



IIT BOMBAY

DIRECTOR'S REPORT 2020



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2020

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By
Prof. Subhasis Chaudhuri
Director, IIT Bombay

*Fifty-Eighth Convocation
23rd August 2020*

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IIT Bombay attracts the brightest students from the country for its Bachelor's, Master's and Doctoral programmes. In the 62 years of its existence, more than 59,900 students have graduated from IIT Bombay.

Director's Report

Prof. Duncan Haldane, co-recipient of the 2016 Nobel Prize in Physics, and a Professor of Physics at Princeton University.

Mr. Stephen Schwarzman, the Chairman and CEO of The Blackstone Group, and above all, a philanthropist.

Prof. Margaret Gardner, President & Vice-Chancellor of Monash University, members of the Board of Governors, members of the Senate, Parents, distinguished guests, colleagues, viewers of this program all across the globe, and most importantly, our graduating students.

I have great pleasure in welcoming you all to the 58th Convocation of the Indian Institute of Technology Bombay. We are indeed privileged to have Prof. Duncan Haldane and Mr. Stephen Schwarzman, two of the most distinguished and accomplished global personalities of the recent time to grace this occasion as the Chief Guest and the Guest of Honour.

Prof. Frederick Duncan Michael Haldane is currently the Sherman Fairchild University Professor of Physics at Princeton University, and a Distinguished Visiting Research Chair at Perimeter Institute for Theoretical Physics. Prof. Haldane worked initially at Institut Laue–Langevin in France, then at the University of Southern California, and then at the University of California, San Diego until he moved to Princeton University in 1990 – the same year when I moved out of UC San Diego to join IIT Bombay! Prof. Haldane is known for a wide variety of fundamental contributions to condensed matter physics including the theory of the Haldane gap in integer spin chains, and theoretical studies of Luttinger liquids, fractional quantum Hall

effect, exclusion statistics, entanglement spectra and much more.

Prof. Haldane was elected a Fellow of the Royal Society (FRS) in 1996 and a Fellow of the American Academy of Arts and Sciences in 1992; a Fellow of the American Physical Society in 1986 and a Fellow of the American Association for the Advancement of Science in 2001. Prof. Haldane was elected as a member of the U.S. National Academy of Sciences in 2017. He was awarded the Oliver E. Buckley Prize of the American Physical Society (1993); Alfred P. Sloan Foundation Research Fellow (1984–88); Lorentz Chair (2008), and Dirac Medal (2012). With David J. Thouless and J. Michael Kosterlitz, Prof. Haldane shared the 2016 Nobel Prize in Physics for “theoretical discoveries of topological phase transitions and topological phases of matter”. Prof. Haldane, we are truly honoured at your virtual presence in our annual convocation.

Mr. Stephen Allen Schwarzman, a graduate of the Wharton School, is an American businessman, investor, and philanthropist. He is the Chairman and CEO of The Blackstone Group, a global private equity firm he established in 1985 along with his partners. From a modest beginning in 1985, today Mr. Schwarzman is included in Forbes’ list of top 100 Billionaires in the world. Mr. Schwarzman briefly served as the Chairman of President Donald Trump’s Strategic and Policy Forum. He has been selected in Bloomberg’s list of top-50 most influential persons in the world several times.

The Blackstone Group, which initially

focused on mergers and acquisitions, subsequently under his leadership branched into business acquisition, real estate, direct lending, alternative assets, and now has some \$500 billion in assets under management. Mr. Schwarzman is also a well acknowledged philanthropist and several universities, schools and public libraries across the globe have benefitted from his substantive gifts. In 1999, he received the American Academy of Achievement’s Golden Plate Award. In December 2018, Schwarzman was awarded the Order of the Aztec Eagle from Mexico. His book ‘What It Takes: Lessons in the Pursuit of Excellence’, published in 2019 is a New York Times best seller. Mr. Schwarzman, we are honoured to have you with us and the entire graduating batch is looking forward to your commencement speech.

On behalf of the Institute, I wish to thank the Ministry of Human Resources Development for their continued support to enhance the research programmes and infrastructure of the Institute, and the faith reposed on us. Their excellent support for the growth of this Institute since its inception in 1958 has enabled us to achieve a number of milestones and has allowed us to set new targets for the future.

