Prof. Anushree Malik, *'Institute Chair Professor'*, IIT Delhi, 2019.
- Prof. Kavya Dashora, *'Innovation in Food Award'*, PETA (People for the Ethical Treatment of Animals), 2019.
- Prof. Kavya Dashora, *'Best Women Scientist Award 2020',* Society for Research in Biological Sciences, 2020.
- Prof. S.N. Naik, *'Prof. J.G. Kane Memorial Award'*, Oil Technologist's Association of India, 2019.
- Prof. S.N. Naik, *'Judge, 2nd ASEAN Grassroots Innovation Forum 2019,* at Davao, Phillipine, ASEAN – India Grassroots Innovation Forum, 2019'*.
- Prof. V.K. Vijay, *'Scientist Award'*, European Advanced Materials Congress, 2019.
- Prof. V.K. Vijay, *'Pt. Deen Dayal Upadhyaya Recognition for Re-engineering India',* ReTHINK INDIA, 2020.

### Amar Nath and Shashi Khosla School of Information Technology
- Prof. M. Balakrishnan, *'ACM Eugene L. Lawler Award'*, ACM.
- Prof. Manik Varma, *'Elected as a Fellow,* Indian National Academy of Engineering (INAE)'*, Government of India.
- Prof. Manik Varma, *'Shanti Swarup Bhatnagar Award'*, Government of India.
- Prof. Mausam, *'KnowDis Machine Learning Medal'*, KnowDis Data Science.
- Prof. Mausam, *'25th Most Influential Scholar, AI for 2019',* Arnet Miner.
- Prof. Mausam, *'Jai Gupta Chair Fellowship',* IIT Delhi.

### Bharti School of Telecommunication Technology and Management
- Prof. Sukumar Mishra, *'NASI-Reliance Industries Platinum Jubilee Award, Application Oriented Innovation in Physical Sciences',* The National Academy of Sciences (NASI), 2019.
- Prof. Sukumar Mishra, *'National Mission Innovation Champion Award',* Ministry of Science and Technology, Government of India, 2019.
- Prof. Sukumar Mishra, *'Bimal Bose Award',* Institution of Electronics and Telecommunication Engineers (IETE), 2019.
- Prof. Sukumar Mishra, *'Distinguished Investigator Award'*, Science & Energy Research Board (SERB), 2019.
- Prof. Swades De, *'Om Prakash Bhasin Award', Science and Technology',* Government of India, 2019.
- Prof. Swades De, 'IETE Ram Lal Wadhwa Award', 2019.

### Kusuma School of Biological Sciences
- Prof. Anita Roy, *'DBT Wellcome Trust Intermediate Fellowship',* DBT Wellcome Trust India Alliance, 2020.
- Prof. Shilpi Minocha, *'Ramalingaswami re-entry fellowship',* DBT, 2019.

# Performance of Academic Units

## PUBLICATIONS

During the period under report, international bibliographic databases have indexed 3260 research articles published by faculty members and researchers of the institute in international journals including 2842 articles indexed in Scopus, an international indexing service in Science & Technology and Social Sciences. The faculty members have also presented a similar number of papers in national and international conferences. Besides, they have also published many books and conducted several continuing education programmes. The Institute supported participation of faculty members to international and national conferences this year. Many more participated with financial support from sponsored projects, and other funding agencies.

IIT Delhi is proud to recognize the world-class publications produced by its faculty members. This year, the faculty members published multiple books, edited volumes, book chapters, journal articles and conference proceedings. A bar graph showing the various publications published by academic units during the period is given below:

### Books Authored/Co-Authored

#### Applied Mechanics

- Ferdinand P. Beer, E. Russell Johnston Jr., David F. Mazurek, Phillip J. Cornwell, Brian P., Sanjeev Sanghi, 2019, *'Vector Mechanics for Engineers Statics/ Dynamics'*. Chennai, McGraw Hill Education India Pvt. Ltd.

#### Chemical Engineering

- Garima Chauhan, Perminderjit Kaur, K.K. Pant, K.D.P. Nigam, 2020, *'Sustainable Metal Extraction from Waste Streams'*, Wiley-VCH.

#### Design

- Sandeep Sen, Amit Kumar, 2018, *'Design and Analysis of Algorithms: A contemporary perspective'*, Cambridge University Press.

#### Electrical Engineering

- Manan Suri, 2020, *'Applications of Emerging Memory Technology'*, Springer Series in Advanced Micro-electronics, Springer.
- Satnesh Singh, S. Janardhanan, 2020, *'Discrete-Time Stochastic Sliding-Mode Control using Functional Observation'*, Springer-Verlag.
- Spandan Roy, Indra Narayan Kar, 2020, *'Adaptive-Robust Control with Limited Knowledge on Systems Dynamics: An Artificial Input Delay Approach and Beyond'*, Springer.
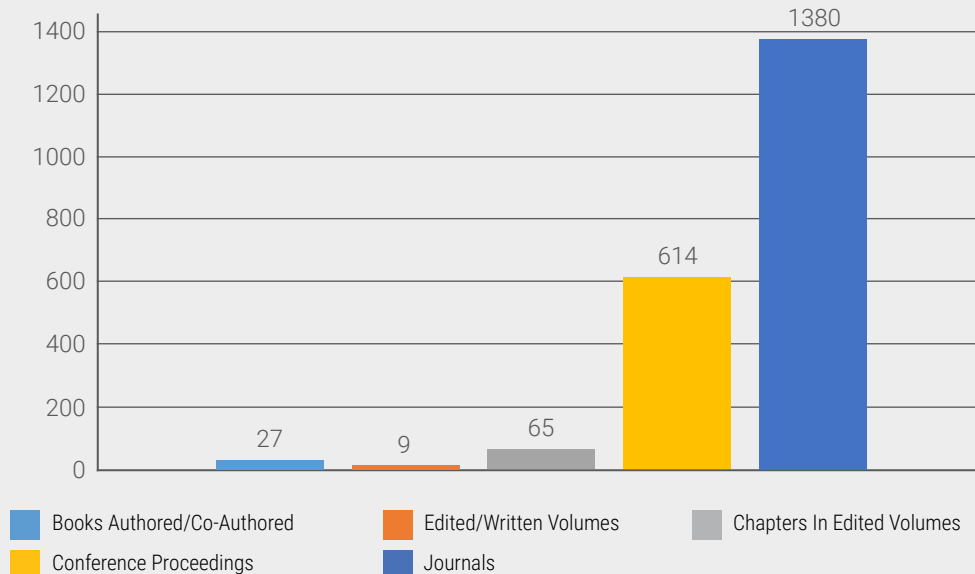
#### Humanities and Social Sciences

- Kamlesh Singh, Singroha Suman, 2019, *'Translational Research and Applied Psychology in India'*, New Delhi, Sage.

#### Management Studies

- Shushil, 2020, *'Global Journal of Flexible Systems Management'*, Springer.
- S.S. Yadav, 2019, *'Understanding Corporate Risk A Study of Risk Measurement'*, Disclosure and Governance, Springer.

## PUBLICATIONS

- Ravi Shankar, 2019, *'Reprint Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies (Third Edition)',* Mc-Graw Hill Publishing company.
- Ravi Shankar, 2019, *'Strategic Management of Technological Innovation (6th Edition)',* Mc-Graw Hill Publishing company.
- Ravi Shankar, 2019, *'Advances in Industrial and Production Engineering',* Springer.
- Shveta Singh, 2019, *'Flexibility in Financing: Review of Capital Structure Theories',* book series - *Vietnam and the Global Economy,* World Scientific Publishers, Singapore.
- Arpan K. Kar, 2020, *'Recent Innovations in Computing (Eds. from selective articles of ICRIC) LNEE',* Springer Nature.
- Sanjay Dhir, 2019, 'Cases in Strategic Management: *A Flexibility Perspective'*, Springer.
- Sushil, 2019, 'Cases in Strategic Management: *A Flexibility Perspective',* Springer.
- Eri Ikeda, 2020, *'Global Business Cycles and Developing Countries',* Routledge Focus.
- Vigneswara I.P., 2019, *'Factors Affecting Customer Service Engagement–Six Cases Assessing Strengths and Weaknesses for Telecom and Payment Service Providers',* ICETIT, Springer.
- Arpan K. Kar, 2019, *'Factors Affecting Customer Service Engagement–Six Cases Assessing Strengths and Weaknesses for Telecom and Payment Service Providers',* Proceedings of ICETIT, Springer.

### Materials Science and Engineering
- Anup K. Ghosh, Mayank Dwivedi, 2020, *'Processability of Polymeric Composites,* Springer.

### Textile and Fibre Engineering
- Anindya Ghosh, Prithwiraj Mal, Abhijit Majumdar, 2019, *'Advanced Optimisation and Decision Making Techniques in Textile Manufacturing',* CRC Press.
- Shakeel Ahamed, Wazed Ali, 2020, *'Green Nanomaterials -Processing, Properties, and Applications',* Singapore, Springer.
- Mangala Joshi, Bapan Adak, 2019, *'Advances in Nanotechnology Based Functional, Smart and Intelligent Textiles: A Review',* Comprehensive Nanoscience and Nanotechnology, 2nd edition, Publisher Elsevier.
- N. Zakaria, Deepti Gupta, 2019, *'Anthropometry, apparel sizing and design',* UK, Elsevier 2nd Edn.

### Applied Research in Electronics
- Karun Rawat, Patrick Robin, Shiban K. Koul, 2020, *'Bandwidth and Efficiency Enhancement in Radio Frequency Power Amplifiers for Wireless Transmitters',* Germany, Springer Nature.
- Shiban K. Koul, Sukomal Dey, 2019, *'Radio Frequency Microwave Switches, Switching Networks and Phase Shifters',* USA, CRC Press.

## Edited/Written Volumes

### Electrical Engineering
- S. Bhattacharyya, T. Gandhi, K. Sharma, P. Dutta (Eds.) (2017). *Advanced Computational and Communication Paradigms:* Proceedings of International Conference on ICACCP 2017. Volume 1 (Lecture Notes in Electrical Engineering). Springer.
- T. Gandhi, S. Bhattacharyya, S. De, D. Konar, S. Dey (Eds.) (2020). *Advanced Machine Vision Paradigms for Medical Image Analysis.* Academic Press Inc.

### Humanities and Social Sciences
- Kamayani Kumar, Angelie Multani (Eds.) (2020). *Childhood Traumas: Narratives and Representations.* Oxford & NY. Routledge.
- Divya Dwivedi (Eds.) (2020). *Inde: Colossal et Capital.* Critique (special issue). (pp.872-873). Paris Éditions Minuits.

### Mangement Studies
- Arpan K. Kar (Eds.) (2020). *Innovations in Computing.* Proceedings of ICRIC. Springer.

### Physics
- Vinay Gupta, Dennis Meier, Alexei Gruverman, Ratnamala Chatterjee (Eds.) (2019). *Proceedings of International Symposium on Integrated Functionalities.* (ISIF 2017). Taylor & Francis.

### Textile and Fibre Engineering
- Abhijit Majumdar, Deepti Gupta, Sanjay Gupta (Eds.) (2019). *Functional Textiles and Clothing.* Springer.
- Mangala Joshi (Eds.) (2020). *Nanotechnology in Textiles Advances and Developments in Polymer Nanocomposites.* New York. Jenny Stanford Publishing.

## Chapters in Edited Volumes

### Applied Mechanics
- Shivdayal Patel, Mradul Awasthi, Suhail Ahmad (2020). *Safety Assessment of Femur.* In Gupta V., Varde P., Joshi N., Kankar P. (Eds.). *Reliability and Risk Assessment in Engineering LNME Book Series.* pp. (467-477). Singapore. Springer.

### Biochemical Engineering and Biotechnology
- Dubey S., Sharma S. (2019). *Rhizospheric Microbiome Engineering as a Sustainable Tool in Agriculture: Approaches and Challenges.* In Satyanarayana T., Das S., Johri B. (Eds.). *Microbial Diversity in Ecosystem Sustainability and Biotechnological Applications.* (pp. 257-272). Singapore. Springer.
- Jangir M., Sharma S. (2019). *Non-target Effects of Trichoderma on Plants and Soil Microbial Communities.* In Varma A., Tripathi S., Prasad R. (Eds.). *Plant Microbe Interface.* (pp.239-251). Cham. Springer.
- Sharma R., Bisaria V. S., Sharma S. (2019). *Rhizosphere: A Home for Human Pathogens.* In Varma A., Tripathi S., Prasad R. (Eds.). *Plant Biotic Interactions,* (pp. 113-127). Cham, Springer.
- Singh P., Samal J., Zarin S., Elangovan R., Hasnain S.E., Ehtesham N.Z. (2019). *Breaking the Transmission of TB: A Roadmap to Bridge the Gaps in Controlling TB in Endemic Settings.* In Hasnain S., Ehtesham N., Grover S. (Eds.). *Mycobacterium Tuberculosis: Molecular Infection Biology, Pathogenesis, Diagnostics and New Interventions.* (pp. 451-461). Singapore. Springer.

- Parwin S., Kalan S., Srivastava P. (2019). *Bacterial Cell Surface Display. In Next Generation Biomanufacturing Technologies.* (Eds.). ACS Symposium Series. Chapter 5. (pp. 81-108). American Chemical Society.

- Shahadat M., Ahmad A., Bushra R., Ismail S., Ahammad S.Z., Ali S.W., Rafatullah M. (2020). *Recent Advancement in Wastewater Decontamination Technology.* In Oves M., Ansari M., Zain Khan M., Shahadat M., M.I. Ismail I. (Eds.). *Modern Age Waste Water Problems.* Edn. (pp. 1-22). Cham. Springer.

- Vora D.S., Dhanjal J.K., Sundar D. (2020). *Engineering of Cas9 for improved functionality.* In Singh V., Dhar P.K. (Eds.). *Genome Engineering via CRIPSR-Cas9 Systems.* Elsevier.

## Chemical Engineering

- B. Rajbongshi, Anil Verma (2019). *Emerging Nano-technology for third Generation Photovoltaic cells,* In Melvin Gan Jet Hong (Eds.). *Nanotechnology: Applications in Energy Drug and Food.* Springer.

- E. Ahmad, A. Vani, K.K. Pant (2019). *An Overview of Fossil Fuel and Biomass Based Integrated Enery Systems: Co-firing, Co-combustion, Co-pyrolysis, Co-liquefaction, and Co-gasification,* In Sonil Nanda, Prakash Kumar Sarangi, Dai-Viet N. Vo (Eds.). *Fuel Processing and Energy Utilization.* Chapter 2. (pp. 15-30). New York. Chapman and Hall/CRC. Taylor and Francis Group.

- K. Ahmad, F. Parveen, Anushree, S. Upadhyayula (2019). *Heterogeneous Catalytic Conversion of Greenhouse Gas $CO_2$ to Fuels.* In Shahid-ul-Islam (Eds.). *Integrating Green Chemistry and Sustainable Engineering.* Chapter 3. (pp. 57-80). New York, Scriviner Publishing Wiley.

- F. Parveen, K. Ahmad, S. Upadhyayula (2019). *Catalytic Conversion of Biomass Derived Cellulose to 5-Hydromethyl Furfural, Integrating Green Chemistry and Sustainable Engineering.* In Shahid-ul-Islam (Eds.). *Integrating Green Chemistry and Sustainable Engineering.* Chapter 5. (pp. 113-163). New York. Scriviner Publishing Wiley.

- Rekha Yadav, Sreedevi Upadhyayula (2020). *Natural gas dehydroaromatization.* In Jianli Hu, Dushyant Shekhawat (Eds.). *Direct Natural Gas Conversion to Value-Added Chemicals.* 1st Edition. (512 pages). London. CRC Press. Taylor & Francis Group.

## Design

- Ray (2019). *Three steps to better PL pronunciation,* In D. Ellsberry, F.G. Harrington-lynnes (Eds.). *Startling new data on an African PL variant.* (pp. 447-478). Monaco. University of Monaco Press.

## Electrical Engineering

- S. Gupta, T. Gandhi. (2019). *Identification of Neural Correlates of Face Recognition Using Machine Learning Approach.* In S. Bhattacharyya et al. (Eds.). *Computer Vision and Machine Intelligence in Medical Image Analysis.* (pp. 13-20). Springer. Lect. Series.

## Humanities and Social Sciences

- Jayan Jose Thomas, Satheesha B. (2020). *Agriculture and Rural Labour Markets in India (with Satheesha B).* In T. Forthcoming. Rajesh Raj S.N., Komol Singha (Eds.). *The Routledge Handbook of Post-Reform Indian Economy.* 1st Edition (forthcoming). New Delhi. Routledge.

- Jayan Jose Thomas, Jayesh M.P. (2019). *Labour Market in Kerala: Examining the Role for Industrial and Employment Policies.* In Sundar, K.R. Shyam (Eds.). *Globalization, Labour Market Institutions, Processes and Policies in India.* 1st Edition. (pp. 471-98). Singapore. Palgrave Macmillan.

- Farhana Ibrahim. (2020). *Beyond state and nation: anthropology of Muslims in South Asia in Exploring Sociabilities of Contemporary India.* In Sujata Patel (Eds.). *Exploring Sociabilities of Contemporary India* New Delhi: Orient Blackswan.

## Management Studies

- Arpan K. Kar. (2020). *Assessing Drivers for Telecom Service Experience—Insights from Social Media.* In Kar A.K., Goyal K., *Lecture Notes in Electrical Engineering* 597. (pp. 715-722). Springer.

- Arpan K. Kar. (2020). *Recommendation Systems for Interactive Multimedia Entertainment.* In Aggarwal S., Goswami D., Hooda M., Chakravarty A., Kar A.K. (Eds.). *Lecture Notes on Data Engineering and Communications Technologies* 32. (pp. 23-48). Springer.

- Arpan K. Kar. (2020). *Determinants of Customer Satisfaction in Telecommunication.* In Goyal K., Kar A.K. (Eds). *Lecture Notes in Electrical Engineering 605.* (pp. 754-761). Springer.

- Arpan K. Kar. (2020). *Factors Affecting Customer Service Engagement—Six Cases Assessing Strengths and Weaknesses for Telecom and Payment Service Providers.* In Agarwal A., Kar A.K., Ilavarasan P. V. (Eds.). *Lecture Notes in Electrical Engineering 605.* (pp. 775-784). Springer.

- Arpan K. Kar. (2020). *Assessing Service Quality Factors in Mobile Payments-Insights Based on User Experiences in Social Media.* In Goyal K., Kar A.K. (Eds.). *Lecture Notes in Electrical Engineering 605.* (pp. 743-753). Springer.

- Arpan K. Kar. (2020). *Comparing SERVQUAL for Transportation Services in the Sharing Economy for Emerging Markets: Insights from Twitter Analytics.* In Bijarnia S., Ilavarasan P.V., Kar A.K. (Eds.). *Digital and Social Media Marketing.* (pp. 127-134). Springer.

- Arpan K. Kar. (2019). *Social Media Presence & Usage in Indian Business Sector.* In Vagrani A., John J., Vigneswara Ilavarasan P., Kar A.K. (Eds.). *IFIP Advances in ICT 55.8.* (pp. 457-469). Springer.

- Arpan K. Kar. (2019). *Authenticating Fake News: An Empirical Study in India.* In Prakash G., Verma R.K., Ilavarasan P.V., Kar A.K. (Eds.). *IFIP Advances in ICT. 55.8,* (pp. 339-350).Springer.

## Materials Science and Engineering

- L. Nebhani, A. Jaisingh. (2020). *Chemical Analysis of Polymers,* In Mariam Al Ali, Al Maadeed, Deepalekshmi Ponnamma, Marcelo A. Carignano (Eds.). *Polymer Science and Innovative Applications, Materials, Techniques, and Future Developments.* (pp. 69-116). Elsevier.

- L. Nebhani, S. Mishra, T. Joshi. (2020). *Polymer Functionalisation of Mesoporous Silica Nanoparticles Using Controlled Radical Polymerization Techniques.* In Rafael Huirache Acuna (Eds.). *Advances in icroporous and Mesoporous Materials,* Tech Open.

- Aiswarya T. T., Dr. Sampa Saha. (2020). *Biocompatible Anisotropic Designer Particle.* Springer.

- Sampa Saha, Dr. Arun Sharma, Srijita Purkayastha, Kalpana Pandey and Shaifali Dhingra. (2019). *Bioplastics and Biofuel: Is it the Way in Future Development for End Users?.* In William Andrew (Eds.).

## Mechanical Engineering

- V. Kumar, S.K. Sinha, A.K. Agarwal. (2019). *Tribological studies of an internal combustion engine.* In A.K. Agarwal, J.G. Gupta, N. Sharma, A.P. Sharma (Eds.). *Advanced Engine Diagnostics.* (pp. 37-253). Singapore. Springer.

## Physics

- P. Satyarthi, B. Joshi, P. Srivastava, S. Ghosh. (2019). *Ferromagnetism in Zinc Oxide, Intrinsic/Extrinsic origin-Correlation with electronic structure.* In S. Zhang (Eds.). USA. Nova science Publisher.

## Textile and Fibre Engineering

- S. W. Ali, S. Bairagi, P. Shankar. (2020). *Biomaterials-Based Nanogenerator: Futuristic Solution for Integration Into Smart Textiles.* In Mohd. Shabbir, Shakeel Ahmed, Javed N. Sheikh (Eds.). *Frontiers of Textile Materials: Polymers, Nanomaterials, Enzymes, and Advanced Modification Techniques,* (pp. 189-201). Scrivener Publishing.

- Ashish Kapoor, Pramod Shankar, Wazed Ali. (2020). *Green Synthesis of Metal Nanoparticles for Electronic Textiles.* In Shakeel Ahmed, Wazed Ali (Eds.). *Green Nanomaterials -Processing, Properties, and Applications.* (pp. 81-97).Singapore. Springer.

- S. Wazed Ali, Satyaranjan Bairagi. (2019). *Conductive Polymer Based Flexible Supercapacitor.* In Inamuddin, Boddula R., Asiri A. (Eds.). *Self-standing Substrates.* (pp. 211-233). Cham. Springer.

- Mohammad Shahadat, Akil Ahmad, Rani Bushra, Suzylawati Ismail, Shaikh Ziauddin Ahammad, S. Wazed Ali, Mohd Rafatullah. (2019). Recent *Advancement in Wastewater Decontamination Technology Oves.* In M. Ansari M., Zain Khan M., Shahadat M., M.I. Ismail I. (Eds.). *Modern Age Waste Water Problems.* (pp. 1 -22). Cham. Springer.

- Abdul Hakeem Anwer, Nishat Khan, Mohammad Shahadat, Mohammad Zain Khan, Ziauddin Ahammad Shaikh, Syed Wazed Ali. (2019). *Polymer-Supported Nanocomposite-Based Nanomaterials for Removal and Recovery of Pollutants and Their Application in Bio-Electrochemical System.* In Shahid ul-Islam, B.S. Butola (Eds.). *Advanced Functional Textiles and Polymers: Fabrication, Processing and Applications.* (pp. 265-290). Scrivener Publishing.

- Puhup Puneet, Bhanu Nandan (2020). *Polymer Nanocmposites Fiber via Self-Assembly.* In Mangala Joshi (Eds.). *Nanoetchnology in Textiles: Advances and Developments in Polymer Nanomcposites.* (pp. 573-614). New York. Taylor and Francis Group.

- Manjeet Jassal, Ashwini K. Agrawal, Deepika Gupta, Hardeep Singh Jhinjer (2020). *Recent Advances in Electrospun Nanocomposite Nanofibrous Webs for Filtration.* In Mangala Joshi (Eds.). *Nanotechnology in Textiles Advances and Delevopments in Polymer Nanocomposites 51.* Chapter 9. New York. Jenny Stanford Publishing.

- Mangala Joshi, Bapan Adak (2019). *Advances in Nanotechnology Based Functional, Smart and Intelligent Textiles: A Review.* In David Andrews Thomas, Nann Robert Lipson (Eds.). *Comprehensive Nanoscience and Nanotechnology.* 2nd edition. United States. Academic Press. Elsevier.

- B. Adak, M. Joshi, W. Ali (2020). *Dyeability of polymer nanocomposite fibers.* In Mangala Joshi (Eds.). *Nanotechnology in Textiles: Advances and Developments in Polymer Nanocomposites.* Singapore. Pan Stanford.

- M. Joshi, Anasuya Roy (2020). *Recent Developments on Antimicrobial Polymer Nanocomposites: Focus on Fibers and Yarns.* In Mangala Joshi (Eds.). *Nanotechnology*

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- Mangala Joshi, Anasuya Roy, B.S. Butola (2020). *POSS based Polymer Nanocomposite Fibers- A Review on Recent Developments*. In Mangala Joshi (Eds.). *Nanotechnology in Textiles: Advances and Developments in Polymer Nanocomposites*. Singapore. Pan Stanford.

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- Deepti Gupta (2019). *New Directions in the field of Nathropomerty, sizing and Clothing Fit*. In N. Zakaria, Deepti Gupta (Eds.). *Anthropometry, Apparel sizing and Design*. (pp. 3-26). 2nd Edition. UK. Elsevier.

## Applied Research in Electronics

- K.D. Tyagi, R. Bahl, A. Kumar, S. Saxena, S. Kumar (2019). *Study of Noise Interfering with Dolphin Clicks*. In R. Rawat, A. Trivedi, S. Manhas, V. Karwal (Eds.). *Advances in Signal Processing and Communication, Lecture Notes in Electrical Engineering*. vol. 526. (pp. 353-362). Singapore. Springer.

## Energy Studies

- K.N. Patil, S.C. Kaushik, Ayush Aggarwal (2020). *Evaluation of Natural Ventilation Potential for Indoor Thermal Comfort in a Low-Rise Building in Arid and Semi-arid Climates of India*. Advances in Energy and Built Environment.

- S.C. Kaushik, Akhilesh Arora, Manoj Dixit (2020). *Hybrid Absorption Cycles for Solar Cooling*. Advances in Energy and Built Environment.

- Shiv Lal, S.C. Kaushik (2020). *Comparative Study of Earth Air Tunnel and Borehole Heat Exchanger Applied for Building Space Conditioning*. Advances in Energy and Built Environment.

- S.F. Ali, D. Rakshit (2020). *Utilising Passive Design Strategies for Analysing Thermal Comfort Levels inside an Office Room using PMV-PPD Models*. In H. Tyagi, P. Chakraborty, S. Powar, A.K. Agarwal. (Eds.). *Solar Energy: Systems, Challenges, and Opportunities*. (pp. 35-57). Singapore. Springer.

- R. Saxena, D. Rakshit, S.C. Kaushik (2020). *Review on PCM Applications for Cooling Load Reduction in Indian Buildings*. In H. Tyagi, P. Chakraborty, S. Powar, A.K. Agarwal (Eds.). *Solar Energy: Systems, Challenges, and Opportunities*. (pp. 247-275). Singapore. Springer.

- Ravinder Goyal and R.P. Sharma (2019). *Turbulence Generation in Inhomogeneous Magnetized Plasma Pertaining to Damping Effects on Wave Propagation*. In Dr. Tetsu Mieno (Eds.). *Progress in Fine Particle Plasmas*. London. UK. Intech Open publishers.

## Rural Development and Technology

- Hans N., Naik S.N., Malik A. (2019). *Platform Molecules from Algae by Using Supercritical $CO_2$ and Subcritical Water Extraction,* Handbook of Algal Technologies and Phytochemicals. (pp. 229-243). CRC Press.

- Dey S., Bano F., Malik A. (2019). *Pharmaceuticals and personal care product (PPCP) contamination - a global discharge inventory*. In M.N.V. Prasad, A. Kapley, M. Vithanage (Eds.). *Pharmaceuticals and Personal Care Products: Waste Management and Treatment Technology*. (pp. 1-26). USA. Elsevier.

- Ghosh P., Shah G., Sahota S., Singh L., Vijay V. K. (2020). *Biogas production from waste: technical overview, progress, and challenges*. In L. Singh, D. M. Mahapatra. A Yousuf (Eds.). *Bioreactors: Sustainable Design and Industrial Applications in Mitigation of GHG Emissions*. (pp. 89-104). Elsevier.

- Monika Jangir, Satyawati Sharma, Shilpi Sharma (2019). *Non-target Effects of Trichoderma on Plants and Soil Microbial Communities*. In Ajit Varma, Swati Tripathi, Ram Prasad (Eds). *Plant Microbe Interface* (pp. 239-251). Springer.

- Sonal Yadav, Satyawati Sharma (2019). *Pesticides: Problems and remedial measures*. In Ashita Sharma, Manish Kumar, Satwinderjeet Kaur, Avinash Kaur Nagpal (Eds). *Evaluation of Environmental Contaminants and Natural Products: A Human Health Perspective*. (pp. 94-114). Bentham Science Publishers.

- Kavya Dashora, Zoya Javed, Gyandatta Tripathi, Mansi Mishra.(2020). *Role of secondary metabolites in plant protection*. In P. Gehlot and J. Singh (Eds.). *New and Future Developments in Microbial Biotechnology and Bioengineering*. Elsevier.

- S. Kala, N. Sgan, S.N. Naik, P. K. Patajali, J. Kumar (2020). *Biopesticides: Formulations and Delivery Techniques, Natural remedies for Pest, Disease and Weed control*. Elsevier Academic Press.

- Lopa Pattanaik, Falguni Pattnaik, Devesh Kumar Saxena, Satya Narayan Naik (2019). *Biofuels from agricultural wastes*. In A. Basile, F. Dalena (Eds.). *Second and Third Generation of Feedstocks*. (pp.103-142). Elsevier.

- Smriti Kala, Nisha Sogan, Amrish Agarwal, S.N. Naik, P.K. Patanjali, Jitendra Kumar (2020). *Biopesticides: Formulations and Delivery Techniques, Natural Remedies for Pest, Disease and Weed Control* (pp. 209-220). Academic Press.

- Priyanka Prasad, J.K. Sahu (2020). *Atmosphere Cold Plasma Applications in Food Processing*. In Das K.K. and S. Chakraborty (Eds), *Advances in Thermal and Non-thermal Food Process Technology*. USA. CRC Press.

## Amar Nath and Shashi Khosla School of Information Technology

- Kalra, Kumar, Banerjee (2019). *Acquisition, Representation, Processing and Display of Digital Heritage Sites*. In Mallik A., Chaudhury S., Chandru V., Srinivasan S. (Eds). *Digital Hampi: Preserving Indian Cultural Heritage*. Singapore. Springer.

- Prasenjit Chakraborty, Bharath Narasimha Swamy, Preeti Ranjan Panda (2019). *Manycore Processor Architectures*. In Bashir M. Al-Hashimi and Geoff V. Merrett (Eds), *Many-Core Computing - Hardware and Software*. London. IET.

# MAJOR PROJECTS UNDERTAKEN

## Applied Mechanics

- India Africa S&T Collaborative Initiative for Africa Centers of Excellence (ACE), *Department of Science and Technology (DST),* ₹52.27 Lakhs, 2 Years, Prof. Sanjeev Sanghi.
- Study of the aerodynamic wake behind aircraft carriers for safer landings, *Naval Research Board,* ₹44.50 Lakhs, Prof. Sawan S. Sinha.
- Higher overall stiffness of triangular shaped ductile/brittle lattice composite structure compared to square and hexagonal shaped structure, *SERB,* ₹41.20 Lakhs, 2 Years, Prof. Gaurav Singh.
- Augmentation of PANS methodology with non-linear eddy viscosity closure for simulating turbulent separated flows, *Department of Science and Technology,* ₹29.50 Lakhs, Prof. Sawan S. Sinha.
- Equipment Matching Grant, *IRD IIT Delhi,* ₹28.21 Lakhs, 2 Years, Prof. Gaurav Singh.
- A numerical study of submesoscale processes driven by river plumes in the Bay of Bengal region, *Science and Engineering Research Board (SERB), DST,* India, ₹26.17 Lakhs, 2 Years, Prof. Vamsi Chalamalla.
- Self-folding and supercoiling in elastic rods with application to biomolecules, *SERB, DST,* ₹26.00 Lakhs, 3 Years, Prof. Ajeet Kumar.
- Scientific research in the field of solid mechanics, *NOKIA Ireland (Donation),* Euros 30,000, 5 Years, Prof. Gaurav Singh.
- Modeling preheating, start-up transience and internal/external cooling processes in steam turbines, *Bharat Heavy Electricals Limited,* ₹21.00 Lakhs, Prof. Sawan S. Sinha.
- Equipment Matching Grant to Prof. Vamsi Krishna Chalamalla, Department of Applied Mechanics under Research project No. RP03839, *IRD, IIT Delhi*, ₹12.00 Lakhs, Prof. Vamsi Chalamalla.
- Finite Element Analysis and development of Miniscrew Implant Supported Bi-helix Appliance (MISBA) for true asymmetric maxillary expansion (Under IRD MFIRP Scheme in collaboration with AIIMS), *IRD IIT Delhi,* ₹10.00 Lakhs, 2 Years, Prof. Gaurav Singh.
- Crack growth direction in amorphous silica under extreme temperature using molecular mechanics, *ISRO,* ₹6.73 Lakhs, 1 year, Prof. Gaurav Singh.
- Numerically solving a singular integral equation when the reciprocal of the solution lies in the integrand, *MATRICS,* ₹6.60 Lakhs, 3 Years, Prof. Gaurav Singh.

## Biochemical Engineering and Biotechnology

- Development of protocols for the production of value added bio-degradable polymers from methane & $CO_2$, *GAIL (India) Limited India,* ₹113.40 Lakhs, 2 Years, Prof. A.K. Srivastava.
- Metabolic engineering of Bacillus subtilis for the production of biorenewable isoprene, *SERB,* GoI, ₹31.19 Lakhs, 3 Years, Prof. Ashish Misra.

- Development of an Integrated Process for Conversion of Biomass to Affordable Liquid Biofuel, *DST,* GoI, ₹90.09 Lakhs, 3 Years, Prof. Atul Narang.
- Model Based Approach for Optimizing Recombinant Protein Synthesis in Continuous cultures of Pichia Pastoris, *DBT, GoI,* ₹48.92 Lakhs, 5 Years, Prof. Atul Narang.
- To Strengthen the Gear Engineering Research in the Department of DBEB (under FIST programme of DST) (RP03103G), *DST, GoI,* ₹283.00 Lakhs, 5 Years, Prof. Atul Narang.
- Unit of Excellence in Cancer Research *DBT,* GoI, ₹314.00 Lakhs, 5 Years, Prof. D. Sundar.
- DBT-AIST International Laboratory for Advanced Biomedicine (DAILAB) - expansion to DBT-AIST International Center for Translational and Environmental Research, (DAICENTER), *DBT, GoI,* ₹1,997.00 Lakhs, 3 Years, Prof. D. Sundar.
- Finding of a New RNA Aptamer and Mediated Drug Delivery Method Specific to Prostate Cancer a Pioneer Cancer Research Approach in India, *DST,* GoI, ₹31.55 Lakhs, 3 Years, Prof. Prashant Mishra.
- Molecular events responsible for the switching of cell shape with respect to cell cycle in Rhodococcus erythropolis PR4, *DST, GoI,* ₹19.20 Lakhs, 3 Years, Prof. Preeti Srivastava.
- Development of Stationary Phase Prompter - Based Gene Expression System for Actinomycetes, *DBT, GoI,* ₹ 59.17 Lakhs, 3 Years, Prof. Preeti Srivastav.
- DOSA - Diagnostics for One Health and User Driven Solutions for AMR, *DBT, GoI,* ₹232.54 Lakhs, 3 Years, Prof. Ravi Krishnan Elangovan.
- Dev. of an Affordable Automated and Field deployable Point of Care and contained system for Rapid diagnosis of TB Caused by Mycobacterium Tuberculosis, (Ministry of Health under IMPRINT Sch. Proj., *Ministry of Health & Family Welfare, GoI,* ₹115.20 Lakhs, 3 Years, Prof. Ravi Krishnan Elangovan.
- Development of an Affordable, Automated and Field Deployable, Point of Care and Contained System for Rapid Diagnosis of TB Caused by Mycobacterium tuberculosis, (Under IMPRINT Scheme) *MHRD, GoI,* ₹119.25 Lakhs, 3 Years, Prof. Ravi Krishnan Elangovan.
- Functional and Regulatory Characterization of Hypoxia Regulated Micro RNAs and evaluation of their Therapeutic and Prognostic Potential in Glioblastoma, *DBT, GoI,* ₹45.76 Lakhs, 3 Years, Prof. Ritu Kulshreshtha.
- Development of an Integrated Bioprocess for Synthesis and Purification of Galacto-oligosaccharides, *DST, GoI,* ₹29.30 Lakhs, 4 Years, Prof. Saroj Mishra.
- Does AMR in livestock contribute to AMR in people in NE India? An interdisciplinary study, *DBT, GoI,* ₹62.42 Lakhs, 3 Years, Prof. Shaikh Ziauddin Ahammad.
- Biotechnology for the recovery of germanium, indium and copper from industrial copper dust waste, (Bio-CuInGe) (RP03532N),' *Indo German Science and Technology,*

*Germany,* ₹161.00 Lakhs, 3 Years, Prof. Shaikh Ziauddin Ahammad.

- Study on the changes in microbial community structure and function in organic farming vs. conventional farming, *DBT, GoI,* ₹49.66 Lakhs, 3 Years, Prof. Shilpi Sharma.
- Multiparty Agreement for Technology Transfer (MI01200), *DBT, GoI,* ₹4.20 Lakhs, 5 Years, Prof. Shilpi Sharma.
- Local Treatment of Urban Sewage Streams for Healthy Reuse, (LOTUS) (INDO-DUTCH Joint project) *DBT, GoI,* ₹1,648.67 Lakhs, 4 Years, Prof. T.R. Sreekrishnan.
- Design & Development of Bioreactor for Degradation of explosives, *DRDO*, GoI, ₹39.21 Lakhs, 5 Years, Prof. T.R. Sreekrishnan.

## Chemical Engineering

- Methanol Production from Indian Coal: Pilot Plant Demonstration, Catalysis and Scale-up Technologies, *Department of Science & Technology India,* ₹3,824.00 Lakhs, 3 Years, Prof. Shantanu Roy.
- Centre of Excellence on Energy Storage Platform on Batteries, *Department of Science and Technology India,* ₹108.7 Lakhs, 5 Years, Prof. Anil Verma.
- Design, Development and Demonstration of 1kWh Vanadium Redox Flow Battery for Stationary Application, *Department of Science and Technology India,* ₹150.00 Lakhs, 3 Years, Prof. Anil Verma.
- Development and Deployment of Redox-flow Battery Energy Storage for Rural Electrification, *Ministry of Human Resource Development,* ₹76.00 Lakhs, 3 Years, Prof. Anil Verma.
- Synthesis of Artifical Sweeteners and High Value Chemicals from Biorenewable Resources using Nobel Aerogel Catalyst, *Science and Engineering Research Board,* ₹55.00 Lakhs, 3 Years, Prof. K.K. Pant.
- Catalyst Development for Methanol and DME Production via $CO_2$ Hydrogenation, *GAIL India Limited,* ₹90.00 Lakhs, 2 Years, Prof. K.K. Pant.
- Development of Hierarchical Novel Catalyst for One Pot Conversion of $CO_2$ Rich Synthesis Gas to Dimethyl Ether and Scale-up Studies, *Department of Science and Technology, India,* ₹169.00 Lakhs, 2 Years, Prof. K.K. Pant.
- Sustainable Resource Recovery through Optimal Treatment and Use of Petroleum Industry Waste Water in an Algal-bacterial Bio-refinery Model, *Department of Science and Technology, India,* ₹15.00 Lakhs, 2 Years, Prof. K.K. Pant.
- Development & demonstration of Closed loop I-S process in all quartz/glass assembly, *ONGC Energy Trust,* ₹123.00 Lakhs, 2 Years, Prof. S. Upadhyayula.
- Integrated process for conversion of lignocellulosic Biomass to Bio-ethanol and Value Added Chemicals, *PCRA,* ₹35.16 Lakhs, 30 months, Prof. S. Upadhyayula.
- Simulation and Experimental Validation of the Closed Loop I-S Process, *ONGC Energy Trust,* ₹25.00 lakhs, 1 Year, Prof. S. Upadhyayula.
- Bimetallic nanocatalysts supported on nanostructured carbon for production of biofuels and value-added

chemicals through a hydrodeoxygenation process, *MHRD,* ₹59.64 Lakhs, 2 Years, Prof. S. Upadhyayula.
- Integrated $CO_2$ absorption and conversion to methanol in slurry phase reactors using metal complexes as catalyst, *Department of Science & Technology India,* ₹103.00 Lakhs, 3 Years, Prof. S. Upadhyayula.
- Insights into the structural tuning of bifunctional catalyst for carbon-neutral fuel production from second-generation biomass, *UCL-IITD Strategic partner fund,* ₹10.00 Lakhs, 2 Years, Prof. S. Upadhyayula.

## Design

- Development of Refreshable Braille Cells (IMPRINT-2), *Science and Engineering Research Board (SERB), DST,* ₹126.00 Lakhs, 3 Years, Prof. P.V.M. Rao.
- Development of Electric Three wheeler, *FIRP-IITD,* ₹5.00 Lakhs, 2 Years, Prof. Sumer Singh.
- A Novel Video Laryngoscope for Endotracheal Intubation in Patients with Reduced Mouth Opening, *MFIRP-IITD,* ₹5.00 Lakhs, 1 Year, Prof. Jay Dhariwal.
- Refreshable Tactile Drawing, *IRD MFIRP Scheme in collaboration with UCL,* ₹5.00 Lakhs, 1 Year, Prof. P.V.M. Rao.
- Development of a low cost wireless sensor network for monitoring urban air pollution, *FIRP-IITD,* ₹5.00 Lkahs, 1 Year, Prof. Jay Dhariwal.
- Tactile Diagrams of Visually Impaired, *Indian National Academy of Engineering,* ₹95.00 Lakhs, 5 Years, Prof. P.V.M. Rao.

## Electrical Engineering

- Design of time domain ADCs with an improved linearity, *Science and Engineering research board, India,* ₹33.58 Lakhs, 2 Years, Prof. Ankesh Jain.
- Biomolecular Circuit Design Using RNA Thermometers, Department of Biotechnology, *Ministry of Science & Tech. India,* ₹79.28 Lakhs, 3 Years, Prof. Shaunak Sen.
- Facilitation of Global Cooling Prize by DST Mission Innovation Programme, *Department of Science & Technology India,* ₹329.43 Lakhs, 2 Years, Prof. Sukumar Mishra.
- Integrated Magnetoelectric Energy Harvesting and Wireless Power Transfer Devices for Wearable and Implantable Applications, Science and Engineering Research Board (SERB), *DST India,* ₹32.97 Lakhs, 2 Years, Prof. Dhiman Mallick.
- Photon-phonon Interactions for Communications applications, Science and Engineering Research Board (SERB), *DST India,* ₹31.54 Lakhs, 2 Years, Prof. Amol Choudhary.
- Design and Development of Display source, projection & collimating optics and Camera for use in helmet mounted display and sight (HMDS) (Under JATC 2019), *DRDO, Ministry of Defence India,* ₹320.68 Lakhs, 1.5 Years, Prof. Mukul Sarkar.
- Physical Unclonable Function (PUF) for Electronic and Communication Security, *Department of Science & Technology India,* ₹88.41 Lakhs, 3 Years, Prof. Manan Suri.
- Study of various classification problems using frequency modulated continuous wave (FMCW) radar,

- *Semiconductor Research Corporation United States,* ₹25.82 Lakhs, 3 Years, Prof. Seshan Srirangarajan.
- Large-Signal RF Reliability Modelling and Characterization of Hot-Carrier Degradation in 10-nm FinFETs, Science and Engineering Research Board (SERB), *DST India,* ₹64.49 Lakhs, 3 Years, Prof. Abhisek Dixit.
- Development of an ultra-precision XYZ positioning stage with real-time compensation of volumetric errors (Joint project with CSIR-CMERI, *West Bengal, Department of Science and Technology India,* ₹0.86 lakhs, 2 Years, Prof. Anandarup Das.
- High Performance Magnetic Field Sensors based on WBG Materials and High Bandwidth Current Sensors for WBG based Power Converters, *Ministry of Electronics and Information Technology India,* ₹42.16 Lakhs, 3 Years, Prof. Sumit Kumar Pramanick.
- Flexible inorganic devices for backplane and sensor node electronics Science and Engineering Research Board (SERB), *DST India,* ₹52.86 Lakhs, 3 Years, Prof. Madhusudan Singh.
- Development of Advanced Neuromorphic- and Memory-Centric Computing Hardware, Science and Engineering Research Board (SERB), *DST India,* ₹66.11 Lakhs, 3 Years, Prof. Manan Suri.
- Design and Development of Polar Encoder and Decoder for Robust Burst Wireless Communication, *Bharat Electronics Limited India,* ₹10.47 Lakhs, 1 Year, Prof. Saif K. Mohammed.
- Modelling & Control of Electromagnetic Levitation Systems, Science & Engineering Research Board, *DST India,* ₹41.63 Lakhs, 3 Years, Prof. Mashuq-Un-Nabi.
- Design and development of modular multilevel converters for large scale grid connected Photovoltaic and Battery Energy Storage Systems, *Department of Science & Technology India,* ₹33.80 Lakhs, 3 Years, Prof. Anandarup Das.
- Mission Innovation Challenge #7: Affordable Heating and Cooling of Buildings Innovation challenges- Setting up of MI Resource Centre at IIT Delhi, *Department of Science & Technology India,* ₹75.47 Lakhs, 3 Years, Prof. Sukumar Mishra.
- Physical Unclonable Function (PUF) based Application Specific IC (ASIC) by Technology-Circuit-System Co-development for Strategic Applications, Office of the Principal Scientific Adviser, *GoI, India,* ₹132.30 Lakhs, 3 Years, Prof. Manan Suri.
- Self-healing and energy-efficient Internet of Energy, *Ministry of Human Resource & Development India,* ₹82.37 Lakhs, 2 Years, Prof. Sukumar Mishra.
- Synchrophasor Assisted Efficient Operation of Ancillary Services in Smart Grid (Under SPARC Scheme Project no. 07), *Ministry of Human Resource & Development, India,* ₹40.54 Lakhs, 2 Years, Prof. Nilanjan Senroy.
- Development of application oriented AI System (Neurocomputing and Cognitive Intelligence), *Meity, Government of India,* ₹231.31 Lakhs, 3 Years, Prof. Tapan Gandhi.

- 3D Motion perception in children with Eye-motion Disorders, *DST, Govt. of India,* ₹72.26 Lakhs, 3 Years, Prof. Tapan Gandhi.
- Joint Software Development for Traction Motor Control Module, *Autometers Alliance Limited,* ₹25.00 Lakhs, 1 Year, Prof. Anandarup Das, Prof. Amit Kumar Jain, Prof. Soumya Shubhra Nag, Prof. Sumit Pramanick.

## Humanities and Social Sciences

- A Multidimensional Study of Happiness among Indians Rajya, Anand Sansthan, *Bhopal (M.P.),* ₹10.00 Lakhs, 3 Years, Prof. Kamlesh Singh.
- Security Work, Unionisation and Everyday Violence: Works and Lives of Security Guards in Mumbai and Delhi, *ICSSR,* ₹10.40 Lakhs, 2 Years, Prof. Mahuya Bandyopadhyay.
- Demographic Dividend and the Indian Economy: Opportunities, Challenges and the Way Ahead, *United Nations Populations Fund (UNFPA),* ₹5.50 Lakhs, 2019, Prof. Jayan Jose Thomas.
- Demographic Changes, the Employment Challenge and Development: Evidence from Indian States, *United Nations Populations Fund (UNFPA),* 2020, Prof. Jayan Jose Thomas.
- Mechanisms of choosing pronouns in Hindi, *Leverhulme Trust,* ₹10.95 Lakhs, 1 Years, Prof. Samar Husain (CoPI: Prof. Fukumara, University of Stirling).
- Syntactic Complexity in Context: Role of Discourse and Priming during Hindi comprehension, *Department of Science and Technology – Cognitive Science Research Initiative, Govt. of India,* Details not provided by the funding agency yet, 3 Years, Prof. Samar Husain.
- Behaviour based evaluation for reliable annotation in NLP, *Science and Engineering Research Board,* ₹18.59 Lakhs, 3 Years, Prof. Ashwini Vaidya.
- Group based humiliation, Social Identification and Justice Processes: A Multi-Method Investigation, *Indian Council of Social Science Research (ICSSR),* ₹4.30 Lakhs, Prof. Yashpal Jogdand.
- Divine Ganges, Profane Development: Sacred Geographies and the Governing of Pollution, *Swedish Research Council,* ₹340.13 Lakhs, 2 Years, Prof. Yashpal Jogdand.
- Evolutionary Implementation in Large Economies, *SERB, DST,* ₹6.00 Lakhs, 3 Years, Prof. Saptarshi Mukherjee.

## Management Studies

- Development of Quantification Tool for HIV Testing Kits, *JSI R&T India Foundation, New Delhi India,* ₹12.24 Lakhs, 6 Months, Prof. Gourav Dwivedi.
- Technical Textile Industry in India: Challenges and Opportunities, *Ministry of Textiles (GOI) India,* ₹120.79 Lakhs, 1 Year, Prof. Smita Kashiramka.
- Understanding the Antecedents of Innovation Implementation in Organisations, *Chandragupt Institute of Management Patna, Bihar India,* ₹41.52 Lakhs, 2 Years, Prof. Sanjay Dhir.
- Assessment of Indian Higher Education Institutions in NIRF Ranking: A Comparative Analysis, *Indian Council of Social Science Research India,* ₹10.50 Lakhs, 2 Years, Prof. Sushil.

- Design, development and validation of tool to assess the competency of nurses and doctors on psychometric dimensions, *Bodhi Health Education Pvt. Ltd., New Delhi India,* ₹1.00 Lakhs, 1 Year, Prof. P. Vigneswaral Iavarasan.
- Exploring Migration and its Impacts in Europe, *FIL India Business and Research Services Private Limited India,* ₹28.80 Lakhs, 2 Years, Prof. Arpan Kumar Kar.
- Platform Economies in Digital India: Assessing Implementation, Impact, Infrastructure and Aptitude, (Under SPARC Scheme of MHRD), *Ministry of Human Resource & Development India,* ₹11.00 Lakhs, 3 Years, Prof. P. Vigneswara Ilavarasan.

Materials Science and Engineering

- Foam Processability of Ultra High Molecular Weight Polyolefins and Its High Performance Applications, *Reliance Industries Limited, Navi Mumbai India,* ₹101.48 Lakhs, 3 Years, Prof. A.K. Ghosh.
- Design and Development of Polymeric Gels for Metal Ion Sequestration from Wastewater, *Science & Engineering Research Board, DST India,* ₹43.48 Lakhs, 3 Years, Prof. Josemon Jacob.
- To conduct Expert Committee Meeting in the area of Chemical Sciences during 13-14 December, 2018 at IIT Delhi, *Science and Engineering Research Board (SERB), DST India,* ₹5.45 lakhs, 1 Year, Prof. Josemon Jacob.
- Plastic Waste recycling for use in Civil Construction (IRD Student Startup Action - IRD Funded), *IRD, IIT Delhi India,* ₹2.00 Lakhs, 1 Year, Prof. Bhabani Kumar Satapathy.
- Development of Engineered Non-woven Textured Surfaces for Gum Pad Cleaning of Infants, *Indian Council of Medical Research India,* ₹29.88 Lakhs, 2 Years, Bhabani Kumar Satapathy.
- Development of Structurally Engineered Artificial Dura Material (EN-DURA), *Indian Council of Medical Research India,* ₹20.67 Lakhs, 2 Years, Prof. Bhabani Kumar Satapathy.
- Synthesis of (Hydro-) Gels Bearing Organo-catalysts for the Use in Micro fluidic Reactors (Indo-German Joint Project- DST DAAD), *Department of Science & Technology (International Bilateral Cooperation Division) India,* ₹14.90 Lakhs, 2 Years, Prof. Leena Nebhani.
- New Methods of Catalysing Thiol-ene Reaction and its Application for Surface and Polymer Functionalisation, *Science and Engineering Research Board, (DST) India,* ₹46.41 Lakhs, 4 Years, Prof. Leena Nebhani.
- Development-Evaluation of Aptamer based High Sensitive-Low cost kits for the detection of mycotoxins in food, *Department of Science & technology (DST), India,* ₹35.69 Lakhs 2 Years, Prof. Sampa Saha, Prof. Dinesh Kalyanasundaram, Prof. Hariprasad P.
- Non-leaching Anti-infective Coating for Bio-degradable Medical Implant, *Science and Engineering Research Board, (DST), India,* ₹42.91 Lakhs, 3 Years, Prof. Sampa Saha.
- Novel micro-fabricated polymeric nano-brush based apta-assay for detection of food borne mycotoxins, *Industrial Research and Development, IIT Delhi, India,* ₹10.00 Lakhs, 2 Years, Prof. Sampa Saha,

Prof. Ravi Kumar, Prof. Hariprasad P.
- Development of Multi-compartmental Smart Polymeric Particles, *Science and Engineering Research Board, (DST),* ₹47.80 Lakhs, 3 Years 6 months, Prof. Sampa Saha, Prof. Bhabani K Satapathy.
- Multi-compartmental polymer nanoparticles for programmable drug delivery and deep tissue bio-imaging, *Multi Institutional Faculty Interdisciplinary projects (MFIRP),* ₹10.00 Lakhs, 2 Years, Prof. Sampa Saha, Prof. Yang-Hsiang Chan.
- Compartmentalized particles as a multiple drug delivery kit for efficient management of Parkinson's disease, *Indian Council of Medical Research (ICMR),* ₹39.67 Lakhs, 2 Years, Prof. Sampa Saha, Prof. Pramit Chowdhary, Prof. Achal Kumar Srivastava, Prof. Meenakshi K. Chauhan.
- Development and Laboratory Testing of a Self-adhesive Stainless-steel Dental Splint Prototype, *AIIMS - IIT Delhi (M-FIRP),* ₹20.00 Lakhs, 2 Years, Prof. Suresh Neelakantan, Prof. Leena Nebhani.
- Investigations on the mechanical properties of Rubber Composite Hoses and their FEA Simulation, *Pranav Vikas India Ltd., Faridabad India,* ₹2.80 Lakhs, 1 Year, Prof. Suresh Neelakantan.
- Aluminium Composite Panel Materials: Measurement of Properties and Analysis, *4MANN Industries Private Limited, Mumbai India,* ₹4.32 Lakhs, 3 Months, Prof. Suresh Neelakantan.
- 6th PAC Meeting of Materials, Mining and Minerals Engineering at IIT Delhi during 28.02.2020 to 29.02.2020, *Science & Engineering Research Board, DST India,* ₹8.80 Lakhs, 1 Year, Prof. Bijay Prakash Tripathi.
- Active surface modification strategies to inhibit biofilm formation and bacterial infections (MFIRP2019), *IRD, IIT Delhi India,* ₹5.00 Lakhs, 1 Year, Prof. Bijay Prakash Tripathi.
- To Conduct the 5th PAC Meeting of Materials, Mining and Minerals Engineering at IIT Delhi during 23.11.2019, *Science & Engineering Research Board, DST India,* ₹6.00 Lakhs, 1 Year, Prof. Bijay Prakash Tripathi.
- High Performance Aqueous Redox Flow Batteries based on Redox Active Polymers and Janus membranes, *Department of Science & Technology (International Bilateral Cooperation Division) India,* ₹48.39 Lakhs, 3 Years, Prof. Bijay Prakash Tripathi.
- Design of Anti (bio-) Fouling Block Copolymer Membranes by Molecular functionalization for Clean Water Generation (Indo-German), *Alexander von Humboldt Foundation, Germany,* ₹44.00 Lakhs, 3 Years, Prof. Bijay Prakash Tripathi.
- Equipment Matching Grant, *IRD, IIT Delhi,* India, ₹27.43 Lakhs, 2 Year, Bijay Prakash Tripathi.
- Creation of novel organic-inorganic hybrid materials as sorbents for wastewater treatment from heavy metal ions (Indo-Ukraine Joint Project), *Department of Science and Technology (International Bilateral Cooperation Division) India,* ₹13.02 Lakhs, 2 Years, Prof. Bijay Prakash Tripathi.

- To Conduct the 2nd PAC Meeting of Materials, Mining and Minerals Engineering at IIT Delhi during 15-16 February 2019, *Science and Engineering Research Board (SERB), DST India,* ₹7.60 Lakhs, 01 Year, Prof. Bijay Prakash Tripathi.
- Self-Cleaning Ultrathin Microgel Membranes for Clean Water and Separation Applications, *Science and Engineering Research Board (SERB), DST India,* ₹48.72 Lakhs, 3 Years, Prof. Bijay Prakash Tripathi.
- Equipment matching grant to Dr. Nirat Ray (Under RP03852), *IRD, IIT Delhi, India,* ₹24.00 Lakhs, 5 Months, Prof. Nirat Ray.
- Magneto-transport in ferromagnetic nanowire networks and Device Applications, *Science and Engineering Research Board (SERB), DST India,* ₹30.91 Lakhs, 2 Years, Prof. Nirat Ray.
- Design of quantum dot based thermoelectric devices: An experimental and multiscale modeling approach (FIRP2019 Project#5), *IRD, IIT Delhi, India,* ₹5.00 Lakhs, 1 Year, Prof. Nirat Ray.
- INSPIRE Faculty Award *Department of Science & Technology India,* ₹14.00 Lakhs, 2 Years, Prof. Nirat Ray.
- Development of Photo-Triboelectric Nanogenerator (PTENG) For Sustainable Green Energy Harvesting From Mechanical Motion And Solar Energy, *Science & Engineering Research Board, DST, India,* ₹ 31.87 Lakhs, 2 Years, Prof. Ankur Goswami.
- Energy harvesting using droplet-based microfluidics for self-powered wearables, (FIRP 2019 Project #15), *IRD, IIT Delhi India,* ₹5 Lakhs, 1 Year, Prof. Ankur Goswami.

## Mathematics
- Games and Optimization for Energy Management with Stochasticity - GOEMS, Indo-French Project by *DST-CNRS,* 3 Years, Prof. Vikas Vikarm Singh.
- Modelling and validation of dinucleotides in the human genome, FIRP 2019, *IIT Delhi,* 3 Years, Prof. Vikas Vikarm Singh.
- Development of Predictive Data Analysis system using Artificial Intelligence, *DGGI, Ministry of Finance, Govt. of India,* ₹150.00 Lakhs, 3 Years, Prof. Niladri Chatterjee.
- Wavelet methods for PDEs on network, *DST-SERB, India,* ₹6.60 Lakhs, 3 Years, Prof. Mani Mehra.
- Multiscale Modelling, Simulation and Optimization for Energy, Advanced Materials and Manufacturing, *Indo-German partnership (IGP), India,* ₹280.00 Lakhs, 4 Years, Prof. Mani Mehra.
- Valuing Variable Annuities with Lifelong Guarantees, *DST-SERB, India,* ₹6.60 Lakhs, 3 Years, Prof. S. Dharmaraja.
- Performance and Dependability Analysis and Development of Testbed of 5G Networks, 3 Years, Prof. S. Dharmaraja.
- Existence and multiplicity results for nonlocal elliptic and parabolic problems, *DST-SERB, India,* ₹6.60 Lakhs, 3 Years, Prof. K. Sreenadh.
- DST-FIST project, Computational Lab for Mathematics, *DST-FIST,* ₹55.00 Lakhs, 3 Years, HOD, Mathematics.

- Average and Relevant Sampling in Reproducing Kernel subspace of Mixed Lebesgue Space, *DST, India,* ₹28.79 Lakhs, 3 Years, Prof. Sivananthan Sampath.
- Indo-French Project: Evolutionary PDEs: degeneracy, noise and approximations, *IFCAM (Indo-French),* 3 Years, Prof. Ananta Majee.
- India Development Fund (IDF) of budget AUD 9,970, *University of Sydney,* ₹4.40 Lakhs, 1 Year, Prof. Biplab Basak.
- Fourier algebras on ultraspherical hypergroups, *DST-SERB,* ₹06.60 Lakhs, 3 Years, Prof. N. Shravan Kumar.
- Stable Numerical Schemes for Relativistic Fluid and Plasma Flows, *DST-SERB,* ₹6.60 Lakhs, 3 Years, Prof. Harish Kumar.
- Image of locally finite and locally nilpotent derivations over the polynomial algebra, *DST-SERB,* ₹6.60 Lakhs, 3 Years, Prof. Surjeet Kour.
- Pseudo-differential Calculus on the Affine Group, *DST-SERB,* ₹6.60 Lakhs, 3 Years, Prof. Aparajita Dasgupta.
- Functional Classes and Hyperbolic equations on Hilbert Spaces, *DST-SERB,* ₹27.86 Lakhs, 3 Years, Prof. Aparajita Dasgupta.
- Study of new types of continued fractions and applications, *DST-SERB,* ₹6.60 Lakhs, 3 Years, Prof. Ritumoni Sharma.
- Mathching and Its Variations: Structural and Algorithmic Study, *DST-SERB,* ₹6.60 Lakhs, 3 Years, Prof. B.S. Panda.
- Pointwise A Posteriori Error Estimates for Finite Element Methods for The Elliptic Obstacle Problem, *DST-SERB,* ₹6.60 Lakhs, 3 Years, Prof. Kamana Porwal.
- Finite element methods for the variational inequalities of the second kind, *DST-SERB,* ₹15.16 Lakhs, 3 Years, Prof. Kamana Porwal.

## Mechanical Engineering
- To study the effects of exposure to diesel, biodiesel and biodiesel blend fuel-engine exhaust on testicular morphology and spermatogenesis in male wistar rats, *IRD, IIT Delhi,* ₹20.00 Lakhs, 2 Years, Prof. Debabrata Dasgupta, Prof. Bahni Ray, Prof. Mayank Kumar.
- Mitigation of air pollution: micro-to-macro scale study of particle capture by liquid droplets, *DST,* ₹62.07 Lakhs, 3 Years, Prof. Bahni Ray, Prof. Debabrata Das Gupta, Prof. Mayank Kumar.
- Automation Solutions for the Metal Scrap Handling Industry, Madhuban Trade Steels Private Limited, *MTC Group of Companies,* ₹14.16 Lakhs, 1 Year 7 Months, Prof. Varun Ramamohan.
- Predictive maintenance models for industrial chillers and lifts in large buildings, *Spacemonk Technologies,* ₹2.54 Lakhs, 1 Year, Prof. Varun Ramamohan.
- Development of a semi-automated machine learning based tool for chest radiograph image interpretation to differentiate active pulmonary tuberculosis (TB) from healed pulmonary TB sequelae, *AIIMS MFIRP,* ₹18.00 Lakhs, 2 Years, Prof. Varun Ramamohan.

- Pressurized drop tube furnace experiments towards obtaining high-pressure kinetics of Indian coals and coal blends, *SERB,* ₹49.28 Lakhs, Prof. Mayank Kumar.
- Measuring real-world automobile pollution by on-road experiments, *IRD, IIT Delhi,* ₹04.00 Lakhs, Prof. Mayank Kumar.
- Digi Seeker (IRD student start up Project 2019), *IRD, IIT Delhi,* ₹2.00 Lakhs, Prof. Rama Krishna.
- Development of High Voltage DC (HVDC) Circuit Breaker (Under FIRP Scheme of IRD 2019 call), *IRD, IIT Delhi,* ₹5.00 Lakhs, 2019, Prof. Rama Krishna.
- To Host DD-Robocon 2019 Competition at IIT Delhi, *Doordarshan, Delhi,* ₹55.50 Lakhs, 2019, Prof. Rama Krishna.
- To Conduct the 6th Joint International Conference on Multi-body System Dynamics and 10th Asian Conference on Multi-body Dynamics IMSD-ACMD 2020, *IIT Delhi,* ₹84.99 Lakhs, 2018, Prof. Rama Krishna.
- Research in Human-Centered Robotics with special emphasis on Field and Bio-Medical Rehabilitation (Indo-Korea Joint Network Centre on Robotics), *Department of Science & Technology,* ₹223.77 Lakhs, 2018, Prof. Rama Krishna.

### Physics

- Unravelling the role of charged defects in inorganic-orgranic (IO) hybrid perovskites at realistic conditions: A multi-scale modelling starting from hybrid DFT, GW, BSE combined with ab initio thermodynamics, *SERB (Core Research Grant),* ₹50.00 Lakhs, 3 Years, Prof. Saswata Bhattacharya.
- Taking SUSY "lightly": Exploring phenomenological viability of light singlet states in the context of non-minimal super symmetric models, *SERB (under SRG scheme),* ₹6.77 Lakhs, 2 Years, Prof. Pradipta Ghosh.
- Nano-structured si rich silicon nitride thin films for third generation solar cell, *CSIR,* ₹17.00 Lakhs, 3 Years, Prof. Pankaj Srivastava & Prof. Santanu Ghosh.
- DST-IIT Delhi energy storage platform on batteries, *DST,* ₹1,008.75 Lakhs, 5 Years, Prof. Anil Verma, Prof. S. Basu, Prof. R.S. Dhaka, Prof. M. Ali Haider, Prof. Anupam Shukla, Prof. Amit Gupta.
- Nanofabrication of sculptured thin films by a combination of glancing angle deposition and shadow sphere lithography and study their application in Nano-photonics and Biosensors, *MHRD, India,* ₹43.88 Lakhs, 2 Years, Prof. J.P. Singh.
- Bio-Inspired Micro and Nano-Textures Surface for Tunabilty and Directional sliding Friction, *DST Nano mission,* ₹67.88 Lakhs, 3 Years, Prof. J.P. Singh.
- Quantum Technologies using Hybrid Photons for Secure Communication & Quantum Information, *DRDO/JATC,* ₹593.00 Lakhs, 5 Years, Prof. Joyee Ghosh.
- Integrated sources of entangled photons for quantum communication and quantum information applications, DST - QuST (Quantum Science & Technology), ₹420.00 Lakhs, 3 Years, Prof. Joyee Ghosh.

- Investigation of low-frequency dynamics of magnetic skyrmions using highly sensitive III-V semiconductor hetrostructures based micro-Hall devices, SERB (Core Research Grant), ₹60.99, Lakhs, 3 Years, Prof. Pintu Das.
- 'Nanomaterials for Nanosatellite, Global engagement bid, 10,000 Pound, 1 year, Prof. S. Ghosh, Prof. D. Kataria.

### Textile and Fibre Engineering

- Nano Respiratory Nasal Filter, *UAY,* ₹60.40 Lakhs, 2 Years, Prof. Ashwini Agrawal, Prof. Manjeet Jassal.
- Abdul Kalam Technology Innovation National Fellowship, *INAE,* ₹90.00 Lakhs, Prof. Ashwini Agrawal.
- Novel Nano-silver polymer composite for bioactive technical textiles and plastics, *RESIL,* ₹1,200.00 Lakhs, Prof. Ashwini Agrawal, Prof. Manjeet Jassal.
- Biocompatible dressing for pediatric hypospadias repair, *AIIMS, New Delhi,* ₹10.00 Lakhs, Prof. Ashwini Agrawal, Prof. Manjeet Jassal.
- Development of Multilayered Coated and Laminated Fabric for Aerostat Hull Material (JATC Sub project #22) from DRDO under SITEX vertical, *DRDO (Under SITEX Vertical),* ₹796.28 Lakhs, 5 Years, Prof. Mangala Joshi, Prof. B.S. Butola, Prof. S. Wazed Ali, Prof. Abhijit Majumdar, Prof. Bipin Kumar.
- Design and Development of Multilayered Laminated Fabric for High altitude Airship, *DRDO (Under SITEX Vertical),* ₹637.69 Lakhs, 5 Years, Prof. B.S. Butola, Prof. Mangala Joshi, Prof. S Wazed Ali, Prof. Abhijit Majumdar, Prof. Bipin Kumar.
- Fabrication and in-vivo (rat model) evaluation of novel local drug delivery system based on polymer nanocomposite for treatment of periodontitis, *ICMR,* ₹39.58 Lakhs, 3 Years, Prof. Kunaal Dhingra, AIIMS, Delhi, Prof. Mangala Joshi, IIT Delhi.

### Applied Research in Electronics

- Development of Quantum Computing Architecture with Silicon-based Spin Qubits, *DRDO,* ₹31.00 Lakhs, 5 Years, Prof. Samaresh Das.
- Sub-5V Metal Based MEMS SPDT Switch for Radar Beam Steering Antenna Under Harsh Environments, *IM Pacting Research Innovation and Technology, MHRD India,* ₹124.30 Lakhs, 3 Years, Prof. Pushpapraj Singh.

### Atmospheric Sciences

- Development of National Hazard Profile for the state of Kuwai, *RMSI Private Limited, Noida, India,* ₹14.20 Lakhs, 3 Years, Prof. Manju Mohan.
- Feasibility study for improving performance of WRF Urban Canopy model and preparing inputs for human health impact assessment, *University of Tokyo,* ₹12.50 Lakhs, 1 year, Prof. Manju Mohan.
- Delhi Air Quality Experiment: A Paradigm Shift in Source Apportionment, *Central Pollution Control Board, New Delhi,* ₹45.64 Lakhs, 2 Years, Prof. Dilip Ganguly.
- Investigation of dry air intrusion over the Arabian Sea and its implications on Indian summer monsoon, *SERB-DST, Govt. of India,* ₹14.65 Lakhs, 2 Years, Prof. S Sukumaran.

- Implications of Arctic sea ice melting on tropical climate, *National Centre for Polar and Ocean Research,* ₹41.43 Lakhs, 2 Years, Prof. S. Sukumaran.

- Automated intra-day solar power generation forecasting system for NTPC: Development, implementation and capacity building, *NTPC Energy Technology Research Alliance NETRA, Noida,* ₹6.51 Lakhs, 2 Months, Prof. S.B. Roy.

- Assessment of the variability of physical oceanic parameters in the arctic ocean in response to the sea ice melt using observation and numerical model, *NCP and Ocean Research,* ₹39.02 Lakhs, 3 Years, Prof. Vimlesh Pant.

- High resolution climate scenarios for basin-scale water resource management application, *Ministry of Water Resources, River Development & Ganga Rejuvenation,* ₹131.00 Lakhs, 3 Years, Prof. S.B. Roy.

- Mortality burden of ambient Pm 2.5 exposure in Delhi NCR, *IRD under MFIRP (MI01906).* ₹5.00 Lakhs, 1 Year, Prof. Sagnik Dey.

## Biomedical Engineering

- Re-engineering High End Audiometric Devices for Robust and Affordable audio logical testing sound4All – phase 2, *Indo-German Science and Technology Center,* ₹55.00 Lakhs, Prof. Dinesh Kalyana sundaram.

- Designing of patient specific Total elbow replacement prothesis for Indian population, *ICMR,* ₹135.00 Lakhs, Prof. Bhavuk Garg, AIIMS.

- Development of methodology for quantitative multi-parametric MRI and evaluating its potential along with Machine Learning in classification of brain tumor and treatment followup, *DST,* ₹30.00 Lakhs, Prof. Anup Singh.

- Artificial skin (Bio-inspired bi-layer polymeric hybrid Scaffold) for burn injuries and trauma care IMPRINT India, *MHRD & MOH,* ₹220.00 Lakhs Prof. Veena Koul.

- MUC1 pulsed DC-derived exosomes for cancer immunotherapy, *DBT*, ₹63.00 Lakhs Prof. Jayanta Bhattacharyya.

- International Biodesign Programme, *DBT*, ₹150 Lakhs, Prof. Harpal Singh.

## Energy Studies

- Design and Demonstration of Sustainable Building Infrastructure, *Yardi Systems, USA,* ₹670.00 Lakhs, 3 Years, Prof. Ashu Verma (PI), Co-PI's: Prof. K. Ravi Kumar, Prof. Dibakar Rakshit, Prof. Ramesh Narayanan, Prof. Satyananda Kar, Prof. Kaushik Saha, Prof. K.A. Subramanian, Prof. Sandeep Pathak, Prof. Sumeet umar Chattopadhyay, Prof. T.R. Sree Krishnan, Prof. C.T. Dhanya, Prof. Shashank Bishnoi, Prof. Babu J. Alappat, Prof. B.K. Panigrahi.

- Designing and assessing impacts of clean and efficient agricultural residue-fuel (biomass pellets) based heating systems for Jaggery making in northern India, *IRD, IIT Delhi India,* ₹10.00 Lakhs, 2 Years, Prof. S.K. Tyagi, K.K. Agrawal, Upasna.

- Thermal analysis of underground vegetable storage structure during winter seasons at Leh-Ladakh, Defence Institute of High Altitude Research, *DRDO, India,* ₹10.00 Lakhs, 2 Years, Prof. S.K. Tyagi, Prof. Sanjeev Jain.

- Sustainable Technologies for Distributed Level Application and Energy Support to Rural Development (STAR) - (ITPAR Phase-IV), *Department of Science & Technology ITPAR,* ₹180.00 Lakhs, 3 Years, Prof. Dibakar Rakshit (Principal Investigator).

- Characterization and testing of the adsorption pairs of HFOs and ammonia with halide salts and functional activated carbon groups for application in adsorption heat pump/cooling systems, *Ministry of Human Resource Development,* ₹87.00 Lakhs, 2 Years, Prof. Dibakar Rakshit (Principal Investigator).

- Characterization studies of Nano-enhanced Phase Change Material (NEPCM) in thermal storage devices for sustainable building designs in India, *Department of Science & Technology,* ₹64.00 Lakhs, 3 Years, Prof. Dibakar Rakshit (Principal Investigator).

- Energy Efficient Buildings: Technology with Intelligence, *Department of Science & Technology,* ₹250.00 Lakhs, 3 Years, Prof. Dibakar Rakshit (Co-Principal Investigator).

- Design of Phase Change Material Based Thermal Management System for Pulsed Heat Dissipating Devices, *Defence Research and Development Organisation,* ₹10.00 Lakhs, 2 Years, Prof. Dibakar Rakshit (Principal Investigator).

- Demonstration of Effective Technology Solutions to eliminate and use waste from municipal drains in Delhi, *Principal Scientific Advisor, GoI,* ₹444.7 Lakhs, 2 Years, Prof. Satyananda Kar, DESMI Denmark, Vertiver Delhi.

- Efficacy of cold atmospheric plasma jet for its antimicrobial activity against drug resistant bacterial and fungal pathogen: An in-vitro and in-vivo study, *IITD-AIIMS (MI-FIRP),* ₹10.00 Lakhs, 2 Years, Prof. Satyananda Kar, Prof. Sarita Mohapatra.

- Plasma treatment of sewage water for inactivation of antibiotic resistance bacteria, *IITD (FIRP),* ₹10.00 Lakhs, 2 Years, Prof. Satyananda Kar, Prof. Sreekrishnan, Prof. Ziauddin.

- Development and characterization of an ECR plasma thruster, *SERB-DST,* ₹44.71 Lakhs, 3 Years, Prof. Debaprasad Sahu.

- Nonlinear waves and turbulence with implication on the magnetic reconnection, *Indian Space Research Organisation (ISRO),* ₹21.00 Lakhs, 3 Years, Dr. R. Uma, Prof. R.P. Sharma.

- Turbulent magnetic field amplification in laboratory and astrophysical plasmas, *Department of Science & Technology India,* ₹35.00 Lakhs, 3.5 Years, Dr. R. Uma, Prof. R.P. Sharma.

- Atmospheric water generator, Green Company, *New Delhi, India,* ₹2.20 Lakhs, 2 Years, Prof. S.K. Tyagi, Prof. Rahul Goyal.

- Thermochemical Conversions of Lignocellulosic Biomass/Wastes into Bioenergy and Biofuels with its

Utilization in Internal Combustion Engine, *DST,* ₹42.49 Lakhs, 3 Years, Prof. K.A. Subramanian.

- Development of a methanol-gasoline fuelled spark ignition engine, *SERB,* ₹71.26 Lakhs, 3 Years, Prof. K.A. Subramanian.

## Rural Development and Technology

- Development of termiticidal formulation derived from termite resistant plant extracts and their fungal endophytes, *Department of Science and Technology,* ₹25.00 Lakhs, 2 Years, PI: Dr. Kanika Chowdhary, Mentor: Prof. Satyawati Sharma.
- Non-aqueous and aqueous sol-gel synthesis, characterization and applications of ceramic material in agriculture, horticulture and water purification, UGC (Post doctoral fellowship WM 2017-18), ₹18.44 Lakhs, 2 Years, Prof. Anita Raj Sanwaria (PDF-wm UGC), Prof. Satyawati Sharma.
- Concentrating solar-thermophilic anaerobic reactor for municipal solid waste (COSTARMSW), *UKIERI – DST,* ₹22.00 Lakhs, 2 Years, Prof. V.K. Vijay, Prof. Ram Chandra.
- Development of high protein textured food (mock meats) from plants, *Industry,* ₹77.00 Lakhs, 2 Years, Prof. Kavya Dashora.
- Developing Blockchain technology for enhancing export of Indian Honey, *Industry,* ₹28.00 Lakhs, 2 Years, Prof. Kavya Dashora.
- Concentrating solar-thermophilic anaerobic reactor for municipal solid waste (COSTARMSW), *UKIERI – DST,* ₹22.00 Lakhs, 2 Years, Prof. V.K. Vijay, Prof. Ram Chandra, Prof. Pooja Ghosh.
- Study on Supply of safe Drinking Water by Govt. of Madhya Pradesh to each house hold and Sustainability Analysis for preparation of DPR leading to Project execution through association of IIT, Delhi and Government of M.P., *M.P. Pey Jal Nigam,* ₹74.5 Lakhs, 18 Months, Prof. Vivek Kumar, Prof. V.K. Vijay.
- Livelihood generation through technology intervention for sustainable harnessing of hemp ad neem fruit pulp, *DST,* ₹76.30 Lakhs, 3 Years, Prof. Vivek Kumar, Prof. S.N. Naik, Prof. V.K. Vijay.
- Inspection of Grossly Pollution Industries (GPIs) discharging into main stem of Hindon and its tributaries, *CPCB,* ₹74.60 Lakhs, 6 Months, Prof. Vivek Kumar.
- Inspection of Grossly Pollution Industries (GPIs) discharging into main stem of Ganga and its tributaries, *CPCB,* ₹49.00 Lakhs, 1 Year, Prof. Vivek Kumar.
- Development of sustainable rural livelihood options utilizing locally available bioresources through transformative rural technologies in the Indian Himalayan Region of Himachal Pradesh and Sikkim, *NMHS, Almora,* ₹49.31 Lakhs, 3 Years, Prof. J.K. Sahu.

## Bharti School of Telecommunication Technology and Management

- Sustainable Network Communication through Cognitive Intelligence at the Edge, *Science and Engineering Research Board,* ₹53.86 Lakhs, 3 Years, Prof. Swades De.

## Amar Nath and Shashi Khosla School of Information Technology

- Development and dissemination of Braille Factor Blocks: a kit to improve numeracy skills, *Microsoft Corporation India Pvt. Ltd., India,* ₹29.27 Lakhs, 2 Years, Prof. P.V. Madhusudhan Rao.
- Empower 2019- accessibility and inclusion, *Microsoft Corporation India Pvt. Ltd., India,* ₹28.91 Lakhs, 2 Years, Prof. P.V. Madhusudhan Rao.
- Optimising system performance and energy in multi-sensor visual perception systems (Under Indo - U.S. Virtual Networked Centers), *Indo-US Science and Technology Forum (IUSSTF), United States,* ₹33.52 Lakhs, 2 Years, Prof. Chetan Arora.
- Extreme Classification (Unrestricted Grant), *Microsoft Research Lab India Pvt. Ltd., India,* ₹11.90 Lakhs, 2 Years, Prof. Sumeet Agarwal.
- Creating Accessible STEM documents (Under SPARC scheme of MHRD), *Ministry of Human Resource & Development, India,* ₹54.03 Lakhs, 2 Years, Prof. Prem Kumar Kalra.
- Algorithms and Architectures for Machine Learning and Computing on the Edge Cadence, *Design Systems, USA,* ₹350.00 Lakhs, 2 Years, Prof. P.R. Panda, Prof. Brejesh Lall.

## Kusuma School of Biological Sciences

- Regulation of insulin signaling by dephosphorylation of AS160 and GSK3beta and its possible implication in insulin resistant diabetes in neuronal cells in vitro, *CSIR,* ₹15.00 Lakhs, 3 Years, Prof. C.S. Dey.
- Isoform Specific Functions of Akt Kinase in Neuronal Insulin Signaling and Insulin-Resistant Diabetes, *DBT,* ₹82.50 Lakhs, 3 Years, Prof. C.S. Dey.
- Role of protein kinase C alpha in neuronal insulin signaling, *ICMR,* ₹62.00 Lakhs, 3 Years, Prof. C.S. Dey.
- Diabetes and frailty: investigating insulin signaling and resistance of intrafusal muscle fibers, *MFIRP/UCL, UK/ IIT Delhi,* ₹5.00 Lakhs, 1 Year, Prof. C.S. Dey.
- To identify pharmacological agents for treatment of non-alcoholic fatty liver disease (NAFLD) and uncover the regulatory mechanisms that maintain metabolic homeostasis upon NAFLD-associated injury and liver surgery, *DBT,* ₹42.5 Lakhs, 5 Years, Prof. Shilpi Minocha.
- Porting of Sanjeevini (a complete Drug Design software suite) on High Performance Computing based NSM Platform and creation of Computational Protein Data Bank (Co-PDB) for Drug targets, *CDAC/National Supercomputing Mission,* ₹183.9 Lakhs, 3 Years, Prof. Aditya Mittal.
- Study of the erythroid and megakaryocyte lineages under normal development and pathological myeloproliferation, *DBT, Wellcome Trust India Alliance,* ₹374.00 Lakhs, 5 Years, Prof. Anita Roy.
- Understanding the molecular mechanisms of SB202190-induced defective autophagy, *ICMR,* ₹35.5 Lakhs, 3 Years, Prof. Manoj B. Menon.

- Studies on ligand binding, gating and allostery in hetero pentameric neuronal nicotinic acetylcholine receptors, *SERB,* ₹27.39 Lakhs, 2 Years, Prof. Tapan K. Nayak.

- Role of intracellular ion channels in Autophagy induced in a neuronal cell line model of Parkinson's disease, *MFIRP/ IIT Delhi - NII,* ₹5 Lakhs, 1 Years, Prof. Tapan K. Nayak.

- Structure function studies on a membrane protein from Chikungunya Virus (CHIKV), *DBT,* ₹140.73 Lakhs 3 Years, Prof. Manidipa Banerjee.

- Monitoring disassembly of viral capsids and nucleocapsids using all atom and coarse grained molecular dynamics simulations, *DBT,* ₹32.57 Lakhs, 3 Years, Prof. Manidipa Banerjee.

- Development and evaluation of aptamer based lateral flow assay kit for detection of SARS-CoV2, *DBT, BIRAC,* ₹48.5 Lakhs, 0.5 Years, Prof. Ashok Patel.

- Protecting public health and novel microbial indicators to monitor the performance of water reuse systems in India, *University of Nebraska,* US$18500, 1 Year, Prof. Vivekanandan Perumal.

- To identify Vitamin D elements in virus genomes and their putative functions, *IRD, IIT Delhi,* ₹2.00 Lakhs, 1.5 Years, Prof. Vivekanandan Perumal.

- Development of superhydrophobic catheters to inhibit bacterial and yeast growth, *IRD, IIT Delhi,* ₹5.00 Lakhs, 1.5 Years, Prof. Vivekanandan Perumal.

- Understanding the mechanism of survival of Salmonella typhimurium by targeting the host Rab GTPase(s) via miRNAs, *CSIR,* ₹29.6 Lakhs, 2 Years, Prof. Amitabha Mukhopadhyay.

- Studies on ligand 'Binding', 'Gating' and 'Allostery' In Heteropentameric Neuronal Nicotinic Acetylcholine Receptors, *DST, SERB,* ₹27.3 Lakhs, 2 Years, Prof. Tapan Kumar Nayak.

- Probing cell-to-cell variation in signal-induced NF-kB responses, *IRD, IIT Delhi,* ₹5.00 Lakhs, 1.5 Years, Prof. James Gomes.

- Exploring Moonlight Enzyme, Glutamate Racemase, of Neisseria Gonorrhoeae as a Target for Anti-Gonococcal Drug Discovery, *ICMR,* ₹5.5 Lakhs, 3 Years, Prof. Bishwajit Kundu.

- Exploiting the cell cycle regulatory role of CedA in Salmonella typhi pathogenesis and drug resistance, *DST, SERB,* ₹22.3 Lakhs, 2 Years, Prof. Bishwajit Kundu.

- Funds for Improvement of S&T Infrastructure in Universities and Higher Educational Institutes, *DST,* ₹165.00 Lakhs, 5 Years, Prof. Bishwajit Kundu.

# CONFERENCES/SEMINARS/WORKSHOPS/LECTURES

A department wise list of conferences, Seminars, Workshops, and Lectures organised by the Academic units of the Institute during the period.

## Conferences

### Chemical Engineering

- *International Conference on Smart Materials and Sustainable Technology* (SMST 2020), organised by Prof. Shalini Gupta, IIT Delhi, at Bogmallo beach resort, Goa, from 22 to 25 February, 2020.

- *Indian Chemical Engineering Congress CHEMCON-2019,* 72nd Annual Session of Indian Institute of Chemical Engineers, organised by Chemical Engineering Department IIT Delhi, Indian Institute of Chemical Engineers (Northern Regional Centre), Indian Oil Corporation Ltd, and European Federation of Chemical Engineering, at IIT Delhi, from 15 to 19 December, 2019.

### Design

- *Empower 2019,* organised by Prof. P.V.M. Rao and Prof. M. Balakrishnan, at IIT Delhi Sonipat Campus, from 14 to 17 October, 2019.

### Electrical Engineering

- *20th International Conference on Intelligent Systems Applications to Power Systems,* organised by Prof. Sukumar Mishra, Deptt. of Electrical Engineering, at IIT Delhi, from 10 to 14 December, 2019.

### Humanities and Social Sciences

- *International Conference On Reproduction, Demography and Cultural Anxieties in India and China in The 21st Century,* organised by Prof. Ravinder Kaur, Department of Humanities & Social Sciences, at IIT Delhi, from 20 to 21 February, 2020.

- *Beyond Productivity and Populism: Reimagining India's Agricultural and Rural Policies,* organised by Prof. Richa Kumar, Department of Humanities & Social Sciences, at IIT Delhi, from 26 to 28 September, 2019.

### Management Studies

- *Challenges and Opportunities for the future of work,* organised by By Prof. Shuchi Sinha and Prof. Venkat Ram Reddy, DMS, at IIT Delhi, from 17 to 18 January, 2020.

### Physics

- *IONS-India 2020: International OSA Network of Students,* organised by OSA Student Chapter, IIT Delhi c/o Anurag Sharma, at IIT Delhi, from 29 February to 02 March, 2020.

- *ISQIT-2019: International Symposium on Quantum Information Technology,* organised by DIAT/DRDO Pune and IIT Delhi (c/o Joyee Ghosh), at DIAT/DRDO Pune, from 2 to 5 December, 2019.

- *Incubator Meeting on Agri-photonics,* organised by Prof. Amartya Sengupta, IIT Delhi, INDIA; Krishnan Parameswaran, Analog Devices, Boston, USA; Joachim Sacher, Sacher Lasertechnic, GERMANY; G Ariunbold, Missisipi State University, Missisipi, USA, Aaron Pung, Sandia National Laboratory, Washington DC, USA, from 12 to 14 May, 2019.

### Textile and Fibre Engineering

- *Functional Textiles and Clothing Conference,* organised by Prof. Deepti Gupta, Prof. Abhijit Majumdar, at IIT Delhi, from 07 to 09 February, 2020.

- *3rd Young Researchers Symposium on Emerging Trends in Textile, Fiber and Polymer Research,* organised by Prof. Rajiva Srivastava, Prof. Abhijit Majumdar, Prof. Bipin Kumar and Prof. Javed Sheikh, Deptt. of Textile and Fibre Engineering, IIT Delhi, from 15 to 17 May, 2019.

### Rural Development and Technology

- *Tech4Seva,* Unnat Bharat Abhiyan, at IIT Delhi, from 10-12 August, 2019.

### Kusuma School of Biological Sciences

- *BIOWORLD 2019,* organised by Prof. Bishwajit Kundu and Prof. Tapan K. Nayak at Naukuchiatal, Uttakhand.

## Seminars

### Chemical Engineering

- *Interpark,* organised by Department of Chemical Engineering, Seminar Hall, IIT Delhi.

- *Workshop on Symposium on advanced Simulation Methods: DFT, MD and Beyond,* organised by Jointly Departments of Physics, Chemistry, Chemical Engineering, Civil Engineering, CSC and the HPC group, at LHC (Lecture Hall Complex), IIT Delhi.

### Design

- *UK Best Practices in Inclusion for Higher Education Institutes,* organised by Prof. P.V.M. Rao, on 27 November, 2019.

- *Design Degree Show 2019 (Keynote Speaker: Prof. Praveen Nahar, Director NID; Other Speakers: Sh. Sudhir Sharma, Head Indidesign, Sh. Anuj Prasad, Head Desmania Design, Sh. Sathiyaseelan Head Styling, Ashok Leyland),* organised by Prof. Sumer Singh, IIT Delhi, on 22 June, 2019.

### Electrical Engineering

- *From compressed sensing to deep learning: tasks, structures, and models,* by Yonina Eldar, organised by Prof. Seshan Srirangarajan, IIT Delhi, on 13 December, 2019.

- *Smart Sampling: Super-Resolution and Learning Strategies,* by Satish Mulleti, organised by Prof. Seshan Srirangarajan, IIT Delhi, on 5 February, 2019.

- *Digital Design in FPGA for Power Electronics Applications,* organised by Prof. Sumit Pramanick, NIT Uttarakhand, on 21 November, 2019.

- *Pulse Width Modulation Techniques for Grid Connected DC-AC Converters,* organised by Prof. Sumit Pramanick, NIT Silchar, on 28 July, 2019.

### Humanities and Social Sciences

- *Seminar on Why True Criticism is Poetic Criticism by Prof. Michel Chaouli,* organised by Prof. Divya Dwivedi, Department of Humanities and Social Sciences, IIT Delhi, February, 2020.

- *A Nation and its Development: The Excluded Knowledge Society,* organised by Prof. Madhulika Bannerjee (Delhi University), HSS Committee Room (MS 610), IIT Delhi, on 09 April, 2019.

- *Ambedkar's Agonism: Caste as Sovereign Violence and Pakistan Peace,* organised by Prof. Shruti Kapila (University of Cambridge), LH 534, IIT Delhi, on 17 September, 2019.

- *रीति और रति की विस्मृत दुनियाः रीति काल और कविदेव,* organised by Prof. Mrityunjay Tripathi (Ambedkar University), LH 534, IIT Delhi, on 24 September, 2019.