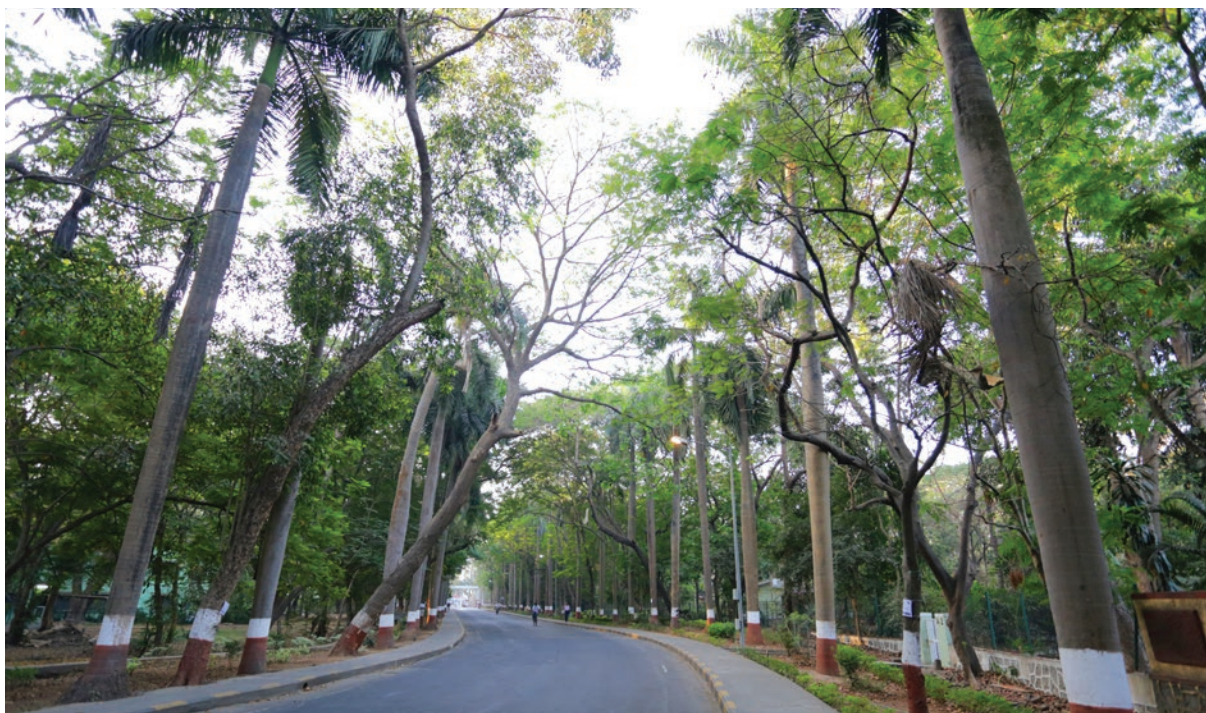
Dear parents of the students, I am pleased to inform you that the Institute continues to be ranked as one of the top universities of the country and among the best in the world. IIT Bombay attracts the brightest students from the country for its Bachelor’s, Master’s and Doctoral programmes. In the 62 years of its existence, about 60,000 students have graduated from IIT Bombay. The alumni of the Institute have made their alma mater proud

through their achievements and contributions in diverse fields and our engagements with them are steadily growing. Research, along with its translational opportunities, is an increasing focus of activity of the Institute. The Institute has been able to attract outstanding faculty members from not just India but other parts of the globe also. Today, I am happy to inform you that we have 681 faculty members on roll – with many of them globally acknowledged for their research contributions. We have also been able to further our links with international and national peer universities, enabling us to enhance research and educational programmes at the Institute. The progress of IIT Bombay on all fronts has been extremely creditable in the past year despite the unforeseen difficulties faced due to the current pandemic. I would like to acknowledge the devoted efforts of the faculty, staff, students and administration of the Institute towards these goals.