- *Rethinking the Industrial Revolution: Myths and Machines,* organised by Prof. Barbara Hahn, Texas Tech University, HSS Committee room, MS 610, IIT Delhi, 3 January, 2020.

- *Re-Imaging the Green Revolution: Irrigation and Food Production in Twentieth Century India,* organised by Prof. Kapil Subramanian, HSS Committee room, MS 610, IIT Delhi, on 21 January, 2020.

- *Transmedia Australian Literature,* organised by Prof. Kim Wilkins, HSS Committee room, MS 610, IIT Delhi, on 28 January, 2020.

- *Imbalance in China: Consequence, Policy and Governance,* organised by Prof. Shuzhuo Li, HSS Committee room, MS 610, IIT Delhi, on 12 February, 2020.

- *Laws of the State and Competing Logics of Democracy and Security,* organised by Prof. Anushka Singh, HSS Committee room, MS 610, IIT Delhi, on 17 February, 2020.

- *Writing Exile: Activism and Writing as a Tibetan Refugee,* organised by Prof. Tenzin Tsundue, HSS Committee room, MS 610, IIT Delhi, on 03 March, 2020.

### Management Studies

- *Concerns in Digital Payments and Telecom- Input for Policy,* organised by Prof. Arpan K. Kar, DMS, IIT Delhi.

### Materials Science and Engineering

- *Some aberration uncorrected electron microscopy,* organised by Prof. Jayant Jain, MSE Deptt., IIT Delhi, on 10 February, 2020.

### Physics

- *Seminar on Contemporary Optics and Photonics (COAP),* organised by Coordinator: Prof. Anurag Sharma, IIT Delhi, from 9 to 10 November, 2019.

- *Indo-French Seminar on Radiation damage in Nuclear materials,* organised by Coordinator: Prof. Santanu Ghosh, Prof. A. Debelle, IUAC, IIT Delhi, from 18 to 20 February, 2019.

### Applied Research in Electronics

- *Nano sensors,* by Dr. Saakshi Dhanekar, organised by Prof. Monika Aggarwal on August, 2019.

- *Oceanic response to Tropical Cyclone in the Bay of Bengal,* by Dr. Vimlesh Pant, organised by Prof. Monika Aggarwal, on 09 June, 2019.

- *Non Coherent Reception for Multiple Antenna Systems,* by Prof. Ranjan Malik, organised by Prof. Monika Aggarwal, on 23 September, 2019.

- *A story around Human Psychology, Artificial Intelligence and Finance,* by Mr. Nitendra Rajput, VP and Head, AI Garage and Mastercard, organised by Prof. Monika Aggarwal, on 23 October, 2019.

- *Microgrid Control,* by Prof. Sukumar Mishra, organised by Prof. Monika Aggarwal, on 18 December, 2019.

- *Marine Technology Society Delhi Chapter Inauguration Lecture,* organised by Prof. Monika Aggarwal, on 07 June, 2019.

- *Women in Electronics (WIE)-IEEE Inauguration Lecture,* organised by Prof. Monika Aggarwal, on 23 August, 2019.

- *IEEE Oceanic Engineering Society Inauguration Lecture,* organised by Prof. Monika Aggarwal, on 07 February, 2020.

### Atmospheric Sciences

- *National Seminar on Climate Change and Coastal Ocean Processes,* organised by CAS IIT Delhi, from 04 to 05 July, 2019.

### Rural Development and Technology

- *Orientation Workshop on Inspection and Monitoring of Pulp & Paper Industry under GPI Inspection,* organised by Prof. Vivek Kumar, IIT Delhi, on 20 May, 2019.

- *Workshop on Augmenting Writing Skills for Articulating Research (AWSAR),* organised by Prof. Vivek Kumar, IIT Delhi, on 01 July, 2019.

- *Role of Higher Education Institutes in Regional Development,* organised by Prof. Vivek Kumar, IIT Delhi, on 04 November, 2019.

### Amar Nath and Shashi Khosla School of Information Technology

- *AI For Societally Relevant Problems: Influence Maximization in an Uncertain World,* organised by Prof. Aaditeshwar Seth, on 3 June, 2019.

- *An Information Session on Working with Indian Political Data by TCPD,* organised by Prof. Aaditeshwar Seth, on 18 October, 2019.

- *Novel and Efficient Techniques for Guaranteeing Routing and Protocol Level Deadlock Freedom in Interconnection Networks,* organised by Prof. P.R. Panda, on 2 January, 2020.

- *Computing on Largest open science supercomputers in the world,* organised by Prof. Anoop Chawla, on 8 January, 2020.

- *The ubiquity of synchrony in nature,* organised by the Department, on 30 January, 2020.

- *Green Computing through Adaptive Multi-core Architectures,* organised by Prof. P.R. Panda, on 10 February, 2020.

- *Detecting and Counteracting Benign Faults and Malicious Attacks in Cyber-physical Systems,* organised by Prof. P.R. Panda, on 11 February, 2020.

### Kusuma School of Biological Sciences

- *Your Health......Your Choice* by Prof. Rima Dada from AIIMS, New Delhi, organised by Prof. Rahul Garg NRCVEE and Prof. Vivekanandan Perumal, KSBS committee room, on 07 August, 2019.

- *Computational Approaches to Protein Dynamics and Binding Kinetics for Drug Discovery* by Prof. Rebecca C. Wade, organised by KSBS and Chemistry, KSBS committee room, on 02 December, 2019.
- *Mintu Chandra,* organised by KSBS, KSBS committee room, on 23 August, 2019.
- *Hema Chandra Kotamarth,* organised by KSBS, KSBS committee room, on 23 August, 2019.
- *Muthamilarasan M,* organised by KSBS, KSBS committee room, on 23 August, 2019.
- *Anand Teertha Vaidya,* organised by KSBS, KSBS committee room, on 23 August 2019.
- *Arjun Sengupta,* organised by KSBS, KSBS committee room, on 26 August, 2020.
- *Sanhita Sinharay,* organised by KSBS, KSBS committee room on 26 August, 2020.
- *Velmurugan G.,* organised by KSBS, KSBS committee room, on 26 August, 2020.
- *Rahul Kumar,* organised by KSBS, KSBS committee room, on 26 August, 2020.
- *Purba Mukherjee,* organised by KSBS, KSBS committee room, on 29 August, 2020.
- *Reena Singh,* organised by KSBS, KSBS committee room, on 29 August, 2020.
- *Prashant Khare,* organised by KSBS, KSBS committee room, on 29 August, 2020.
- *Saurabh Raj,* organised by KSBS, KSBS committee room, on 29 August, 2020.
- *Suman Jha,* organised by KSBS, KSBS committee room, on 30 August, 2020.
- *Jogender Singh,* organised by KSBS, KSBS committee room, on 30 August, 2020.
- *Mukesh Saini,* organised by KSBS, KSBS committee room, on 30 August, 2020.

## Workshops

### Chemical Engineering

- *Electroanalytical Techniques for Energy Conversion and Storage,* organised by Prof. Anil Verma, IIT Delhi, from 6 to 8 June, 2019.
- *Advanced Pedagogies: Active Learning and Digital Tools,* organised by Prof. Anil Verma, IIT Delhi, 24 June to 05 July 2019.
- *Antimicrobial Resistance Dx Bootcamp organised on 4th and 5th under joint SPARC proposal* organised by the Prof. Shalini Gupta with the help of Ravi Elongvan, IIT Delhi, on 02 January, 2020.

### Design

- *All India Design Innovation Centre (DIC) Exhibition,* organised by Prof. P.V.M. Rao, Department of Design as a part of MHRD DIC) Design Innovation Center Activities), Lecture Hall Complex, IIT Delhi, on 26 November, 2019.
- *Smart India Hackathon (Hradware Edition),* organised by Prof. Srinivasan Venkataraman, Department of Design, IIT Delhi, from 08 to 12 July, 2019.

- *MIT-IIT Exchange Programme on Assistive Technology,* organised by Prof. P.V.M. Rao, Departt of Design as a part of MHRD DIC) Design Innovation Center Activities), IIT Delhi, from 20 to 21 January, 2020.
- *IIT-AIIMS Summer Workshop on Biodesign,* organised by P.V.M. Rao and Prof. Jay Dhariwal, Department of Design as a part of MHRD DIC (Design Innovation Center Activities), IIT Delhi, from June - July 2019.
- *Design Thinking Workshop on Waste Management,* organised by Prof. P.V.M. Rao, Prof. Deepti Gupta, IIT Delhi, on 10 August, 2019.
- *One Day Workshop on B.Des. Programme and Curricula,* organised by Department of Design, LHC, IIT Delhi, on 01 November, 2019.
- *Design Workshop On Home Solutions,* organised by Prof. Sumer Singh, Department of Design, at M.Des. Studio, IIT Delhi, on 01 May, 2019.
- *Design Workshop on Packaging Design,* organised by Prof. Sumer Singh, Department of Design, at M.Des. Studio, IIT Delhi, on 02 January, 2020.

### Electrical Engineering

- *International Workshop on Science of Intelligence,* organised by Prof. Tapan Gandhi, Department of Electrical Engg., IIT Delhi, from 05 to 09 March, 2020.
- *Tools and Techniques to Understand Human Brain,* organised by Prof. Tapan Gandhi, Department of Electrical Engg., IIT Delhi, from 02 to 06 March, 2019.
- *International Workshop on Science of Intelligence,* organised by Prof. Tapan Gandhi, Department of Electrical Engineering & IIT Jodhpur, from 18 to 19 January, 2020.

### Humanities and Social Sciences

- *Workshop on Qualitative Research Methodology,* organised by Prof. Shuchi Sinha, Deptt. Management Studies, IIT Delhi, from 8 to 10 November, 2019.
- *Workshop on Verbal Multiwords in Indian languages,* organised by Prof. Ashwini Vaidya, at IIIT- Hyderabad, (Co-located with the ICON 2019 conference), on 21 December, 2019.
- *Workshop on Formal Semantics.* Faculty Instructor: Rahul Balusu, English and Foreign Languages University, Hyderabad, organised by Prof. Pritha Chandra, Department of Humanities & Social Sciences, IIT Delhi, on 01 September, 2019.
- *Workshop on Philosophy of Quantum Physics* by Prof. Michel Bitbol, organised by Prof. Divya Dwivedi, Department of Humanities & Social Sciences, IIT Delhi, on 10 January, 2020.
- *Mentoring Initiative of Network of Rural and Agrarian Studies (Nras),* organised by Prof. Richa Kumar, Department of Humanities and Social Sciences, IIT Delhi, on 28 September, 2019.
- *Two-day Workshop on Thematic Analysis,* organised by Prof. Yashpal Jogdand, HuSS, IIT Delhi, Department of Humanities and Social Sciences, from 06 to 07 April, 2019.

- *Two-day Workshop on Structural Equation Modelling,* organised by Prof. Yashpal Jogdand, HuSS, IIT Delhi, Department of Humanities and Social Sciences, from 13 to 14 April, 2019.
- *Two-day Pre-conference Workshop on Thematic Analysis,* organised by Prof. Yashpal Jogdand, HuSS, IIT Delhi, Pondicherry University, from 18-19 December, 2019.
- *Workshop on Toward a Societally Relevant Social Psychology,* organised by Prof. Yashpal Jogdand, HuSS, IIT Delhi, at Aligarh Muslim University, Aligarh, on 23 March 2019.

## Mangement Studies

- *Workshop on Qualitative Research Methodology,* organised by Prof. Suchi Sinha, from 08 to 10 Nov., 2019.
- *Workshop on Creating Public Awareness & Engagement Through Communication,* organised by Prof. Mahim Sagar, on 09 December, 2019.
- *Great Skills, Wrong Era: Are Universities Providing Employability Skills For Jobs That Won't Exist?,* organised by Dr. Shuchi Sinha (alongwith colleagues from outside of IIT Delhi), British Academy of Management Conference at Aston University, on 19 September, 2019.

## Materials Science and Engineering

- *Workshop on Polymer Technology,* organised by Prof. Bijay P. Tripathi, on 15 July, 2019.
- *Workshop on Engineering Materials for Automobile Applications,* organised by Prof. J. Jain, Prof. S. Neelakantan, Prof. N.N. Gosvami, on 29 April, 2019.

## Physics

- *IWTT-2019: International Workshop on THz Technologies,* organised by Prof. Amartya Sengupta, INDIA, IIT Delhi, from 25 to 27 September, 2019.

## Textile and Fibre Engineering

- *Introduction to Textiles,* organised by Prof. Deepti Gupta and Prof. Wazed Ali, from 15 to 19 July, 2019.

## Applied Research in Electronics

- *SIMULIA CST Studio Suite,* organised by the Centre, from 16 to 17 December, 2019.

## Biomedical Engineering

- *AIIMS-IITD Biodesign Summer Workshop,* organised by Prof. Neetu Singh, 2019.

## Energy Studies

- *Small-scale Biomass, Wind and Hydro Energy Systems under the theme of Sustainable Energy at Tech4Seva,* organised by Panel discussion led by Prof. Dibakar Rakshit, from 10 to 12 August, 2019.

## Rural Development and Technology

- *Workshop on Sustainable Rural Development (University of Toronto-IITB-IITD),* organised by Prof. Vivek Kumar, CRDT, IIT Delhi, from 07 to 08 December, 2019.
- *Orientation workshop for PIs,* organised by Unnat Bharat Abhiyan, IIT Delhi, on 24 September 2019.

- *Role of Higher Education Institution in Regional Development,* organised by Unnat Bharat Abhiyan, IIT Delhi, on 11 April, 2019.
- *Blockchain Technology for Enhancing Basmati Rice Export from India,* organised by Prof. Kavya Dashora, APEDA Board Room, Siri Fort Auditorium, IIT Delhi, on 23 April, 2019.
- *Addressing the Key Challenges in the Export Of Indian Honey and Developing Traceability Mechanism Through Blockchain Technology,* organised by Prof. Kavya Dashora, IITD Board Room, IIT Delhi, on 28 Sept., 2019.
- *Biogas Production, Purification and Power Generation,* organised by Prof. V.K. Vijay and Prof. Ram Chandra, IIT Delhi, from 04 to 05 March, 2020.
- *Joint Research Workshop on Sustainable Rural Development (IITD-Univ. of Toronto- IIT Bombay),* organised by Prof. Vivek Kumar, IIT Delhi, from 07 to 08 December, 2019.
- *Sea buckthorn: current status, problems and future prospects,* organised by Prof. J.K. Sahu, Lahaul- Spiti District, Himachal Pradesh, on 02 June, 2019.
- *Value Chain Management of Sea buckthorn,* organised by Prof. J.K. Sahu, Keylong, Himachal Pradesh, on 06 July, 2019.

## Bharti School of Telecommunication Technology and Management

- *Bringing Technologies Together with 5G,* organised by Prof. Brejesh Lall, at seminar Hall, IIT Delhi, on 17 October, 2019.
- *Indian Intellectual Property Ecosystem Conclave,* organised by Prof. Brejesh Lall, at seminar Hall, IIT Delhi, from 05 to 06 November, 2019.
- *Machine Learning in Future Networks and Role of Standardization,* organised by Prof. Brejesh Lall, at Room No. IIA-101, Bharti School Building, IIT Delhi, on 29 November, 2019.

## Kusuma School of Biological Sciences

- Workshop on Computational Biology, organised by Prof. B. Jayaram, SCFBio, from 28 May to 03 June, 2019.

## Lectures

### Applied Mechanics

- *Fire Safety Research, New Trends and Opportunities,* speaker Prof. Asif Usmani, Head, Department of Building, Services Engg. The Hong Kong Polytechnique University, Hong Kong, Kowloon, organised by Prof. Suhail Ahmad, Department of Applied Mechanics, IIT Delhi, on 02 November, 2019.
- *Fire Safety Research, New Trends and Opportunities,* speaker Rep of IHQ MoD (N), speaker Officer in Charge, NCW, IIT Delhi.

### Chemical Engineering

- *Application of Graphene in Electrochemical Devices for Environment and Energy,* speaker Prof. Anil Verma, organised by Department of Chemical Engineering, (NIT Raipur) from 13 to 14 February, 2020.

- *Modelling Dual-Scale Porous Media Flows During Optimization of Resin Transfer Molding Process Used for Making Polymer Composites,* speaker Prof. Krishna M. Pillai, University of Wisconsin-Milwaukee in USA, organised by Department of Chemical Engineering, at Deptt. Seminar Hall, IIT Delhi, on 12 April, 2019.

- *Molecular Modelling Guided Catalyst Design for Fischer-Tropsch Synthesis,* speaker Dr. Arghya Banerjee, CSIR-CIMFR, Dhanbad, organised by Department of Chemical Engineering, at Department Seminar Hall, IIT Delhi, on 01 April, 2019.

- *Lithium Ion Battery Life Estimation: Coupled Mechanical and Chemical Degradation,* speaker Dr. Rutooj Deshpande, Battery Research Engineer working with Electrified Powertrain Engineering Department at Ford Motor Company (Dearborn, Michigan) Powertrain Engineering Department at Ford Motor Company, organised by Department of Chemical Engineering, at Department Seminar Hall, IIT Delhi, on 30 May, 2019.

- *Colloidal Dynamics and Functional Colloids for Self-Assembly,* speaker Dr. Somnath Ghosh, Post Doctoral researcher at Lund University, Sweden, organised by Department Chemical Engineering, at Department Seminar Hall, IIT Delhi, on 4 June, 2019.

- *Molecular Mechanism of Listeria Monocytogenes Infection and Disease Prevention using a Next-Generation Bioengineered Probiotic Strain,* speaker Prof. Arun Bhunia, Purdue University, organised by Department Chemical Engineering, at Dept. Seminar Hall, IIT Delhi, on 26 June, 2019.

- *Plasma-molten Metal and/or Liquid Interactions for Materials Processing,* speaker Prof. Mahendra Sunkar, Director of the Conn Center for Renewable Engineering Research, Professor of Chemical Engineering and Distinguished University Scholar at University of Louisville, organised by Department Chemical Engineering, Department Seminar Hall, IIT Delhi, on 25 July, 2019.

- *Trophoblast differentiation of human embryonic stem cells,* speaker Dr. Prasenjit Sarkar, Research Fellow at Maine Medical Center Research Institute, Department organised by Chemical Engineering, Department Seminar Hall, IIT Delhi, on 31 July, 2019.

- *Holistic Approach in Algae Conversion to Bioproducts and Biofuels,* speaker Prof. Sandeep Kumar, Department of Civil & Environmental Engineering at Old Dominion University, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 09 August, 2019.

- *Zeolite Synthesis and Architecture: Molecular Control during the Transient Stage of Nucleation and Crystal Growth,* speaker Prof. Manjesh Kumar, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 13 September, 2019.

- *Understanding the Behaviour of Colloids Across Different Domains: From Pickering Emulsions to Food Physics Researcher,* speaker Dr. Omkar Deshmukh, postdoctoral researcher at University of Queensland, Brisbane, Australia, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 18 September, 2019.

- *MOFs at Interfaces: Opportunities in Membrane Separation and Devices,* speaker Prof. Vicki Chen, Executive Dean, Faculty of Engineering, Architecture & Information Technology, Univ. of Queensland, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 26 September, 2019.

- *Optimization Methods and Algorithms for Data-driven Process Systems,* speaker Dr. Ishan Bajaj, postdoctoral scientist, Department of Chemical and Biological Engineering at University of Wisconsin-Madison, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 16 October, 2019.

- *Opportunities in the Energy Sector at the Interface of Chemistry and Chemical Engineering,* speaker Dr. Anjan Ray, Director of CSIR-Indian Institute of Petroleum, organised by Department of Chemical Engineering, at Department Seminar Hall, IIT Delhi, on 08 November, 2019.

- *Transport Models for Non-Isobaric Electrolytes,* speaker Dr. Priyamvada Vada, Oxford University, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 18 November, 2019.

- *Electrochemical Kinetics of Degradation of Carbon Anodes in Lithium Ion Batteries,* speaker Supratim Das, Deptt. of Chemical Engineering (MIT), organised by Department of Chemical Engineering, at Department Seminar Hall, IIT Delhi, on 22 November, 2019.

- *Characterization and Modelling of Aerated Bioreactors,* speaker Dr. Frederic Augier, IFP Energies nouvelles (French Institute of Petroleum), organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 28 November, 2019.

- *Mixed Metal Oxide Catalyst Development for Selective Oxidation and Ammoxidation of Light Hydrocarbons,* speaker Prof. Douglas Buttery, Department of Chemical Engineering, University of Delaware, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 06 December, 2019.

- *The End of Nanomaterials,* speaker Prof. Satish Bhatia, School of Chemical Engineering, University of Queensland, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 09 December, 2019.

- *Engineering a Synthetic 3D Lung,* speaker Aritra Nath Kundu, Ph.D. student from University of Massachusetts Amherst, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 22 January, 2020.

- *Surface Free Energy- concept and Measurement Methods,* speaker Dr. Youssef Akil, KRUSS GmbH, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 02 March, 2020.

- *Material Robotics and Low Cost Development,* speaker Dr. S.K. Smoukov, Active & Intelligent Materials Lab,

Queen Mary University of London, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on 02 March, 2020.

- *Hikita-Asai Approximation Based Analytical Solution to film Model for Gas-liquid Mass Transfer Accompanied by (M, N) Order Reaction in the Liquid Film and Bulk in the Presence of a Finite Gas Film Resistance and Comparison with Rigorous Numerical Solution,* speaker Prof. D.P. Rao, Department of Chemical Engineering, IIT Delhi, organised by Department of Chemical Engineering, Department Seminar Hall, IIT Delhi, on  05 March, 2020.

### Design

- *Why Nature is So Creative & Sustainable, Some Insights or Man-made World of Design,* speaker Prof. L.K. Das, Honorary Distinguished Faculty, DTU, organised by Sumer Singh, at LHC, IIT Delhi, on 23 September, 2019.

- *Role of Colors in Communication,* speaker Tanu Sinha, Design Dirctor, India, Pepsico, organised by Sumer Singh, at LHC, IIT Delhi, on 21 October, 2019.

- *Luminaire Design and Lighting Applications,* speaker Saradindu Ghosh (G. Manager at Philips Lighting India Limited), organised by Sumer Singh, at LHC, IIT Delhi, on 11 November, 2019.

- *S.T.E.M. Learning Based Educational D.I.Y. Toys,* speaker Rajat Jain Design Head & Co-Founder, Smartivity, organised by Sumer Singh, at LHC, IIT Delhi, on 07 November, 2019.

### Electrical Engineering

- *Design Challenges in High Power DC-DC Converter,* speaker Soumya Shubhra Nag, organised by IEEE PES/ IAS Society, IIT Kanpur, on 20 November 2019.

### Humanities and Social Sciences

- *Second Dr. P.C. Bansil Memorial Lecture, Improving School Education in India: Evidence and Policy Implications,* speaker Prof. Karthik Muralidharan (University of California, San Diego), organised by Economics faculty of the Department at Lecture Hall Complex, IIT Delhi, on 10 February 2020.

- *Physical Laws and Human Behavior,* speaker Prof. Shyam Sunder. Professor at Yale School of Management, organised by Dr. Sumitava Mukherjee, at LHC, IIT Delhi, on 30 January, 2020.

- *Impact of Demographic Dynamics on Migration,* speaker Prof. Francois Heran, organised by Prof. Divya Dwivedi, on 15 October, 2019.

### Materials Science and Engineering

- *Synthesis of Functional Smart Hybrid Materials,* speaker Prof Dirk Kuckling, University of Paderborn, Germany, organised by Prof. Leena Nebhani, at LHC-408, IIT Delhi, on 20 February, 2020.

- *Accelerated Materials Development for Strategic Applications: A Journey from Concept to Deployment,* speaker Dr. Vikas Kumar, Director, DMRL, organised by Prof. Nitya Nand Gosvami and Prof. Rajesh Sharma, IIT Delhi, on 14 October, 2019.

- *Thermoelectric Materials,* speaker Dr. Padmavati, Scientist, SSPL-DRDO, India, organised by Prof. Nitya Nand Gosvami and Prof. Rajesh Sharma, IIT Delhi, on 24 October, 2019.

### Mathematics

- *Differential Calculus via Commutative Algebra,* speaker Professor Nitin Nitsure, TIFR Mumbai, organised by Prof. Shiv Prakash Patel, IIT Delhi, on 08 April, 2019.

- *A glimpse into the Foundations of Mathematics,* speaker Professor Nitin Nitsure, TIFR Mumbai, organised by Prof. Shiv Prakash Patel, at LHC, IIT Delhi, on 10 April, 2019.

- *The Implicit Function Theorem in Algebraic Geometry,* speaker Professor Nitin Nitsure, TIFR Mumbai, organised by Prof. Shiv Prakash Patel, on 12 April, 2019.

- *A Family of Godunov-type Solvers for the Pressureless Gas Dynamics and Related Models,* speaker Professor Veerappa Gowda, TIFR-CAM Bangalore, organised by Prof. Shiv Prakash Patel, on 15 April, 2019.

- *Reductions of Galois Representations and the Theta Operator,* speaker Prof. Eknath Ghate, TIFR Mumbai, organised by Prof. Shiv Prakash Patel, on 14 August, 2019.

- *Help or Hindrance? How do Mobile Technologies Influence Teaching and Learning, with Mathematics in Particular,* speaker Prof. Nigel Calder, University of Waikato, New Zealand, organised by Prof. Shiv Prakash Patel, at LHC, IIT Delhi, on 22 August, 2019.

- *Glimpses of Solitons and KdV Equation,* speaker Prof. Phoolan Prasad, IISc. Bangalore, organised by Prof. Shiv Prakash Patel, on 29 August, 2019.

- *Topological Derivatives and Its Applications,* speaker Prof. Ravi Prakash, Universidad de Concepción, Chile, organised by Kamana Porwal, on 11 September, 2019.

- *The Method of Discharging,* speaker Prof. N. Narayanan, IIT Madras, organised by B.S. Panda, on 16 October, 2019.

- *Divergence-free Discontinuous Galerkin method for ideal Compressible MHD,* speaker Praveen Chandrashekar, TIFR-CAM Bangalore, organised by Prof. Shiv Prakash Patel, Department of Maths, IIT Delhi, on 24 October, 2019.

- *Factorization Theorems for Classical Group Characters,* speaker Prof. Arvind Ayyer, IISc. Bangalore, organised by Prof. Shiv Prakash Patel, on 04 November, 2019.

- *Contragredient representations of p-adic groups,* speaker Dr. Amiya Kumar Mondal, Bar Ilan University, Israel, organised by Prof. Shiv Prakash Patel, on 14 November, 2019.

- *Topological Data Analysis,* speaker Dr. Lokendra Thakur, Broad Institute of MIT and Harvard, organised by Prof. Shiv Prakash Patel, on 16 December, 2019.

- *Regular Bernstein Blocks,* speaker Prof. Manish Mishra, IISER Pune, organised by Prof. Shiv Prakash Patel, on 08 January, 2020.

- *Some Consequences of Completeness in Analysis,* speaker Prof. S.H. Kulkarni, IIT Palakkad, organised by Prof. Shiv Prakash Patel, on 31 January, 2020.

- *A Delta Modules Hochschild Homology and higher derivations,* speaker Prof. Abhishek Banerjee, IISc Bangalore, organised by Prof. Surjeet Kour, on 17 February, 2020.
- *Proving Unsatisfiability of Constraint Satisfaction Problems,* speaker Prof. Daya Ram Gaur, University of Lethbridge, Canada, Prof. B.S. Panda, on 18 February, 2020.
- *Reconstruction from the Deck of k-vertex Induced Subgraphs,* speaker Prof. Douglas B. West, Zhejiang Normal University and University of Illinois, organised by Prof. Minati De, at LHC, IIT Delhi, on 19 February, 2020.
- *Cut-edges and Regular Subgraphs in Odd-degree Regular Graphs,* speaker Prof. Douglas B. West, Zhejiang Normal University and University of Illinois, organised by Prof. Minati De, at LHC, IIT Delhi, on 20 February, 2020.

## Mechanical Engineering
- *Adsorption: An Innovative Path of Sustainable Cooling,* Speaker Prof. Bidyut Baran Saha, Professor, Mechanical Engineering Department, Kyushu University, Japan, organised by Prof. Sanjeev Jain, at seminar room (II 422), IIT Delhi, on 21 August, 2019.

## Physics
- *Optical Tweezers - The Pied Piper in the Mesoscopic World,* speaker Ayan Banerjee (IISER, Kolkata), organised by Prof. Sunil Kumar, Prof. Rohit Narula, at LH108, IIT Delhi, on 19 February, 2020.
- *Physics Understanding from Neutron Scattering Study on the Fe-based Superconductors,* speaker Prof. Wei BAO from City University of Hong Kong, organised Prof. Rajendra S. Dhaka, Physics Committee Room, IIT Delhi, on 10 April, 2019.
- *Understanding of Complex Phenomena in Magnetic Materials by first Principles Theory,* speaker Dr. Biplab Sanyal, Associate Prof. at Uppsala University, organised by Prof. Sujeet Chaudhary, Physics Committee Room, IIT Delhi, on 06 January, 2020.
- *When Glancing Angle Deposition Meets with Nano-sphere Lithography Scalable design of plasmonic metamaterials,* speaker Prof. Yiping Zhao, organised by Prof. J.P. Singh, LHC 310, IIT Delhi, on 04 February, 2020.
- *Surface Enhanced Raman Scattering Based Optical Sensors for Medical Diagnostics, Food Safety, and Environmental Detection,* speaker Prof. Yiping Zhao, organised by Prof. J.P. Singh, Physics Committee Room, IIT Delhi, on 12 February, 2020.

## Textile and Fibre Engineering
- *Development of Printing-based Secured Traceability Tag for Textiles,* speaker Tarun Kumar Agrawal (The Swedish School of Textiles, University of Borås, organised by Prof. Amit Rawal, on 17 Sepetember, 2019.
- *Multifunctional Fiber based Sensors for Electronic Textile Applications,* speaker Dr. Ashish Kapoor, organised by Prof. Amit Rawal, on 26 March, 2019.
- *Printing on Textiles: A Wetting View,* speaker Prof. David Seveno (Associate Professor, Department of Metallurgy and Materials Engineering (MTM), KU, Leuven), organised by Prof. Amit Rawal, on 12 June, 2019.
- *Through micro CT and what we found there?,* speaker Prof. Stepan Lomov (Professor, Department of Metallurgy and Materials Engineering (MTM), KU, Leuven), organised by Prof. Amit Rawal, on 12 July, 2019.
- *How can Artificial Intelligence and Machine Learning be useful for Textile Engineers?,* speaker Vishwas Lele (Chief Technology Officer, AIS & Microsoft Regional Director, Washington DC,USA), organised by Prof. Mangala Joshi, Committee Room, on 15 October, 2019.

## Applied Research in Electronics
- *GHz to THz Radios,* organised by CARE, IIT Delhi, on 24 October, 2019.
- *Scaling further down - Moving from On-chip Integration to Heterogeneous System on IC architectures and its challenges in ESD protection,* speaker Dr. Harald Gossner, Intel Inc., GERMANY, organised by Prof. Ankur Gupta, on 02 March, 2020.

## Atmospheric Sciences
- *Projected Changes in the Indian Monsoon in a 1.5°C Warmer World and Beyond,* speaker Dr. Amulya Chevuturi, University of Reading, UK, organised by the Centre, on 18 April, 2019.
- *Atmospheric Organic Aerosols: Their Chemistry and Implication for Identifying Aerosol Sources,* speaker Dr. Sudhanshu Kumar, PDF-CAS, organised by the Centre, on 23 April, 2019.
- *The Impact of Climate Change on Crop Productivity in India,* speaker Dr. Deepak Ray, Institute of the Environment, University of Minnesota, Saint Paul, USA, organised by the Centre, on 04 September, 2019.
- *A Review of Aerosol-cloud Interactions: Measurement Challenges,* speaker Dr. Duncan Axisa, Droplet Measurement Technologies, USA, organised by CAS IIT Delhi, on 27 September, 2019.
- *Surface and internal Wave Dynamics in the coastal Ocean,* speaker Prof. Nirmish Kumar, Department of Civil Environmental Engineering University of Washington, organised by the Centre, on 11 October, 2019.
- *Rain Drops, their Collisions and Growth,* speaker Prof. Rama Govindrajan, TIFR, Bengaluru, organised by the Centre, on 23 October, 2019.
- *How Predictable is Mean Indian Summer Monsoon Rainfall,* speaker Prof. B.N. Goswami, SERB Distinguished Fellow, Cotton University Guwahati, organised by the Centre, on 04 November, 2019.
- *Air Pollution and Global Health: Universal Challenges and Opportunities,* speaker Prof. Luke Knibbs, University of Queensland, organised by the Centre, on 09 November, 2019.
- *Modelling the Transport and Deposition of 10 Be from the Strongest Holocene Solar Particle Event,* speaker Prof. Shigeo Yoden, Kyoto University, Japan, organised by the Centre, on 21 November, 2019.

- *Prediction Weather-driven Impacts in the Current and Future Climate,* speaker Dr. Lloyd Treinish, IBM Distinguished Engg., USA, organised by the Centre, on 30 January, 2020.

- *Monsoon Variability Over the Last 22,000 Years: Role of Forcing and Feedbacks,* speaker Mr. J. Chetan Kumar, IISc. Bangalore, organised by the Centre, on 03 March, 2020.

## Biomedical Engineering

- *Electroceuticals,* speaker Prof. Pedro Irazoqui, Reilly Professor of Biomedical Engineering and Professor of Electrical and Computer Engineering, Purdue University, USA, organised by the Centre on 26 February, 2020.

- *Complex in-vitro Liver Models: Does Organoid Technology Hold Key for Disease Modelling in Preclinical Settings?,* speaker Dr. Manoj Kumar, Stem cell Institute, Department of development and regeneration, KU Leuven, Belgium, organised by the Centre on 06 January, 2020.

- *Picturing the future of Healthcare Through Molecular Imaging,* speaker Dr. Sanhita Sinharay, Faculty Research Instructor at MD Anderson Cancer Center, Houston, Texas in the department of Cancer Systems Imaging, organised by the Centre on 19 September, 2019.

## Energy Studies

- *Energy Saving Potential in Data Centre,* speaker Prof. Sanjeev Jain, Department of Mechanical Engineering, IIT Delhi, organised by Prof. Dibakar Rakshit, CES Committee Room (Block V-343), IIT Delhi, on 07 November 2019.

- *India's Journey to a Distributed Energy Future: Building an Enabling Ecosystem,* speaker Neeraj Kuldeep and Selna Saji, organised by Prof. Sandeep Kumar Pathak, CES Committee Room (Block V-343), IIT Delhi, on 06 November, 2019.

- *Data Analytics and AI for Energy Management Systems using MATLAB,* speaker Mr. Souvick Chatterjee Educational Technical Evangelist at Math Works, organised by Prof. Sandeep Kumar Pathak, CES Committee Room (Block V343), IIT Delhi, on 30 October, 2019.

- *Design Trends in HVAC towards Sustainable, Healthy and Smart Build Environments,* speaker Mr. Kapil Mehrotra, Senior General Manager, Blue Star Limited, India, organised by Prof. Sandeep Kumar Pathak, CES Committee Room (Block V-343), IIT Delhi, on 14 February, 2019.

## Rural Developmet and Technology

- *Foundations of CAMUS-SBT Technology of IIT Bombay,* speaker Prof. H.S. Shankar, Anna University (Retired from IIT Bombay), organised by Centre's Seminar Series, Centre for Rural Development and Technology, IIT Delhi, on 22 November 2019.

- *Solar Thermal Concentrators for Low Temperature Applications,* speaker Prof. Harjit Singh, Brunel University, UK, organised by Centre's Seminar Series, Centre for Rural Development and Technology, IIT Delhi, on 02 January 2020.

- *Research Activities in Purdue University and Scope of Collaborations,* speaker Prof. Dharmendra Saraswat, Purdue University, USA, organised by Centre's Seminar Series, CRDT, IT Delhi, on 10 January 2020.

- *3D Printing in Food Processing Industries,* speaker Prof. Bhesh Bhandari, organised by Invited Lecture, Centre for Rural Development and Technology, IIT Delhi, on 04 September 2019.

## Amar Nath and Shashi Khosla School of Information Technolgy

- *Novel and Efficient Techniques for Guaranteeing Routing and Protocol Level Deadlock Freedom in Interconnection Networks,* speaker Mayank Parasar is a fifth-year Ph.D. candidate in the School of Electrical and Computer Engineering at Georgia Institute of Technology, organised by Prof. P.R. Panda, on 02 January 2020.

- *Computing on Largest Open Science Super Computers in the World,* speaker Anshu Dubey Computer Scientist in the Mathematics and Computer Science Division at Argonne National Laboratory and a Senior Scientist at the University of Chicago, organised by Prof. Anoop Chawla, on 08 January 2020.

- *The Ubiquity of Synchrony in Nature,* speaker Prof. Ramakrishna Ramaswamy, Visiting Professor, Department of Chemistry, IIT Delhi, organised by School of IT, on 30 January 2020.

- *Green Computing through Adaptive Multi-core Architectures,* speaker Prof. Israel Koren Department of Electrical and Computer Engineering, University of Massachusetts at Amherst, organised by Prof. P.R. Panda, on 10 February, 2020.

- *Detecting and Counteracting Benign Faults and Malicious Attacks in Cyber Physical Systems,* speaker Prof. Israel Koren, Department of Electrical and Computer Engineering, University of Massachusetts at Amherst, organised by Prof. P.R. Panda, on 11 February, 2020.

## Bharti School of Telecommunication Technology and Management

- *The Economic Promise of 5G Wireless Technology,* speaker Dr. Harold Furchtgott-Roth, Director, Center for the Economics of the Internet, Hudson Institute, organised by Prof. Saif Khan Mohammad, Department of Electrical Engineering, IIT Delhi, Room No. IIA-101, Seminar Hall, Bharti School Building, IIT Delhi, on 06 August, 2019.

- *Key Drivers and Research Challenges for 6G,* speaker Prof. Matti Latva- aho, Director for 6G Flagship, University of Oulu, Finland, organised by Prof. Arpan Chattopadhyay, on 12 December, 2019.

- *Communication Technologies and Requirements for Industry 4.0,* speaker Prof. Arumugam Nallanathan, Queen Mary University London, UK, organised by Prof. Swades De, Department of Electrical Engineering, IIT Delhi and Prof. Monika Aggarwal, Room No. IIA-101, Seminar Hall, Bharti School Building, IIT Delhi, on 03 February, 2020.

- *Smart Sampling: Super-Resolution and Learning Strategies,* speaker Dr. Satish Mulleti, Postdoctoral Fellow at the Weizmann Institute of Science, Israel, organised by Prof. Seshan Srirangarajan, on 05 February, 2020.
- *Microgrid Control,* speaker Prof. Sukumar Mishra, Department of EE, IIT Delhi, organised by Prof. Swades De, Department of Electrical Engineering, IIT Delhi and Prof. Monika Aggarwal, Room No. IIA-101, Seminar Hall, Bharti School Building, IIT Delhi, on 10 February, 2020.

### Kusuma School of Biological Sciences

- A Question and Answer session with Nobel Laureate, Speaker Prof. Venkatraman Ramakrishnan, organised by KSBS, KSBS Committee room, on 24 January, 2020.

# DISTINGUISHED VISITORS TO THE ACADEMIC UNITS

## Applied Mechanics

- Prof. Asif S. Usmani, Prof. and Head Department of Building Services Engineering, The Hong Kong Polytechnic University, Kowloon, on 11 November, 2019.
- Rear Admiral Nirmal K. Menon, Director General Naval Design, Submarine Design Group, Valedictory Function, on 03 December 2019.
- Dr. Karsten Weiss, Deputy Head of Institute of Biochemistry HPME 6 Otto-Stern-Weg3 Switzerland, Delivered Seminar, on 13 November, 2019.
- Dr. Dhruv Chandel, Technical Evangelist Education, Math Works India Pvt. Ltd., Delivered Seminar, on 29 November, 2019.
- Dr. Sebastian P. faller, FAU Erlangen, Germany, Collaborative project, on 01 February, 2020.

## Chemical Engineering

- Dr. Raghavendra, Faculty, Delhi University, INSA Visiting Scientist.
- Prof. Krishna M. Pillai, University of Wisconsin-Milwaukee in USA, Seminar.
- Prof. Arun Bhunia, Purdue University, Seminar.
- Prof. Mahendra Sunkara, Director of the Conn Center for Renewable Engineering Research, Professor of Chemical Engineering and Distinguished University Scholar at University of Louisville, Seminar.
- Prof. Sandeep Kumar, Department of Civil & Environmental Engineering at Old Dominion University, Seminar.
- Prof. Vicki Chen, Executive Dean, Faculty of Engineering, Architecture & Information Technology, University of Queensland, Seminar.
- Dr. Anjan Ray, Director of CSIR-Indian Institute of Petroleum, Seminar.
- Dr. Frederic Augier, IFP Energies nouvelles (French Institute of Petroleum), Seminar.
- Prof. Douglas Buttery, Department of Chemical Engineering, University of Delaware, Seminar.
- Prof. Satish Bhatia, School of Chemical Engineering, University of Queensland, Seminar.
- Dr. S.K. Smoukov, Active & Intelligent Materials Lab, Queen Mary University of London, Seminar.

## Design

- Gianmauro Vella, Senior Design Director, PepsiCo Global, Lecture cum Interaction, Visited the Department, on 23 April, 2019.
- Kim Wilkins, Associate Professor, University of Queensland, Interaction, Visited the Department on 28 January, 2020.
- Rahul Kamble, Associate Director, Disruptive Innovations, PepsiCo, India, Interaction, on 28 November, 2019.
- Ashish Jayaswal, AGM, Maruti Suzuki Studio, Interaction, on 28 November, 2019.
- Sunetra Majumdar, Associate Design Director, IBM iX, Interaction, on 28 November, 2019.

## Electrical Engineering

- Prof. Prasad Gudem, Adjunct faculty, Electrical and Computer Engineering University of California San Diego La Jolla, California, IEEE SSCS Distinguished Lecture, on 16 October, 2019.
- Prof. Maurits Ortmanns, Director, Institute of Microelectronics, University of ULM, Germany, IEEE SSCS Distinguished Lecture, on 15 November, 2019.
- Prof. H.S. Bindra, Assistant Professor, University of Twente, Netherlands, IEEE SSCS Distinguished Lecture, on 09 January, 2020.
- Dr. Keith Bowman, Principal Engineer and Manager in the Processor Research Team at Qualcomm Technologies, Inc. in Raleigh, NC, USA, IEEE SSCS Distinguished Lecture, on 02 March, 2020.
- Prof. Juyang Weng, Professor, Department of Computer Science and Engg., Michigan State University, USA, talk, on 04 March, 2020.
- Prof. Govind Agrawal, Professor, University of Rochester, talk, on 06 January, 2020.

## Humanities and Social Sciences

- Prof. Karthik Muralidharan, Professor of Economics, UCSD, to deliver the Second Dr. P.C. Bansil Memorial Lecture, on 10 February, 2020.
- Prof. Michel Bitbol, Professor of Philosophy, Ecole Normale Superieur, Workshop, on 10 January, 2020.
- Prof. Michel Chaouli, Professor of Germanistic and Comparative Literature, Indiana University, Seminar, on 20 February, 2020.
- Prof. Francois Heran, Professor of Migrations Demography, College de France, Seminar, on 15 October, 2019.
- Prof. Shyam Sunder, Professor at Yale School of Management and renowned experimental economist, Lecture, on 30 January, 2020.
- Prof. Nozomu Muto, Professor YNU, Japan, Visit, on 01 December, 2020.

## Management Studies

- Prof. Devender B. Thapa, Professor, University of Agder, Norway, MSV 803 (Selected Topics in Information Technology Management, Focus on IS theory), from 16 to 29 June, 2019.
- Mr. Piyush Lahoti, Product Manager, Media. Net, MSL 862 (Product Management), Sem II, 2018-19.
- Mr. Himanshu Manglik, Head of Marketing and Communication, BLS International, Delhi, MSL 863 (Advertising and Sales promotion), Sem II, 2018-19.
- Dr. Prabhat Kumar, MSL 859 (Current & Emerging issues in IT Management), Sem II 2018-19.
- Prof. Indu Amar and Prof. Tarun Jain, CA by Profession, Deolitte, MSV 805 (Selected Topics in Economics, Focus on GST Policy), from 09 to 18 April, 2019.

- Ms. Sapna Popli, Professor, Marketing-IMT Gaziabad, MSL 865 (Sales Management), Sem II, 2018-19.
- Dr. Nakul Gupta, Assistant Professor, Information Management, MDI Gurugram, MSL886-IT consulting and practices, Sem II, 2018-19.
- Dr. Parul Gupta, Assistant Professor, Information Management, MDI Gurugram, MSL 706 (Business Law), Sem II, 2018-19.
- Prof. K.J. Chaudhary, Professor NIFM, MSL 720 (Microeconomics environment of Business), Sem II, 2018-19.
- Prof. Praveen Kumar Sinha, Ex-head - HR Centre of Excellence, Escorts Ltd., MSL733 Organization Theory, Sem II, 2018-19.
- Prof. Mridula Dwivedi, MSL 894 (Social Media and Business Purchase), on 02 April, 2019.
- Mr. Sachin Kumar, Assistant Professor, Knowledge management & Business, University of Plymouth, U.K, MSL 745 (Operation Management Focusing an Contemporary Issues in Implementing six Sigma), Sem II, 2018-19.
- Sh. Maneesh Srivastva, Vice President, Corporate Professionals, Merchant Banker, MSL 708 (business evaluate), Sem II, 2018-19.
- Dr. Ishita Tripathy, Ph.D. IIT Delhi, MSL 873 (SAPM), Sem II, 2018-19.
- Mr. Abhishek Agrawal, Ex-Partner, Mckinzey and Co., MSL 711 (Strategic Management for MBA), Sem II, 2018-19.
- Prof. S.K. Jain, Ph.D. (Economics-Management), IIT Kanpur, MSL 802 Management of IPR, Sem II, 2018-19.
- Prof. Thomas Joseph, Associate Professor, IIM Udaipur, MSL 825 (Strategies in Functional Management), Sem II, 2018-19.
- Prof. Suprateek Kundu, Assistant Professor, Department of Biostatistics, Emory University, Atlanta, USA, KSS (Knowledge Sharing Session), on 25 June, 2019.
- Prof. Momaya, Professor Strategic/Technology Management and Competitiveness, Shailesh J. Mehta School of Management (SJMSOM), Indian Institute of Technology Bombay (IITB), KSS, on 19 June, 2019.
- Prof. Varun Grover, The David D. Glass Endowed Chair and Distinguished Professor of IS at the Walton School of Business, University of Arkansas, USA., KSS, on 12 June, 2019.
- Mr. Ravi Soni, Co-Founded Observe, MSl 760 (Marketing Management), on 23 August, 2019.
- Mr. Sanjay Kumar, Principal Commissioner of Income tax (Retired), MSL 851(Strategic Alliance), Sem-I, 2019-20.
- Mr. Avik Chanda, Advisor, author and Speaker, MSL 703 (Management of technology transfer and Adoption), Sem-I, 2019-20.
- Mr. Sarad Krishan Sharma, Regional Director, SEBI, MSL 874 (Indian Financial System), on 02 September, 2019.
- Mr. Pradeep Kumar Juneja, Tecno Management Consultant, MSL 855 (E Commerce), Sem-I, 2019-20.

- Ms. Lopamudra Banerjee, Head, HR Carrier Midea India Pvt. Ltd., MSL724 (Business Communication), Sem I, 2019-20.
- Dr. Nikhil Kumar Varma, Assistant Professor, Anisfield School of Business Ramapo College of New Jersey, MSL 845 (Total Project Management), Sem I, 2019-20.
- Prof. Kaushal Goel, MSL 805 (Services Operation Management), Sem I, 2019-20.
- Prof. Peter Trkman, Professor, University of Ljubljana, Solvenia, MSL 807 (Selected Topics in Strategic Management), Sem I, 2019-20.
- Mr. Anurav Banerjee, MSL 839 (Current Emerging Issues in Organisational Management), Sem I, 2019-20.
- Dr. Ishita Tripathy, Director, GOI, MSL 875 (International Finance Management), Sem I, 2019-20.
- Mr. Sameer Mathur, Senior Principal Accenture Strategy, MSL 703, Sem I, 2019-20.
- Dr. Palayil Anuradha Balram, Chief Coordinator, The Awakened Citizen Programme, Ramakrishna Mission Delhi, MSL 822 (International Business), Sem I, 2019-20.
- Prof. Sabri Baubaker, Professor of Finance, South Champagne Business School, Paris, MSV 819 (Contemporary issues in Finance), from 29 July to 08 August, 2019.
- Mr. Tarun Gupta, CTO, Chief Architecture, Technology Partner and Advisor, MSV 820 (Contemporary Issues in IT Management, Focus on Enterprise Architecture), from 18 to 25 October, 2019.
- Prof. Adrian, Associate Professor, University of Queensland, Australia, MSV 816 (Contemporary issues in Management, Focus on Platform economies in India), from 08 to 15 October, 2019.
- Prof. Thomas Joseph, Associate Professor, IIM Udaipur, MSL 829 (Current & Emerging issues in Strategic Management), Sem I, 2019-20.
- Prof. S.K. Jain, Ph.D. (Economics-Management), IIT Kanpur, MSL 802 Management of IPR, Sem I, 2019-20.
- Dr. S.N. Gosh, Guest Lectures, NALSAR, MSL 706 (Business Law), Sem I, 2019-20.
- Mr. Siddhartha Misra, DGM, RBI, MSL871 Banking & Financial Services, on 14 October, 2019.
- Ms Anita Patnaik, GM, RBI, MSL871 Banking & Financial Services, on 21 October, 2019.
- Prof. Justin Paul, Professor, Graduate School of Business, University of Puerto Rico, Rio Piedras, USA, KSS, on 02 July, 2019.
- Prof. Ajay, Founder and CEO of AJDEV Inc., KSS, on 04 July, 2019.
- Prof. Julia, Professor, University of Puerto Rio, USA, KSS, on 12 July, 2019.
- Prof. Madhubala, Assistant Professor, Texas Southern University, USA, KSS, on 26 July, 2019.
- Ms. Smriti, Lawyer and Policy Researcher, National Institute of Public Finance and Policy, New Delhi, KSS, on 01 August, 2019.

- Prof. Nikhil, Assistant Professor of Management, Ramapo College, New Jersey, KSS, on 05 August, 2019.
- Prof. Pradeep Yadav (Oklahoma) & Prof. Yesha, W. Ross Johnston Chair and Professor of Finance, Price College of Business, University of Oklahoma, KSS, on 08 August, 2019.
- Dr. Krishna Mohan, Department of Management Studies Indian Institute of Technology, Madras, KSS, on 21 August, 2019.
- Prof. Kuttimani, Lecturer in Marketing, School of Management, Bradford University, UK, KSS, on 06 September, 2019.
- Prof. Rajendra P. Srivastava, Professor Emeritus of Accounting & Information Systems in the School of Business, University of Kansas, Lawrence, USA, KSS, on 21 September, 2019.
- Prof. Amandeep Dhir, Adjunct Professor, National Taiwan University of Science and Technology NTUST, KSS, on 22 October, 2019.
- Prof. Renuka Sane, Associate Professor at the National Institute of Public Finance and Policy (NIPFP), KSS, on 31 October, 2019.
- Ms. Lestyani, Indonesian Embassy, Meeting, on 03 June, 2019.
- Dr. Nozerand Dr. Waykao, Department of Statistics the George Washington University Washington, D.C., Meeting, on 18 April, 2019.
- Dr. Rajul Dube, Political & Bilateral Affairs, British High Commission, Chevening, UK global Award Scheme, on 28 September, 2019.

## Materials Science and Engineering

- Srinivasan Srivilliputhur, Department of Materials Science and Engineering, Associate Professor, University of North Texas, Academic and Research Collaboration, from 22 to 28 December, 2019.
- Prof. Dirk Kuckling, Professor, University of Paderborn, Germany, To work on collaborative project under DST-DAAD (with Prof. Leena Nebhani), Visited the Department, IIT Delhi, on February, 2020.
- Carsten Schmiegel, Ph.D. Student, University of Paderborn, Germany (Prof. Dirk Kuckling), To work on collaborative project under DST-DAAD (with Prof. Leena Nebhani), Visited the Department, IIT Delhi, on February, 2020.

## Mathematics

- Prof. Paola Taredelli, Professor, University of L'Aquila, Italy, Research collaboration, from 17 to 28 February, 2020.
- Dr. Manish Mishra, Assistant Professor, IISER PuNE, Invited Lectures, from 31 December to 16 January, 2020.
- Prof. Douglas B West, Professor, University of Illinois, Urbana, USA, Research collaboration, from 15 to 20 February, 2020.
- Prof. J. Giacomoni, Professor, Universitede Pau, Pau, France, Research collaboration, from 15 to 28 November, 2019.

- Dr. Sweta Tiwari, Assistant Professor, IIT Guwahati, Research collaboration, from 18 to 31 December, 2019.
- Prof. Praveen Chandrashekar, Professor, TIFR CAM, Bangalore, Invited Lectures, from 20 to 26 October, 2019.
- Prof. Eknath Ghate, Professor, TIFR Bombay, Mumbai, Research collaboration, from 09 to 26 August, 2019.
- Dr. Seema Kushwaha, Assistant Professor, IIIT Allahabad, Research collaboration, from 15 to 20 July, 2019.
- Dr. Sweta Tiwari, Assistant professor, IIT Guwahati, Research collaboration, from 10 to 15 June, 2019.
- Dr. Rakesh Arora, Research Associte, Universite de Pau, France, Research collaboration, from 22 July to 21 August, 2019.
- Prof. Nitin Nitsure, Professor, TIFR Bombay, Mumbai, Invite Lectures, from 07 to 14 August, 2019.
- Prof. Daya Ram Gaur, University of Lethbridge, Canada, Invite Lectures, on 18 February, 2019.

## Mechanical Engineering

- Prof. Abhishek Jain, College of Engineering, Texas A&M University, Talk, Bioinspired Microfluidics: Engineering Biology for Medicine.
- Prof. Bidyut Baran Saha, Mechanical Engineering Department, Kyushu University, Talk, An innovative path of sustainable cooling.
- Prof. Bhaskar Dasgupta, Department of Mechanical Engg, IIT Kanpur, Talk, A beginner's introduction to optimization.
- Prof. Vivek Sharma, Chemical Engineering, University of Illinois at Chicago, Talk, Nanoscopic thickness transitions and variations in stratifying, micellar foam film.
- Prof. Marcus G. Pandy, Department of Mechanical Engineering, University of Melbourne, Australia, Talk, Muscle and joint function in human locomotion.
- Prof. T.R. Ramamohan, Emeritus Professor of Chemical Engineering at M.S. Ramaiah Institute of Technology at Bangalore, Talk, A Basic Introduction to Chaos and Fractals.
- Prof. N. Matsuhira, Department of Engineering and Science and Mechanics (ESM), Shibaura Institute of Technology, Japan, Talk, Robotics research at SIT (Japan).
- Prof. Chirag Kalelkar, Assistant Professor, Department of Mechanical Engineering, Indian Institute of Technology, Kharagpur, Talk, Stress-bending in compressed quasi two-dimensional aqueous foams.
- Prof. Mingjian Zuo, University of Alberta, Talk, Machine learning methods for PHM and reliability assurance.
- Prof. Nikesh Yadav, Warsaw University of Technology, Poland, Talk, Hydrodynamic instability, chaos and mixing in a grooved channel.
- Prof. Sunita Chauhan, Professor at the Mechanical and Aerospace Department, Faculty of Engineering at Monash University, Australia, talk, Robotics and Intelligent Diagnostics for Image-Guided Surgical Interventions.

- Prof. Anshu Dubey, University of Chicago, Talk, Computing on Largest open science supercomputers in the world.
- Prof. Yukio Ishida, Nagoya University, Japan, Talk, Introduction of Our Research on Passive Vibration Methods for Rotors.
- Prof. (Ms.) Marion Merkein, Head of the Institute, Institute for Manufacturing Technology (LFT).
- Friedrich-Alexander-Universität (FAU) Erlangen Nürnberg, Germany, talk, shaping ideas into solutions - Presentation of research at the Institute of Manufacturing Technology.
- Prof. Hinnerk Hagenah, Institute for Manufacturing Technology (LFT), Friedrich - Alexander - Universität (FAU) Erlangen Nürnberg, Germany, talk, Research Methodology.

## Physics
- Prof. Yiping Zhao, University of Georgia Athens, USA, Collaboration, from 08 January to 30 March, 2020.
- Prof. Eric Freysz, University of Bordeaux, France Collaboration, from 11 October to 02 November, 2019.

## Textile and Fibre Engineering
- Prof. Mirela Blaga, President, Association of Universities for Textiles (AUTEX), on 06 February 2020.

## Applied Research in Electronics
- Prof Nambi Seshadri, Professor, University of California, San Diego, USA, Department of CARE, on 16 October, 2019.

## Biomedical Engineering
- Prof. Pedro Irazoqui, Reilly Professor of Biomedical Engineering and Professor of Electrical and Computer Engineering, Purdue University, USA, Talk, on 26 February, 2020.
- Dr. Manoj Kumar, Stem cell Institute, Department of development and regeneration, KU Leuven, Belgium, Talk, on 06 January, 2020.
- Dr. Sanhita Sinharay, Faculty Research Instructor at MD Anderson Cancer Center, Houston, Texas in the department of Cancer Systems Imaging, Talk, on 19 September, 2019.

## Energy Studies
- Prof. Udayraj, Assistant Professor, Department of Mechanical Engineering, IIT Bhilai, For a possible collaboration for projects, from 06 to 13 March, 2020.

- Prof. Rajnish Kaur Calay, Professor, Department of Building, Energy and Material Technology, The Arctic University of Norway, Norway, For a possible collaboration for projects, on 03 February, 2020.
- Prof. Ramesh Narayanswamy, Associate Professor, School of Civil and Mechanical Engineering, Curtin University, Australia, For a possible collaboration for projects, on 16 November, 2019.
- Prof. Bidyut Baran Saha, Professor, Mechanical Engineering Department, Kyushu University, For conducting a special module course on "Thermally activated adsorption cooling systems", as a part of SPARC research proposal, September, 2019.

## Rural Development and Technology
- Prof. Timothy L. Killeen, President of University of Illinois System, USA, Research collaborations, technological aspects and student/faculty exchange programme, on 31 January, 2020.
- Dr. Jakob Williams Orberg (Counsellor for Innovation, Research and Higher Education), Mr. Abhi Malik (Innovation Associate), Mr. Roberto Flore (Foodlab Manager), Technical University of Denmark and Royal Danish embassy, To expand our research collaboration and student exchange opportunities.
- Prof. A.K. Dalai, University of Saskatchewan Canada, Reseaarc Collaboration.
- Prof. Ramin Farnood, University of Toronto, Research Collaboration.
- Prof. Bhesh Bhandari, University of Queensland, AUS, Research Collaboration, on 04 September, 2019.

## Amar Nath and Shashi Khosla School of Information Technology
- Prof. Volker Sorge, School of Computer Science University of Birmingham Edgbaston Birmingham B15 2TT UK, Travel under SPARC project interaction, from 28 September to 28 October, 2019.
- Prof. Steven Mannheimer, IU School of Informatics and Computing at IUPUI 535 W. Michigan Street IT 475 Indianapolis, IN, U.S.A. 46202, Empower 2019 Conference, from 14 to 17 October, 2019.
- Prof. Israel Koren, Prof. Emeritus of Electrical and Computer Engineering at the University of Massachusetts, Amherst and a fellow of IEEE, Seminar and research interaction, from 08 to 11 February, 2020.

## Kusuma School of Biological Sciences
- Prof. Venkatraman Ramakrishnan, Nobel Laureate from the University of Cambridge, for a Q&A session, organised at KSBS, on 24 January, 2020.

# NEW COURSES DEVELOPED

Following are the new courses that were introduced into the IIT Delhi curriculum this year. A department-wise distribution is provided below:

## Applied Mechanics

- APL421 Applications of Computational Fluid Dynamics
- APL422 Advanced Computational Fluid Dynamics
- APL815 Hydrodynamic Stability
- APL707 Integral Equations
- APV808 Planar Contact Mechanics
- APL104 Solid Mechanics
- Nonlinear Theory of Cosserat Plates

## Chemical Engineering

- CLL729 Colloids and Aerosols
- CLL760 Crystal Growth and Engineering
- CLL789 Applied Time Series Analysis for Chemical Engineering

## Design

- CLL788 Process Data Analytics

## Humanities and Social Sciences

- HSL521 Introduction to Cognitive Science
- HSS521 Independent Study in Cognitive Science (Bridge course)
- HSL522 Basics of Programming for Cognitive Science
- HSL541 Language in the Mind
- HSL561 Cognitive Neuroscience
- HSL621 Mathematical Foundations for Cognitive Science
- HSL622 Computation and Cognition
- HSL651 Philosophy of Mind and Cognition
- HSL661 Cognitive Processes: From Labs to Fields
- HSL721 Research Methods in Cognitive Science
- HSL747 Language Computations and Mental Architecture
- HSP700 Workshop on Scientific Writing
- HSL726 Culture and Cognition
- HSL766 Advances in Social Cognition
- HSL767 Emotion and Decision making
- HSL768 Judgment and Decision Making
- HSL769 Number Cognition
- HSL780 Social and Cultural Construction of Emotions
- HSL722 Data Analysis for Behavioral Research using R
- HSL723 Advanced Computational Methods
- HSL724 Advanced Experimental Methods
- HSL725 Advanced Qualitative Methods
- HSL748 Natural Language Understanding
- HSL749 Optimality Theory and Harmonic Grammar
- HSL821 Eye Movement and Cognitive Processes
- HSL822 Advanced Data Analysis for Behavioral Research using R
- HSL844 Computational Models of Meaning
- HSL511 Microeconomics I

- HSL512 Macroeconomics I
- HSL513 Probability and Statistics for Economics
- HSL516 Mathematical Economics
- HSL514 Issues in Development
- HSL611 Microeconomics II
- HSL612 Macroeconomics II
- HSL613 Econometrics
- HSL614 Development Economics
- HSL515 Indian Economy
- HSP612 Research Seminar in Economics
- HSP511 Economics Lab
- HSP611 Advanced Economics Lab
- HSP520 Research Project in Economics I
- HSP620 Research Project in Economics II

## Management Studies

- MSV825 Frontiers in Management
- MSV826 Frontiers in OB & HR Management
- MSV827 Frontiers in Finance
- MSV828 Frontiers in IT Management
- MSV829 Frontiers in Operations Management
- MSV830 Frontiers in Economic Policy
- MSV831 Frontiers in Marketing Management
- MSV832 Frontiers in Strategic Management
- MSL735 Qualitative Methods in Management
- MSL781 Macroeconomic Dynamics
- MSL837 Entrepreneurial Finance
- MSL750 Behavioral Finance
- MSL751 Financial Technology
- MSL860 Derivatives
- MSL838 Fixed Income Security
- MSL890 Financial Engineering
- MSL310 Financial Institutions and Market
- MSL718 Management of Blockchain Technology
- MSL722 Managing Enterprise AI/ML Systems
- MSL782 Business Cycles and Global Economy
- MSL783 Global Economic Development
- MSL784 Sovereign Debt and Default

## Materials Science and Engineering

- MLL701 Structure and Characterization of Materials
- MLL702 Thermodynamics of Materials
- MLL703 Mathematical and Computational Methods in Materials
- MLL704 Materials Processing & Characterization Lab
- MLV705 Special Topics in Materials
- MLL711 Mechanical Behaviour of Materials
- MLL712 Materials Design and Selection

- MLL713 Phase Transformations
- MLL714 Fracture Mechanics
- MLL715 Advanced Engineering Materials
- MLL716 Engineering Failure Analysis & Prevention

## Mechanical Engineering
- MCV849 Thermally Powered Adsorption Cooling Systems
- MCV390 Refrigeration & Air-conditioning Product Design

## Mathematics
- MTL796 Stochastic Differential Equations and Applications
- MTL750 Harmonic Analysis and Applications
- MTL850 Abstract Harmonic Analysis

## Physics
- PYL774 Polarized Light and its Applications
- PYL758 Advanced Quantum Optics
- PYL435 Advanced Computational Physics

## Textile and Fibre Engineering
- TXL601 Introduction to Textiles

## Biomedical Engineering
- BML815 Computational Biomechanics

## Energy Studies
- MCV849 Special Module in System Design
- ESL724 Energy Audit
- ESL772 Energy Storage
- ESN703 Technical Writing

## Rural Development and Technology
- RDL770 Rural Value Chain for Holistic Development
- RDL761 Value Chain in Agro Food Processing

## Kusuma School of Biological Sciences
- SBV895 Development Biology
- SBV893 Cellular Differentiation and Therapy
- SBV894 Current Methods in Mammalian Genetics
- SBL724 Decoding Protein Modifications in Biology
- SBL723 Principles of Neural Excitability and Conduction
- SBV892 Current Topics in Ion Channels and Receptors
- SBL722 Stem Cells

# QIP/CEP/GIAN PROGRAMMES ORGANISED

## Applied Mechanics

- *Fracture Mechanics: Linear Elasticity & FEM,* organised by Prof. Gaurav Singh, Department of Applied Mechanics, IIT Delhi, from 30 September to 04 October, 2019.
- *Mid Career Refresher Course,* organised by Officer-in-Charge, Naval Construction Wing, from 08 to 19 July, 2019.

## Chemical Engineering

- *Electroanalytical Techniques for Energy Conversion and Storage,* organised by Prof. Anil Verma, IIT Delhi from 06 to 08 June, 2019.

## Design

- *Project Management for Entrepreneurs (1 DPE Unit Course Attended by 33 IIT Delhi students),* organised by DIC (MHRD's Design Innovation Center), from March-April, 2019.
- *Design Technology and Innovation (I DPE Unit Course Attended by more than 600 IIT Delhi students),* organised by DIC (MHRD's Design Innovation Center), from February to March, 2020.

## Electrical Engineering

- *Leadership and Entrepreneurial Skills,* organised by Prof. R. Chattopadhyay, Prof. Kushal Sen, Department of Textile and Fibre Engineering, IIT Delhi, from 30 April to 12 May, 2018.
- *Brain Mapping & Artificial Intelligence,* organised by Prof. Tapan K. Gandhi, Department of Electrical Engineering, IIT Delhi, from 05 to 09 March, 2020.
- *Next Generation Power Converters: Design, PWM Strategy and Control,* organised by Prof. Anandarup Das, Department of Electrical Engineering, IIT Delhi, from 01 to 05 July, 2019.
- *Electric Vehicles Technologies based on Power Electronics and Drives,* organised by Prof. Amit K. Jain, Prof. Soumya S. Nag, Department of Electrical Engineering, IIT Delhi, from 26 to 30 November, 2019.
- *Technologies Associated with Electric Traction Systems,* organised by Prof. Sumit Pramanick, Department of Electrical Engineering, IIT Delhi, from 14 to 15 February, 2020 and 20 to 22 February, 2020.
- *Tools and Techniques to Understand Human Brain,* organised by Prof. Tapan K. Gandhi, Department of Electrical Engineering, IIT Delhi, from 02 to 06 March, 2020.

## Management Studies

- *Strategic Innovations, Digital Marketing & Business Analytics,* organised by Prof. P. Vigneswara Ilavarasan, Prof. Sanjay Dhir, Prof. Arpan Kumar Kar, IIT Delhi, from 05 January to 09 June, 2019.
- *Startup Basecamp 101,* organised by Prof. Manmohan Prasad Gupta, IIT Delhi, from 01 June to 21 July, 2019.
- *Data and Decision Sciences Consulting,* organised by Prof. Arpan K. Kar, Prof. S.P. Singh, IIT Delhi, from 01 June to 21 July, 2019.
- *Business Management (focus: Digital Marketing),* organised by, Prof. Harish Choudhary, IIT Delhi, from 01 June to 09 August, 2019.

- *Developing Skills for Effective Communication,* organised by Prof. Suchi Sinha IIT Delhi, from 21 to 23 May, 2019.
- *Certificate Course Business Management (focus: Digital Marketing),* organised by Prof. Harish Choudhary, IIT Delhi, from 19 October to 22 December, 2019.
- *Strategic Innovations, Digital Marketing & Business Analytics,* organised by Prof. Arpan Kumar Kar, IIT Delhi, from 04 January to 07 June, 2020.
- *Case Teaching and Case Writing,* organised by Prof. Mahim Sagar, IIT Delhi, from 03 to 07 January, 2020.
- *Marketing of Goals Initiatives & Causes (MAGIC),* organised by Prof. Mahim Sagar, IIT Delhi, from 07 to 09 December, 2019.
- *Excellence in School Education,* organised by Prof. Harish Choudhary, IIT Delhi, from 14 to 15 March, 2020.

## Materials Science and Engineering

- *Crystallography for Materials Science,* organised by Prof. Rajesh Prasad, IIT Delhi, from 24 to 28 June, 2019.
- *Atomistic Simulation of Materials,* organised by Prof. Rajesh Prasad, IIT Delhi, from 23 to 27 December 2019.

## Mechanical Engineering

- *Multiscale Modelling and Simulation,* organised by Prof. Debabrata Dasgupta, Prof. Bahni Ray, Prof. Subhra Datta, Department of Mechanical Engineering, IIT Delhi, from 09 to 13 December, 2019.
- *Joining of Advanced Materials,* organised by Prof. Naresh Datla, Prof. S. Aravindan, from 09 to 13 December, 2019.

## Applied Research in Electronics

- *Training Course on Underwater Acoustic Signatures: Generation, Measurement & Analysis,* organised by CARE, IIT Delhi, from 18 to 22 November, 2019.
- *Training Course on Signal Processing using MATLAB,* organised by CARE, IIT Delhi, from 17 to 21 February, 2020.

## Energy Studies

- *Advances in Energy Storage Technology,* organised by Prof. Dibakar Rakshit, Centre for Energy Studies, IIT Delhi, from 09 to 13 March, 2020.

## Rural Development and Technology

- *QIP cum CEP Course on Entrepreneurship, Innovation and Design,* organised by Prof. V.M. Chariar, CRDT, IIT Delhi, from 06 to 10 December, 2019.
- *Advanced Pedagogies: Active Learning and Digital Tools,* organised by Prof. Kavya Dashora, IIT Delhi, from 17 to 21 June, 2019.
- *Advanced Pedagogies: Active Learning and Digital Tools,* organised by Prof. Kavya Dashora, IIT Delhi, from 24 to 28 June, 2019.
- *International Training Programme on Biogas Production, Power Generation and Upgradation for Vehicular Application,* organised by Prof. Ram Chandra, Prof. V.K. Vijay, IIT Delhi, from 14 to 25 October, 2019.
- *QIP cum CEP Course on "Biomass to Energy and Other Value Added Products,* organised by Prof. P. Kaushal, Prof. V.K. Vijay, IIT Delhi, from 25 to 29 November, 2019.

# NEW EQUIPMENT INSTALLED

## Applied Mechanics

- 'Ultra High Speed Camera System', installed at Impact Lab of Applied Mechanics Department.
- 'Testing Machine 50KN with temperature Chamber', installed at Strength of Materials Lab of Applied Mechanics Department.
- 'Workstation: DELL Precision Tower 5820', CFD, installed at Design Optimization and Computational Lab.
- 'Workstation: Lenovo Thinkstation P330 Graphics Workstation,' CFD, installed at Design Optimization and Computational Lab.

## Chemical Engineering

- 'MPAES', installed at Green and Sustainable Engineering Lab.
- 'HPLC', installed at Green and Sustainable Engineering Lab.
- 'GC', installed at Green and Sustainable Engineering Lab
- 'E-waste recycling pilot plant', installed at Waste to Wealth Technologies Lab.
- 'BET', installed at Energy and Environment Lab.
- 'BIOSMB-PD-LD100-BIOSMB 1MM PD system with LDI100 PUMP SET', installed at department lab.
- 'Dispersion Stability Analyser', Model No. Turbiscan Tower, installed at Department Lab.

## Electrical Engineering

- 'High End GPU Server using Supermicro Server', installed at Department Lab.
- 'GTDO High Speed Digital Output', installed at Department Lab.
- 'Visionics Real Space 5/64 Panoramic Audio Visual Camera', installed at Department Lab.
- 'Scanning Probe Microscopy System', installed at Department Lab.
- 'PMC Parstat Multichannel (PMC)', installed at Department Lab.
- 'Chasis Model PMC', installed at Department Lab.
- 'Glove Box with Accessories', installed at Department Lab.
- 'Thermal and E-Beam Evaporation System', installed at Department Lab.
- 'Organic Evaporation System', installed at Department Lab.
- 'Scanning Probe System', installed at Department Lab.
- 'Electrical Characterization System', installed at Department Lab.
- 'Vacuum System Air Lock', installed at Department Lab.
- 'Spares of Micro RAMAN Spectroscopy', installed at Department Lab.
- 'TOBII Pro Glasses Eye Tracker PackagePro Lab', installed at Department Lab.
- 'Controller with Specs', installed at Department Lab.
- '23 GHz MSO 4 Analog/16 Logic Channeled Model MS072304DX', installed at Department Lab.
- '16 Bit 2G Samples/ Channel Record Length 2 Channel Arbitrary', installed at Department Lab.
- 'Arbitrary Waveform Generator', installed at Department Lab.
- 'Controller as pe specs', installed at Department Lab.

- 'Vector Netork Analyzer', installed at Department Lab.
- 'PMSG Wind Turbine Emulator', installed at Department Lab.
- 'HIOKI Make Power Analyzer', installed at Department Lab.
- 'SMU (Source Measurement Unit)', installed at Department Lab.
- 'Switch Matrix Card, Mainframe and Accessories', installed at Department Lab.
- 'Thermal Imager', installed at Department Lab.
- '15kW Bidirectional DC Power Supply', installed at Department Lab.
- 'High bandwith four channel Oscilloscope', installed at Department Lab.
- 'High voltage probe (1.3 KV)', installed at Department Lab.
- 'High bandwidth current probe (30A)', installed at Department Lab.
- 'Visi Sonics Real Space 5/64 Panoramic Audio/Visual Camera (Spherical Microphone Array)', installed at Multichannel Signal Processing (MSP Lab - MS201).

## Materials Science and Engineering

- 'Creep Testing Machine', installed at Characterization Lab, DMSE.
- 'Hardness Testers', installed at Characterization Lab, DMSE.
- 'BET Surface Area Analyzer', installed at Characterization Lab, DMSE.
- 'Centrifuge' (~₹12 lacs), installed at Characterization Lab, DMSE.
- 'Fluorescence Microscope' (~₹25 lacs), installed at Characterization Lab, DMSE.
- 'Universal Tribometer' (R-Tec Instruments), installed at Characterization Lab, DMSE.
- 'X-Ray Flurorscence Analyzer', installed at Materials Testing Lab.
- 'Eddy Current Testing', installed at Materials Testing Lab.
- 'Ultrasonic Testing', Materials Testing Lab.
- 'Thermal Analysis Instruments (M-DSC, SD-TGA and DMA)', installed at Thermal Characterization Lab, DMSE (Installed in July 2019).
- 'In Situ Mechanical Testing SEM Stage - 5 KN (Make: Kammrath & Weiss, Germany)', installed at FESEM Lab, Block IV (Installed in February 2020).

## Mechanical Engineering

- 'Aerosol Chemical Speciation Monitor', installed at Department Lab.
- 'Ambient Continuous Metals Monitor', installed at Department Lab.
- 'Multi-wavelength Black Carbon Monitor', installed at Department Lab.
- 'Scanning Mobility Particle Sizer', installed at Department Lab.
- 'Aerodynamic Particle Sizer', installed at Department Lab.
- 'CAPS NO2 Analyzer', installed at Department Lab.
- 'CLD NOx Analyzer', installed at Department Lab.

- 'Optical Particle Sizer', installed at Department Lab.
- 'Zero Air Generator', installed at Department Lab.
- 'Ejector Diluter', installed at Department Lab.
- 'Multi-core Workstation', installed at Department Lab.

## Physics
- 'Optical Spectrum Analyser', installed at Experimental Quantum Interferometry and polarization (EQUIP).
- 'Digital Storage Oscilloscope', installed at Experimental Quantum Interferometry and polarization (EQUIP).
- 'Spectrograph', installed at Experimental Quantum Interferometry and polarization (EQUIP).
- 'EMCCD', installed at Experimental Quantum Interferometry and polarization (EQUIP).
- 'Telecom Wavelength Laser', installed at Experimental Quantum Interferometry and polarization (EQUIP).
- 'Electrochemical Workstation', installed at Novel Materials and Interface Physics Laboratory (RSD).
- 'Inverted Optical Microscope (Axiovert A1 FL_Zeiss)', installed at GLAD and Nano-CVD (Nano Indentation Lab).
- 'Handheld Raman System (MIRA, Metrohm)', installed at GLAD and Nano-CVD.
- 'Femtosecond Laser Facility', installed at FemtoSpec Laboratory.
- 'Test Bench with Electrochemistry Workstation', installed at IIT-Sonipat campus.
- 'Digital Storage Oscilloscope', installed at Quantum Photonics Lab (JG).
- 'Nonlinear Crystals with Temperature Controller', installed at Quantum Photonics Lab (JG).
- 'EMCCD', installed at Quantum Photonics Lab (JG).
- 'Function Generator', installed at Quantum Photonics Lab (JG).
- 'Time-correlated Single Photon Counter', installed at Quantum Photonics Lab (JG).
- 'Single Photon Detectors', installed at Quantum Photonics Lab (JG).
- 'OAM Manipulators', installed at Quantum Photonics Lab (JG).
- 'Noise Spectroscopy Set-up', installed at M.Tech. (SSM) Lab.
- 'THz-TDS and FDS facility with UV-Pump', installed at THIS Lab (Amartya).
- 'PPMS', installed at Central Research Facility.

## Textile and Fibre Engineering
- 'Single Screw Extruder with Slit Die', installed at Airship and Aerostat Materials Lab.
- 'Weatherometer', installed at Airship and Aerostat Materials Lab, IV LT 3.
- 'High Pressure Microfluidizer', installed at Airship and Aerostat Materials Lab, IV LT 3.
- 'FTIR (Thermo Fisher)', installed at Fiber Science Lab.
- 'HR-TEM', installed at IIT-Sonipat campus.
- 'Melt Capillary Rheometer', installed at IIT-Sonipat campus.
- 'GCMS', installed at IIT-Sonipat campus.
- 'Particle Counter', installed at IIT-Sonipat campus.
- 'FTIR-ATR', installed at IIT-Sonipat campus.

- 'Test Bench with Electrochemistry Workstation', installed at IIT-Sonipat campus.

## Applied Research in Electronics
- 'Vapor HF Release set-up for MEMS Device Release', installed at MEMS Lab, CARE.
- 'Rapid Thermal Annealing for High Temperature Processing', installed at NRF.
- 'Cryogenic Probe Station, Microelectronics Lab', installed at CARE.
- 'Spectrum Analyzer upto 110 Hz', Microwaves Lab, installed at CARE.

## Biomedical Engineering
- 'Skid Resistant Tester', installed at Biomechatronics Lab.
- 'InBody 720 Analyser', installed at Biomechatronics Lab.

## Energy Studies
- 'Tunable Diode Laser', installed at Plasma Application Lab, V-236.
- 'Automatic Bomb Calorimeter Make-IKA, and Semi-micro Balance, Make-Metler,' installed at Biomass Combustion Device Testing Laboratory, WS206-207.
- 'Portable Gas Analyzer, Make Horiba, Japan', installed at Biomass Combustion Device Testing Laboratory, WS206-207.
- 'Eddy Current Dynamometer Coupled Automotive CRDI Engine with Open ECU', installed at IC Engine Laboratory.
- 'Eddy Current Dynamometer', installed at IC Engine Laboratory.
- 'Dual Fuel Electronic Control Unit (ECU)', installed at IC Engine Laboratory.
- 'Combustion Analyser', installed at IC Engine Laboratory.
- 'Automotive Spark Ignition Engine Test Rig with Eddy Current Dynamometer and Open ECU (purchase order placed)', installed at IC Engine Laboratory.
- 'OPAL-RT', installed at EPRES Lab V-151/153.

## Rural Development and Technology
- 'HPLC', installed at Environmental Biotechnology Lab.
- 'Combi Flash Chromatography', installed at Environmental Biotechnology Lab.
- 'Gas Chromatography', installed at Applied Microbiology Lab.
- 'Lyophilizer', installed at Micromodel- Applied Biology Lab (Centre Facility).
- 'Fermenter', installed at Micromodel- Applied Biology Lab.

## Bharti School of Telecommunication Technology and Management
- 'Air Pollution Monitoring Device', installed at IITD Campus.
- 'Phasor Measurement Unit', installed at CNRG Lab.
- 'DSO Analog', installed at Photonics Lab.
- 'AWG 2-Channel', installed at Photonics Lab.
- 'VXT PXLE (MIMO Vector Signal Analyzer)', installed at Next Generation Wirelss Comm (MIMO) Lab.
- 'Server', installed at Server Room, Bharti School.

## Kusuma School of Biological Sciences
- 'dPatch Patch-Clamp Amplifier', at Ion channel and Receptor Biology Lab.
- 'FPLC', at Structural and Molecular Virology Lab.
- 'Multimode Reader', at Structural and Molecular Virology Lab.

# Central Facilities

(April 1, 2019 - March 31, 2020)

## CENTRAL LIBRARY

The IIT Delhi Library System comprises of a Central Library and about 32 Unit Libraries of departments, centres, schools, etc. that collectively support the teaching, research and extension programmes of the Institute. The library currently has over 9000 registered members.

The library has ICT based facilities and services. It has a state of the art Computer Lab for regular users of the library, participants in Training, Workshops and Examinations.

The Central Library has strong collection pertaining to physical sciences, engineering, technology, biotechnology, computer science, information technology, social sciences, management, etc.

As per the record, the tentative collection of the library as on 31st March 2020 is as follows:

| | |
|---|---|
| Books | 1,87,216 |
| Journals (Bound Volume) | 1,05,765 |
| Theses | 6176 |
| Online Electronic Journals/Conference Proceedings/Patents/Standards/Manuals, etc. (Directly subscribed + available through eSS Consortia) | 60,000 (Approx.) |
| Bibliographic Databases | 15 |

The Book Bank holds multiple copies of selected textbooks for making these available to the students for the entire period of a semester, free of cost. Students can draw upto six books over and above for the whole semester. During the book bank in August 2019, 1785 books were issued to 570 students, while in January 2020, 972 books were issued to 311 students. A total of 2757 books were issued to the students during both the semesters.

The institute has access to over 60,000 full-text electronic journals/proceedings/standards and over 15 databases/bibliographic databases from several publishers and aggregators through the Direct subscription/access through eShodh Sindhu consortium.

The Central Library has access to eBooks from several publishers/aggregators, e.g., Bloomsbury, Cambridge University Press, De Gruyter, Elsevier eBooks and Major Reference Works, E-Text Books (Miscellaneous), Lectures Notes in Computer Science, Mathematics and Physics (upto the year 1996), McGraw Hill Education, Pearson, Springer, Taylor and Francis eBooks and Major Reference Works, Wiley, World Scientific, SAGE Bhasha (Hindi), etc. Apart from the above eBooks, two eBook collections,

"World eBook Library" and "South Asian Archives," are also available through the National Digital Library of India (NDL). Other library facilities and services include IIT Delhi Faculty Profiling System (IRINS), Library App for Single Window Seach, Discovery Service/Single Window Search, eNewClipping Service, Ask the Librarian, Reader's Assistance, Circulation of Books and Library Membership, Inter-Library Loan (ILL) and Resource Sharing Facility, Photocopying, Scanning, Digital Printing, and Binding Facility, Text Books Facility (Print and Online), Theses Consultation Facility, Institutional Repository, and User-Centric Workshops/Trainings/Talks/Outreach programmes etc.

Central Library, in collaboration with INFLIBNET and IIT Delhi CSC, is providing Remote Login facility to all its authorized users from anywhere in the world using VPN and Shibboleth based access. Individual Password-based access is also being provided wherever agreed by the Publishers to access the E-Resources.

As an extra-ordinary achievement, the Central Library has been declared as the National Resource Centre for Library and Information Science of India by the MHRD, Govt. of India for offering the Annual Refresher Programme In Teaching (ARPIT) from the year 2019-20 with Dr. Nabi Hasan, Librarian & Head as the Coordinator/PI. The programme achieved overwhelming success, and 2908 learners were registered in the first batch of this course at IIT Delhi, which was delivered successfully by the team of Central Library executives in collaboration with the top-most resource persons of the subject and allied sciences.

## HINDI CELL

The Hindi Cell in IIT Delhi organises various activities for progressive use of Hindi in the Institute. This includes the promotion of official work in the language, the monitoring of internal progress of the Institute regarding use of Hindi, submission of quarterly progress reports, and preparing inspections by the Ministry of Education, Rajbhasha Vibhag, Ministry of Home Affairs and Parliamentary Committee on Official Languages.

**Activities during the period of 2019-2020:**

- Workshop on "Rajbhasha Hindi Karayanvayan main praykt e-Tools ki sarthaktha" was held on 09 July, 2019 for new staff members (Group 'B' & 'C') of the Institute.
- Workshop on "Takneek – Saksham Hindi: Unicode se aage Kya" was held on 13 September, 2019 for staff members (Group 'A', 'B' & 'C') of the Institute.
- Hindi Pakhwara was organised during the 13 to 30 September, 2019. A number of activities were organised during the Hindi Pakhwara.

# CENTRAL RESEARCH FACILITY

A Central Research Facility is of utmost importance in any academic institution where state-of-the-art analytical and high-end instruments are manned by qualified personnel to provide scientific and technical services to faculty, research students and project students. Such a facility represents a key commitment for preserving and raising the efficiency of research to the international standards. In this connection, apart from upgrading and procuring new facilities at the main campus in Hauz Khas, an independent building at Sonipat Campus has been built to house the most modern equipment to service UG/PG students and researchers (from academia and industries). Soon, this facility will be available to external academic and research institutions, industries, and organisations of the country.

## List of new equipment purchased in CRF in the last one year

With the support of HEFA and SATHI funding, nine new facilities have been approved/procured for CRF in the last one year. These facilities are as follows:

- Electron Paramagnetic Resonance Spectrometer with X, Q-band, and CW-ENDOR and Dual Mode Resonator
- High Performance Multipoint BET Surface Area Analyzer with Chemisorption Facility
- Circular Dichroism Spectrometer combined with Stopped Flow and other accessories
- Single-Shot Full Resolution Motorized Digital Holographic Microscope (DHM) System
- Nano Tracking Analyzer
- Cryogenic Prober
- DC and Noise Measurement System
- Helium Cooled CryoProbe for NMR
- 300 kV Cryoelectron Microscope

The installations of most of the facilities, which were procured in the previous year, have either been completed or underway in IIT Delhi Hauz Khas and Sonipat campuses.

The following instruments have been recently installed and are either available or will be available to the users very soon:

- X-ray Diffraction (XRD) with sample stage for Low Temperature (temperature range is from 12 to 315 K)
- Small-angle X-ray scattering (SAXS) system with tensile stage heating/cooling module
- Thermal series comprising of Modulated Differential Scanning Calorimeter; Modulated Thermo gravimetric Analyzer with DTA and DSC; Dynamic Mechanical Analyzer (DMA) and Thermomechanical Analyzer (TMA)
- Fourier-transform infrared spectroscopy (FTIR) Advanced Spectrometer (MID, FAR, NIR, ATR)
- Cryogen free Physical Property Measurement System (PPMS) with 14 Tesla superconducting magnet
- Femto Second Laser Cutting System having laser source for cutting and ablation of polymers and thin metals; wavelength of laser source 1035 ± 5 nm; pulse energy of Maximum 80 µJ and pulse width of<400 fs.
- Ion Milling System along with Ultrasonic Disc Cutter with Stereo Optical Microscope; Disc Grinder; Dimple Grinder-II with Auto-terminator & with Stereo Microscope; TEM Cross Section Kit; Disc Punch and Minitom Low Speed Diamond Saw

Installation of the following instruments is underway:

- X-ray Photoelectron Spectroscopy (XPS)
- Universal Testing Machine (Static and Dynamic UTM) .
- Rheometer system having separate motor & transducer technology with Peltier plate system (Environmental Control Box)
- Ion Milling System along with Ultrasonic Disc Cutter with Stereo Optical Microscope; Disc Grinder; Dimple Grinder-II with Auto-terminator & with Stereo Microscope; TEM Cross Section Kit; Disc Punch and Minitom Low Speed Diamond Saw



## CRF Facility at Sonepat

## EDUCATIONAL TECHNOLOGY SERVICES CENTRE

The Educational Technology Services Centre (ETSC) is actively engaged in providing and promoting the use of Educational Technology within the Institute and also at the national level. Some of the activities are: design, development and dissemination of video and web-based instructional resources; provision and maintenance of A/V equipment for classroom teaching; organisation of training programmes for faculty, staff and professionals across the country and undertaking sponsored research and consultancy projects; audio/video conferencing for faculty selection interviews and other meetings including Ph.D. viva voce examination; e-learning and distance education using video conferencing facility.

Some of the new initiatives of the ETSC include projects sponsored by MoE, Swayam, Swayam-Prabha and IIT-PAL. Uner Swayam, ETSC actively encourages faculty members of the institute to develop MOOCs (massively open and online courses) to be disseminated country-wide. ETSC is responsible for recording, post-production and uploading content into the Swayam platform, as well as hand-holding faculty members towards developing content. Under Swayam-Prabha, ETSC manages 2 TV-channels (Electrical Engineering and Civil Engineering). In IIT-PAL ETSC engages in working with faculty members of the institute towards content creation, recording, post-production and managing of 4 TV channels (Physics, Chemistry, Maths and Biology). In addition, 3 courses for Annual Refresher Programme In Teaching (ARPIT) have been recorded, edited, and uploaded on SWAYAM. These courses will be treated as Faculty refresher course for career advancement scheme (CAS) for promotion.

During the lockdown period due to COVID-19 pandemic, ETSC has played a major role in reaching out to students by managing online classes, conducting VCs and meetings.