Dear students, you are the first batch of graduates among those who are still in the pipeline, who had faced extreme hardship due to the spread of the pandemic. You had to leave the campus within a few days of notice,

you had to make do with your regular classes by online means, you had to lock yourselves up at home and possibly you still are, you had to face so much uncertainties that possibly Mr. Heisenberg himself would not have envisaged! These uncertainties might have cast a pall of gloom among you all. But despair no more, dear students, you are now proud graduates of IIT Bombay. We would have loved to have you all physically attending this convocation, but mother nature has a different plan. As I talk from the podium in this august convocation hall and stare at the empty chairs, I wish all these missing occupants to stand up to their true potential, to be happy and safe in their lives and start shining as all our graduates do. Because of you, we have specially created this virtual reality-based convocation where you will be experiencing personally created avatars of each one of you collecting degree certificates from my own avatar surrogating me, from the comfort of your home. Possibly this is the first time anywhere in the world, to the best of my knowledge, such an attempt is being made!

I now present a brief report of the Institute activities this year.



Academic Programmes

IIT Bombay continues to make forays into newer territories pertinent to undergraduate and postgraduate education. At postgraduate level, three master's programmes have been introduced: Dual Degree MA + PhD programme in Humanities and Social Sciences, MS by research programme in Computer Science and Engineering, and Inter-Disciplinary Dual Degree (IDDD) programme towards a Masters (without honours) in 'Artificial Intelligence and Data Science' in the Centre for Machine Intelligence and Data Science (C-MInDS)

IIT Bombay continues to be a sought-after destination for UG and PG studies and attracts the top performers in national examinations such as GATE, CEED, UCEED, NET, JAM and JEE (ADV). Out of 37 available seats for Undergraduate Common Entrance Exam for Design (UCEED) at IIT Bombay, 16 out of top 30 rankers have joined IIT Bombay for BDes programme.

(Due to COVID-19 outbreak, JEE(Advanced) 2020, which was scheduled to be held on May 17, 2020 has been rescheduled and will be held on September 27, 2020).

With an increase in undergraduate (UG) and postgraduate (PG) intake, the student population has undergone significant changes in the last 10 years. In 2008-09, the number of on-roll UG students was 2583 (44.04%) while the number of PG students was 3282 (55.95%) (Masters – 1774, PhD – 1508). This has changed to 3900 (42.35%) and 5307 (57.64%) for UG and PG students, respectively, in 2013-14. Presently, the Institute has about 10949 students of which 4558 (41.6%) are UG and 6391 (58.37%) are PG.

In order to continue imparting high-quality and holistic education to the much larger student population, the Institute continues to modify and evolve processes which can effectively address the changing situations.



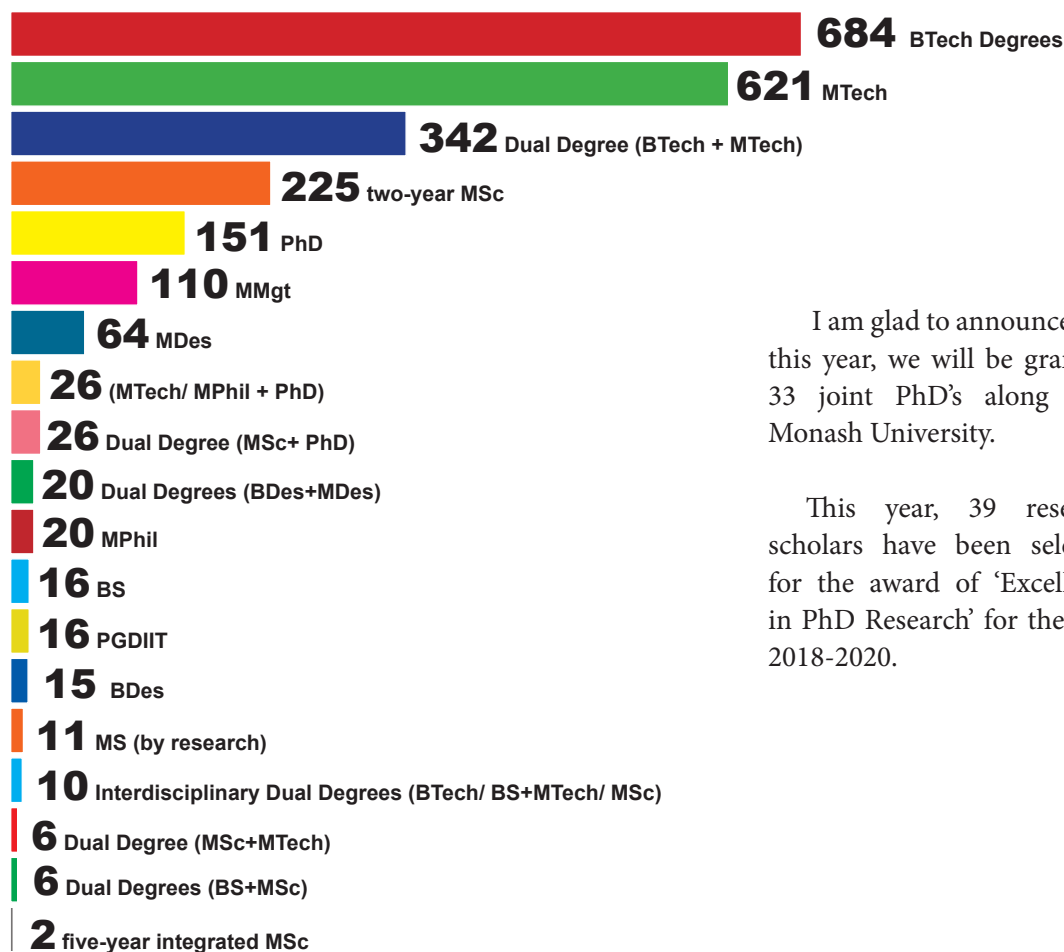
The PhD student strength has increased in leaps and bounds in the last 15 years. From 1028 PhD students in 2003-04, the number has gone up to 2518 in 2013-14 and currently stands at about 3310.

Number of PhDs awarded in the 58th interim convocation is 140.

The number of students graduating with a PhD has also been steadily increasing. In the last 10 years, the number of PhD degrees awarded has gone up from about 180 to 385 this year. A significant fraction of these are in the engineering discipline. All students involved in research at the Institute are given an opportunity to interact with research community at the national and international level by providing funds to attend international conferences. During the academic year 2019-20, 315 students were granted financial assistance for attending international conferences and an amount of Rs.4.4 Crores (Rs. 4,47,48,447/-) was utilised for this purpose.



TOTAL DEGREES : 2404



I am glad to announce that this year, we will be granting 33 joint PhD's along with Monash University.

This year, 39 research scholars have been selected for the award of 'Excellence in PhD Research' for the year 2018-2020.

SUPPORT FROM MINISTRY OF HUMAN RESEOURCE DEVELOPMENT

Grant in Aid Received from MHRD for the F.Y. 2019-20 includes:

Recurring	Rs. 62422.00 lakhs
Non Recurring	Rs. 8000.00 lakhs
Total	Rs. 70422.00 lakhs

Income :	
Student Fees	Rs. 10099.25 lakhs
Other Income	Rs. 4681.58 lakhs
Total	Rs. 14780.83 lakhs

(Above figures are subject to finalisation of Accounts and audit.)

Research and Development Activities

Research and development activity at IIT Bombay has continued its rapid momentum. The receipt for R&D projects during FY 2019-20 is Rs. 331.24 crores.

1. R&D Activities

During the year 2019-20, new R&D projects were initiated in all areas of science, engineering, management and social sciences, typically ranging from two to five years duration. These included short-term consulting projects and long-term sponsored research projects (Table 1).

Fin.Year	Sponsored projects		Consultancy projects	
	Number	Sanctioned outlay (Rs. In crores)	Number	Project outlay (Rs. in crores)
2019-20	345	251	705	79.8*
2018-19	388	214.6	745	104.16
2017-18	303	186.1	703	64.70
*: includes GST for Indian party/ clients				

Sponsored projects sanctioned outlay ranges during FY 2019-20 from few lakhs (in Rs.) to 9.56 crores and the distribution of outlay ranges is shown in the Figure 1.