## IIT HOSPITAL



The Institute has a 14 bedded hospital centrally located in the campus, which provides facilities for OPD treatment as well as IPD. The Hospital is managed by a team of full time 10 Allopathic Doctors and 04 Allopathic Contract Doctors from Apollo Life. The Hospital has AYUSH facility with one full time Homeopathic doctor and one visiting Ayurvedic doctor from All India Institute of Ayurveda, New Delhi (AIIA), for Dental procedures, a qualified dentist is available.

| Hospital Statistics 2019-20 | |
|---|---|
| Patients Attended in OPD | 92,772 |
| X-Ray | 1,474 |
| Ultra Sound | 335 |
| Patients Admitted | 205 |
| Physiotherapy | 4,427 |
| Surgical Dressing | 3,625 |
| Dental Treatment | 4,730 |
| Pathology Lab Test | 36,394 |
| ECG | 1,611 |

# COMPUTER SERVICES CENTRE

The main objectives of the Computer Centre are to:

- Provide round the clock computing and networking facilities to serve a user population of 12000+ users consisting of UG students, PG students, Research Scholars, Faculty & Staff of the Institute and also to visiting faculty and students.
- Implement and maintain system & application software.
- Implement and manage the Institute Network.
- Computational lab facility to students for the conduct of UG/PG lab courses.
- Impart Introductory and advanced instructions to users.
- Work on cutting edge technology & provide Services to users based on new technology.
- Provide support both in development & administration of ERP related module implementation.
- Provide training to Institute employees.

## Computing Facilities

The Centre is equipped with 144 HP/CISCO UCS blade servers out of which 112 Blade Servers are used for Cloud computing with 200 TB of virtualized storage and 32 blade servers with 130 TB of storage for user homes and infrastructure use like email, proxy, web services etc. CSC also has around 450 Desktop computers under Windows & Linux environment connected over a switched fast Ethernet. Uninterrupted Power Supply is provided through 2x 80 KVA MGE UPS system and DG set. The High-Performance Computing (HPC) facility in the Data Centre consists of 405 CPU nodes and 201 GPU nodes with 678 TB of Home space and 3430 TB of Scratch space.

## Network Services

The Institute LAN is a state-of-the-art switched network with Fiber Optics and enhanced CAT5/CAT6 UTP backbone. It consists of more than 9000 network access points spread over the campus using about 450 Cisco switches and about 75 virtual LANs. Network access is provided to every student, faculty, Doctor, Laboratory, offices and rooms in guest houses. Internet connection has been provided through a router, redundant firewall switching modules, and 2x10 Gbps from NKN. IIT Delhi is connected to the National Knowledge Network (NKN) with 10 Gbps dual connectivity from Power Grid and RailTel. This connectivity provides virtual routing service, Internet Connectivity, and connectivity with other Institutes connected on the NKN backbone. Internet and Intranet access is provided to faculty/officer homes via GPON over fiber (750+ houses) and ADSL connectivity over internal telephone lines. The Academic, Hostel area, both Guest houses, RCA and Hospital are also connected through WIFI. There are 1400+ wireless access points. Many network services including mail, web, and domain name, anti-virus is being provided over this network.

## Facilities/Services

- All Services are authenticated and authorized using a Central Kerberos System.
- The email facility is provided to all students, staff and faculty with webmail interface "Round cube".
- Baadal is a Cloud computing environment that provides virtualized computing resources for academic and scientific environments. Some of the main features of Baadal are: Dynamic Resource scheduling and power management; Facilities for suspend, resume, shutdown, power off, power on, specifying resource requirement of VM; and Dynamic resource utilization monitoring.
- The Data Center (DC) consists of Cisco UCS B200: Five chassis with 40 blade servers – 16 blades each with 2x12 Cores Intel(R) Xeon(R) CPU E5-2695 v2 @ 2.40GHz with 128 GB RAM, 8 blades each with 2x14 cores CPU E5 with 256 GB RAM and 16 blades each with 2x18 cores CPU Intel Xeon Gold 6140 with 256 GB RAM.
- The Disaster Recovery Data Centre (DRDC) is situated in the SIT building. The DRDC has been built by IBM and can support a total IT load of 60 KW. It has redundant UPS power supplies and precision air conditioners in N+N and N+1 configurations respectively.
- The CSC provides Infrastructure Services through Virtualization technology.
- The CSC has Microsoft Volume Licensing EES agreement for the Campus under which Microsoft software such as Windows Server, Windows OS, MS Office, Office365 are available for use.
- The center also has the following third-party software packages: MATLAB, Mathematica, Ansys, COMSOL, LabVIEW, etc. available on the CSC webpage.
- The centre maintains local repositories of several popular open-source and commercial licensed software.
- The CSC has configured moodle a public domain course management software, for use by faculty and students for the courses running during the semester.
- IIT Delhi is also a part of Eduroam, a global WIFI roaming programme across academic campuses through ERNET India.
- Own Cloud/Next Cloud, a file and document sharing utility similar to the popular drop box is also provided for user community. The utility supports storing and sharing of files, images, music and documents, contacts, calendars, tasks etc.
- To facilitate downloads of data files through non-standard ports, download Server: download.iitd.ac.in can be used. and to facilitate download of huge data for Research, proxy server xen03.iitd.ac.in (Research proxy) can be used. The faculty has been authorized to provide download permissions to their students from the webpage.
- Virtual web hosting facility can be used for securely hosting all websites of the form http://xyz.iitd.ernet.in which are not maintained by CSC. In addition, CSC maintains large number of websites including IITD main websites and some departmental websites.
- User web pages is available for the use of faculty and Ph.D. students for hoisting their webpages on the server web.iitd.ac.in.

- To provide Internet access to the visitors, the faculty and officers have been authorized to create user account for their visiting faculty/students.
- To facilitate limited access within IITD, CSC has a separate web server privateweb.iitd.ernet.in where users can have their personal web pages.
- VPN facility is provided to the users for accessing IITD internal network from outside IIT Delhi. The faculty have been authorized to create cert-keys for their own use and their advisees from the VPN webpage on the CSC website.
- Network Time Protocol (NTP) servers are synchronized with standard internet time servers with time drift less than a few milliseconds and can be used by all users.
- MRTG and RRD Health Graphs have been provided to see the Status Reports of the various System activities/ Services.
- SLA ticketing systems- SLA for Networking & SLA for Software have been provided for resolving User problems pertaining to Network and Software issues.

The following new modules have been implemented in the new ERP: -

- UG/PG Student Onboarding Module
- Estate Complaint System
- Student General Request
- No Dues for Staff/Faculty
- No Dues for Students
- PMRF portal
- ASEAN portal
- Security ID Card
- Vehicle Sticker
- Telephone Reimbursement
- Professional Development PDA
- Children Education Allowance
- PF Loan Application

The following websites have also been developed/updated:

- ASEAN
- CSC
- CART
- Corporate Relations
- Industry Day
- International Student Portal
- IoE
- Physics
- Four Institute Newsletters have also been designed

# Research and Development

(April 1, 2019 - March 31, 2020)

## ACADEMIC AND SPONSORED RESEARCH

### Academic Research

The academic research carried out by the students for the Ph.D. degree, the final semester major project included in the four-year B.Tech. programme, the five-year integrated M.Tech. programmes, and the four-semester M.Tech./M.S.(R.)/M.Des. programmes make a significant contribution to the research output.

The principal source of academic research, however, continues to be through Ph.D. research projects. With a total of 3033 students enrolled for a research degree during the year under review, the emphasis on and commitment to academic research is evident. During the two semesters of 2019-20, 733 candidates were admitted out of which 441 were full-time Institute scholars with the remaining 292 belonging to other categories like sponsored, part-time etc. A total of 331 theses were approved for the award of Ph.D. degree.

IIT Delhi faculty remain engaged in publishing their research results in various journals, conferences and seminar proceedings. The number of publication along with citation and h-index for the last 5 years is stated below:

| Year | No. of Publications | No. of Citations | h-index |
|------|---------------------|------------------|---------|
| 2020 | 1120* | 355 | 6 |
| 2019 | 2736 | 4482 | 17 |
| 2018 | 2683 | 12449 | 31 |
| 2017 | 2515 | 17680 | 42 |
| 2016 | 2124 | 21155 | 51 |

Source* : Scopus as on 18th June 2020.

### Sponsored Research

Along with teaching and academic research leading to doctoral degree, IIT Delhi gives high priority to research and development projects sponsored by national & international agencies, industries and other user organisations. The Institute has as one of its cardinal guiding principles continuous, and meaningful interaction with the world of science & technology and industry.

### Industrial Research and Development Unit (IRD)

The Industrial Research & Development (IRD) Unit has been specifically set up in the Institute to provide specialized administrative and managerial support for the operation of Sponsored Research Projects, Consultancy Jobs, and other related R&D activities. Over the years, the institute has set up many modern laboratories and is continuously supporting infrastructure through these projects. Under Sponsored Research Enhancement Actions (SREA 1, 2 & 3) schemes IRD provides support to senior staff to facilitate and enhance sponsored research activities, both in terms of formulating/writing research project proposals and coordinating research projects.

IRD provides a one-time grant of Rupees One Lac to each new faculty member who joins the Institute. This Grant has been given to forty-eight (48) new faculty members during the financial year 2019-2020. This assistance is being given to the new faculty so that they can initiate new projects, which may subsequently be submitted to various funding agencies.

IRD also provides matching equipment grant to new faculty for the purchase of equipment sanctioned under a project. Faculty can avail this grant within 2 years of joining with a sealing of ₹35.00 Lakhs or an amount equivalent to the funds sanctioned by the funding agency for the equipment under the project whichever is lower. Equipment Matching Grants to the tune of ₹372.00 Lacs have been sanctioned to 18 new faculty members during the financial year 2019-20.

The Faculty Interdisciplinary Research Project (FIRP) scheme by IRD aims to enhance interdisciplinary and collaborative research interest in the Institute. Selected projects are given an initial grant of ₹10.00 Lakhs. It is expected that the joint research team will submit at least one research project to external funding agency on the completion of 1st year.

In the previous calls, a total of 56 projects were sanctioned. As an outcome of FIRP Call-2016 scheme, total 21 research papers have been published in high impact journals, 63 research papers have been presented in various national and international conferences, 8 patents have been processed for filling IP through FITT, and 3 technologies have been transferred. Four academic/research awards have been received by FIRP projects. IRD had made an expenditure of about ₹3.56 Cr for FIRP Call-2016, while about ₹25.00 Crore has been generated from the 10 externally funded projects to the FIRP Principal Investigators as a spinoff from the leads generated through IRD FIRP scheme. About 14 more projects are under-review.

In the current year, FIRP call was announced as First Connect FIRP project Call-2019 to give opportunity to the faculty members joining the institute in the last 3 years. Total 23 projects were sanctioned for support with a seed grant of ₹10.00 Lakhs for 2 years.

With an aim to positively and collectively impact society and environment, multi-institute faculty interdisciplinary projects - Multi-institutional Faculty Interdisciplinary Research Project (MFIRP) - have been initiated in collaboration with different institutes across India & foreign countries. There will be at least two PI's (one from each institute) and the total grant will be ₹20.00 Lakhs for two years, equally shared by IIT Delhi and other institutions. Faculty members from IITD-AIIMS formed a cross functional team with an aim of building a more robust Health Care system by Engineering and Technology interventions through 'cross-institutional interactions' between the two premier institutes. 47 projects are on-going under this scheme with an aim to alleviate some of the challenges of the Health Care sector. Interim review of 24 projects of Call-2018 was carried out on 20th February, 2020.

Total 23 new projects under the IITD-AIIMS Call-2019 have been approved for the support in the area of Artificial Intelligence and Robotics for Health Care, Point of Care Diagnostics, Design and Development of Biomedical Devices, and Sensors & Biocompatible Materials.

In order to harness the advances of science for the welfare of society in the areas of agriculture, faculty members from Indian Council of Agriculture Research (ICAR) and IITD formed a cross-functional team and 10 projects are ongoing to create new avenues for tackling the challenges and developing advance technologies in farm sector.

In the areas of immunology and molecular biology; 5 joint research projects are ongoing between National Institute of Immunology and IITD.

3 collaborative research projects on disease management are ongoing between Clemson University, South Carolina and IITD.

4 collaborative research projects between University College London and IITD are ongoing for the project duration of one year in the areas of Advanced Materials, Biotechnology and global health & well-being and sustainable urban design & waste management.

18 collaborative projects between National Chiao Tung University and IITD under MFRIP scheme are ongoing in areas of Artificial Intelligence, Internet of things, Cyber Security, Electrical and Electronics, Renewable Energy/ Clean Energy, Biotechnology, Drug Development and Biomedical devices.

### IRD Students Schemes

**Student Startup Action & Discover & Learn (1-2-3-4) schemes:** In order to enhance research aptitude among undergraduate & graduate students and increase the component of 'learning by research' IRD Student Startup Action & Discover & Learn (1-2-3-4) schemes were launched from the year 2016 onwards. Currently 18 IRD Student Startup action projects involving about 34 students and 37 Discover & Learn (1-2-3-4) projects involving about 122 students are ongoing in the various research areas of national interest. Interim review of the ongoing IRD Student Startup Action projects and Discover & Learn projects was conducted on 18th October, 2019.

In call–2019, a total 18 projects including 8 Student Startup Action and 10 Discover & Learn projects were approved for the IRD support of Rs. 2 Lakh per year. Amongst these, three Student Startup Action and 6 Discover & Learn projects are mentored and financially supported with Rs. 2 Lakh per year by industries such as CERCA, ReNEW power, Nokia, and Ornate Solar in addition to the IRD support.

**Summer Undergraduate Research Award (SURA):** Objective of SURA scheme is to encourage Research & Development activities among undergraduate students. The students are encouraged to take initiative in identifying, studying and analyzing problems as well as formulating solutions. In the current year thirty (30) projects have been awarded to the successful students under SURA scheme.

**Research Excellence Travel Award (RETA):** Highly meritorious Research Scholars (full-time as well as part-time) working fulltime on IRD/FITT projects can be awarded Research Excellence Travel Award (RETA) amounting to ₹1,50,000/- from IRD promotional funds. RETA can be used only for a single conference travel. Total 49 students were given RETA this year.

**Research Scholar Travel Award (RSTA):** All Research scholars can be awarded a travel grant under "Research Scholar Travel Award" (RSTA) upto a maximum of ₹80,000/- from IRD Research Promotion Fund over and above the initial grant of ₹20,000/- provided by the Institute.

**National Resarch Project**

**Uchhatar Avishkar Yojana (UAY):** Twelve (12) UAY projects including nine of UAY Phase I and 3 of UAY Phase II are administratively managed by IRD. These projects are funded 50 % by MHRD, 25 % by Industry and 25 % by respective Ministry. Numerous tasks including project review, project tenure extension, Statement of Expenditure and Utilization Certificate preparation and submission are managed by IRD.

**Impacting Research Innovation and Technology (IMPRINT):** Twenty IMPRINT projects including twelve projects of IMPRINT Scheme-1 and eight projects of IMPRINT Scheme-2 are administratively managed by IRD. These projects are funded MHRD and DST-SERB/ DRDO/ICMR/ respective Ministry. IRD supported many tasks including project review, project tenure extension, Statement of Expenditure (SoE) and Utilization Certificate (UC) preparation and submission.

**Grand Challenge Projects:** The objective of the Grand Challenge initiative was to establish new research platforms for strengthening the interface between our R&D activities and to address some of the societal challenges faced by the nation. Four (4) projects in the challenging areas were funded by IRD in 2018. In 2019, IRD organised interim review of four grand challenge projects in the areas- Air pollution control, Electric Vehicles, MBE growth for 2D materials for sensors and optoelectronic devices and antibacterial diagnostic solution by inviting team of external experts and sharing the interim report provided by project PIs. The project PIs & Co-PIs presented their work in the review meeting held on 28th November, 2019.

## Highlights (2019-20)

Some important highlights about research are:

- 280 Sponsored Projects with a total funding of ₹329.61 Crores were undertaken.

- 278 Consultancy Assignments worth ₹19.02 Crores were undertaken through IRD Unit and 67 Technology Development Projects/ Contract Research Projects worth ₹16.93 Crores were undertaken through FITT.

- New Faculty Grant to the tune of ₹48.00 Lakhs have been given to new Faculty members (₹1.00 Lakh per faculty).

- 23 projects are selected for support under the scheme Faculty Interdisciplinary Research Project (FIRP).

- 23 (AIIMS)+ 10 (ICAR)+ 5 (NII)+ 03 (Clemson USA) + 04 (UCL, UK) + 18 (NCTU, Taiwan) = Total sixty three (63) projects are selected for support under the scheme under Multi-institutional Faculty Interdisciplinary Research Project (MFIRP) Scheme.

- 02 technologies were successfully launched from Start-up Action Call-2016: Significant achievements of 4 Startup action projects of Call 2016 includes development of new products with innovative technologies and a new software. A patent has been filed and 2 companies namely Suxma System Pvt. Ltd. based on Mastitis detector device by Prof. Subrat Kar and group and FLEXMOTIV TECHNOLOGIES based on Clutches by Prof. Jitendra Khatait have been established and registered. Funding from external agencies have been received in addition to the recognition from Startup India.

- 03 Technologies were transferred from FIRP Call -2016: namely (i) A process to produce δ-decalactone by integrated fermentation and catalytic processing of biomass (ii) Process for the preparation of hydric alcohols and (iii) Conversion of 2-pyrone into 2-nonene-4-one via ring opening and decarboxylation.

## Research Projects & Consultancy

The trend in research funding and their number for last five years is shown in Table I and in Figure1 & 2.
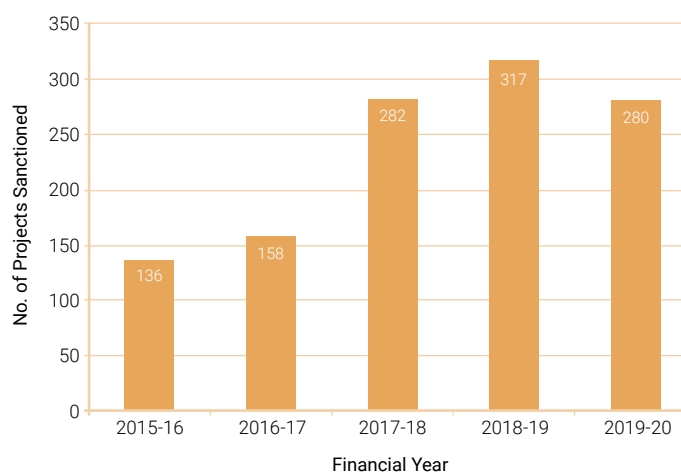
**Table I:** Statistics of Sponsored Research Project

| Sponsored Research Projects | | |
|---|---|---|
| Financial Year | Number of Projects | Value (Rupees Cr.) |
| 2015-16 | 136 | 72.44 |
| 2016-17 | 158 | 140.21 |
| 2017-18 | 282 | 417.19 |
| 2018-19 | 317 | 347.52 |
| 2019-20 | 280 | 329.61 |



Fig. 1: Trends in Sponsored Research Projects
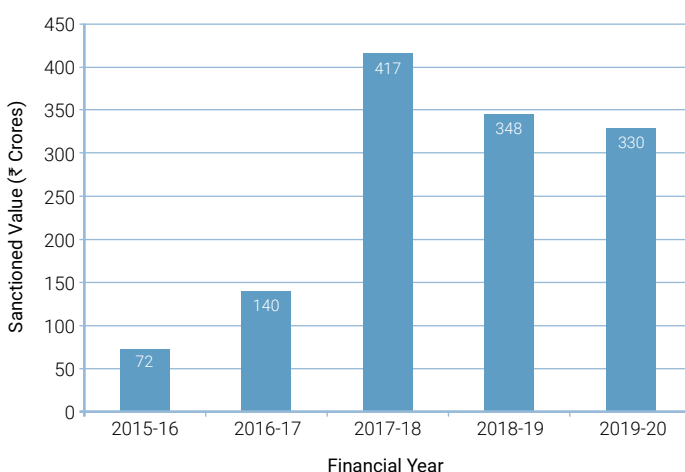


Fig. 2: Number of Projects Sanctioned

Some of the major projects undertaken during the period are listed below:

**Table II:** Financial Outlay of Some of the Major Projects during 2019-20 (with sanctioned value ₹100 Lacs and above)

| Project Title | Sponsoring Agency | Sanctioned Funds (₹ Lacs) |
|---|---|---|
| To Establish Sophisticated Analytical and Technical Help Institute (SATHI) at IIT Delhi | DST, Ministry of Science & Technology | 12,500.00 |
| DST - IITD Energy Storage Platform on Batteries (ESPOB) (Multi Institutional Project) | DST, Ministry of Science & Technology | 1,087.07 |
| ASEAN Ph.D. Fellowship Programme Secretariat | Ministry of Human Resource & Development | 927.80 |
| Technology Innovation Hub (TIH) on Cobotics | DST, Ministry of Science & Technology | 725.00 |
| Design and Demonstration of Sustainable Building Infrastructure | Yardi Systems, USA | 670.97 |
| Enhancing India's Policy Analysis Capabilities to Meet Energy and Environment Challenges | Children's Investment Fund Foundation - UK | 532.50 |
| Demonstration of Effective Technology Solutions to eliminate and use waste from municipal drains in Delhi | Office of the Principal Scientific Adviser, GoI | 444.70 |
| Study of nanoscale electrical properties of 2D/2D and 2D/3D interfaces for solar energy, photoconductivity and Thermometric applications | DST, Ministry of Science & Technology | 431.58 |

Table II contd……

| | | |
|---|---|---|
| Development of freeform and large size aspheric optics for thermal and optical imaging | DRDO, Ministry of Defence, GoI | 418.49 |
| Study of The Erythroid and Megakaryocyte Lineages Under Normal Development and Pathological Myeloproliferation | Wellcome Trust/DBT India Alliance | 374.19 |
| Design, Fabrication and Testing of a High Efficiency Vertical Axis Wind Turbine (VAWT) and optimization of VAWT Farm | MHRD. MNRE. Industrial Boilers Ltd. | 365.40 |
| Facilitation of Global Cooling Prize by DST Mission Innovation programme | DST, Ministry of Science & Technology | 329.43 |
| Design and Development of Display source, projection & collimating optics and Camera for use in helmet mounted display and sight (HMDS) | DRDO, Ministry of Defence, GOI | 320.68 |
| PAVITRA GANGA - Unlocking wastewater treatment, water re-use and resource recovery opportunities for urban and peri-urban areas in India | Department of Biotechnology | 217.73 |
| Platform for production of affordable biopharmaceuticals: Ranibizumab as a case study | Biotechnology Industry Research Assistance Council (BIRAC) | 203.90 |
| Porting of Sanjeevini (a complete Drug Design software suite) on High Performance Computing based NSM Platform and creation of Computational Protein Data Bank (Co-PDB) for Drug targets. | Centre for Development of Advance Computing | 183.90 |
| Development of hierarchical novel catalyst for one pot conversion of CO2 rich synthesis gas to Dimethyl Ether and scale-up Studies | DST, Ministry of Science & Technology | 169.21 |
| Funds for Improvement of S&T Infrastructure in Universities and Higher Educational Institutes (FIST) Grant for School of Biological Sciences | DST, Ministry of Science & Technology | 165.00 |
| Design, Development and Demonstration of 1kW (1kWh) Vanadium Redox Flow Battery for Stationary Application | DST, Ministry of Science & Technology | 144.71 |
| Direct 3D Bioprinting strategies to study articular cartilage development, degeneration and regeneration | Department of Biotechnology | 144.07 |
| GenomeIndia: Cataloguing the Genetic Variation in Indians | Department of Biotechnology | 140.00 |
| Virtual Immersion in Under-water Sites | DST, Ministry of Science & Technology | 138.60 |
| Physical Unclonable Function (PUF) based Application Specific IC (ASIC) by Technology-Circuit-System Co-Development for Strategic Applications | Office of the Principal Scientific Adviser, GoI | 132.30 |
| High-resolution climate scenarios for basin-scale water resource management applications | National Mission for Clean Ganga, Ministry of Water Resources | 131.00 |
| Scalable Spatio-Temporal Measurement and Analysis of Air Pollution Data for Delhi-NCR using Vehicle-Mounted Sensors | Science and Engineering Research Board (SERB), DST | 127.47 |
| Technical Textile Industry in India: Challenges and Opportunities | Ministry of Textiles, GoI | 120.79 |
| Establishing a research programme in India focused on evaluating safety of rural roads and highways | National Institute of Health, USA | 102.60 |

## Consultancy Jobs

Industrial consultancy is another significant area of activity of the Institute. The nature and extent of the industrial consultancy projects undertaken by the Institute is an index of its credibility with the industry and is symbolic of the relevance of a centre of excellence in the context of nation's socio-economic development.

**Table III:** Statistics of Consultancy Jobs Undertaken

| Financial Year | Consultancy Jobs (IRD) | | Technology Development Projects / Contract Research (FITT) | | TOTAL |
|---|---|---|---|---|---|
| | No. of Projects Sanctioned | Sanctioned Value in ₹ Cr. | No. of Projects Sanctioned | Sanctioned Value in ₹ Cr. | Sanctioned Value in ₹ Cr. |
| 2015-16 | 365 | 29.29 | 79 | 16.06 | 45.35 |
| 2016-17 | 318 | 20.36 | 52 | 16.02 | 36.38 |
| 2017-18 | 282 | 22.18 | 51 | 12.08 | 34.26 |
| 2018-19 | 292 | 26.86 | 57 | 18.87 | 45.73 |
| 2019-20 | 278 | 19.02 | 67 | 16.93 | 35.95 |
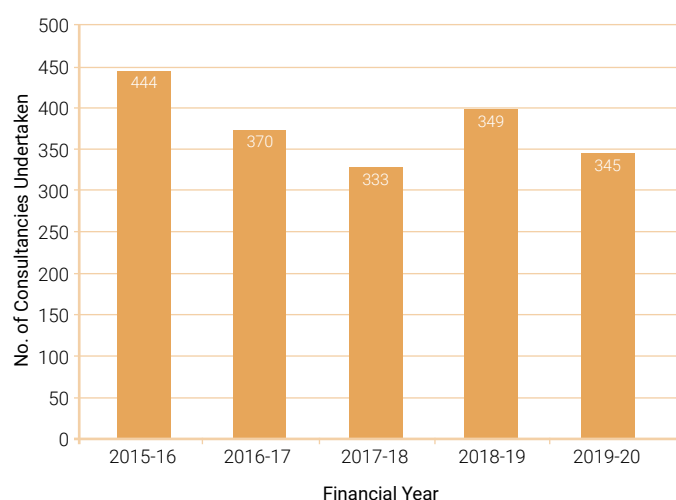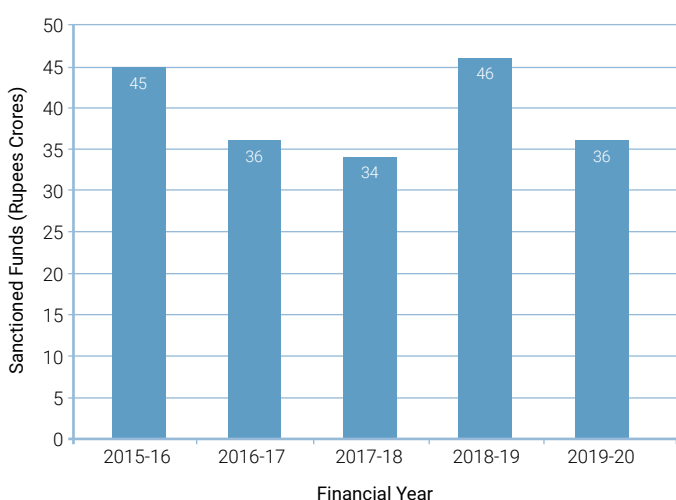




## COLLABORATIVE RESEARCH

The Institute is actively involved in collaborative programmes with national and international organisations/universities to remain at the forefront of scientific and technological developments and to share knowledge. A large number of collaborative Research Projects are under operation with Institutes/Organisations of Austria, Australia, Belarus, Brazil, Canada, Denmark, Ethiopia, European Commission, France, Finland, Germany, Holland, Hungary, Ireland, Israel, Italy, Japan, Korea, Kuwait, Latvia, Netherlands, Nepal, Poland, Portugal, Russia, Slovenia, Sweden, Sri Lanka, Switzerland, Taiwan, Tunisia, UK, USA, etc. Major research activities have also been undertaken in the areas of national importance.

During the year under report, the Institute has undertaken 21 new Collaborative Sponsored Research Projects with International funding.

**Table IV :** International Sponsored Research Projects undertaken during the year 2019-20 (with sanctioned value ₹50 Lacs and above)

| Project Title | Sponsoring Agency/ Collaborating Institute(s) | Sanctioned Funds (₹ Lacs) | Principal Investigator / Department |
|---|---|---|---|
| Enhancing India's Policy Analysis Capabilities to Meet Energy and Environment Challenges | Children's Investment Fund Foundation -UK (Funded through Indian Office) | 532.50 | Ambuj D. Sagar *School of Public Policy* |
| Study of The Erythroid and Megakaryocyte Lineages Under Normal Development and Pathological Myeloproliferation | Wellcome Trust/DBT India Alliance | 374.19 | Anita Roy *School of Biological Sciences* |
| Establishing a Research Programme in India Focused on Evaluating Safety of Rural Roads and Highways | National Institute of Health, USA | 102.60 | Geetam Tewari *Department of Civil Engineering* |
| p53 in Regulation of Epithelial-Mesenchymal Transition in Breast Cancer : Role of micro-RNA | Department of Science & Technology International Bilateral Cooperation Division & Russian Science Foundation *Collaborating Institutes:* Russian Academy of Sciences, Russia | 96.30 | Ritu Kulshrestha *Department of Biochemical Engg. & Biotechnology* |

Table IV contd......

| Collaborative Research and Education under IIT Delhi- BNERC, Toyo University Joint Bio-Nano Mission Programme | Bio-Nano Electronics Research Centre, Toyo University Japan | 62.96 | Joby Joseph<br>*Department of Physics* |
|---|---|---|---|
| Assessment of Fire Performance of Structural Elements and Structural Systems Through Conventional Fire Tests and Hybrid Fire Simulation | Thorough Department of Science & Technology International Bilateral Cooperation Division<br>*Collaborating Institutes:* University of Toronto, Canada, Carleton University, Canada Central Building Research Institute, India | 59.99 | Dipti Ranjan Sahoo<br>*Department of Civil Engineering* |
| Heat Transfer Analysis of Methane Steam Reforming Reactions Through Particle-Resolved CFD Simulations (HeTrAPaR-cfd) | HaldorTopsøe A/S Denmark | 55.25 | Vivek Vitthal Buwa<br>*Department of Chemical Engineering* |
| Re-engineering High-end Audiometric Devices for Robust and Affordable Audiological Testing | Indo German Science and Technology Centre<br>*Collaborating Institutes:* Technische University, Munchen Path Medical GmbH, Munchen AIIMS India | 54.64 | Dinesh Kalyanasundaram<br>*Centre for Biomedical Engineering* |

## CONSULTANCY ASSIGNMENTS WITH INTERNATIONAL ORGANISATIONS

The Institute has been undertaking Consultancy Assignments with International Organisations like: Jaiprakash Associates Ltd., Bhutan; Bulk Testing International, France; Total Marketing Services, France; Japan Automobile Research Institute, Japan; U.S. Air Force Research Laboratory (AFRL), Asian Office of Aerospace R&D, Japan; Nippon Steel & Sumitomo Metal Corp., Japan; LG Electronics Inc, Korea; Panchkanya Plast (P) Ltd., Nepal; Royal Norwegian Embassy, Nepal; G.S. Seismic Control System (P) Ltd., Nepal; Common Fund for Commodities, Netherlands; Energy Research Center of Netherlands; FCG Anzdec Limited, New Zealand; Escom Research and Innovation Department, South Africa; Uppsala University, Sweden; National Property Board, Sweden; International Institute of Non- Aligned Studies, Switzerland; McLellan and Partners Ltd, UK; Emerald Group Publishing Limited, UK; Marvel Chemicals Ltd, UK; Aquatech International Corp., USA; Fushi Copperweld Inc., USA; PPG Industries Inc., USA; United Technologies Corp./ Pratt & Whitney, USA; McAfee Inc., USA; Safe Water Network, USA; Gulf Coast Technical Service, USA; Corning Inc., USA; Biomorphic VLSI Inc., USA; Institute for the Future, USA; Yardi Systems, USA; Dezaview LLC, USA; Owens Corning Sales, LLC, USA; Ahlstrom Nonwovens LLC, USA; Chapter Apps Incorporated, USA; and Universities/Institutions abroad.

During the year under report, the Institute has undertaken 2 new Consultancy Jobs with International funding.

### International Consultancy Jobs undertaken during the year 2019-20

1. "Testing Shape Memory Materials for Orthodentics" (₹0.83 Lakhs), Sponsored K Line Europe GmBH, Germany, Consultant Incharge / Department - Bipin Kumar (Dept. of Textile & Fibre Engineering).
2. "Testing Shape Memory Performance of Materials used in Invisible Orthodentics" (₹0.81 Lakhs), Sponsored K Line Europe GmBH, Germany, Consultant Incharge / Department - Bipin Kumar (Dept. of Textile & Fibre Engineering).

### Other Activities

Besides handling Direct Fellowships sponsored by various funding agencies, sponsored Chairs, PAC/Expert Committee Meetings, new faculty grants, PDF Management, DDF/CDF Management, IRD has also undertaken the following activities during 2019-20:

- "EMPOWER 2019- Accessibility And Inclusion" Conference.
- International Conference on "Smart Materials for Sustainable Technology 2020"
- International Workshop on "Intelligent Robot Teammates for Complex Mission in Unstructured Environments"
- International workshop on "The Impact of THz Technologies (IWITT-2019)".
- Indo-Italian Workshop on "Circular Economy".
- NDLI-UNESCO International Symposium on "Knowledge Engineering for Digital Library Design 2019 (KEDL-2019)" .
- International Seminar on "Reproduction, Demography and Cultural Anxieties in India and China in the 20th Century".
- 20th International Conference on "Intelligent Systems Applications to Power Systems (ISAP) − 2019".
- Smart India Hackathon 2019: Hardware Edition Finals.
- Women in S&T in India: A public lecture/discussion series.
- Ballistic Materials Manufacturing & Modelling - SPARC Sponsored Short Term Course.

**Table V :** Industrial Research and Development Board as on 31.3.2020

| Chairperson | Ex-Officio | |
|---|---|---|
| *Prof. Sunil Kumar Khare* | *Prof. B.R. Mehta* | *Prof. Sukumar Mishra* |
| | *Prof. S. Mukherjee* | |
| **Representatives of Department / Centre / School** | | |
| *Prof. Sawan S. Sinha,* Department of Applied Mechanics | *Prof. S.K. Mishra,* Centre for Atmospheric Sciences | |
| *Prof. Saroj Mishra (Ms.),* Department of Biochemical Engineering & Biotechnology | *Prof. N. Tandon,* Centre for Automotive Research and Tribology | |
| *Prof. K.K. Pant,* Department of Chemical Engineering | *Prof. Veena Koul (Ms.),* Centre for Biomedical Engineering | |
| *Prof. Sidharth Pandey,* Department of Chemistry | *Prof. Vamsi Krishna,* Centre for Energy Studies, | |
| *Prof. J.T. Shahu ,* Department of Civil Engineering | *Prof. B.K. Satapathy,* Department of Materials Science & Engineering | |
| *Prof. Prem Kalra,* Department of Computer Science & Engineering | *Prof. V.K. Vijay,* Centre for Rural Development & Technology | |
| *Prof. Subrat Kar,* Department of Electrical Engineering | *Prof. Satish Kumar Dubey,* Centre for Sensors, Instrumentation and Cyber Physical Systems Engineering | |
| *Prof. Ambuj D. Sagar,* Department of Humanities & Social Sciences | *Mr. K. Narayanan,* Computer Services Centre | |
| *Prof. Ravi Shankar,* Department Management Studies | *Prof. Kolin Paul,* Educational Technology Services Centre | |
| *Prof. Niladri Chatterjee (Ms.),* Department of Mathematics | *Prof. Nomesh Bolia,* National Resource Centre for Value Education in Engineering | |
| *Prof. S. Mukherjee,* Department of Mechanical Engineering | *Prof. C.S. Dey,* Kusuma School of Biological Sciences | |
| *Prof. Neeraj Khare,* Department of Physics | *Prof. Subrat Kar,* Bharti School of Telecommunication Technology & Management | |
| *Prof. S.M. Ishtiaque,* Department of Textile and Fibre Engineering | *Prof. Sanjiva Prasad,* Amar Nath & Shashi Khosla School of Information Technology | |
| *Prof. Arun Kumar,* Centre for Applied Research in Electronics | | |
| **Outside Technical Experts From Industry** | | |
| *Dr. A.K. Saxena,* AGM & Head - BHEL, Gurgaon, Haryana | *Dr. Rajiv Sharma,* Head, Technology  Mission Division, Nano Mission, Department of Science & Technology, Technology Bhawan, New Mehrauli Road, New Delhi- 110 016 | |
| *Mr. Ujjwal Chaudhary,* AGM – Operation, NTPC – EOC, Sector 24, Noida | *Dr. Satendra Kumar,* M/s SWAJAL, 230, Udyog Vihar, Phase-I, Gurgaon | |
| *Dr. S. S. V. Ramakumar,* Director (R&D), Indian Oil Corporation Ltd. (IOCL), Sector 13, Old Faridabad, Faridabad - 121 006, Haryana | *Mr. Vineet Prakash,* Geomarket Operations Manager, Software Integrated Solutions- Schlumberger, 14th Floor, Tower C, Building No. 10, DLF Cyber City,  Phase II, Gurgaon - 122002, India | |
| *Dr. S.D. Sherlekar,* Sankhya Sutra Labs Pvt. Ltd., C/o Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bangalore-560064 | *Dr. Jai Menon,* Group Director, HT Media, 18-20 HT House, K.G. Marg, New Delhi-110 001 | |
| **Managing Director FITT** | | |
| *Dr. Anil Wali* | | |
| **Special Invitee** | | |
| Deputy/Joint Registrar (Accounts) | | |
| Assistant/Deputy Registrar (Stores) | | |
| Assistant Registrar (IRD Accounts) | | |
| **Secretary** | | |
| Assistant Registrar (IRD) | | |

# FOUNDATION FOR INNOVATION AND TECHNOLOGY TRANSFER (FITT)

Foundation for Innovation and Technology Transfer (FITT) at IIT Delhi has been the vanguard of knowledge transfer activities from academia since its inception in 1992. This techno-commercial organisation from academia is counted amongst the successful such organisations. FITT provides superior program management services and is steadily increasing its operational landscape. The varied roles of FITT can be seen in enabling innovations and technopreneurship, business partnerships, technology development, consultancy, collaborative R&D, technology commercialization, development programmes, corporate memberships etc. These roles are necessitated by the key agenda of the Foundation to showcase the Institute's "intellectual ware" to industry, and thereby unlock its knowledgebase and inculcate industrial relevance in teaching and research at IIT Delhi.

FITT is a DSIR approved Scientific and Industrial Research Organisation (SIRO), by virtue of its charter to implement, inter-alia, industrial R&D projects. During financial year 2019-2020, 67 technology development and transfer projects worth ₹16.93 crores have been contracted at FITT.

FITT manages the Institute's IPs and IP Rs. Over 900 patents have been filed for IIT Delhi. During the last financial year 2019-2020, 172 patents were filed, and 8 licensing deals were closed. To augment its outreach and technology commercialization efforts, FITT also engages with specialist outside agencies. Besides enabling regular industry academia meetings, FITT organised a number of visits by IIT Delhi faculty to industrial units in order to assess their R&D needs so as to initiate industry-relevant R&D programmes at the Institute. FITT has been instrumental in organising several visits by overseas companies and delegations, enabling dialogue between the visiting delegates and academic community of the institute.

### Technology Transfer @FITT



*IIT Delhi's technology on "Preparation of the aliphatic anionic surfactant system" by Prof Bhubnesh Gupta, Department of Textile and Fibre Engineering Technology transferred to Gujarat Fluorochemicals Ltd. on May 9, 2019.*

Professional Candidate Registration (PCR) programme has been adopted towards extending the academic courses at the Institute, amongst the targeted segments of industry, research, and academic establishments. Through this unique programme, suitably qualified professionals can undertake relevant semester-long course modules here at IIT Delhi, to augment their knowledgebase and skill set. During the academic year 2019-2020, 46 candidates participated in this programme. PCR programme promises good capacity building potential in the targeted Delhi NCR region.

For the promotion of innovation and entrepreneurship among the graduating students at IIT Delhi, the alumni of the Batch of 1969 have signed an MoU with the Institute to establish an annual award named the "Batch of 1969 Innovation Fellow (Award)". This award is executed and managed by FITT. During the first edition of this award in 2019, Mr Anand Yadav was shortlisted for his project on "Development of Smart Fabric based actuator for Pain Management in Long Standing Professionals and athletes".

Towards fostering innovation-led start-ups, FITT has enabled the establishment and operation of thriving incubators on the campus - Technology Business Incubation Unit (TBIU) and Bio-technology Business Incubation Facility (BBIF). The TBIU is a flagship institute programme designed primarily to promote partnership with new technology entrepreneurs and start-up companies, and also serve as a medium of technology transfer. During the last financial year there were 28 companies' resident at the incubator. FITT provides co-share equipment facility to bio-tech start-ups. These companies are working in the technology domains of IT, Biotechnology, Engineering design, Cleantech etc. Out of 115 companies admitted so far in the incubator since its inception in the year 2000, more than 45 companies have started their up-scaling / commercial operation after completing their incubation and are reported to be growing at a steady pace.

### FITT start-up CYRAN launched BUDDHI kit for School Students



*Prof. Manan Suri, Department of Electrical Engineering (right), launched his "Build Understand Design Deploy Human-like Intelligence" (BUDDHI) kit, a Do It Yourself AI kit, in the presence of Prof. V. Ramgopal Rao, Director, IIT Delhi (centre), Dr. Anil Wali, MD, FITT (left) on January 27, 2020 at the Senate Room, IIT Delhi.*

### Start-up Entries (FY 2019-20)

- Medicfibers
- Sisdy Estilo
- Aerogram
- Gitan Biocare
- Nanosafe Solutions
- Machphy Solutions
- Trydan CleanTech

- Quanteon Powertrain
- Nable IT Consultancy Services

## Start-up Exits (FY 2019-20)

- Virmat
- Cerelia Nutritech
- Aquasence Equipments
- Nano Clean Global
- Vizara Technologies
- Luminasic Technologies

FITT has been at the forefront in managing several innovation and entrepreneurship programmes in the country. As a nodal agency in several Government schemes, FITT administers the Technology Incubation and Development of Entrepreneurs" (TIDE) programme of - Ministry of Electronic and Information Technology (MietY) – for strengthening technology start-ups in selected areas of national concern by leveraging emerging technologies. BIRAC has selected FITT as one of the eight BIG Partners in the country under the Biotechnology Ignition Grant (BIG) Scheme to support start-ups and scientist entrepreneurs from research institutions towards commercialization of research resultants by providing early stage grants for development and maturation of their discoveries/inventions into marketable products. FITT is in association with Pfizer, for implementation of the Pfizer IIT Delhi Innovation and IP Programme, thereby providing financial grant support:

i) Upto ₹60 lakhs to healthcare based innovators/start-ups for incubation

ii) ₹3 lakhs for IP protection for selected applicant

Under the NIDHI-Seed Support System (NIDHI-SSS) programme of DST, introduced in the year 2017, FITT provides funding to incubatee start-ups upto ₹1 crore. So far 11 incubatees have been supported by seed funding to the tune of ₹2.7 crore.

FITT has ben promoting the Women Entrepreneurship and Empowerment (WEE) programme supported by the Department of Science and Technology (DST) at IIT Delhi. WEE classes were conducted during the weekends at IIT Delhi with the global industry experts mentoring the woman entrepreneurs. During the 4th phase of this WEE programme 14 women were shortlisted for the award.

The Deferred Placement Policy (DPP) offered by IIT Delhi is being implemented by FITT for students who opt out of placement in order to inculcate their start-up idea. A student must opt for deferred placement in the final semester of the pre-final year and is eligible to sit for placement after two years if their start-up is not successful. Selected innovative ideas are eligible for incubation at the TBIU. In the year 2019-2020, five applicants have been shortlisted under DPP.

For promotion of entrepreneurship, FITT and N.S. Raghavan Centre for Entrepreneurial Learning (NSRCEL), IIM Bangalore has been mentoring start-ups and innovators. Joint Mentoring Session by IITD & IIMB alumni is held at FITT on the 4th Saturday of each calendar month.



*Mentoring session for innovators and budding start-ups*

FITT has associated with Ministry of Skill Development and Entrepreneurship (MoSDE) for execution of National Entrepreneurship Awards (NEAS). This award aims to recognise the efforts and achievements of exceptional entrepreneurs and those individuals and organisations who are working in the field of entrepreneurship development.

Power System Operations Corporation Ltd. (POSOCO), in association with FITT has been implementing the POSOCO Power System Awards (PPSA) since 2013. PPSA is a part of the CSR initiatives of POSOCO, which aims to reward excellence in the area of power system and its related fields. During the 8th edition of this award- PPSA-2020, 15 awardees were shortlisted in Doctoral category and 15 awardees in the Master category.



*Awardees of PPSA-2020 were felicitated by Mr. Sanjay Malhotra, Additional Secretary, Ministry of Power, GoI and Prof. T.C. Kandpal, Deputy Director (Operations), IIT Delhi at the Senate Room, IIT Delhi*

The Defence Innovation Organisation has signed an MOU with FITT to foster innovation & technology development in Defence and tor entrepreneurs and MSMEs to create, deploy and commercialise technologies and products for the Indian military and defence PSUs.



*FITT organised an iDEX Awareness Session at IIT Delhi on Dec. 04, 2019*

To encourage the spirit of entrepreneurship, FITT has instrumented the FIRE programme - Faculty Innovation and Research-driven Entrepreneurship. The programme envisions commercialisation of the technologies developed at IIT Delhi through creation of Faculty-led Enterprises. Technologies and concepts backed by strong scientific evidence that may lead to a commercially viable solution shall be supported under this programme.

FITT collaborated with Boeing India for Boeing University Innovation Leadership Development Programme (BUILD) - 2019. The programme aimed at identifying student innovators and budding start-ups and transform their ideas into sellable value propositions in the Northern region.



*Pi Drones and PS-1925 two start-ups mentored at FITT were among the Top 6 teams selected in BUILD-2019*

To help entrepreneurs working in deep technology domains and further commercialization, FITT has launched the Platform for Harnessing Deep Technologies (PHD) Incubator Programme. The idea is to support innovators

and entrepreneurs to carry forward a promising deep technology idea and generate proof of concept to validate the idea. Further details on application is available on: fitt-iitd.in

FITT has corporate members representing small/medium/large scale industrial and R&D units. Corporate members receive preferential treatment in matters of collaboration with the Institute in addition to information and technical services that FITT provides.

**FITT has been implementing BIRAC's SPARSH- the Social Innovation programme for Products:** Affordable and Relevant to Societal Health. This programme is aimed at the promotion and development of innovative solutions to society's most pressing social problems. Under this programme, shortlisted innovators are provided with a mini kick start grant of ₹5 lakhs and a monthly fellowship of ₹50,000/- along with technical support.

The AIC IIT Delhi Sonipat Innovation Foundation a Section 8 company created by FITT and IIT Delhi at the I-TEC, IIT Delhi Sonipat Campus under the Atal Innovation Mission (AIM) of the NITI AAYOG is ready to take off following the receipt of the first tranche of funding from the AIM. AIM is supporting the AIC for creating a world class incubation facility with over 10,000 sq.ft. of space and state-of-the-art physical infrastructure, in terms of capital equipment and operating facilities for incubatee start-ups. Apart from this, business planning support, access to sectoral experts for mentoring and seed capital, industry partnerships, training and other relevant components required for supporting innovative start-ups will be provided.

## GLIMPSES OF FIIT ACTIVITIES DURING FY 2019-20



*FITT organised a lecture on "Industry 4.0 – India Inc Gearing-Up for the Change" for delegates from Samsung STI, South Korea June 19, 2019.*



*"Python for Glass Genomics (PyGGi)"—an indigenous software package was launched at the Senate Room @IIT Delhi August 2, 2019.*



*Start-ups and Innovators in the area of life science met on July 12, 2019 for a networking session at the Bharti School, IIT Delhi.*



*Bio-tech Innovators meet on October 25, 2019 at IIT Delhi*

Seminar on "AI in Healthcare" held on July 6, 2019 at the Seminar Hall, IIT Delhi.


Delegation from the University of Queens, Belfast visited FITT on May 3, 2019.


FITT signed MoU with Power Finance Company on October 3, 2019


Vinod Khosla, alumnus IIT Delhi, co-founder, Sun Microsystems is discussion with start-ups at the Technology Business Incubator during his visit to IIT Delhi on August 9, 2019.


FITT, AIC- BIMTECH and Huddle Incubator launched a sector agnostic programme, tailor-made for the start- up founders of young India on February 10, 2020.


Union Minister of State for Commerce and Industry, Shri Som Parkash, GoI visited FITT's incubation centre on November 13, 2019.


FITT in association with Gopalakrishnan- Deshpande Centre for Innovation & Entrepreneurship, IIT Madras organised the 9th Cohort over two weekends in February on Feb. 15-16; Feb. 21-22, 2020.


A delegation from Danish Patent and Trademark office visited FITT on November 25, 2019.

# Collaborations

Global outlook of Indian education is certainly a game changer in this age of faster growth and economic opportunity. International collaboration by Indian Institutions is prominent in higher education, which has remarkably transformed the higher education ecosystem. With premier institutions like IIT Delhi working on a student-centric learning development model, it becomes imperative to have a holistic and integrated outlook. This means, institutions have to enhance the learning outcomes for its students. While the enrolment numbers in higher education in the country have increased to the largest in the world, this magnitude has also amplified competition, making differentiated and impactful deliverables of education mandatory. One such driving force of institutional development is Internationalization of education and increasing international collaborations.

## Indian Institute of Technology Delhi (IITD) and National Chiao Tung University (NCTU), Taiwan

IITD-NCTU have established academic cooperation through a Joint Doctoral Program (JDP) as a part of an agreement signed on the 16th May 2019. The major activities that have emerged through this academic cooperation in the year 2019 include the enrollment of around 15 Numbers of Ph.D. students; establishment of the National Chiao Tung University Liaison Office at IIT Delhi; Rolling out of NCTU-IIT Delhi Collaborative Project proposal scheme similar to MFIRP programme of IIT Delhi and initiation of 18 Nos. of such collaborative research projects under the scheme. Joint Workshops programme at IIT Delhi to connect the potential collaborators from faculties of IIT Delhi, NCTU, Industry Partners, and the students were also held during November 2019.

## Scheme for Promotion of Academic and Research Collaboration (SPARC)

SPARC programme is initiated by the Ministry of Human Resource Development (MHRD) for research collaboration and academic exchanges with institution from partnering country. The scheme is being administered by the IIT Kharagpur as Nodal Implementing agency of the programme.

During first call in 2018-19, total 16 projects involving, 14 Faculty Members from nine Departments and Centres. The projects are administrative support and implemented by IRD within the overall objectives of the SPARC programme these projects have progressed well including the exchange visits of students and faculty members from both countries.

In the 2nd announcement call during July/August 2019, more than 60 proposals have been received from IITD faculty members. The evaluation is under progress at MHRD.

## UQ – IITD Academy of Research (UQIDAR)

The University of Queensland (UQ), a top 50 global university in Australia, and the Indian Institute of Technology Delhi (IIT Delhi), an Institution of global repute, have joined hands to create a joint Ph.D. programme that will support Ph.D. scholars to deliver global impact.

The University of Queensland and Indian Institute of Technology Delhi Academy of Research (UQIDAR) invited applications from exceptional candidates with backgrounds in science, technology, engineering, mathematics, humanities and social sciences, for Ph.D. research projects commencing in July 2020.

A delegation from UQ led by their VC visited IIT Delhi on September 26, 2019. IIT Delhi organized department tours and a faculty roundtable discussion. The delegation was led by Vice Chancellor, UQ and other dignitaries. This was followed by an information session for prospective students and an Industry forum meet that happened at the India Habitat Centre.

## Memorandum of Understandings (MoUs) Signed by the Institute

In order to have close cooperation in the field of Teaching and Research, the Institute has signed MoUs/Agreements with institutions/organisations in India and abroad. Currently there are 122 MoUs with foreign Institutions/ Organisations and 30 MoUs with Indian Institutions/ Organisations. The objectives of these MoUs include exchange of students and faculty, joint research activities and fellowships for training at doctoral and postdoctoral level etc.

During the period, 17 MoUs were signed with the foreign Institutions/Organisations:

| S.No. | Name of the Institution | Country |
|---|---|---|
| 1 | Newcastle, Australia | Australia |
| 2 | Macquarie University Sydney, Australia (Student Exchange Agreement) | Australia |
| 3 | The Royal University of Bhutan | Bhutan |
| 4 | Implement Agreement Universiti Brunei Darussalam (UBD) | Brunei |
| 5 | University of Victoria | Canada |
| 6 | Technical University of Denmark (DTU) | Denmark |
| 7 | Arab Academy for Science Technology and Maritime Transport | Egypt |
| 8 | The American University in Cairo | Egypt |
| 9 | Universite Federale De Toulouse MIDI- Pyrenees | France |
| 10 | TU9 German Universities of Technology e.v. | Germany |
| 11 | University of Mauritius | Mauritius |
| 12 | KTH Royal Institute of Technology Stockholm (Renew) | Sweden |
| 13 | National Taipei University of Technology (Taiwan) | Taiwan |
| 14 | National Formosa University Taiwan | Taiwan |
| 15 | University of Newcastle upon Tyne UK | UK |
| 16 | Loughborough University UK (Renew) | UK |
| 17 | University College London | UK |

# INTERNATIONAL VISITORS

## Ministerial/Senior Diplomatic International visits

- Prof. Yao-Nan Lien, Dean College of Information and Electrical Engineering, Asia University Taiwan visited the Institute on April 23rd 2019. In the meeting the discussion revolved around latest academic development of mechanical engineering and introducing some programe & scholarships between IIT Delhi and Taipei Economic and Cultural Centre, Taiwan.

- Dr. Malcolm Butler, VP Academic & Research from St. Mary's University, Helifax, Nova Scotia, Canada visited the Institute on May 1st 2019 to explore the opportunities and possibilities of establishing academic & research partnership between IIT Delhi and St. Mary's University.

- Ms. Tina Hovsepian, an architect and founder of Cardborigami visited the Institute on May 23rd 2019.

- Ms. Rebecca Hall, Senior Industry Expert, Australian Trade and Investment Commission, Australia visited the Institute on 17th July 2019, to discuss the impact "Institute of Eminence (IOE)" initiative on India's higher education sector & key opportunities for Australia to engage with IITs & IoEs.

- Ms. Hilda Farkas Counsellor for Science and Technology from Embassy of Hungary visited the Institute on 8th August 2019.

- Mr. Chintaka Lokuhetti, Ministry of Science, Technology and Research, Sri Lanka visited the Institute on 13th August 2019, to explore future collaboration between the two countries.

- Hon'ble Minister Mr. Buti Manamela along with 3 members from South Africa visited the Institute on 28th August 2019, to possibilities of future cooperation between two countries in area of Higher Education Science & Technology.

- Prof. Tijjani Muhammad-Bande, President-elect of the UN General Assembly, Nigeria on 02nd September 2019.

- Dr. Chutima Hanpachern, Deputy Secretary-General of the OCSC visited the Institute on 5th September 2019.

- Mr. Grant McPherson, Chief Executive, Education New Zealand visited the Institute on 23th September 2019, to strength the New Zealand IITD relationship.

- High Commissioner H.E. Ms. Grace Akello, Uganda High Commission visited the Institute on 03rd October 2019.

- Prof. Herman Rauschenberg from Delft University of Technology visited the Institute on 17th October 2019.

- Hon. Muswere Jenfan, Deputy Minister from Embassy of Zimbabwe on 18th October 2019.

- Hon. Minister Badara Joof, Minister for Higher education research, science & technology, Gambia on 30th October 2019.

- Prof. Dasho Nidup Dorji, Vice Chancellor of the Royal University of Bhutan visited the Institute on 07th November 2019, to discuss the idea of reserving seats in Technology based Masters Programme at IIT Delhi.

- Mr. Fred Eisenberger, Mayor of Hamilton, Canada visited the Institute on 20th November 2019, to exploring international tie-up opportunities.

- Hon. Dan Tehan MP, Australian Minister for Education on 21st November 2019.

- Minister of Higher Education & Scientific Research, Egypt on 26th November 2019.

- Mr. Patrick Mullins, First Secretary, Australian High Commission visiting the Institute on 04th December 2019, to discuss the initiatives that IIT Delhi has taken to address the issue of plastic waste and recycling.

- Prof. Vladimiro Miranda from INESC Technology & Science, Portugal visited the Institute on 12th December 2019, to discuss the possibility of signing an MoU with the IIT Delhi.

- Ms. Yining Guo, Director International Cooperation (Tsinghuwa University, Beijing China) visited the Institute on 08th January 2020, to explore the possibilities for collaboration.

- Mr. Usuki, CEO of new Frontier Capital Management, Hong Kong visited the Institute on 08 January 2020, to discuss Innovation & leading edge technology in India collaboration of Japanese corporation with India startup & exchange of information on innovation & incubation.

- Mr. Erin L. Moran IITKGP Foundation of USA visited the Institute on 20th January 2020, to meet with Dean AAIP.

- Prof. Dame Anne Jhonson, Vice President, International of the Academy of Medical Science, London visited the Institute on 28th January 2020, to discuss their AMR programme to organize the second scientific meeting in India in 2021.

- Mr. Sayit Yusuf, Deputy President of the Presidency of Turks Abroad and related Communities (YTB) of the Republic of Turkey visited the Institute on 29th January 2020, to discuss Turkey Scholarship.

- Prof. Timothy Killeen, President, University of Illinois visited the Institute on 31st January 2020, to explore possible future interaction with IIT Delhi.

- Mr. Jean-Francois Dutrey from Campus France Agency, Paris visited the Institute on 13th February 2020.

- Mr. Yan Xiad, CEO ZTE India visited the Institute on 19th February 2020.

- Mr. Winston Peters, Deputy Prime Minister and Minister of Foreign Affairs, New Zealand on 26th February 2020.

## Other International Delegation Dignitaries

The number of delegations from the Industry, Academia and the Government from several countries visited the Institute to explore the possibilities of mutual interaction. Some of these are highlighted below:

- A 3 member delegation from UCL Institute of Healthcare Engineering, London visited the Institute on 11th April 2019.

- A 6 member delegation from University of Hong Kong visited the Institute on 18th April 2019.

- A delegation from Industrial Bank of Korea visited the Institute on 18th April 2019.

- A 2 member delegation from Stellenbosch University, South Africa visited the Institute on 30th April 2019.

- A delegation from Embassy of Republic of Iraq/Cultural Attaché visited the Institute on 3rd May 2019 to discuss about educational cooperation between India and Iraq with the University.

- A 3 member delegation from YUVA, Mauritius visited the Institute on 6th May 2019 to learn about the laudable case(s) and propose to deliver a short speech to students (IIT Delhi) regarding leadership and youth engagement.

- A 35 member delegation led by Mr. Gustavo Westmann (Political Counsellor, Embassy of Brazil) visited the Institute on 9th May 2019 to discuss regarding promote the exchange of ideas, projects and effective actions.

- A 3 member delegation from University of Porto, Portugal visited the Institute on 20th May 2019 for discussing regarding mobility agreement for student exchange.

- A delegation from University College of Dublin (UCD), Ireland visited the Institute on 21st May 2019.

- A 4 member delegation from National Cheng Kung University, Taiwan visited the Institute on 21st May 2019 to explore the opportunities of enhancing the interaction between IIT Delhi and NCK University, Taiwan.

- A 3 member delegation from Uganda High Commission/ Soroti University of Science and Technology visited the Institute on 23rd May 2019.

- A 10 member delegation from Government of the Kingdom of Morocco visited the Institute on 24th May 2019 for discussion on expertise of India in the field of vocational training with a focus on specific sectors such as digital, paramedical and naval industry (related to construction of ships etc.).

- A delegation from Weizmann Institute of Science visited the Institute on June 6th 2019 and discussed opportunities for collaboration/partnership, student exchange programme and research collaboration between IIT Delhi and Weizmann Institute of Science.

- A 3 member delegation from Skills Future, Singapore visited the Institute on 6th June 2019 to explore potential areas for (i) collaborations with IIT Delhi and (ii) to understand the India's Skills Ecosystem and the role of IIT plays to support the workforce development efforts.

- A 3 member delegation from Embassy of Chine visited the Institute on 21st June 2019 to explore the potential of cooperation between IIT Delhi and Universities of China on Science, Technology and innovation.

- A 2 member delegation form University of Liverpool, England visited the Institute on 28th June 2019 to discuss potential partnership and potential areas of exchange alongside research or academic collaboration.

- A 6 member delegation from Shanghai Municipal Commission of Housing, China visited the Institute on 17th July 2019, to exchange ideas about urban construction & Technology and to promote cooperation between IIT Delhi and Shanghai.

- A 4 member delegation from University of Auckland visited the Institute on 31st July 2019, to discuss advancement of the Duel Ph.D. program and the proposal of setting up a New Zealand Center of Excellence at IIT Delhi.

- A 4 member delegation from Khalifa University, UAE visited the Institute on 31st July 2019, to explore the potential of Academic & Research cooperation or opportunities for student exchange programme at undergraduate & graduate level.

- A 3 member delegation from United Arab Emirates University, UAE visited the Institute on 7th August 2019, to establish high level dialogue & discuss strategic cooperation between two Institutions and exploring ways to strength research collaboration & stimulate mobility of students and scholars.

- A 2 member delegation from University of Melbourne visited the Institute on 19th August 2019, to discuss research collaboration.

- A group of 10 member delegation from Hungarian Universities visited the Institute on 2nd September 2019, to discuss further development of the cooperation between the two Institutions.

- UKIERI (3rd September 2019)

- A group of 13 Students from Royal University of Bhutan visited the Institute on 4th September 2019.

- A 8 member delegation form National Formosa University, Taiwan visited the Institute on 5th September 2019, to discuss academic cooperation and signing the MoU between IIT Delhi and NFU.

- A 3 member delegation from University of Sheffield visited the Institute on 09th September 2019, to discuss how IIT Delhi and University of Sheffield can collaborate & work together.

- A 32 member delegation from Danish ATV Think Tank visited the Institute on 16th September 2019, exchange knowledge & form relationships that can provide a future fruitful collaboration with mutual benefit.

- A 3 member delegation from Cambridge University press visited the Institute on 18th September 2019, to explore opportunities of collaboration, discuss new research accessibility platforms created by Cambridge University Press.

- A 2 member delegation from Columbia University School of Professional Studies, New York visited the Institute on 18th September 2019.

- A 4 member delegation from French Institution visited the Institute on 20th September 2019, to discuss further enhance academic cooperation and student mobility.

- A group of 20 students from Victorian young leaders, Australia to India visited the Institute on 24th September 2019.

- A 6 member delegation from University of Leeds visited the Institute on 24th September 2019.

- A 5 member's delegation from India-Oman Joint Committee for Science & Technology (JCSTC) visited the Institute on 25th September 2019, to discuss future collaboration.

- A 3 member delegation from University of Namibia visited the Institute on 31st September 2019.
- A 3 member delegation from Edith Cowan University, Australia visited the Institute on 30st September 2019.
- A group of 5 members from City University of Hong Kong visited the Institute on 03rd October 2019.
- A 8 members group from University of Indonesia visited the Institute on 08th November 2019, to explore cooperation.
- A 5 member delegation from Danish Think Tank visited the Institute on 21st November 2019, to discuss different areas in which Denmark & India can collaborate in science & Research activities.
- A 6 member delegation from Newcastle University, UK visited the Institute on 21st November 2019, to collaborate for research & explore avenues for further development in research & International internship programme.
- A 10 member delegation from University of Sydney visited the Institute on 22nd November, 2019.
- A 6 member delegation from Hong Kong Bapist University visited the Institute on 25th November 2019, to explore potential collaboration between IIT Delhi and Hong Kong in areas of research, student learning etc.
- A 3 member's delegation from Embassy of Argentina visited the Institute on 25th November 2019, to explore fields of cooperation and to faster mobility scheme between Argentina and IIT Delhi.
- A 3 member's delegation from Embassy of Japan visited the Institute on 26th November 2019.
- A group of 12 students from Zhejiang University of China visited the Institute on 27th November 2019, to promote the culture & Technology communication between the students of both India and China.
- A 2 member delegation from University of Waterloo, Canada visited the Institute on 28th November 2019, to discuss issues of common interest & provide an update on development at University of Waterloo.
- A group of 40 students 58th (Know India Programme) KIP visited the Institute on 04th December 2019.
- A 3 member's delegation from Georgia Institute of Technology, USA visited the Institute on 09th December 2019, to learn about the current priorities of IIT Delhi about the landscape of higher education in India and potential area of interest for collaboration.
- A 3 member delegation from University of Victoria visited the Institute on 11th December 2019, to discuss & explore collaboration opportunities especially by deepening their research connections.
- A group of 17 members from National Centre for Good Governance (NCGG), Maldives visited on 12th December 2019.
- A 5 member delegation from Guangxi Administrative College, China visited the Institute on 31st December 2019, to learn the teaching mode at IIT Delhi.
- A 10 member delegation from KU Leuven Science, Technology & Engineering group visited the Institute on 06 January 2020, to explore ways to further develop this relationship both in terms of structure, research cooperation as well as possible education oriented mobility.
- A 7 member delegation from Wesleyan University, US visited the Institute on 10th January 2020, to discuss possible student exchange partnership between Wesleyan University and IIT Delhi.
- A group of 21 students with their faculty members from New York University, US visited the Institute on 21st January 2020.
- A group of 25 member delegation from UK Space delegation (British High Commission) visited the Institute on 23rd January 2020, to exploring collaboration opportunities in the Indian Space Industry.
- A 2 member delegation from Nagoya University Japan, visited the Institute on 03rd February 2020.
- A group of 15 members from The University of Auckland visited the Institute on 10-11 February 2020 for 2 day workshop on Knowledge exchange organized by Mr. Brett Berquist (Director International, The University of Auckland).
- A 2 member's delegation from Kyoto University visited the Institute on 11th February 2020, to discuss exchange views on initiatives to future early career research.
- A 2 member delegation from IMT Atlantique visited the Institute on 21st February 2020.



A 10 member delegations from Taiwan
(2 August 2019)



A group of 40 students from various countries under Knowledge India Programme (KIP) visited the Institute (20 August 2019)

# Distinguished Visitors


Prof. Tijjani Muhammad-Bande, President-elect of the UN General Assembly, Nigeria visited the Institute (02 September 2019).


A group of 80 member's delegation from UKIERI visited the Institute (03 September 2019).


Indo-Mexican Social Innovation Workshop and Seminar (09 October 2019).


Hon. Minister Badara Minister for Higher Education, Research, Science & Technology, Gambia (30 October 2019).


Prof. Dr. Gamal Helmy Said, President of Benha University, Minister of Higher Education & Scientific Research, Egypt (26 November 2019).


Prof. Way Kuo, President City University Hong Kong (16 January 2020).


Joint session by French & German Ambassadors (17 February 2020)


Rt. Hon. Winston Peters, Deputy Prime Minister and Minister for Foreign Affairs, New Zealand (26 February 2020).

# Corporate Relations

Corporate Relations at IIT Delhi aims to build collaborations that link the industry to our research community while creating scalable solutions for the local and global community. More than 200 of our faculty are actively involved in industry collaboration projects today with many co-founders of startups. Our partnerships are focused on merging science and engineering innovations at the Institute with the rigor and implementation capabilities of the industry to create effective solutions.

## Events Organised During the Period

**IIT Delhi Industry Day 2019:** Industry Day aims to harness and promote the power of Industry-Academia collaboration, kindle ideas for cogent partnerships and showcase cutting edge technology research conducted by the IIT Delhi research community. Our objective is to demonstrate technical research capabilities, forge new collaborative relationships and further strengthen our existing partnerships.

The annual flagship event of IIT Delhi, Industry Day 2019 was organised on 21st September, 2019. The inaugural session was addressed by Dr. V. K. Paul, Member (Health), NITI Aayog, Prof. V. Ramgopal Rao, Director, IIT Delhi, and attended by business leaders, research community, delegates from Finland, Japan and IIT Delhi faculty, staff and students.

Chief Guest Dr. V.K. Paul stressed on the idea of launching exchange programmes between medical institutions like AIIMS and IIT Delhi on critical health issues, which can support immersion programmes of IIT Delhi.

Prof V. Ramgopal Rao, Director, IIT Delhi called upon the industry to collaborate with the academia. He added, "IIT Delhi is not only looking for collaborations with the industry but IIT Delhi also wants the industry to treat it as part of their innovation ecosystem".

Prof. Anurag S. Rathore, Dean, Corporate Relations, IIT Delhi said, "A productive academic-industry relationship is the necessary foundation for the long-term development of India".

Key highlights:

- Footfall: 550+ Industry, 136 Faculty; 44 Staff; 595 Students + 110 Student volunteers, over 50 elite speakers.
- Industry Day 2019 witnessed discussions and deliberations by illustrious speakers like Dr. Randeep Guleria, Director, AIIMS; Mr. M.S. Unnikrishnan, MD & CEO, Thermax Ltd.; Mr. R.V. Jasra, Sr. V-P, R&D, Reliance Industries; Mr. Ajit Manocha, President & CEO, SEMI and many other thought leaders on the following five themes:
  1. Clean Energy for Sustainable Economy and Environment
  2. Sustainable Medical Technologies
  3. Emerging Nano and Advanced Materials
  4. Sustainable Environment
  5. Make in India
- More than 25 hands-on products demonstrated
- Over 130 industrially relevant posters showcased
- Another special feature was a session on "Women in Science" that discussed the need for gender parity in various science disciplines by women personalities from various fields. This was followed by a Deep Tech Panel Discussion.
- Placement session exclusively for Ph.D. students of the Institute in which 17 expressed interest and 11 companies attended Industry Day to interview more than 70 students.
- "Research Café" sessions were also held on side-lines to facilitate interaction between IITD research scholars and CXOs of Industry.

**TCS Research Day:** TCS Research Day was organised on 21st Jan 2019 with the main objective to identify synergies and collaborate. It was attended by senior delegates consisting of their CTO, Senior Scientists, Business Unit VP's and many IITD faculties. Daylong discussion and deliberations were around five topics: Life sciences, Energy and Utilities, Manufacturing, AI and 5G.

**TCS 5G Workshop:** IIT Delhi – TCS 5G workshop was organised on 13th May'19, with the aim to brainstorm on the key areas of collaboration under 5G that can be pursued forward, in the form of joint research to leverage on the expertise of IIT Delhi.

Workshop was jointly attended by IIT Delhi faculty including Prof. Anurag S. Rathore - Dean, Corporate Relations, Prof. Brejesh Lall - Department of Electrical Engineering, Prof. Monika Aggarwal - Centre for Applied Research in Electronics, Prof. Huzur Saran- Computer Science and Engineering and key luminaries from TCS, like Debashis Mitra- CTO Industry Forum and Standards Cell, Rajeev Shorey- Principal Scientist, Gautam Shroff- Chief Scientist and many other TCS business unit heads.

**Finland Day at IIT Delhi:** A delegation consisting of The Permanent Secretary - Ministry of Economic Affairs and Employment, The Ambassador Designate – Embassy of Finland, India, and other officials from Ministry of Economic Affairs and Employment, Embassy of Finland, and Ministry of Education and Culture and Business Finland visited Corporate Relations Office to foster relations with IIT Delhi on 22 November 2019. Accompanying the government officials was a delegation representing the top 10 companies of Finland, namely City of Tampere, IQM Finland Oy, Reaktor, Ramboll Finland Oy, Quupa, Nokia, Kone and Fortum. This event was attended by the Director IIT Delhi, Dean Corporate

Relations, Prof. B.K. Panigrahi (EE), Prof. Niladri Chatterjee (Maths), Prof. Chetan Arora (CSE), Prof. Debanjan Bhowmik (EE), Prof. Kedar Khare (Physics) and Prof. Manan Suri (EE). The areas of technical collaboration included Imaging, Quantum Computing, Artificial Intelligence and Air Pollution. Along with Industry Partnerships, there was also a discussion with The University of Tampere to hold joint programmes with IIT Delhi.

**Huawei and IIT Delhi Collaboration Meet:** Huawei is a leading global provider of information and communications technology (ICT) infrastructure and smart devices. Team from Huawei China visited IIT Delhi on 10th Dec. 2019 to further explore new and future area of research opportunity. Key areas discussed were autoML in machine learning and deep learning, AI-Enable database, Intelligent Storage, Big data Platform, HPC, GPU Accelerator, Edge Computing, Distributed computing and Intelligent (AI) Video Surveillance. This meeting was attended by Prof. Chetan Arora, Department of Computer Science and Engineering, Prof. Harshan Jagadeesh, Department of Electrical Engineering, Prof. Sumantra Dutta Roy, Department of Electrical Engineering, Prof. Smruti R. Sarangi, Department of Computer Science and Engineering, Prof. Arpan Chattopadhyay, Department of Electrical Engineering and Dr. Manish Agarwal, Computer Services Centre.

**Denso Day:** Denso Day was organised on 28th January 2020. The event focused on setting Technology Collaborations and Student Recruitment. Day included discussions and deliberations around three key focus areas:

- FIoT: Factory IoT
- MaaS: Mobility as a Service
- Autonomous Vehicles

The event was attended by Denso's Vice President, Mr. Hiroyuki Wakabayashi, and various IIT Delhi faculty members including Prof. Chetan Arora (CSE), Prof. Subodh Sharma (CSE), Prof. Sunil Jha (ME), and Prof. Arpan Chattopadhyay (EE). There was also a Denso booth that showcased cutting edge technology that Denso is actively working on.

**Nano 2020 @ IIT Delhi:** In the run-up to the 11th edition of 'BENGALURU INDIA NANO 2020', India's biggest nanotechnology event, 'Nano 2020: An Industry-Academia Interaction' was organised at IIT Delhi on 5th February 2020. It was inaugurated by Prof. V. Ramgopal Rao, Director, IIT Delhi. The attendees got a glimpse of research at IIT Delhi in the area of nanotechnology. The day long event saw active participation from IITD faculty and research scholars. This event was in collaboration with Nano Research Facility (NRF) at IIT Delhi and spearheaded by Prof. Neeraj Khare.

### Collaborations

**TCS:** TCS and Corporate Relations Department are closely working together since more than 3 years now on Sponsored Research Projects with Prof. S.K. Saha, Prof. Shubhendu Bhasin, Prof. Anurag S. Rathore and Prof. Sanjiva Prasad, Research Scholar Programme and Industry Day. Apart from faculties involved in Sponsored Research projects we also have Prof. A.K. Ganguly (DD S&P), Prof. B.K. Panigrahi and Prof. Rahul Garg as members of the TCS engagement.

### Research Scholar Programme

- Currently there are five scholars availing scholarship from TCS since 2018
- In July 2019, TCS announced hike in scholarship amount
  1. Junior Fellowship (1st and 2nd Year) : ₹41,000/- per month
  2. Senior Fellowship (3rd and 4th Year): ₹45,000/- per month

**Srijan – Mock Meat Project:** Srijan Technologies Pvt. Ltd. has awarded a consultancy project to Dr. Kavya Dashora, Assistant Professor, CDRT titled "Development of meat-textured, high protein plant meat products from plant-based sources (Mock Meat)".

**Nutanix MoU Signing:** Nutanix Technologies, a unicorn and a global cloud computing software company, signed a Memorandum of Understanding with Foundation for Innovation and Technology Transfer (FITT) for long term collaboration between the global R&D teams of Nutanix and Faculty of IIT Delhi in the field of Distributed Systems, Virtualized systems, Artificial Intelligence and Machine Learning for Data Center Management. Under the MoU, Nutanix Technologies has awarded two projects on Learned Index Structures and Network Efficient VM scheduling, to a group of faculty members of the Department of Computer Science Engineering, IIT Delhi.

### Tower Research Capital:

- Tower Research Capital has collaborated with IIT Delhi to set up a merit scholarship for undergraduate students under Corporate Social Responsibility (CSR) Programme. The objective of this initiative is to give Scholarship to undergraduate students entering their 3rd & 4th years. An online Hacker Rank Test was conducted on November 6th, 2019, in LHC, IIT Delhi. Harish Yadav, a student of 2nd year from Computer Science & Engineering successfully qualified the test and has been awarded with the Tower Research Capital India Scholarship.
- Tower Research Capital contributed ₹40 Lacs as a part of their CSR Funding.
- Additional CSR contribution of ₹2 lacs from Tower Research Capital Markets India Pvt. Ltd. for Environment Related Projects at IIT Delhi.

**Yes Bank:** Yes Bank Chair Position held by Prof. S.K. Mishra has received its annual fund of ₹5 Lac. The chair position focuses on excellence and leadership in research and development in the field of Climate Change Research in general and Climate model development and improvement for accurate future climate change projections in the Indian context, in particular.

**Agilent to Set Up Incubator Site for Bioanalytical Science:** Agilent and IIT Delhi signed a MoU under which, Agilent, a leader in the biopharma space, contributed funds to support the incubator at IIT Delhi to support researchers at the institute to establish global best practices for identifying and characterizing biopharmaceuticals. Agilent CEO, Mike McMullen, discussed about Agilent's history of innovation, focus on research and academia, and vision for the future. Agilent will be contributing funds to the IIT Delhi

incubator site, as a part of its corporate social responsibility initiative, with the goal of enhancing the quality and safety of biotherapeutics. The aim is to offer world-class training to researchers from academia and industry on protein characterisation. The setup will be under the DBT Centre of Excellence for Biopharmaceutical Technology (CBT).

**Creche Inauguration under Share the Care – Construction Worker Programme – 3rd February:** One Porta Cabin modified for its use as Creche for the children of construction workers has been sponsored by National Buildings Construction Corporation Limited (NBCC). Creche facility was inaugurated on 3rd February at NBCC project site of Faculty Housing. This initiative aims to promote welfare of small children of the construction workers deployed at execution of various project sites that are spanned over campus for next 4-5 years and entails the following objectives:

- A Daycare Centre for children who accompany their parents to the construction site
- Mid-day meals for the children.
- Regular Teaching

**Ansys Software Pvt. Ltd.:** Ansys contributed ₹10 Lacs as a part of their CSR Funding. They will be collaborating to conduct a technical research project.

**Mitsui & Company India Pvt. Ltd.:** Mitsui & Co. India Pvt. Ltd. is collaborating with IIT Delhi for a project based on the study of batteries of EVs. An MoU signed between Mitsui and FITT with a Project Budget of 50 lakhs. In view of the prevalent environmental issues, Mitsui want to help the society by supporting a project in this domain, through its trust - Mitsui & Co. Environmental Engineering Trust, MEET. MEET was established when Mitsui had completed 100 years in India (in 1993), and they use this as a way to give back to the country.

**Twitter Team's Visit to DA/ML Lab:** Twitter team led by Mr. Parag Agarwal (CTO), Mr. Manish Maheshwari (MD), Ms. PrethaAthrey (Marketing Head) along with Public Policy team members at Twitter visited DA/ML lab at SIT building and interacted with research scholars on 14th February 2020. They also delved upon future collaboration opportunities with IIT Delhi.

**Resil Chemicals:** Resil Chemicals Private Limited is majorly in Manufacturing (Metals & Chemicals, and products thereof) business from last 29 years. They have collaborated with Smita Research Lab headed by Prof. Ashwini K. Agrawal and Prof. Manjeet Jassal in terms of a CSR Contribution of ₹18.28 Lac.

**DS Group – Centre of Excellence:** Dharampal Satyapal (DS) Group is a diversified conglomerate that intends to further its "Livelihood" dimension of CSR by collaborating with IIT Delhi. They have contributed ₹4.9 Crore for the creation of DS Centre for Entrepreneurship at IIT Delhi. The Centre will be located in the upcoming Research Park in the main IIT Delhi campus. In addition, a DS Chair of Artificial Intelligence will be established.

In the near term, the Centre will aim on seeking out teams that offer promising ideas on entrepreneurship and offering them support to ensure success. In the long term, the Centre will aim to gradually establish itself as a credible, global entity on Entrepreneurship. IIT Delhi students are responsible for more than half of the Unicorns that have been created by Indians across the world. This Centre will aim to further ignite this spirit and help create an Indian ecosystem that encourages innovation and entrepreneurship.

**Jhajjar Research Park:** IIT Delhi's Jhajjar research park in Jhajjar district of the Haryana, will be a health satellite campus for the research and development in the Biomedical Research with the strong collaboration with the National Cancer Institute (NCI), All India Institute of Medical Science (AIIMS), Industries, international collaborators and other institutes in the Delhi and National Capital Region. This research park would provide access to an outstanding research community in an unparalleled environment and gives opportunity to work in close proximity with Industry partners to weave a symbiotic interface to give a boost to translational research and innovation activities through interdisciplinary and impactful bio-research. It will provide an organisational structure, eco-system and governance processes that can ensure long term sustainability, scope for growth, and a collaborative model of working, public/private partnership and entrepreneurship for the Health Technology Initiatives to meet the National goals.

## COVID -19

IIT Delhi is committed to developing solutions to help diagnose and treat those with COVID-19. To jointly contribute to the society, we requested our partners in providing financial support through CSR funds to combat this global public health emergency. Our 30+ faculty members and incubated startups are working on over 28 Covid related projects targeting areas like PPE, Therapeutics and Diagnostics. Overall, we have 13 PPE Projects, 11 for Diagnostics and 4 for Therapeutics. Apart from our 100+ industry partners, we are also engaged with the Principal Scientific Advisor's Office and the CII to ensure that the efforts put in by IIT Delhi are well recognised and suitably funded. Following are the contributions received so far:

| S.No. | Company | Project Title | PI | Amt. (In Lakhs) |
|---|---|---|---|---|
| 1 | Kisankraft | Development of a novel peptide-based therapy for COVID-19 | Dr. Avinash Mishra, Growdea Tech. Pvt. Ltd. | 3 |
| 2 | Huawei Telecommunications Co Pvt. Ltd./Plan International Ltd. | Infection-proof fabric which is able to kill 99.9% of the bacteria within 2 hours. | Prof. Samrat Mukhopadhyay, Fabiosys Innovations | 100 |
| 3 | PNB Housing | Research and development of personal protective equipment. | Porf. Bipin Kumar | 126 |
| 4 | Microsoft | Development of ELISA based assay for detection of COVID-19 | Prof. Anurag Singh Rathore | 36 |
| 5 | Microsoft | Optimization and validation of a one-step RT PCR test for Covid | Prof. Vivekanandan Perumal | 33 |
| | | | **Total Funding** | **298** |

# Endowment Fund

Hon'ble President of India, Shri Ram Nath Kovind, launched the first of its kind IIT Delhi Endowment Fund of India from the Rashtrapati Bhawan on 31st October 2019. Prof. V. Ramgopal Rao, Director, IIT Delhi and Prof. Sanjeev Sanghi, Dean, Alumni Affairs and International Programmes and a few of the Endowment Fund founder alumni were present. IIT Delhi launched the endowment fund with an initial commitment of ₹255 crore. The aim is to reach ₹1,000 crores till the end of 2020 and then 1 billion US dollars by the end of 2025. The endowment fund will work towards the development of the institute, encourage innovation and entrepreneurial spirit. IIT Delhi has become the first institute in the nation to launch a billion-dollar Endowment Fund. Such endowments also allow institutions to confidently engage in long-term planning without sustainability risk to critical projects. This will also put IIT Delhi on the global map for education along with the prominent foreign universities.

This Fund will have a transparent structure and corporate governance model that will work towards building a relation of trust and credibility with its alumni through better communication, professionally managed team structure and periodic reporting. IIT Delhi understands the gaps in the Endowment systems and knows where it stands globally as compared to the endowment systems of US Universities and other leading institutes. The framework IIT Delhi is developing and standardizing will make a competent Endowment platform which will increase fund collections. This structure can become a paradigm for all the other leading IIT'S and educational institutions of India which can be effectively emulated.

# Alumni Affairs

## DISTINGUISHED ALUMNI AWARD/ALUMNI SERVICE AWARD

IIT Delhi lays great emphasis on a strong and vibrant relationship with its alumni. The Institute is proud of its alumni and their achievements.

To recognize the outstanding contributions made by the alumni in areas of academics, teaching & research, corporate business development, profession and / or public service, the Institute confers the Distinguished Alumni Award each year. This is the highest honour conferred by the Institute on its alumni. For the year under report, the prestigious award was conferred upon the following at the 50th Convocation of the Institute.

**Mr. Binny Bansal**
*Distinguished Alumni Award*
B.Tech. Computer Science & Engineering (2005),
CEO Flipkart

**Mr. Mohit Aron**
*Distinguished Alumni Award*
B.Tech. Computer Science & Engineering (1995),
Founder and CEO of Cohesity

**Prof. Srinivasan Keshav**
*Distinguished Alumni Award*
B.Tech. Computer Science & Engineering (1986),
Professor in the Cheriton School of Computer Science at the University of Waterloo

**Mr. Arun Duggal**
*Distinguished Alumni Service Award*
B.Tech. Mechanical Engineering (1967),
Chairman of ICRA Ltd., Mangalore Chemicals & Fertilizers Limited

**Mr. Amarjit Singh Bakshi**
*Distinguished Alumni Service Award*
B.Tech. Civil Engineering (1967),
Founder, Chairman and Managing Director of the Bakshi Group

# INTERACTION WITH ALUMNI

**Silver Jubilee Reunion:** The Silver Jubilee Reunion of the 1995 batch was celebrated during 20 to 22 December 2019.

**Alumni Day:** IIT Delhi Celebrated its Alumni Day on December 22, 2019.

**Pearl Reunion:** The Pearl Reunion of the 1985 batch was celebrated during 27 to 28 December 2019.

**Ruby Reunion:** The Ruby Reunion of the 1979 batch was Celebrated during December 31st January to 1st February, 2020.

**Giving Week:** This year's Giving Week initiative was a grand success with about ₹16 Lakhs being collected during the campaign from donors across different continents.

**Alumni Interaction Events in Australia with its Dignitaries:** An alumni interaction event was organised in the city of Melbourne in Australia on March 11, 2020. During the event the alumni had an interaction with Prof. Sanjeev Sanghi,

Dean of Alumni Affairs and International Programmes. The meet was organised with the support of 1970 batch alumnus, Mr. Ravi Bhatia.

Further, on March 13, 2020, a much larger event was organised in Sydney. The alumni interacted with the IIT Delhi delegation. The delegation was headed by Director Prof. V. Ramgopal Rao and comprised of Prof. A.K. Ganguly (Deputy Director, Strategy & Planning), Prof. Sanjeev Sanghi (Dean, Alumni Affairs and International Programmes), Prof. Shantanu Roy (Dean, Academics) and Prof. Naveen Garg (Department of CSE). This event was organised with the support of 1977 batch alumnus, Mr. Pradeep Khanna (B.Tech. Electrical Engineering). The delegation members shared with the alumni the latest initiatives of the Institute, and discussed ways to steer the IIT Delhi Endowment Fund towards its goal.

## ALUMNI CONTRIBUTION

The Alumni are a very valuable resource for the Institute, and increasingly, they have started to make a difference to the way things are done at IIT Delhi. The Alumni have directly contributed for instituting Chair Professorships, Young Faculty Incentive Fellowships and Student Awards and even for Infrastructure Development.

The Institute has garnered excellent support for its vision and mission from its Alumni during the year.

Some of the contributions from the Alumni in the previous year are listed below and are gratefully acknowledged:

| HEAD | CONTRIBUTION (IN RUPEES) |
|---|---|
| **BATCHES AND REUNIONS** | **14,752,524.00** |
| 1969 Golden Jubilee Reunion Endowment Fund | 90,589.00 |
| 1979 Ruby Reunion | 10,838,247.00 |
| 1982 Pearl Reunion Endowment Fund | 987,462.00 |
| 1984 Pearl Reunion Endowment Fund | 1,708,711.00 |
| 1994 Silver Jubilee Reunion Endowment Fund | 1,077,514.00 |
| Silver Jubilee 1993 Batch Fund | 50,000.00 |
| **CHAIR** | **16,551,190.00** |
| CERCA Chair | 1,500,000.00 |
| Hi Tech Chair | 2,719,000.00 |
| Mehra Professorial Chair | 363,000.00 |
| Soumitra Dutta Chair | 1,969,190.00 |
| Uma Puruskar Liril Gupta Chair | 10,000,000.00 |
| **ENDOWMENT FUND** | **250,235,381.00** |
| Global Alumni Endowment Fund | 250,235,381.00 |
| **OTHER DONATIONS** | **375,557.00** |
| Miscellaneous donations | 375,557.00 |

| | |
|---|---|
| Arun Duggal | 20,000,000.00 |
| Amarjit Singh Bakshi | 10,000,000.00 |
| OTHER CAMPAIGNS | 9,247,567.00 |
| CS&E Anshul Kumar Professorial Chair | 1,304,685.00 |
| CS&E Research Acceleration Fund | 1,472,650.00 |
| CSE TBO Group new faculty fellowship | 1,500,000.00 |
| CSE/Chandruka Doctoral Grant | 1,072,700.00 |
| Each One Teach One | 1,603,574.00 |
| Giving Week 2019 | 1,241,286.00 |
| Giving Week 2020 | 938,361.00 |
| Stay Con | 114,311.00 |
| SCHOLARSHIP AND AWARDS | 13,244,515.00 |
| Aditya Birla Scholarship | 200,000.00 |
| Amar Chand Memorial Scholarship | 75,000.00 |
| Asha Gupta Award | 150,000.00 |
| B.S. Haleja memorial scholarship | 50,000.00 |
| Baba Sant Nagpal Ji Award | 350,000.00 |
| Bihari Lal and Lajvanti Batra Scholarship | 1,974,197.00 |
| Boss Award | 600,000.00 |
| Buti Foundation Scholarship | 350,000.00 |
| Dr. Amrik Singh Award | 500,000.00 |
| Dr. Usha Krishan Baveja | 300,000.00 |
| HR Gulati Scholarship | 200,000.00 |
| Manohar Lal and Indravati Kapur Scholarship | 1,974,197.00 |
| Microsoft Research Lab India Pvt. Ltd. | 235,000.00 |
| Mudit Sharma Medal & Award | 100,000.00 |
| National Building Construction Corporation Award | 25,000.00 |
| Nirmal Prasad Jain Scholarship | 100,000.00 |
| Nitin Gupta Award | 150,000.00 |
| O.P. Gupta Gold Medal | 470,000.00 |
| Pranab Chatterjee Family Scholarship | 397,293.00 |
| Prof Maithali Sharan Scholarship | 200,000.00 |
| Prof. P.K. Katti Award | 150,000.00 |
| Prof. J. Nanda Cash Award | 300,000.00 |
| Rahul Giri Memorial Award | 150,000.00 |
| Ramesh & Chanda Kapur Scholarship | 1,974,197.00 |
| Reba and Pranab Chatterjee Excellence Award | 198,646.00 |
| Sarla and Ratan Gupta Merit Scholarship | 413,986.00 |
| Suman Upma Memorial Gold Award | 7,000.00 |
| Suyash Chandra Memorial Cash Award | 250,000.00 |
| Tower Research Capital Markets India Pvt. Ltd. | 200,000.00 |
| ZTE Telecom India Scholarship | 1,200,000.00 |
| Total | 334,406,734.00 |

# Student Affairs

(April 1, 2019 - March 31, 2020)

Considerable efforts are made to see that students lead a balanced campus life in harmony with their teachers and fellow students. To ensure that freshers settle down in their new surroundings comfortably, a Freshers' Orientation Programme was organised at the beginning of the academic session. Counselling Service provides counselling to students on adjustment problems or for the problems arising from financial hardship, and emotional/ psychological problems affecting academic pursuits. Outside the classrooms, facilities for a variety of co-curricular activities, sports, games, student publication etc. are provided for the overall growth and development of students' potentialities and initiative with an emphasis on responsible student leadership. The pace and mode of student life on the campus is planned and implemented by the following student bodies.