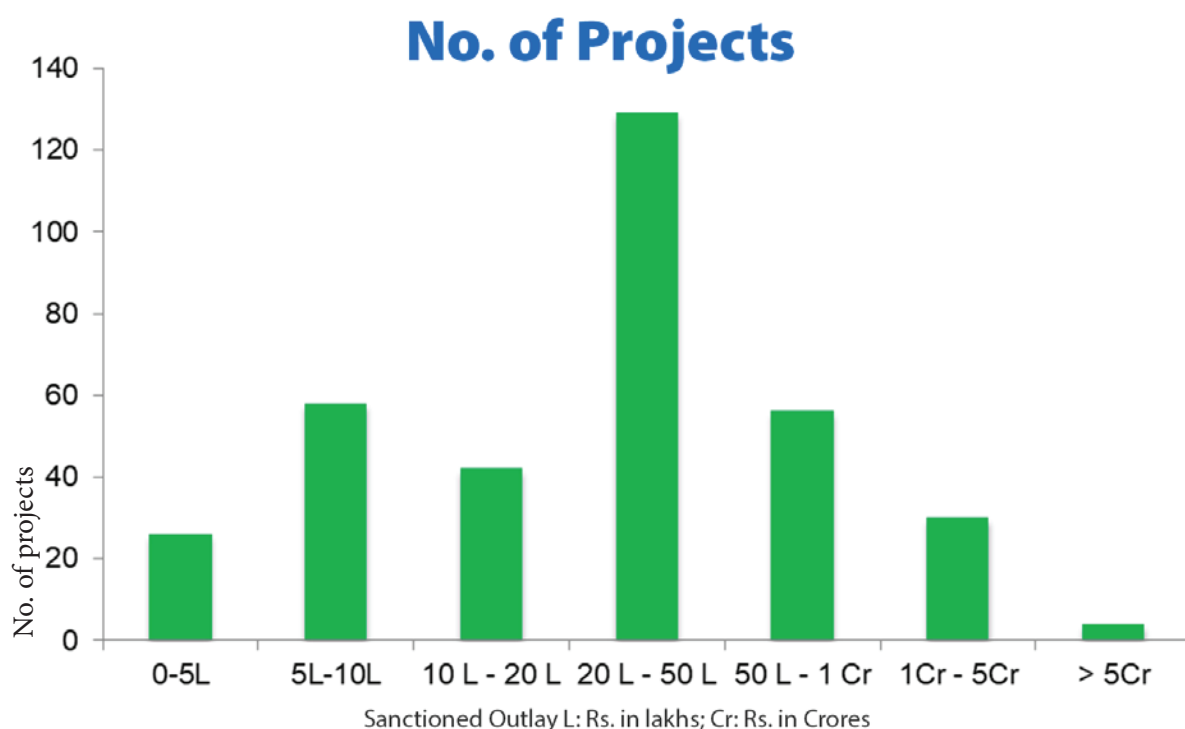


Figure 1: Distribution of Sponsored projects-sanctioned outlay ranges



a) External grants for R&D

The total money received for R&D activity in FY 2019-20 was Rs. 331.24 crores (Table 2). This includes grants received in the year for new projects sanctioned and ongoing projects.

Table 2: Money received for R&D in 2019-20

Project Type	Funds received (Rs. in crores)
Sponsored Projects	263.40
Consultancy Projects	62.60
Royalty	1.44
Equipment usage	3.80
Total	331.24

Some major sponsored projects initiated:

- Quantum Computing Architecture with Silicon-based Spin Qubits**
Sanctioned Outlay: Rs. 9.56 crores over five years
Funding Agency: Defence Research and Development Organization
- Technology Incubation Hub for Technologies for IoT & IoE**
Currently, the sanctioned outlay is Rs. 7.25 crores, with a proposed outlay of 170 crores over 5 years
Funding Agency: Department of Science and Technology
- IBM_IITB_AIHN (AI Horizon Network) Umbrella Project**
Sanctioned Outlay: Rs. 6.84 crores over three years
Funding Agency: International Business Machines Corporations
- Hybrid Layered Manufacturing Using Electron Beam Cladding (EB-HLM)**
Sanctioned Outlay: Rs. 4.15 crores over three years
Funding Agency: Department of Science and Technology