1. Student Affairs Council (SAC) and its five Boards:
   (a) Board for Hostel Management (BHM)
   (b) Board for Recreational & Creative Activities (BRCA)
   (c) Board for Sports Activities (BSA)
   (d) Board for Student Publications (BSP)
   (e) Board for Student Welfare (BSW)
2. National Service Scheme (NSS)
3. National Cadet Corps (NCC)
4. Student Counselling Service (SCS)
5. Student-Teacher Interaction Committee (STIC)
6. National Sports Organization (NSO)
7. Co-curricular and Academic Interaction Council (CAIC)

## 1. STUDENT AFFAIRS COUNCIL (SAC)

The Students Affairs Council remains active throughout the year. SAC representatives do regular meetings to ensure that all facts of student issues are discussed. The representatives interact with student members of senate and other SAC committees for wider participation of students in the affairs of the Institute.

In the year 2019-20, many student related issues were discussed and resolved. Some of them are listed here:

- A comprehensive review of maintenance problems of hostels and the institute was done and steps were taken to interact with Institute Infrastructure Department for a speedy resolution.
- Intra-Campus food delivery options were explored, in order to establish delivery services from all major outlets within the campus.
- Donation of extra food from some of the hostel messes was organised successfully through relevant NGO/ Organisation (presently with- Zomato Feeding India).
- Audit for all hostel messes was done based on the

FSSAI guidelines to improve their health. Actions were taken for betterment.

- Finalized the procedure for installation of 'Air Purifiers' in common areas of the hostels and Institute to create low pollution areas.
- Provided anti-pollution masks and nasal filters for the students, during peak pollution period.
- Work on RFID Based Attendance System for hostel messes progressed.
- Work started for the installation of tablet-based feedback systems at the various food outlets within the IIT Delhi campus. 'Timble Technologies' is working on this.
- Initiatives were made to open new food outlets in the campus for student convenience. 'Food Truck company' and 'Swiggy India' are finalized for this.
- Improvements were identified and suggested for improving hospital services.
- Worked on to strengthen the 'Greenolution' Cycle Sharing System in the campus for recycling the cycles and to arrange for possibility where anyone can sell their old cycle.
- eCERTIFICATION PORTAL was made functional to make the process of verifying/approving PORs and Events more efficient, continuous and transparent.
- Information cell was started. It is collecting, verifying and centrally storing all important student data. This will resolve the problem for students, TnP/OCS and alumni.

Some activities which were in progress got impacted due to Covid-19 lockdown.

Some policy changes were also initiated under SAC, like:

- Instituting a Student Assembly to improve the coordination and discussion between the representatives of different boards a Student Assembly.
- Lifting the timing restrictions for allowing students in hostel common areas of opposite gender.
- Retaining PORs and voting rights of students falling below 7 CGPA.
- Mandating the submission of action taken reports by General Secretaries of all boards recognized by SAC and all House Secretaries to improve transparency and accountability.
- Developing Nalanda Ground as a sports field to solve the problem of shortage of space on the institute fields.

**Work done by various boards of SAC-**

### (a) Board for Hostel Management (BHM)

BHM is moving forward with a vision to set IIT Delhi on a path of sustainability, to ensure good quality and hygienic food in the hostels and providing a good work environment to BHM staff.

## Initiatives

### Constitutional Changes

- Currently, BHM G.Sec. does not have a dedicated team to take care of any Institute level Initiatives and work of BHM, which puts a tremendous load on him/her. Hostel Secretaries cannot be expected to take up such initiatives at the institute level because of their respective hostel. The introduction of the Secretary - BHM & Representatives aims to solve this problem, to help carry out Institute level initiatives in a more streamlined way.

- *Secondly, Current Eligibility Criteria:* Candidates for the post of General Secretary should either have been a House Secretary for at least one year prior to their candidature (and should not have been removed from office) or should be amongst the newly elected House Secretaries.

- *Drawbacks:* It is very much needed that the Chief student representative of the board has been a part of it for at least one year prior to his candidature. Newly elected house secretaries are eligible for contesting as General Secretary which itself gets finalized just two days before the election-day. A person who is BHM general Secretary also serves as a House secretary of one of the hostels since General Secretary and House Secretary both have fair enough workload and in order to manage both simultaneously either of them is compromised.

- *Proposed Changes:* A candidate contesting for General Secretary must have served as a Mess Secretary, Maintenance Secretary, House Secretary or BHM Secretary for at least one year prior to their Candidature (and should not have been removed from office).

- *Current Status:* This year bye elections were conducted for the position of BHM representatives and in the coming session election for all the positions will be conducted and we will have a complete new team.

### BHM Employee Incentivization Scheme

To ensure greater employee satisfaction and enjoyment of work, more time spent focusing on the job and less time complaining. An incentive programme for the BHM Staff (Mess & Garden) is being worked upon and it has almost been finalized. The act of recognizing desired behaviour increases the repetition of the desired behaviour, and therefore productivity.

*Current Status:* A separate committee will be formed to finalize the policy and awards.

### RFID based Attendance System

It is something being worked upon for the past 3 years, with no results to show for. Finally, this year the tender has been finally awarded and we foresee it being implemented soon. Location for setup of RFID based attendance machines has been finalized for each hostel and the policy for flexible messing is also being prepared in parallel. The data generated for this will give more insight about the likes and dislikes of particular cuisine and enable mess supervisors and secretaries to make more informed decisions.

*Current Status:* PO has been released to the contractor for the development of portal and procurement and installation of hardware.

### Mess Rebate

Considering the messing pattern and holidays of students it was noticed that less number of rebates are requested because the minimum number of days for which rebates can be applied was 5. It has been reduced to 3 so that the students living nearby who visit home for extended weekends can also be eligible for the rebate. (But to make it justifiable for all students per day charges has been increased from ₹50 to ₹60 because the fixed cost for running the mess will remain the same.)

Current Status: Students will be allowed to claim minimum 3 days rebate by filling the rebate form at the mess office.

### Dogra Trophy

Every hostel has its garden (though varying size & shape). In order to promote serious efforts for the development and beautification of the same keeping the environmental concerns like waste management, Plastic use, etc. at the same time ensuring this development to be sustainable and environment-friendly we propose this competitive activity with a year-long regular monitoring of following key factors by a committee which will then decide the top three performers who will be awarded trophies on BHM Dinner Night. It is something being worked upon for the past 5 years, with no results to show for.

*Current Status:* This year the initial steps for implementation were taken and inspection of all the hostels and gardens were done. Committee will meet and finalize the result soon.

### Smart Notice Boards

BHM didn't have its webpage so the webpage of the BHM has been made and it will be hosted on the IIT Delhi web soon.

We are working on the implementation of the Digital Notice board in each and every hostel. On the e-Notice board, the hostels will be allowed to subscribe to the channel of their interest be it newsletter of research being done at IIT Delhi or various boards and clubs, etc. and will be allowed to display the content and videos related to the hostel with the approval of the warden.

*Current Status:* Presentation of vendor is pending and post that once the vendor is finalized, order for screens and softwares will be placed. All the 13 hostels will be covered in 3 phases.

### Initiatives for BHM Staff

External agencies (FSSAI approved) are hired for training of mess staff for the proper conduct and hygiene in the mess in order to reduce the chances of mistakes done during the food preparation and handling.

BHM has collaborated with the wellness club of IIT Delhi for meditation and yoga training of mess staff. A four day workshop is conducted by team of wellness club and the staff is trained, which will help them reduce stress, concentrate and improve their working habits and will be able to inculcate the values in the food that they prepare.

We have collaborated with a health checkup agency for free general health checkup of the mess staff to evaluate their general fitness.

An eye checkup camp was organised in collaboration with Lenskart for both students and staff with a special discount for the staff @ ₹1000 for 2 frames.

*Current Status:* Training, Health checkup camp and Eye checkup camp has been successfully conducted and the schedule for the workshop of Wellness club has been prepared but the workshop could not be conducted due to lockdown.

## BHM Night Mess

Night messes of some hostels were not able to match the standards of the good food outlet considering hygiene and taste so BHM decided to run night mess for those particular hostels in the same fashion as other night messes run. BHM night mess is up and running in Udaigiri hostel and the feedback is positive as of now and things are being done to improvise it more. Depending upon the responses we will try to implement it in all hostels. The idea behind this is to provide students with infrastructure wise sound night messes where students can eat while working with the least disturbance possible.

Current Status: Currently Udaigiri is running BHM night mess and the whole concept of operations was presented to all the members in BHM meeting. Considering the interest and responses other hostels are also coming forward to implement this.

## Outlets & Facilities

Digital feedback and monitoring systems has been finalized and will be installed shortly. Each outlet will have a device installed at the billing counter for collecting feedback and students having a valid bill can fill a 30 second feedback form.

We are in talk with Vending machine vendors which will be installed in all hostels which will run 24x7 and the items to be filled in the machine will be finalized by mess secretaries of each hostel in consultation with the residents of that hostel.

Feedback form was floated to understand the demand of students and performance of the existing outlets. Considering the responses of the feedback form swiggy and Food truck vendor was contacted and were asked to present their working model in CELC. After several deliberations, the committee approved the proposal and permitted food truck to set up their kitchen besides Rajdhani Chatkhare and a kiosk of swiggy will be set up in the academic area. Food truck will also cater the demand of girls hostel during the evening and night time and it will be situated in himadri hostel.

*Current Status:* Food Truck vendor has set up its kitchen near Rajdhani Chatkhare and started serving there and will start serving at Himadri hostel using food truck ASAP.

For feedback system PO has been released to Timble Technologies they will be installing the devices soon. We are still negotiating with the vending machine vendor.

## Mess Hygiene and Management

There was no such body to monitor the messes of the hostel centrally. In order to keep a check on the standard working practices and infrastructure as issued by the FSSAI for the hostels there was a need for a committee which can centrally monitor all these stuff. An Internal audit committee has been made, which consist of 5 mess supervisors who visit each hostel and evaluate and give scores to the messes of the hostel on the parameters listed by the FSSAI. Depending upon the score messes are advised to improve the conditions.

Current Status: Internal Audit committee has audited all the hostels and have advised the hostels for improvement depending on their scores.

## Social Initiatives

Cleanliness is a mindset, a positive habit that keeps the body, mind and environment happy, healthy, simple, neat and delightful. So, many initiatives for Waste Segregation, reduction of plastic use, and reducing electricity & water wastage are being launched. One such is mentioned above.

Although the mess supervisors and students of IIT Delhi are mature and responsible enough that they try to reduce the food waste as much as possible, but since this is not the ideal world and we run 13 messes of around 500 students each so a minimal amount of food (which is not served on the plate) gets wasted. In order to deal with this problem, we collaborated with Zomato feeding India for donation of excess food in the mess of hostels. They collect the excess food and distribute it to the needy people in a nearby place.

Current Status: Zomato has started collecting food from 3 - 4 hostels and things are going smooth. We are planning the same for the remaining hostels.

## Maintenance Portal

There is no specific channel for the students to lodge their maintenance related issues online. Students have to go to the caretaker office or fill the form available at the reception to file the complaint of any maintenance related issue. We are developing a portal with the Estate office and CSC, IIT Delhi to digitize this activity in order to save time, solve the problems efficiently and to make it more convenient for the staff and students to coordinate.

Additionally we will also include the feedback mechanism for the workers and staff so that we can incentivise them based upon their performance because currently we don't have any mechanism for the workers to analyse their performance and incentivise them.

*Current Status:* Currently the process has been digitized but in the initial phase only caretakers have the authority to lodge a complaint conveyed by the students. In the coming phase we will give students the authority to file the complaint.

### The Wardens / House Masters during 2019-20

| Hostel | Warden |
| --- | --- |
| Aravali | Prof. Seshan Srirangarajan |
| Girnar | Prof. Anoopkrishnan Naduvath Mana |
| Himadri | Prof. Priyanka Kaushal (Ms.) |
| Jwalamukhi | Prof. Vivek Kumar |
| Kailash | Prof. Joyee Ghosh (Ms.) |
| Karakoram | Prof. Manojkumar Charandas Ramteke |
| Kumaon | Prof. Sri Harsha Kota |
| Nilgiri | Prof. Dinesh Kalyanasundaram |
| Nalanda | Prof. Dipti Ranjan Sahoo |
| Satpura | Prof. Hariprasad Kodamana |
| Shivalik | Prof. Sujin B Babu |
| Udaigiri | Prof. Jayant Jain |
| Vindhyachal | Prof. Ashok Kumar Patel |
| Zanskar | Prof. Sumedha Chakma |

## (b) Board for Recreational and Creative Activities (BRCA)

BRCA was made competitive for 2019-20 with the reconstitution of BRCA overall championship at inter hostel level with fresh initiatives from all the cultural clubs. We saw greater enthusiasm among residents of various hostels with enhanced retention of senior year students too in most BRCA clubs owing to the healthy competitive spirit. Significant number of informal events both at the level of individual clubs as well as cross club events too were carried out simultaneously to ensure greater amalgamation of students with BRCA activities.

*Cultural Classes in SAC:* Music Club IIT Delhi has been conducting 4 different music classes in SAC. They include Indian Vocal Classes, BMA Guitar Classes, BMA Keyboard Classes, BMA Drums Classes which are attended by over 50 students in several groups. Indian classical dance forms are elegant and teach us rhythm and expression. To promote this spirit Dance Club BRCA, organises "Kathak Dance Classes" by Mrs Iva Sen, a senior disciple of Pandit Birju Maharaj. The Class is held every Monday and Friday from 4:00 pm to 7:00 pm. A total of about 45-50 faculty members and students attend these classes regularly.

Fine Art classes are being organised by BRCA every month for a total of about 50 attendees. The attendees range from students in UG, PG and PhD programmes to staff, faculties and their family members. The classes are conducted in the FACC room in the Student Activity Center. The classes have been a success, with people refining their artistic talent to a great extent.

*Postgraduate cultural society:* In order to facilitate the entry of post graduate students to the well established cultural clubs of BRCA, a Postgraduate cultural society. 'Sopaan' was raised with the mandate to act as the stepping stone for PG students into BRCA activities.

*Rendezvous 2019:* The annual cultural festival was organised between 2nd to 5th October, with several new initiatives being taken. Most notably the professional nights were shifted from the OAT to the football field for the first time increasing the attendance in pronights from 4000 to 12000 daily. Rendezvous witnessed a cumulative footfall of 163000 students in almost 250 cultural events spread across four days. Rendezvous witnessed performances by noted artists like Shankar-Ehsaan-loy, Amit trivedi, Kumar Vishwas, Ritviz, Naezy, MJ5 etc. making it one of India's biggest college cultural festival.



*Events Organised in the academic year:* Wide range of events have been organised in this session including internal, external, competitive, non competitive, informal and freshers' events. The major highlights being street play competition, inter hostel group dance, mixtape, b-roll challenge, andaaz- e - bayaan etc. Contingents from Dance, Dramatics and Music clubs visited various inter college events and brought laurels to IIT Delhi.

### A glimpse of some club-wise events-

### Fine Arts and Crafts Club

- A series of wall paintings were done in LHC in the new seating area (outside LH 325).
- An international Origami workshop was conducted by Dr. Jun Mitani of the University of Tsukuba in collaboration with the Japan Foundation.
- Regular paid art classes were conducted in SAC for the IITD community, with significant participation from both students and families of the faculties.
- A portrait of Shankar Mahadevan made by a student of the club was presented to the man himself as a gift during Rendezvous '19.
- Significant improvement in the social media presence of Azure, the Fine Arts Society of IITD, with the Instagram page of Azure reaching the highest follower count amongst all college art societies in NCR.



### Hindi Samiti

- Hindi Samiti organised a total of 17 events round the year.
- Hindi Samiti hosted the first edition of IIT Delhi MUN with 4 houses.

- Book Cover Design was organised in collaboration with the FACC club to engage people in writing covers for books.
- By The Chai was an event of one of its kind in collaboration with the Music Club and Literary Club where a stage was offered to people to show their creativity.
- Creative Writing was introduced for the first time keeping in mind the aim to excel in Inter IIT. The event was judges by Prof. Rajesh Khanna, the Dean of Student Affairs.
- Kalamkar was an interview type event organised in collaboration with IITDon-Air, an event where the writers and seniors shared their experience to motivate the new comers.
- Parody Making was organised in collaboration with the Dramatics Club for people to showcase their out of the box talent.
- For the first time, Hindi Samiti collaborated with Shri Ram College of Commerce to host a Mushaira called Mehfil to provide a stage to the young writers of IIT Delhi.

## Music Club

- Regular workshops for societies were introduced showing significant improvements in the results at competitions among the DU circuit. The Eastern Group Singing team won 2nd prize in RDV, after almost 4-5 years of being in the bottom 5 teams. Few other RDV achievements include 2nd in Fusion Band Competition and 4th in Acapella competition. The societies also saw a huge rise in the number of shortlists at other colleges compared to previous years. There was also a workshop for bands, and others taken by senior students to acquaint juniors with sound production and equipment. The workshop culture for societies continued even during the quarantine, with the initiatives of online workshops.
- The construction of a sound-proofed control room within the SAC Music Room. This helped in the execution of a better recording process and ensured safety of the expensive equipment in the locker.
- The Inter IIT Cultural Meet was a great learning experience for the club, with two of the three songs performed being original compositions. We bagged 2nd position in the Pair on Stage competition and 3rd position in Western Solo Singing. 4. A significant improvement in the quality of performances in the internal events along with better sound overall. This came as a result of more organised and disciplined sound checks the value of which we realised after the band workshops. The audio recordings of the events were of appreciable quality, being recorded directly through the mixer system.

## Wellness Club

- "Yoga Competition" was conducted for the first time in the IITD campus.
- "Run for Yoga", "Soulful Musical Evenings" were conducted under International Yoga Day celebrations which aimed to increase the awareness about health and yoga.

## SPIC MACAY

- Formal Inclusion of SPIC MACAY Workshops into Rendezvous for the first time allowed interaction and cultural exchange of various SPIC MACAY Chapters across the region.

- One of the trips was dedicated to the Bharatpur Bird Sanctuary in Rajasthan; and the other excursion was made to the historical monuments of the Taj Mahal and the Agra Fort in the city of Agra, Uttar Pradesh.

## Debating Club

- Implemented a new structure called House System, which involved clubbing hostels together to form 4 houses. Benefits of this were that hostels with rich debating culture could help build enthusiasm in the weaker hostels.
- Implemented a 'Challenge Debate system'. This meant that any house could challenge a different house to a debate. These debates would be scored and at the end..

## Literary Club

- Annual Literary Festival- Literati, was organised with BSP's volunteer.
- A new library in SAC with a repository of 800+ books, including fiction, nonfiction, vernacular, and novels was inaugurated thus developing a reading culture in IITD.
- By The Chai was an event of one of its kind in collaboration with other clubs.

## Dramatics Club

- There was a massive participation from the freshers in Inter-Hostel Street Play where more than 150 freshers participated, which is double of what was in the previous year. Events like Parody Making and more were organised. We visited various inter college events and brought laurels to IIT Delhi.

## Dance Club

- The Dance Society maintained its stronghold on Delhi's dance circuit winning various competitions. The Choreography team won the competition held at Rendezvous IITD.

## Quizzing Club

- We successfully organised quizzing events, during Rendezvous with a decrease in budget and an increase in participation compared to last year. There was an increased participation in all quizzes which shows the ground level work done by the representatives of the club.
- We switched to a more environment friendly scheme of conducting prelims via presentations as opposed to printing questions which was held earlier. This also allowed us to increase the variety of questions in prelims.
- Special cross-hostel workshops were held by the representatives of the club to increase the inclusivity of freshers and identify the talent early.

## Photography and Films Club

- Successful events in RDV more than 1000 participants and 500+ entries.
- Expansion of inventory.
- Campus participation has increased by a decent value with increase in Social Outreach.

## (c) Board for Sports Activities (BSA)

Sports and games are essential components of human resource development and help in promoting good health and spirit of healthy competition, which, in turn, has a

positive and deep impact on the holistic development of personality of the Youth- a potential source of energy, enthusiasm and inspiration. Sports, being practical way of education, facilitate recreation, foster social harmony, inculcate discipline and dedication in general life. Board for Sports Activities (BSA) had been looking after this important component for the development of sports environment in the campus.

*Introduction:* The Board for Sports Activities is a constituent body of the Student Affairs Council. It is responsible for the coordination of the various sports activities in the institute. It ensures that adequate facilities are given to sports persons and provides a forum for the students and staff to discuss and formulate policy towards the betterment of sports activities in the campus.

*Facilities:* Our facilities include, a cricket field with four turf wickets, four flood-lit cricket practice pitches, flood-lit hockey and football grounds, three flood-lit volleyball and two basketball courts, eight flood-lit tennis courts (four synthetic and four clay courts), tennis practice wall, two squash courts, one badminton hall, two table tennis halls with synthetic flooring, one weightlifting hall, Olympic size swimming pool, kid's pool, two multi-gyms, a flood-lit stadium with 400 meters athletics track, flood-lit jogging track and ancillary arrangements for all the games. Construction of a new multipurpose hall with facilities for badminton, table tennis and squash courts is under progress. A team comprised of Sports Officer, Deputy & Assistant Sports Officers, part-time coaches and ground staff help the students in their regular sporting activities ensuring that all facilities are being properly maintained and utilized.

*Notable Achievements: 54th Inter IIT Sports Meet (for Students):* The IIT Delhi contingent took part in 54th Inter IIT Sports Meet held at IIT Kharagpur & IIT Bhubaneswar from 14th to 22nd December 2019 and was declared Overall Runners-up (Women and Men Combined) and also Runners-up for Men.

*Notable Achievers of the contingent in the Inter-IIT meet:* Athletics (Women) – 1st Position overall; Cricket – Gold; Volleyball (Men) – Gold; Basketball (Men) – Gold; Volleyball (Women) – Silver; Athletics (Men) – 2st position overall; TT (Women) – Silver; Hockey – Silver; Chess – Silver; Badminton (Men) – Bronze; Football- 4th; Squash – 4th; TT (Men) – 4th.

*26th Inter IIT Staff Sports Meet:* IIT Delhi won the General Championship Trophy (Men) for the second year in a row in 26th Inter IIT Staff Sports Meet 2019 held at IIT Kharagpur from 24th-28th December.

*Notable Achievers of the contingent in the Inter-IIT staff meet:* In Badminton (men) – Gold; Cricket (men) – Gold; Football (men) – Gold; Lawn tennis (men) – Bronze; TT (men) – 4th; Athletics (men): Shot Put – Gold, High Jump – Silver and Hammer Throw – Silver & Bronze; TT (women) – Silver; Athletics (women): Bronze in 100 and 200 meters.

*Spardha Sports Meet (IIT BHU):* The IIT Delhi contingent took part in Spardha held at IIT BHU from 18th to 20th October 2019 and was declared The Best Outstation Contingent at the meet.

*Notable Achievers of the contingent in the Spardha meet:* Athletics (Men)- 1st Position overall; Athletics (Women)- 1st Position overall; Volleyball (Men) – Gold; Squash- Gold; Basketball (Women)- Gold; TT (Men)- Gold; Badminton (Men)- Silver; Chess- Silver; Basketball (Men) Silver; Cricket- Bronze.

## (d) Board for Student Publications (BSP)

The Board for Student Publications has successfully completed the following major work in the academic session 2019-20.

### Semester I

- *September—* A panel discussion was organised on 'The New Urban Queer' to encourage more discussion about the problems faced by Queer people in the urban society and how they overcome it. The panellists were a diverse set of people who identified themselves as Queer, and were fighting for their rights at different levels.
- *December—* we wrote articles on the issue of casual sexism in the campus to create awareness amongst the community and encourage sensitivity.

### Semester II

- *March— International Women's Day:* We organised a panel in association with IGES for International Women's day celebration, which saw very good participation from the Professors and Students of the campus.
- *May–* We followed up on our article on casual sexism and presented it from a new perspective, to keep the constructive discussions on this topic moving ahead.

### Semesterly Magazines

- *July–* published the Fresher's Magazine, Inception. This magazine was aimed to demystify the life at IIT Delhi by introducing them to the IIT Delhi lingo, the various institute fests, the technical and cultural clubs at IIT Delhi, good eating joints near IIT Delhi and of course the hostel life. At the same time, it was also meant to introduce them to the IIT Delhi rules and the important institutions that exist in the campus if they feel overwhelmed with work and pressure at any point of time and want to see a counsellor or talk to a professional for advice. It served as a welcome guide to all the freshers.
- *October—* published Muse, the annual creative magazine, which included entries from students across the campus. We chose the theme of the magazine as 'Escape', with an aim to provide a platform for de-stress. People wrote about stress, heartbreaks, lust and many similar ideas.
- *December—* released our semesterly newsletter, Inquirer I. We talked about the important issue of casual sexism in the campus and ways to avoid it. We also did a survey about the plight of technical clubs in the campus and looked at the ways their functioning could be improved. We also did surveys for the increased security in the campus and availability of Wifi services in different parts of the campus.
- *February—* published Elemental, our annual technical magazine. The magazine was aimed to provide a glimpse of the advancements in scientific, mathematical and technological accomplishments of humankind.

We talked about a variety of topics from quantum computing to medicine to astronomy and beyond.

- *March* – We published the creative magazine, Impulse, written by the students of the Board for Student Publications. The theme was Déjà vu and the team wrote amazing poems and stories on the theme.
- *April* – completed our semesterly newsletter, Inquirer II. It included our annual Freshman Survey (diversity of students in the Fresher's batch) and an article on Mental Health and its correlation with happiness. Both the articles were backed with statistics from the survey of IITD students.

*Round the Year Work:* The Board has been active in covering all the major institute events such as Convocation, Institute Day, Industry Day etc. Others like House Days, All Boards Night, BHM dinner, Inter IIT etc. were also appropriately covered. In addition to this, numerous online series like 2nd year internships, 3rd year internships, Fresher's series, My Experiments with IITD, Professor Next Door, Research of the Month, Guest Editorials etc. were done throughout the year.

*Annual Literary Festival* - Literati, was organised from 6th to 8th September, 2019. The event had talks and discussion on various social and urban issues. Workshop on creative writing, poetry and other competitions were also part of this.

Some new series are started like 'Humans of IITD' to reach out the staff of IIT Delhi, Alum Album, The Scholar's Blog and Couchella- platform to share COVID-19 pandemic time stories .

Some more competition and activities were executed throughout the year like – Story Writing Competition (with drama club), Bluffington Post- inter hostel competition to bring out the issues in creative ways, Storytelling Competition in association with Stellar, Watchdog Journalism Workshop, Vernacular Creative Writing Event, inter-hostel magazine making competition, Movie Screenings – in association with Stephen King's famous literary piece 'IT' and some more.

BSP reported the setting up of new research labs across the campus, upgradation of supercomputing facility making it amongst top 3 in India and other such campus related news throughout the year.

Various activities were executed to help the administration –

- Findings and opinions of IITD students on lateral mode of admission (introduced by IITBombay).
- Training and Placement process – prepared the analysis document on pros and cons of the new system.
- Live update posts on Covid-19 and precautionary to be followed in order to control the pandemic and reduce the panic.
- Surveys for the two YouTube Live Sessions that were done by Director IITD to address the students, concerns of the students on 'Alternate Graduation Plan' due to lockdown.

## (e) Board for Student Welfare (BSW)

The Board for Student Welfare, IIT Delhi is a student body set up with an intention to look after the Welfare of the Student Community. BSW has always been dedicated towards helping the Student Community in every aspect of life in IIT Delhi. The Board adheres to a principle of making itself the organisation of the Students, for the Students, and by the Students.

Mentorship under BSW:

*Mentorship Programme for First Year Students:* To ensure the smooth transition of freshers into IIT life and enable them to make informed decisions when faced with choices in their life at IIT Delhi, every fresher joining the institute is assigned a mentor who they can approach with queries on any issue like academics, extracurricular, personal life or the issue of maintaining a balance between them. They are the friends, philosophers and guides of the freshers through this beautiful journey in IIT Delhi.

Selection of mentors is done through rigorous process which includes online evaluation and interviews followed by trainings.

*Female JEE Counselling:* A female JEE counselling session was organised by BSW in collaboration with IGES (Initiative for Gender Equity and Sensitization) on the 23rd June 2019 to increase awareness among female IIT aspirants who had cleared JEE Advanced. This session was conducted in a view to help the female students who have cleared JEE Advanced 2019 to wisely fill their choices and solve their doubts. The session was conducted in two slots - first slot from 10 to 1 and the second slot from 2 to 5. A total of 170 girls registered for the counselling session and 130 of them attended the session. Many student volunteers and faculty members were present to help the girls and to give them a clear idea. Counters consisting of faculty members,3rd year and 4th year students of all branches were there to provide help. Professor Narayanan Kurur, Shalini Gupta, Ravinder Kaur, Sumeet Agarwal, Sangeeta Kohli among others were present to grace the occasion.

*Tour of Stalls:* A two day event was conducted in Lecture Hall complex to give a glimpse to freshers about various clubs and student boards at IIT Delhi. In the event freshers got an opportunity to make friends from different branches and hostel, and were able to interact with their seniors and mentors. The event was concluded by a street performance given by Drama Club, IIT Delhi focussing over importance of mentor in fresher's IIT journey.

*Parents-Professor Interaction:* A one-day event was conducted in Lecture Hall Complex to bring parents and professors on same platform in order to express the academic issues and problems being faced by freshers. Students also got an opportunity to freely talk with their professors. Since most of the classes in 1st year has a large capacity, many students don't interact with professors as they do in their schools, this interactive session enabled easy communication between professors and students as well.

*Alumni Clinic and Alumni Mentorship Initiative:* the objective for starting the Alumni clinic on campus is for career guidance of students and Alumni mentorship is to initiate the process of matching mentors and mentees for one on one career guidance based on preference of fields. Online portal work is in progress for this.

*Academic Mentorship Initiative:* this is to help undergraduate first year students in their academics via hostel sessions conducted by academically strong second year students.

*Language Mentorship Initiative:* it is started with the objective to help students who are not comfortable with English understanding and comprehend English language so that they can adapt to the academic system in IITD. Last year language mentorship was also extended to Hindi mentorship to help students who do not understand Hindi. The classes are designed into levels to focus better. A startup initiative BBR (Black Board Radio) is being run to assist spoken English.

*Mental Health Initiative:* Hostel sessions are done with the counsellors for creating general awareness in IITD community about Student Counselling Services and Your Dost - an online counselling platform for carrying out open discussion regarding Mental Health issues.

## Mental Health events:

*Celebrated Mental Health Day:* The theme for this year was 'It's Okay to be not Okay'. We put up a 'Happiness Wall' at WindT where students came in and wrote things that made them happy. An online campaign following the same concept was also started through BSW's Facebook page. One of the key events was the Support Group Session conducted in collaboration with Dalberg, Social Consultancy firm.

*"What's Up Zindagi":* BSW in collaboration with We the Young hosted Delhi's biggest youth mental health event at SAC, IIT Delhi on 9th November, 2019.

BSW launched UNLIMITED campaign in collaboration with We the Young to host mentorship and life coaching workshops. The following workshops were conducted in the month of February, 2020:

- *Dance and Movement Therapy –* A mindful session conducted by one of the leading professionals in this field, EshnaKutty which helped students to unwind and de-stress

- *Letter to Emotions –* The session was conducted by Juhi Sharma, Founder of Light Up EMF and Unbottle Emotions. Through the session we were able to create a safe and an authentic space to unwind and reconnect with inner self and to make our mental health a priority.

- *Spoken Word Bootcamp –* The session was conducted by Simar Singh, founder of UnErase poetry. The bootcamp was an engaging activity session to help students understand the power of writing a piece

## Operations under BSW:

*Orientation:* The orientation for the incoming UG students started on the 20th of July with the Director addressing the students and parents in the Dogral Hall. It was followed by a briefing from the Student Counsellors and the Security Head. Later in the evening, the students were invited to the evening games inside LHC where they played different games in various groups. The second day of the orientation was lined up with 3 events - Session with mentors, where the student mentors informed them about all the academic details and the rules and regulations here, Department Orientation, where professors from their departments spoke about various aspects of their department, and Registration, where students did all the paperwork and were finally registered as students of IIT Delhi.

*Delhi-Darshan:* BSW organised the much-awaited Delhi Darshan on the 3rd & 4th of August. It was a tour across Delhi, relishing the beauty of the city involving indelible bus-rides, exciting ice-breakers for freshers and memories they could cherish forever. A minimal cost of Rs.400 was taken from them. It included 2 meals and all travel + ticket expenses.

We visited the Qutub Minar, the Lotus Temple and finally spent some quality time at Lodhi Gardens. "It was a day filled with games and fun activities" - said a fresher, who said that she hadn't had such a great weekend with friends for a long time. This enthusiasm and positivity of students is what drives us, at BSW, to endeavour and make IIT a homely environment for all.

*STIC Dinner:* The annual STIC (Student-Teacher Interaction Council) dinner was organised on the 5th and 6th of September. This year new things like performance from the music club were introduced. After last year's feedback better services were provided like more chairs for seating arrangements, renting a music system and sufficient arrangement of food so that there is no shortage. This year we also introduced the pass system to prevent any extra students to come to the event. Group-wise slotting of students was done to prevent any chaos and professors of various Ist-year courses were invited in accordance with the groups that they teach.

*SPERANZA-CONVERGENZ:* Convergenz is the annual youth fest organised by the BSW. It involves various competitions and events where the student community of IIT Delhi participates and get to explore the recreational aspect of the college. Various events which are generally popular among the youth were organised for the students to enjoy and have fun by getting along with each other. This is also the first exposure to any big event inside the college for the freshers and several fresher-oriented games and competitions were also organised.

Events under this were:

- Inauguration by chief guest Mr. Sanjeeva Singh.
- *Band Night-* The event was organised in collaboration with the Alumni Association. The team worked on finalizing the band, production required for the concert, getting permissions and publicity for the event. Sufi Band performed during the band night which took place in Dogra Hall on 13th September from 8:00 p.m. after the inauguration.
- *Comedy Night-* The event was organised in collaboration with Alumni Association. The team worked on finalizing the comedian, getting permission and publicity for the event. The show was headlined by the internet sensation Nishant Tanwar, famous for his jokes on Delhi. The event took place on 14th September from 7:00 p.m. in Dogra hall. The hall was packed with students who lined up for entering the venue since the afternoon. The gig was appreciated by all the students as they enjoyed and laughed continuously for 2 hours.
- *Jeopardy-* The event was organised on 15th September in two rounds: first round taking place in athletics ground and other at wind tunnel. Jeopardy saw the participation of almost 40 teams.

- *Guftagoo*- This event was organised in the fest. Various alumni were invited on the occasion to inspire and guide the future aspirants. It was an informal session where students asked various questions related to their preparations and prospects.

- *Mock IPL Auctions*- The event was organised in collaboration with Alumni Association. The team worked on finalizing the comedian, getting permission and publicity for the event. The show was headlined by the internet sensation Nishant Tanwar, famous for his jokes on Delhi. The event took place on 14th September from 7:00 p.m. in Dogra hall.

- *Prom Night*- The event was organised in the SAC lawns on 15th of September from 7:00-9:00 p.m. This evening was dedicated to young couples who wanted to know each other better and spend some quality time together. Romantic music as well as some short, quirky games ensured the crowd was always involved. The event was followed by some rocking music wherein everyone- Stags as well as couples- were invited. Everyone danced their souls out and had a blast. This marked the end of successful Convergenz, 2019.

- *Enigma*- Magic Show It was organised on September 15 in the seminar hall. The performer for this event was the acclaimed magician and illusionist Divyansh Apurva. Students were enthralled by the illusions and some of the brilliant tricks he performed on the stage. He also invited some volunteers from the audience on the stage for participating in his magic act.

- *Informative Session on Foreign Intern:* It was held in October. It was an interactive session where seniors from all the branches shared their experiences as well as tips and tricks on how to bag a foreign intern. They also told about CV making, finding universities or programmes, mailing the professors and all other formalities involved along with some additional hacks owing to their personal experiences.

- *Rex Karamveer Awards:* BSW in collaboration with the Rex Foundation organised this event to felicitate people who have been in some way have served the society. The event, which took place on the 12th of October in Dogra Hall, was attended by delegates from all over India as well as selected students from IIT Delhi. The event had an opening session, followed by a workshop by Jerry sir- the founder of the Rex Foundation. Lunch was served to all the attendees. The aim of the workshop was to instil that sense of confidence in the social entrepreneurs of new India. The attendees or 'Rexters' were then given the Karamveer Chakra - an award recognized by the UN.

- *Website revamping:* Prepared a proposal for website development. Proposal includes the basic design and permission to give design credit for web development work. In the new design we focused to display it more systematically and organised. Seeing it through the freshers' perspective, making it more user friendly for them. The tabs include: - About us - General information - Campus life - Academics - Mentorship - FAQ's.

- *Archiving- Previous Year Question Paper:* Collected and uploaded the question papers across all years and departments for the betterment of students.

- *Forex Informative Session:* Successfully conducted and organised informative session for 2nd year students aspiring for Forex. Recent Forex returned students moderated the session and counselled the juniors.

- *Caution Money Collection:* Near the end of the even semester, when the outgoing students are required to do all the formalities and paperwork, the representatives from every hostel approached their seniors to create awareness about the option of donating their caution money towards the BSW fund. They were told about the various initiatives of the board and about the various noble ways in which their money can be utilised by the board. Many seniors went ahead and filled the form for donating full or a part of their caution money to the BSW fund.

- *Mentorship for Prospective Students:* We collaborated with the Board for Student's Publications and IITDOnAir to create a series of informative videos and a webpage for the prospective students of IITD. This would create awareness about the various facilities, curriculum, and prospects of every department for helping the students during their counselling phase to make a more informed decision. We have completed all the backend research and work for this initiative, but the videos have not been shot yet due to the unavailability of equipment from IITDOnAir and the subsequent minor examinations.

## 2. NATIONAL SERVICE SCHEME (NSS)

The National Service Scheme IIT Delhi, with a volunteer base of over 2000 students and faculties, believes in growing together with the society. NSS has currently over 30 projects in domains of Education, Environment, Health, Society and Innovation where the students step up in lending a helping hand to the lesser privileged and mark a contribution towards a greener and cleaner Earth. The projects aim at generating empathy in volunteers while serving the society.

Education Domain:

- *Vidya Teaching Project*- prime focus is to teach students from classes 4th to 10th and inculcate the fundamental concepts of all subjects, especially Mathematics and Science. This year, Vidya was one of the best performing projects of NSS IITD. The regular classes were held in the two semesters and Winter vacations too, with adequate number of volunteers throughout the year.



- *Apna Parivaar Project*- volunteers visit Apna Parivaar children's home on every Sunday in Mandigaon (near

Chhatarpur). Kids are given exposure to different things, inculcate thinking skills in them, provide them creative environment for studies through various activities.

- *NEEM School*- it involves weekly visits to Katwaria Sarai slum. This year, 7 visits were done with about 10 volunteers, led by an NSS Executive. The volunteers conducted activities like storytelling, drawing, short skits, PT, prayer, etc. on a theme focused to impart value education and develop the soft skills in the children.



- *Food for Thought*- it is run in collaboration with Food4Thought Organisation with a purpose to connect idle books to hungry minds, restore endangered books & stories, reignite the joy of reading and build school & community libraries. This year, regular volunteering was done throughout the semesters and in vacations as well in 4 libraries of F4T foundation in Delhi.

- *Munirka Teaching Project*- The Munirka project aims for the upliftment of the slum community by making it self-reliant in various spheres with a focus on children in the community. Regular visits (4-5 days a week) were conducted to Munirka Basti. Along with the co-curricular activities, cleanliness drive was also run.

- *Bachpan*- it provides children at construction sites opportunity of basic education, better living conditions and develop them as individuals. It is started from the children of the labors inside our own campus who do not have a proper chance to grow.

- *Aarohan*- With its aim to provide quality education and inculcate learning habits in students pursuing Engineering Entrances who neither can afford nor have access to these values in current society, we teach Board as well as JEE level material consisting of Physics, Chemistry and Mathematics to students of Class 11th, 12th and 12th Droppers. Summer Internship for 11th Class: The classes were initially held in the campus itself, but later classes were held at Aarohan NGO in Malviya Nagar.

## Health Domain:

- *Blood Donation Camps*- Under this project blood donation camps and several awareness sessions are organised in the campus. During the whole tenure, we had 625 donations in the camps organised in IIT Delhi and 32 requests for Emergency blood donations in hospitals were successfully managed. We were able to make new collaborations namely Sachhi Saheli, DATRI, IAPH and Leo Club and worked with them.



- *Substance Abuse Project*- The project focused on creating awareness about Tobacco, Alcohol and Substance abuse through events and posts on social media platform. Various activities were conducted under the project. Some are- World No-Tobacco Day awareness post, Learn to be Drug-Free - Talk by Dr. Ranveer Singh and Dr. Jateen Ukrani, Think Before you Drink: Documentary screening of an episode of Satyamev Jayate and a postevent survey that received about 300 responses and Movie Screening - A Beautiful Boy (Substance Abuse).

## Environment Domain:

- *Climate Crusade* is an initiative taken by NSS IIT Delhi to tackle the topic of Climate Change which has become a growing concern now-a-day. Some of the activities of tenure are: VIDYA Awareness Session about the harmful effects of burning crackers, Facts of Friday on how a common man can fight climate change, Interactive Talk by Ridhima Pandey- a young climate-activist, WATT IF Documentary Screening on global problems, Waste Segregation Posters and a Conversation with Prof. Achutarao on climate change.

## Animal Care:

- Under this, we make people empathize and create awareness about the pain or sufferings of animals. We facilitate interactions in and out of campus, tell people how to deal with animals and provide a platform for enthusiasts to do their bit. The work done in 2019-20 tenure are: Coordination with administration to deal with the animal safety and dog feeding in campus.

- A talk by PETA on "Man and Animal Conflict in Urban Areas".

- An interactive session by FIAPO on Veganism.

- A documentary by STRAW on "Living with Elephants".

- Organised two trips to Friendicoes, an animal shelter in Gurgaon, one in each semester.

- Dog feeding Training sessions were conducted.

- Furry First Aid - A talk by Straw, Mrs. Aarti (paravet) and our chief guest being Mrs. Gauri Maulekhi, a Nari Shakti Puraskar awardee, with HIS (Humane Society International) in attendance.

- The signature collection drive for the banning of battery cages in collaboration with HSI was done in 7 hostels.

- Session on Animal Cruelty and Eco-sustenance by HSI (29th February 2020).

- A stall by Vegan Outreach was set up at WindT on "Animal Cruelty against Farm Animal".



### Green Warriors

Green Warriors work on sensitizing the commoners about environment conservation, presenting them solutions to their day-to-day wastage, and connecting them to nature. Tree Plantation Drive in collaboration with Akshaya Patra was organised. Waste committee was formed and proposed the need of e-bins. Awareness session was organised on Climate Change with Aman Sharma, a 11th grader from Delhi turned environmentalist and climate striker on witnessing the plight of animals and humans alike at the hands of environmental pollution and climate change. Also screened an anime movie, Mononoke Hime to sensitize the students towards the problems caused by the advent of technology and the vanity of human nature.



### Society Domain:

- *National Association for Blind (NAB)-* The project involves regular volunteering at two centers of NAB, in R.K. Puram and Hauz Khas. The volunteers visit the centers and help the visually disabled people there in studies or some vocational activities.
- *Know Your Rights-* Several digital posters were made in the project that displayed the different government policies and programmes for the underprivileged sections. A Know Your Rights Camp was arranged in collaboration with SRCC (Sri Ram College of Commerce) for the security guards of IIT Delhi about the policies.
- *Old Age Home-* The primary aim of Old Age Home project is to provide mental support to the old people, in a way such that volunteers also learn from it. Regular volunteering was done to nearby old age homes.



- Many activities under Gender Mainstreaming were executed. Some collection drives were run for clothes, medicines, footwear, books, mattresses, toys, etc. for the needy people with support from Goonj.

### Major Events:

- A talk on water Conservation – Shri Rajendra Singh (Waterman of India)
- Mental Health through Arts in collaboration with Dauntless
- Education Conclave on changes in the Education Sector and the Role of Schools in the Technology Age - The event witnessed participation from 800+ students, 100+ teachers, and 25+ policymakers, educationists and investors.
- An interactive talk-session on Redefining Education.
- Anti Human Trafficking - Unseen and Unheard Voices of India.
- Panel Discussion on Road Safety.
- Breath Based Stress Management Workshop
- KAIZEN 2020- the social fest of IIT Delhi was organised from 28th February to 1st March. For the first time, Kaizen was plastic free and saw the organising team using glass bottles and jute folders instead of their plastic alternatives.



### New projects and Activities:

- *Kilkari-* teaching kids at nearby slums, where the location and infrastructure was arranged by Kilkari, while the volunteers of NSS IITD managed the teaching job.
- *Umeed Bhavan Project-* this project is for an orphanage and shelter home boys. Volunteers visit and help the kids in studies and focusing more on the Science subjects.

- *She Codes*- it aims at teaching code to girls. Its teaching base is girls of 6th standard in various government schools . it aims to develop interest of these girls in the technology field and give them an idea about general coding and platforms like Scratch.
- PISA and Video Making- in preparing problem statements for how well students, at age 15, are prepared to meet the challenges they may encounter in future life.

## 3. NATIONAL CADET CORPS (NCC)

The National Cadet Corps is an organisation aiming at the development of leadership, character, comradeship, spirit of sportsmanship and the ideal of service, among the youth in educational institutions. The motto of NCC is "Unity and Discipline".

## 4. STUDENT COUNSELLING SERVICES (SCS)

The aim of Student Counselling Services (SCS) of IIT Delhi is to support the students to enhance their efficiency and output to perform better and to cope with various distresses they experience and to address and satisfy issues of parents regarding their wards and addressing problems of any IIT Delhi faculty and staff as per their requirement.

Three components of SCS are firstly, the initial problem which is to be addressed by the counsellors which is subsequently followed by support through psychological therapies and assessment done by the counsellors and the referrals by the counsellors to a psychiatrist and other medical intervention if required and thirdly, the follow up sessions with the students and staff.

Counselling in SCS involves therapies based on cognitive, behavioural, rational, emotive, supportive, existential and interpersonal and intrapersonal and personality domains of an individual.

With ample opportunities and service to all our stakeholders, we endeavour to be the change that we wish to see.

*Common Psychological Problems Brought at SCS:* The primary problems that individuals come up with and the SCS deals with, that disturb the individual's emotional, psychological, mental and physical well-being, thus leading to poor coping are stress and anxiety, academic concerns, depression, forms of eating disorders, anger and low self-esteem, adjustment problems (at personal, family, friends and social levels), relationship issues, peer pressures, time management, coping with issues, problem solving, decision making, personality orientation of self and that of others (social schemes), interpersonal and intrapersonal communication skills, suicide ideations, addictions (smoking, alcohol, drugs, video gaming), cyber bullying, somatoform disorders, issues pertaining to body image and sexuality.

## 5. STUDENT-TEACHER INTERACTION COMMITTEE (STIC)

STIC (Student-Teacher Interaction Committee) made available funds for Student-Teacher Interactions organised by individual faculty for their respective courses. Also many departments organised dinners involving all their students and faculty by utilizing STIC funds for various courses.

## 6. NATIONAL SPORTS ORGANIZATION (NSO)

NSO is a classification in the scheme of education formulated in furtherance of setting a climate of sports consciousness and improvement of physique among the youth during their period of education. Sports is included in the curriculum at IITD.

## 7. CO-CURRICULAR AND ACADEMIC INTERACTION COUNCIL (CAIC)

The council is a joint committee of undergraduate students, postgraduate students and faculty that provides feedback to the Board of Undergraduate Studies on all academic and allied matters. By means of suitable dialogues with appropriate authorities, it also tries to solve local as well as general problems of students that are co-curricular and academic in nature.

# Academic Outreach

(April 1, 2019 - March 31, 2020)

## Knowledge India Programme (KIP)

The 59th KIP was organised in the Indian Institute of Technology, Delhi on 23rd January 2020 (9:30 am to 2:00 pm). Total 40 participants from several countries i.e. Fiji, Guyana, Mauritius, Myanmar, South Africa, Sri Lanka, Suriname, Trinidad and Tobago interacted with Prof. Nandana Sengupta, Assistant Professor, School of Public Policy. They had visited three departments/ School namely, Kusuma School of Biological Sciences, Department of Design and Department of Materials Science & Engineering.

Prof. Manoj had coordinated the visit in Kusuma School of Biological Sciences. The faculty gave presentation on their school and showed their lab facilities to them.

Prof. P.V. Madhusudan Rao (Head of Department-Department of Design) had interacted with all the participants and Prof. Jay Dhariwal coordinated the visit in Department of Design workshops and Makers' space.

Prof. Anup Kumar Ghosh (Head, Department of Materials Science & Engineering) along with Prof. Sangeeta Santra (Coordinator) gave presentation on their department and interacted with the participants.

The participants had exposed to one expert lecture from Prof. Nandana Sengupta, School of Public Policy.

## 'Pradhan Mantri Innovative Learning Programme (PMILP) Dhruv' Pilot Project

This pilot project's opening ceremony was launched in ISRO Bengaluru on October 10th, 2019 and a pilot project was completed in IIT Delhi & National Bal Bhawan, New Delhi from October 14th to October 22nd 2019.

Total 30 school-going Science students from 9th to 12th standard had participated from 17 states for an intensive mentorship and training programme at IIT Delhi. The selected 30 Science students were winners of KVPY, NTSE, INSPIRE MANAK, Olympiad (Mathematics), Olympiad (Astronomy & Astrophysics), AIM.

**Project Formation:** Total 30 students were divided into three groups of ten each for three different projects (prototype, working models) related with Climate Change theme and they all were involved in different scientific, technical and project activities in IIT Delhi under the mentorship of IIT Delhi Professors from 14th October to 22nd October, 2019.

## Open House

Institute has been organising Open House to exhibit an extensive collection of innovative research and product development projects since last ten consecutive years. The 15th edition of Open House was held successfully on 20th April, 2019. Open House targets young school students in NCR region and the footfall this year was about 5000 students, researchers and industry personnel participated. Key technologies developed through IRD schemes and sponsored research were showcased. Some of these, viz. flexi motive clutches generated lots of interest.

The four projects were finalised as follows:
- CO$_2$ Sequestration Project
- Fabrication of Air Pollution Monitor (Mentor: Dr. Sarita Ahlawat)
- Nano Fabrication of PMILP-Dhruv Logo
- Climate Change Project

To complete the projects in time, some Ph.D. students as volunteers were identified and allocated projects as per their specialisation. Besides this, Lab staffs were also involved.

The students came in IIT Delhi from October 14th to 21st October 2019 excluding Sunday. The schedule for total seven days was prepared (October 14th to 19th October 2019 & October 21st 2019)

A valedictory function of PMILP-Dhruv 2019 was organised by MHRD at Siri Fort, New Delhi on 23rd October, 2019. There all participating 30 science students showcased their knowledge and skills acquired during these days in the form of short movies, presentation, performances, projects, Models in front of Vice President M. Venkaiah Naidu.

## Prime Minister's Research Fellowship (PMRF) Scheme

The PMRF Scheme for Ph.D. students was started in 2018 and selections are normally done twice a year. In 2019-20, seven PMRF fellows joined the Institute taking the total number of fellowship recipients at IIT Delhi to 31. Also, IIT Delhi has been chosen as the coordinating institute for two years starting from February 2020.

Compared to previous rounds, the selection process has been completely revised and starting from this Academic Year 2020-21, there will be two modes of entry - those candidates who are already in the early part of their Ph.D. programme and show exceptional potential can get selected through the 'Lateral Entry' mode, and those amongst fresh entrants in the Ph.D. programme who show exceptional potential can get selected through the 'Direct Entry' mode. The participating institutes play a vital role in nominating candidates through either mode and the final selection will be done by a national level expert committee. These changes were made with a view to increase the number of fellowships across the country. As per the revised guidelines, top institutes in the country including IIT Delhi can have up to 3.5% of their existing PhD student strength as PMRF fellows.

An internal review meeting of all existing PMRF fellows at IIT Delhi to discuss research progress was held in January 2020 where the diversity of the different research projects and exceptional quality of their research work was apparent to all participants and reviewers. Prof. Amit Kumar from Department of Computer Science and Engineering at IIT Delhi has been appointed as the National Coordinator of the programme.

## Continuing Education Programme / Quality Improvement Programme / Technical Education Quality Improvement Programme - IIT Delhi

To cater to the needs of the rapidly transforming needs to the technological, business and regulatory landscape, IIT Delhi conducts several bespoke training programmes every year. We have a dedicated CEP/QIP office that organises a wide spectrum of training activities in collaboration with world class mentors while connecting with industry professionals.

We offer customized skill development courses and diverse lecture series programmes to serve professional specific and company specific needs. The course programmes have different levels to serve different experience levels of corporate executives and designed to incorporate a balanced mix of theoretical, lab sessions, and real-life case studies. A range of short term courses, long term courses and various certificate programmes are conducted as a part of such outreach programmes with durations ranging from three days to six months. The five broad verticals of the activities include:

### Continuing Education Programme (CEP):

Outreach programmes offered to diverse organisations to take advantage of formal course work, conferences or seminars to address their training needs, to remain updated in their fields, learn new skills, change careers or enhance their marketability or improve their businesses and organisations. The programmes help to increase the efficiency, employee retention, gain their loyalty, and ultimately boost organisational productivity. IIT Delhi offers open-enrolment certificates courses and professional development programmes. The diverse programmes are designed in consideration with the industry requirements and delivered by our internationally acclaimed faculty members and the practicing professionals, selected for their industry expertise.

Committed to the cause of making quality education accessible to all, CEP IITD is launching online CEP Certificate Programme for Indian as well as International participants.

IIT Delhi is the first leading national Institute in India to develop and roll out the policy framework for large scale deployment of Online Certificate programmes, in collaboration with service providers in the educational space, on virtual platforms.

Scope of online CEP Certificate Programme is to cater to the needs of Industry, Open participants at National and International level.

### Quality Improvement Programme (QIP):

Endeavor to improve the quality of technical education in the country and upgrade the skills of teachers of the AICTE approved degree-level engineering institutions and National Institutes of Technology (NITs) of the country through degree programmes, short term courses and curriculum development cell activities. The programme is now being implemented and monitored by the National QIP Coordination Committee (NQCC), funded by AICTE (A Statutory Body of the Government of India). Through its Curriculum Development Cell, this programme has also been involved in making efforts to upgrade the teaching curricula to enhance the overall knowledge of teachers.

**Technical Education Quality Improvement Programme (TEQIP-III):**

TEQIP-III is to improve quality of technical education and enhance existing capacities of the institutions to become responsive to the global economic and technological developments. This focusses on improving quality of Engineering Education in existing institutions especially for Low Income States and Special Category States (SCS) and providing support to strengthen technical universities.

**Global Initiative of Academic Networks (GIAN):**

GIAN is a new programme in Higher Education aimed at tapping the talent pool of scientists and entrepreneurs, internationally to encourage their engagement with the institutes of Higher Education in India. The programme arranges Guest Lectures by international renowned experts to augment the country's existing academic resources, accelerate the pace of quality reform, and elevate India's scientific and technological capacity to global excellence.

**Indian Technical and Economic Cooperation (ITEC):**

In ITEC Programme (fully funded by the Government of India) and its sister programme SCAAP (Special Commonwealth African Assistance Programme), 161 countries in Asia, Africa, East Europe, Latin America, the Caribbean as well as Pacific and Small Island countries are invited to share the Indian developmental experience acquired over six decades of India's existence as a free nation.

**Summer Faculty Research Fellow Programme (SFRF):**

IIT Delhi is inviting faculty fellows from various Engineering and Science Institutes and Colleges other than IIT Delhi to come and spend the summer (06 to 08 weeks during May- July of every year) for pursuing research under the guidance of a faculty mentor of IIT Delhi. The objective is to facilitate and orient the faculty fellows to undertake research. The SFRF programme works as a catalyst for those who are considering higher studies (Masters/Ph.D.) at IIT Delhi in the near future.

Programmes and activities conducted by CEP/ QIP, IIT Delhi are enriched with a rigorous yet interactive course design to help you stay abreast with latest global business trends. These programmes allow our corporate partners to strengthen the technical skills of their employees through elite trainers and thereby revitalize the work force. We are the right partner in your journey towards creating a talented and better skilled workforce!

**Activities conducted in the Financial Year 2019-2020:**

A.

| Total Number of Activities | 93 |
|---|---|
| Total Number of Participants benefited | 1887 |

B.

| Summer Faculty Research Fellow Programme-2019 (Six weeks) from May 2019 to July 2019 | |
|---|---|
| Number of Faculty Fellow Joined | 100 |
| Number of College participate | 86 |
| Number of State participate | 16 |
| Number of Faculty Mentor of IIT Delhi Involved | 64 |

## Continuing Education Programme

# Infrastructure Development

(April 1, 2019 - March 31, 2020)

## Creation of World Class Institution

The Institute has been focusing towards attracting young talented academicians and post-doctoral fellows from across the world. For this, we need, on one hand, world-class laboratories, high-end equipment to conduct research, and on the other hand, quality living experience such as accommodation facilities.

The Institute has drawn the blueprints to build lab infrastructure of global standard and acquire equipment for technological convergence domains like smart infrastructure and affordable health care, among others.

In order to achieve the aspirations for higher global ranking it is vital that the IIT rethink and revitalize its approach to its infrastructure. Changes are required at all stages of estate development, including Specification and Prioritization, Delivery and Quality Management and Maintenance. Much work is underway already, however concerns remain and it is vital that significant resources be made available to deliver and internationally competitive infrastructure.

The new space be developed with greater sensitivity to international developments in curriculum design and corresponding changes to learning and teaching approaches (i.e., Project-based work that demands more flexible and reconfigurable space), accommodation standards, student interaction and stimulation, and the requirements of world leading engineering research institute.

## Physical Infrastructure: Approved and in Progress

All infrastructure related activities are managed by the Building & Works Committee. Environment Clearance obtained from Ministry of Environment and Forest (MoEF) for the following projects of IIT Delhi, which was the last of the mandatory approvals/Clearance required commencement of these projects were obtained and constructions commenced on the first seven projects. Salient features of these projects along with their progress status are given in the subsequent paragraphs.

1. Construction of Engineering Blocks 99B & 99C
2. Construction of Research and Innovation Park
3. Construction of Boys Hostel 'E'
4. Construction of New Girls Hostel
5. Construction of Nalanda Married Research Scholar Apartments
6. Construction of Faculty Flats
7. Construction of Indoor Sports Complex
8. Construction of Golden Jubilee G.H. Keswani Research Centre

### Construction of Engineering Blocks 99B & 99C


Engineering Blocks : Concept Render


Engineering Blocks : Work in Progress

CPWD has awarded the work of construction of Engineering Blocks to M/s. NCCL. The work is in full swing and about 50% of work has been completed at site and tentative date for completion of project is 31/03/2021 (date of completion has been re-scheduled due to COVID-19 pandemic). These two blocks are being constructed on either side of Lecture Hall Complex. These blocks shall provide additional area for Labs, Workshops, and Faculty rooms etc. The approximate floor area of the Engineering Block 99B & 99C is 37,416 sqm. and 30,362 sqm. respectively.

### Construction of Research and Innovation Park

The main purpose of this project is to facilitate state of the art facilities for R&D activities. This building consists of 2 Basements, a Ground Floor and 6 Upper Floors. The work has been assigned to NBCC. The work is in full swing and about 50% of work has been completed at site and tentative date for completion is 31/03/2021 (date of completion has been re-scheduled due to COVID-19 pandemic).

## Construction of Boys Hostel 'E'


Boys' Hostel : Concept Render


Boys' Hostel : Work in Progress

A Boys Hostel with 856 seated capacity, fully air conditioned, is being built. The G+7 storied building has a built up area of 24,450 Sqm (approx.). The work by CPWD is in progress and about 40% of work has been completed and tentative date for completion is 31/03/2021 (date of completion has been re-scheduled due to COVID-19 pandemic).

## Construction of New Girls Hostel


Girls' Hostel : Concept Render


Girls' Hostel : Work in Progress

A Girls Hostel with 323 seated capacity, fully air conditioned, is being built. The G+7 storied building has a built up area of 11,696 Sqm (approx). The work by CPWD is in progress and about 45% of work has been completed and tentative date for completion is 31/03/2021 (date of completion has been re-scheduled due to COVID-19 pandemic).

## Construction of Nalanda Married Research Scholar Accommodation (Phase-I)


Nalanda Apartments : Concept Render


Nalanda Apartments : Completed Building

Nalanda Married Research Scholar Accommodation (Phase-I) work has been assigned to NBCC. The proposed accommodation will have 103 single bed room flats. The work is in progress and about 75% of work has been completed and tentative date for completion is 31/07/2020.

## Construction of Faculty Flats

154 numbers Faculty Flats in six towers are being constructed by NBCC in west campus. The work is in progress and about 45% of work has been completed and the tentative date for completion is 31/03/2021 (date of completion has been re-scheduled due to COVID-19 pandemic).

## Construction of Indoor Sports Complex

Construction of Indoor Sports Complex has been assigned to CPWD. This project has been taken up with alumni contribution by 1995 batch alumnus, Mr. Saurabh Mittal. The construction work is in progress and about 45% complete with tentative date of completion as 31/03/2021 (date of completion has been re-scheduled due to COVID-19 pandemic).

## Construction of Golden Jubilee G.H. Keswani Research Centre

Construction of Golden Jubilee G.H. Keswani Research Centre is to be executed as alumni contribution by the owners of M/s. Lemon Tree Hotels. The work is expected to commence shortly.

## Physical Infrastructure in Planning Stage

The Institute has initiated proposals for development of additional infrastructure for the increased intake of Student/Faculty, due to EWS quota and IoE Status of IIT Delhi. The next phase of works has been assigned to RITES for development of architectural design and construction. The projects covered under the additional infrastructure are as under.

### i. Faculty Housing

5 Blocks of residential accommodation with 105 No. of dwelling units is to be constructed with total built up area of 22,050 Sqm.

### ii. Mini Academic Complex

Mini Academic Engineering complex namely Blocks-102A1 & 102A2 are to be constructed with B+G+6 floor with built up areas of 55,000 Sqm. and 40,000 Sqm. respectively.

### iii. Academic Block

Another academic Block 103 is being planned after demolition of a few old type 'A' quarters in dilapidated condition with construction of B+G+7 floors. Approximately built up area will be 28,000 Sqm.

### iv. Staff Housing

For staff, 01 Block of residential accommodation of C-Type with 18 numbers of dwelling units is planned for construction with approximate total built up area of 2820 Sqm.

### v. Construction of Additional Hostels

07 numbers of Hostels are to be reconstructed with G+7 Storey with a covered area of 11,360 Sqm (approx.) for each hostel after demolition of current G+3 storey hostels.

### vi. Construction of Nalanda Accommodation (Phase-II)

Phase-II of Nalanda Research Scholar accommodation is planned to be taken up soon after completion of Boys & Girls hostel construction work. The phase-II will cater for 142 numbers additional flats for married research scholars.

### vii. Rehabilitation/Augmentation network of sewerage, water supply and drainage.

Due to substantial increase in Institute infrastructure, the augmentation of old and existing sewer & drainage system, water distribution network, communication services electrical cabling etc. has become critical. Accordingly, rehabilitation/augmentation of utility network of entire institute is being planned along with proposed buildings.


Faculty Flats : Concept Render


Faculty Flats : Work in Progress


R & I Park : Concept Render


R & I Park : Work in Progress

# Financials

(April 1, 2019 - March 31, 2020)

The Institute is financed by the Department of Higher Education, Ministry of Education, Government of India. During 2018-2019, the Institute received a grant of ₹63,129.30 lakhs from the Ministry of Human Resource Development to meet its yearly expenses. The Institute receives funds for sponsored research projects and for consultancy assignments being undertaken by the Institute from several funding agencies and Industries. The financial year of the Institute corresponds with that of Government of India i.e. 1st April to 31st March. The accounts of the Institute are annually audited by the Director General of Audit & Central Revenue of India. The 120th Finance Committee of the Institute (shown in the box on the side) in its meeting held on 31-10-2019 recommended Plan (Normal) under (OH-35) Revised Estimates for ₹12,000 lakhs for the year 2019-2020 and Budget Estimates for ₹19,000 lakhs for the year 2020-2021 respectively and Plan under (OH-31 & OH-36) Revised Estimates for ₹59,600 lakhs for the year 2019-20 and Budget Estimates for ₹67,535 lakhs for the year 2020-21.

The following are the details for the financial year 2018-2019 and 2019-2020:

### FINANCE COMMITTEE
(As on 31.3.2020)

V. Ramgopal Rao, Chairperson (Officiating)

Prashant Agarwal

Anil Kumar

G. Narendra Kumar

Nalin Pant

T.C. Kandpal

A.K. Ganguli

Kanika T. Bhal (Ms.)

Mohd. Shamim

Sandeep Chatterjee, *Secretary*

## PLAN (Non Recurring) OH-35

Detailed Statement showing the Actual Receipt and Expenditure for 2018-19, 2019-20 along with Revised Estimates and Budget Estimates 2020-21

| Head of Receipt | Actuals 2018-19 (₹ in Crore) | Budget Estimates 2019-20 (₹ in Crore) | Revised Estimates 2019-20 (₹ in Crore) | Actuals 2019-20 (₹ in Crore) | Budget Estimates 2020-21 (₹ in Crore) |
|---|---|---|---|---|---|
| **A. Receipt** | | | | | |
| Plan Grant from MHRD carryforward | 77.25 | - | - | 111.52 | - |
| Plan Grant from MHRD (Normal) | 76.71 | 506.00 | 90.00 | 70.00 | 150.00 |
| Grant Plan Grant from MHRD | - | - | - | - | - |
| Research Park from MHRD | 30.00 | - | 30.00 | 20.00 | 40.00 |
| Special Plan Grant under IOE Scheme | 42.29 | - | - | 40.00 | - |
| Grant Receivable from MHRD | - | - | - | - | - |
| Over spent to be adjusted with Corpus Fund | 80.60 | - | - | - | - |
| **Total A** | 306.85 | 506.00 | 120.00 | 241.52 | 190.00 |
| **B. Expenditure** | | | | | |
| Normal Development Activities & Increase of Students Intake (including new hostel) New Courses Modernisation & Thrust Areas | | | | | |
| (i) Non-Recurring | 195.34 | 506.00 | 120.00 | 178.51 | 190.00 |
| Commitments against L.C.'s for the year 2018-2019 Plan (Normal) | 111.52 | - | - | 63.01 | - |
| **Total B** | 306.86 | 506.00 | 120.00 | 241.52 | 190.00 |

Detailed Statement showing the Actual Receipt and Expenditure for 2018-19, 2019-20 along with Revised Estimates and Budget Estimates 2020-21

| Head of Expenditure | Actuals 2018-19 (₹ in Crore) | Budget Estimates 2019-20 (₹ in Crore) | Revised Estimates 2019-20 (₹ in Crore) | Actuals 2019-20 (₹ in Crore) | Budget Estimates 2020-21 (₹ in Crore) |
|---|---|---|---|---|---|
| **Major Works** | | | | | |
| On Going Schemes | 58.07 | 200.00 | 10.00 | 3.29 | 31.00 |
| Repair & Maintenance on Buildings | 11.24 | 15.00 | 15.00 | 14.76 | 50.00 |
| Fresh Schemes/Projects | - | 200.00 | - | - | - |
| Teaching Equipment/Computerization | 22.32 | 50.00 | 30.00 | 27.78 | 30.00 |
| Office General Equipment, Hospital Equipment/ Furniture and Fixtures & Institute Level Network | 8.91 | 18.00 | 12.00 | 7.99 | 14.00 |
| Motor Vehicles | - | - | - | - | - |
| Research Funds, Central Facilities & Thrust Areas | 2.89 | 3.00 | 3.00 | 2.61 | 3.00 |
| Web Based Academic Systems | - | - | - | - | - |
| Institute Level Network | - | - | - | - | - |
| Library Books & Journals | 26.14 | 20.00 | 20.00 | 17.05 | 22.00 |
| World Class Institutions Scheme (IOE) | 19.42 | - | - | 17.86 | - |
| Science Research Park | 11.00 | - | 30.00 | 36.76 | 40.00 |
| Equipment out of Special Grant | 35.35 | - | - | 50.41 | - |
| **Total** | **195.34** | **506.00** | **120.00** | **178.51** | **190.00** |

## PLAN (Recurring) OH-31 & OH-36

Detailed Statement showing the Actual Receipt and Expenditure for 2018-19, 2019-20 along with Revised Estimates and Budget Estimates 2020-21

| Head of Receipt | Actuals 2018-19 (₹ in Crore) | Budget Estimates 2019-20 (₹ in Crore) | Revised Estimates 2019-20 (₹ in Crore) | Actuals 2019-20 (₹ in Crore) | Budget Estimates 2020-21 (₹ in Crore) |
|---|---|---|---|---|---|
| Institute Income | 117.06 | 111.57 | 117.37 | 123.09 | 121.37 |
| Grant from MHRD OH-31 & OH-36 | 479.81 | 657.51 | 596.00 | 535.94 | 675.35 |
| **Total A** | **596.87** | **769.08** | **713.37** | **659.03** | **796.72** |
| HEFA Loan Interest | - | - | - | 5.75 | - |
| Special Plan Grant from MHRD under IoE Scheme | 0.66 | - | - | 19.10 | - |
| Special Grant under P.M. Research Fellowship | 1.81 | - | - | 1.79 | - |
| **Total B** | **2.47** | **-** | **-** | **26.64** | **-** |
| **Total A+B** | **599.34** | **769.08** | **713.37** | **685.67** | **796.72** |

Detailed Statement showing the Actual Receipt and Expenditure for 2018-19, 2019-20 along with Revised Estimates and Budget Estimates 2020-21

| Head of Expenditure | Actuals 2018-19 (₹ in Crore) | Budget Estimates 2019-20 (₹ in Crore) | Revised Estimates 2019-20 (₹ in Crore) | Actuals 2019-20 (₹ in Crore) | Budget Estimates 2020-21 (₹ in Crore) |
|---|---|---|---|---|---|
| Pay & Allowances | 263.80 | 273.85 | 285.00 | 249.02 | 323.35 |
| Pension & Pensionary Benefits | 101.66 | 110.00 | 110.00 | 96.54 | 125.00 |
| Institute Scholarship | 53.33 | 70.00 | 70.00 | 71.48 | 70.00 |
| Academic Expenses | 12.71 | 16.00 | 14.00 | 13.67 | 16.00 |
| Educational Expenses | 13.29 | 12.00 | 14.00 | 12.95 | 15.00 |
| Estate Maintenance | 71.56 | 85.00 | 80.00 | 75.62 | 100.00 |
| Office Contingencies, Misc. & Commitments/ Contractual Service Charges/Provisions | 21.05 | 3.00 | 3.00 | 19.84 | 26.00 |
| Young Faculty Incentive Fellowships | 0.24 | 2.00 | 0.75 | - | 1.00 |
| Joint Entrance Examination | 3.04 | 4.00 | 4.00 | 3.29 | 4.00 |
| Graduate Aptitude Test in Engineering | 5.03 | 16.00 | 15.00 | 8.65 | 16.00 |
| Joint Admission Test to M.Sc. | 1.26 | 1.80 | 1.80 | 1.38 | 1.80 |
| HEFA Loan Repayment | 36.43 | 58.86 | 52.50 | 55.65 | 58.86 |
| HEFA Interest Repayment | 1.48 | - | - | - | - |
| Expenditure under IoE Scheme | 0.64 | - | - | 21.96 | - |
| Expenditure under P.M. Research Fellowship | 1.05 | - | - | 2.40 | - |
| **Total** | **586.57** | **652.51** | **650.05** | **632.45** | **757.01** |

## INCOME

Detail Statement showing the Actual Income for 2018-19, 2019-20 along with Revised Estimates and Budget Estimates 2020-21

| Head of Expenditure | Actuals 2018-19 (₹ in Crore) | Budget Estimates 2019-20 (₹ in Crore) | Revised Estimates 2019-20 (₹ in Crore) | Actuals 2019-20 (₹ in Crore) | Budget Estimates 2020-21 (₹ in Crore) |
|---|---|---|---|---|---|
| Academic Receipts | 52.70 | 50.00 | 56.00 | 62.42 | 60.00 |
| Receipt-Central Administration | | | | | |
| Interest on Investments/Savings Account | 24.52 | 12.00 | 15.00 | 19.27 | 15.00 |
| Charges for use of Staff Cars and Buses | 0.17 | 0.17 | 0.17 | 0.19 | 0.17 |
| Application Fee | 0.83 | 0.50 | 1.00 | 0.45 | 1.00 |
| Sponsored Project/Consultancy and CEP | - | 0.50 | 0.50 | 0.44 | 0.50 |
| Works & Building | | | | | |
| Licence Fee | 2.86 | 3.20 | 3.20 | 3.06 | 3.20 |
| Seat Rent | 9.12 | 8.70 | 10.00 | 9.62 | 10.00 |
| Water & Electricity | 4.82 | 4.50 | 5.00 | 5.42 | 5.00 |
| Hospital & Medical | 0.90 | 0.30 | 1.00 | 0.89 | 1.00 |
| Guest House | 2.92 | 2.40 | 3.00 | 3.08 | 3.00 |
| Joint Entrance Exam | 3.68 | 4.80 | 4.00 | 3.43 | 4.00 |
| GATE | 11.26 | 21.00 | 15.00 | 11.09 | 15.00 |
| Joint Admission Test for M.Sc. | 1.55 | 2.00 | 2.00 | 1.73 | 2.00 |
| Misc./Other Receipts (Including sale of obsolete equipment) | 1.73 | 1.50 | 1.50 | 2.00 | 1.50 |
| **Total** | **117.06** | **111.57** | **117.37** | **123.09** | **121.37** |

**INTERNAL AUDIT**

Internal Audit is an independent, objective assurance and consulting activity designed to add value and improve an organisation's operations. Internal Audit Section is functioning independently as per Revised Audit System (w.e.f. 01/12/2011)directly under the control of the Director, supported by Assistant Registrar (Audit). The section conducts the Internal Audit of the Departments/Centres/Sections and suggests measures to strengthen Internal Control. The Internal Audit Section also renders advise on various financial as well as administrative/service matters as per needs of the Institute. During the financial year 2019-20, 54 units have been internally audited.

# Senate

(As on 31.03.2020)

V. Ramgopal Rao
(Director): Chairperson

T.C. Kandpal
(Dy. Director, Operations)

Ashok K. Ganguli
(Dy. Director, Strategy & Planning)

B. Premachandran

Dipayan Das

Puneet Mahajan

S.V. Veeravalli

Anupam Dewan

Santosh Kapuria

B.P. Patel

Sriram Hegde

Maloy Kumar Singha

D. Sundar

Saroj Mishra (Ms.)

Sunil Nath

A.K. Srivastava

Prashant Mishra

T.R. Sreekrishnan

Atul Narang

Shilpi Sharma (Ms.)

K.K. Pant

A.N. Bhaskarwar

A.K. Saroha

Vivek Vitthal Buwa

Anil Verma

Sreedevi Upadhyayula (Ms.)

Sudip Kumar Pattanayek

Suddhasatwa Basu

Anil Jacob Elias

Ravi Shankar

Jai Deo Singh

D.K. Bandhopadhyay

Nalin Pant

Siddharth Pandey

N.D. Kurur

N.G. Ramesh

V. Haridas

Shashank Deep

Sameer Sapra

V. Haridas

Shashank Deep

S. Nagendran

Pramit Kumar Chowdhury

Nidhi Jain (Ms.)

A. Ramanan

Surya Prakash Singh

K. Sreenadh

R.K. Sharma

Amitabha Tripathi

S.C.S. Rao

B.S. Panda

S. Kundu

N. Chatterjee

S. Dharmaraja

Aparna Mehra (Ms.)

P.V. Rao

S.G. Deshmukh

Anoop Chawla

Sanjeev Jain

S.K. Saha

Anjan Ray

J.K. Dutt

S.R. Kale

Harish Hirani

M.R. Ravi

P.M.V. Subbarao

Naresh Bhatnagar

Raj Kumar Pandey

Ashish K. Darpe

Subodh V. Modak

Sujeet K. Sinha

S. Aravindan

Pulak Mohan Pandey

Prabal Talukdar

Sunil Jha

Sangeeta Kohli (Ms.)

Sudarsan Ghosh

A.K. Ghosh

Rajesh Prasad

Bhabani Kumar Satapathy

Ratnamala Chatterjee (Ms.)

M.R. Shenoy

V. Ravishankar

Anurag Sharma

Neeraj Khare

Pankaj Srivastava

Sujeet Chaudhary

P. Senthilkumaran

D.S. Mehta

Hitendra K. Malik

R.K. Varshney

Aloka Sinha (Ms.)

Varsha Banerjee (Ms.)

J.P. Singh

Santanu Ghosh

A.K. Shukla

Amruta Mishra (Ms.)

Sankalpa Ghosh

Amita Das (Ms.)

Gaddam Vijay Prakash

Joby Joseph

B.R. Mehta

Ashwini K. Agrawal

B.K. Behera

N.K. Garg

Ashok Gupta

Alok Madan

Manoj Datta

A.K. Jain

A.K. Keshari

Geetam Tiwari (Ms.)

V.R. Gunturi

Mukesh Khare

B.R. Chahar

Rakesh Khosa

R. Ayothiraman

Suresh Bhalla

R.R. Kalaga

Dev Raj Kaushal

S.P. Singh

B.J. Alappat

Neeraj Kumar Jha

Gurmail Singh Benipal

Vasant Annasaheb Matsagar

Sanjiva Prasad

Huzur Saran

S. Arun Kumar

Kolin Paul

S. Banerjee

Amit Kumar

Subodh Kumar

Sandeep Sen

M. Balakrishnan

Mausam

Naveen Garg

Jayadeva

M. Jagadesh Kumar

S.D. Joshi

Ranjan Kumar Mallik

Ranjan Bose

I.N. Kar

G. Bhuvaneswari

Santanu Chaudhury

M. Veerachary

Shankar Prakriya

Manav Bhatnagar

Brejesh Lall

Nilanjan Senroy

Sumantra Dutta Roy

Shouribrata Chatterjee

Bhim Singh

Purnima Singh (Ms.)

Sanil V.

Ravinder Kaur (Ms.)

C.A. Tomy

Seema Sharma (Ms.)

Sushil

| | | | |
|---|---|---|---|
| Ravi Shankar | Arun Kumar | Subrat Kar | Nomesh Bhojkumar Bolia |
| S.S. Yadav | Ananjan Basu | B.K. Panigrahi | Somnath Baidya Roy |
| M.P. Gupta | Monika Aggarwal (Ms.) | V.K. Agarwal | Maya Ramanath (Ms.) |
| Mahim Sagar | Manju Mohan (Ms.) | Jayashree Bijwe (Ms.) | Gagandeep Kang |
| P. Vigneswara Ilavarsan | A.D. Rao | Rahul Garg | S.S.V. Ramakumar |
| Bhuvanesh Gupta | Krishna Mirle Achutarao | P.R. Panda | Najma Akhtar |
| R. Chattaopadhyay | K.A. Subramanian | Swades De | Rohit T. Koshy |
| R. Alagirusamy | Vamsi Krishna Komarala | Ambuj D. Sagar | Ravindra Kumar |
| R.S. Rengasamy | Amit Gupta | Rajendra Singh | Rajiv K. Srivastava (Special Invitee) |
| Manjeet Jassal (Ms.) | Harpal Singh | James Gomes | Shaikh Z. Ahammad (Special Invitee) |
| Mangla Joshi (Ms.) | Prem Kumar Kalra | Tapan Kumar Chaudhuri | Vishal Chadha |
| Apurba Das | K. Narayanan | Aditya Mittal | Faraz Mazhar |
| Kushal Sen | Pardeep K. Gupta | Chinmoy Sankar Dey | Sarthak Kala |
| Abhijit Majumdar | P.K. Babu | Amitabha Mukhopadhyay | Nikita Patwa (Ms.) |
| Sourabh Ghosh | Anushree Malik (Ms.) | Nabi Hasan | Arif Mansoori |
| Amit Rawal | Satyawati Sharma (Ms.) | M.C. Ramteke | JR/DR/AR (Academics) |
| Deepti Gupta (Ms.) | V.K. Vijay | D. Ravi Kumar | Sandeep Chattergee (Secretary) |
| Bhupendra Singh Butola | V.M. Chariar | M.A. Haider | |
| P.V. Madhusudhan Rao | Vivek Kumar | Smruti Ranjan Sarangi | |

## EXECUTIVE COMMITTEE OF THE SENATE (ECS)
### (As on 31.03.2020)

| | | |
|---|---|---|
| V. Ramgopal Rao, Chairperson | Rajendra Singh | **SPECIAL INVITEES** |
| Ashok K. Ganguli | Ratnamala Chatterjee (Ms.) | D. Ravi Kumar |
| T.C. Kandpal | Subrat Kar | Pankaj Srivastava |
| Shantanu Roy | Swades De | Seema Sharma (Ms.) |
| Sudipto Mukherjee | Arun Kumar | B. Kundu |
| S.K. Khare | K.A. Subramanian | A.K. Nema |
| Sanjeev Sanghi | B.K. Panigrahi | Angelie Multani (Ms.) |
| Rajesh Khanna | Anushree Malik (Ms.) | Abhijit R. Abhyankar |
| K.C. Iyer | Amit Gupta | Mahim Sagar |
| Kanika T. Bhal (Ms.) | Ashwini K. Agarwal | M. Balakrishnan |
| Anurag Singh Rathore | Prem K. Kalra | B. Premchandran |
| Puneet Mahajan | Rahul Garg | S. Dharmaraja |
| D. Sundar | P.R. Panda | Anil Wali |
| K.K. Pant | James Gomes | Neeraj Kumar Chaurasia |
| Anil Jacob Elias | Ambuj D. Sagar | Nalin Pant |
| N.K. Garg | Nabi Hasan | K. Narayanan |
| Sanjiva Prasad | P.V.M. Rao | Sameer Sapra |
| Jayadeva | Manju Mohan (Ms.) | Deepayan Das |
| Purnima Singh (Ms.) | Harpal Singh | Sukumar Mishra |
| Seema Sharma (Ms.) | A.K. Ghosh | Anupam Shukla |
| K. Sreenadh | Sandeep Chatterjee (Registrar): Member-Secretary | Josemon Jacob |
| P.V. Rao | | Pritha Chandra (Ms.) |
| | | J.T. Shahu |
| | | Anil Verma |

# Administrative and Other Staff

(As on 31.03.2020)

| ADMINISTRATION | |
|---|---|
| Sandeep Chatterjee | Registrar |
| M.K. Gulati | Joint Registrar (Audit) |
| Kalyan Kumar Bhattacharjee | Joint Registrar (FAA, E-II, E-I, Manpower Training, R&I) |
| Atul Vyas | Joint Registrar (Academics, Publication Cell) |
| Mohd. Shamim | Deputy Registrar (Main Accounts) |
| N. Bhaskar | Deputy Registrar (Director's Office, Health Unit, Legal, Vigilance, Nodal Officer for Public Grievance/PG Portal, Gender Grievance & Related Work |
| V.K. Vashistha | Assistant Registrar (IRD) |
| Alan V. Siante | Assistant Registrar (Store Purchase Section) |
| Raj Kumar Gupta | Assistant Registrar (Accounts) |
| Mukesh Chand | Assistant Registrar (SAS) |
| Ramesh Kumar Thareja | Assistant Registrar (E-II, Recruitment Cell) On contract |
| S.N. Tiwari | Assistant Registrar (on deputation) |
| Debranjan Mukherjee | Assistant Registrar (R&D Accounts) |
| Sanjay Pande | Assistant Registrar (Alumni Affairs & Intl. Progammes, PIO, RTI) |
| Amitabh Mukherjee | Assistant Registrar  (Accounts) |
| S.K. Gohar | Assistant Registrar (Academics) |
| Rama Sharma (Ms.) | Assistant Registrar (IRD) |
| Mukesh Khandelwal | Institute Engineer (on deputation) |
| G.K. Taneja | Executive Engineer |
| K.M. Vijay Kumar | Executive Engineer |
| Anuj Gaur | Executive Engineer |
| Rafat Jamal | Assistant Executive Engineer |
| V.K. Bharaj | Assistant Executive Engineer |
| Prem Kumar | Assistant Executive Engineer |
| Brahm Prakash | Assistant Executive Engineer |
| Ashok Kumar | Assistant Executive Engineer |
| Raju Ram Parihar | Assistant Executive Engineer |
| Pradip Karmarkar | Assistant Executive Engineer |
| Prem Singh Rawat | Assistant Executive Engineer |
| Anishya Obhrai Madan (Ms.) | Industrial Liaison Officer |
| Shiv Prakash Yadav | Public Relations Officer |
| Deepak Negi | Sports Officer |

contd. .....

| | |
|---|---|
| Shachi Mathur (Ms.) | Student Counsellor |
| Sandeep Sharma | Security Officer |
| Bhupender Singh | Principal Technical Officer |
| Neeraj Kumar | Technical Officer |
| Uday Dadwal | Technical Officer |

| ADMINISTRATIVE COMPUTERISATION SUPPORT SERVICE | |
|---|---|
| Prem Kalra | Head |
| K. Narayanan | Senior System Manager (SG) |
| Pardeep Kumar Gupta | Senior System Manager (SG) |
| S.R. Hedge | Senior System Manager (SG) |

| STUDENT COUNSELLING SERVICE | |
|---|---|
| Angelie Multani (Ms.) | Head |

| PROFESSORS-IN-CHARGE OF DIFFERENT SECTIONS | |
|---|---|
| Deepti Gupta (Ms.) | Professor-in-Charge (Guest Houses & Halls) |
| Nalin Pant | Professor-in-Charge (EHLS Unit) |

| TRAINING AND PLACEMENT | |
|---|---|
| S. Dharmaraja | Head |

| HINDI CELL | |
|---|---|
| Seema Sharma (Ms.) | Head |

| LIBRARY | |
|---|---|
| S.P. Singh | Chairperson (Advisory Committee for Library) |
| Nabi Hasan | Librarian & Head |

| IIT HOSPITAL | |
|---|---|
| Lily Khosa (Ms.) | Chief Medical Officer (SAG), (Additional charge, Head, Hospital Services) |
| Ajay Kumar Jain | Chief Medical Officer (SAG) |
| Renu Misuriya (Ms.) | Chief Medical Officer (SAG) |
| Mahesh Kumar Sagar | Chief Medical Officer (SAG) |
| Anila Khosla (Ms.) | Chief Medical Officer (NFSG) |
| P.K. Rajesh | Senior Medical Officer |
| Md. Ashafaque Hussain | Senior Medical Officer |
| Sayed Yasmeen Raunaq | Senior Medical Officer |
| L. Pangerlemba | Senior Medical Officer |
| Rajlaxmi Borah (Ms.) | Medical Officer (on contract) |
| Shalini Singh (Ms.) | Medical Officer (Dental) (on contract) |
| Abhishek Gupta | Medical Officer |

# Other Committees

(As on 31.03.2020)

| BUILDING AND WORKS COMMITTEE | |
|---|---|
| V. Ramgopal Rao, Chairperson | J.T. Shahu |
| P.S.N. Rao | Abhijit R. Abhyankar |
| S. Ramanujam | B. Premachandran |
| Rajendra Kalla | Mukesh Khandelwal |
| K.N. Rai | Anil Kumar Jain |
| Sarvagya Kumar Srivastava | K.C. Iyer |
| T.C. Kandpal | Sandeep Chatterjee, *Secretary* |
| Ashok K. Ganguli | |

| ADVISORY COMMITTEE FOR LIBRARY | |
|---|---|
| S.P. Singh, *Chairperson* | Seshan Srirangarajan |
| K.A. Subramanian | Mahim Sagar |
| Gaurav Singh | Saswata Bhattacharya |
| S. Fatima (Ms.) | S. Sivananthan |
| Atul Narang | Soutrik Basu |
| Pushpraj Singh | S.P. Singh |
| Jayati Sarkar (Ms.) | Priyanshu Gautam |
| K. Narayanan | Bhaskar Kanseri |
| Pramit Kumar Chowdhury | Yash Harshajit Sheth |
| Ajai K. Saini | Bhanu Nandan |
| R.R. Kalaga | Kshitij Sahu |
| Amit Gupta | Sumer Singh |
| Naveen Garg | Harshit Singhal |
| Amit Kumar Jain | L.N. Ramasubramanian |
| Sumeet Agrawal | Seema Sharma (Ms.) |
| Richa Kumar | Krishna Achuta Rao |
| Vivekanandan Perumal | Deepak Joshi |
| Vibha Arora | Nabi Hasan, *Member - Secretary* |

contd. .....

| Computer Users' Committee | |
|---|---|
| Prem Kumar Kalra, *Chairperson* | Agam Gupta |
| M.M. Rao | Gopal Krishan |
| Gaurav Singh | Harish Kumar |
| Prabhu Babu | Pragya Jain (Ms.) |
| Ashish Mishra | D. Dubey |
| Kavya Dashora | Shreya Sharma (Ms.) |
| Gaurav Goel | Sujin B. Babu |
| Kolin Paul | Ojal Kumar |
| Hemant Kumar Kashyap | Dipayan Das |
| Rahul Garg | Rushil Gupta |
| D.R. Sahoo | Nirat Ray |
| Ashok Patel | Aditya Jaiswal |
| Mausam | Dilip Ganguly |
| Hemant Kashyap | Sandeep Jha |
| A.P. Prathosh | Kaushik Saha |
| Nandana Sengupta (Ms.) | Angelie Multani, *Head - Counselling Services* |
| Sourabh B. Paul | Sunil Kak, *Member - Secretary* |

Indian Institute of Technology Delhi
Hauz Khas, New Delhi-110 016, India
Tele : (91) 011-2659 1999, (91) 011-2659 7135
E-mail : webmaster@admin.iitd.ac.in

**w w w . i i t d . a c . i n**