- Diamond-based Quantum Technologies**
Sanctioned Outlay: Rs. 3.90 crores over three years
Funding Agency: Department of Science and Technology
- National Supercomputing Mission Building Capacity and Capability**
Sanctioned Outlay: Rs. 3.02 crores over three years
Funding Agency: Ministry of Electronics and Information Technology (Nanotechnology Division)
- Creating Livelihood in Jawar & Mokhada**
Sanctioned Outlay: Rs. 3.00 crores over three years
Funding Agency: Ministry of Tribal Affairs (STWG Division)
- A Microscopic Traffic Simulator Integrated 3D Driving Simulator for Cond Behavioural Studies and Testing ITS Applications in Disordered and Heterogeneous Traffic Systems**
Sanctioned Outlay: Rs. 2.66 crores over two and a half years
Funding Agency: Department of Electronics and Information Technology
- Development of Compressed Hydrogen -Fuel Cell Integrated System Suitable for Light Duty Vehicles**
Sanctioned Outlay: Rs. 2.42 crores over three years
Funding Agency: Department of Science and Technology
- E-Kalpa III**
Sanctioned Outlay: Rs. 2.24 crores over one year
Funding Agency: Ministry of Human Resource Development

In addition, Government of India has continued

to sanction more projects under the schemes called IMPacting Research INnovation and Technology (IMPRINT) and Uchhatar Avishkar Yojana (UAY) focussing research to solve major engineering and technology challenges in selective domains including manufacturing industry needed by the country. Thus it aims to enable, empower and embolden the nation for inclusive growth and self-reliance. 9 new projects have been initiated under IMPRINT-II scheme this year along with 3 ongoing projects. 29 projects are already nearing completion under IMPRINT – I scheme. Under UAY-I scheme, four projects are ongoing. Two projects have been initiated under UAY-II and one more is ongoing.

Scheme for Promotion of Academic and Research Collaboration (SPARC) Projects:

The Ministry of Human Resource Development (MHRD) initiated new scheme called ‘Scheme for Promotion of Academic and Research Collaboration (SPARC)’ that aims at improving the research ecosystem of India’s higher educational Institutions by facilitating academic and research collaborations between Indian institutions and the best institutions in the world to jointly solve problems of national and/ or international relevance. The scheme proposes to enable productive academic cooperation by supporting the following critical components that can catalyze impact making research, namely:

- Visits and long-term stay of top international faculty/ researchers in Indian institutions to pursue teaching and research
- Visits by Indian students for training and experimentation in premier laboratories worldwide
- Joint development of niche courses, world-class books and monographs, translatable patents, demonstrable technologies or

action research outcomes and products

- Consolidation of bilateral cooperation through academic and research partnerships through workshops in India
- Publication, dissemination and visibility through a high-profile annual international conference in India

The expected outcomes include tangible results in terms of large quantity of high-quality research publications, solution to key national and international problems, development of niche courses, high-quality text books and research monographs, imbibing of best practices from top international academicians and researchers, strong bilateral cooperation and improved world reputation and ranking of Indian institutions. During these interactions, IIT Bombay researchers (faculty, students) will collaborate with their counterpart from universities located at United Kingdom, USA, Canada, Australia and Germany.

IIT Bombay initiated 4 new projects this year along with 8 others that are ongoing.

Consultancy activities were taken up for different government, public sector and industry, both Indian and international. The types of consultancy provided included expert advice, retainership, product/ process/ software development, analysis, evaluation, product design and limited testing.

a) Some typical/ representative consultancy projects initiated during this year:

- Development of applicators for deep seated tumours
- Streamlining GIS-based copper prospectivity modeling
- AI-ML for Chest X-ray Image Analysis
- Pelletization modeling and analysis
- Geotechnical study on erosion and instability caused due to rain water seepage
- CFD modeling of air delivery, noise in fans



Indian Institute of Technology Bombay has secured second position in the Atal Rankings of Institutions on Innovation Achievements, (ARIIA 2020) under the category of Institute of National Importance, Central Universities and CFTIs. The results were announced by the Hon'ble Vice-President of India Shri M. Venkaiah Naidu on August 18, 2020. The Education Minister, Dr Ramesh Pokhriyal 'Nishank', and the Minister of State for Education Shri Sanjay Shamrao Dhotre were also present in the virtual announcement.

Atal Ranking of Institutions on Innovation Achievements (ARIIA) was initiated by the Ministry of Human Resource Development (MHRD), Government of India in 2018, to systematically rank all major higher educational institutions and universities in India on indicators related to "Innovation and Entrepreneurship Development" amongst students and faculties. The parameters used for consideration for ARIIA rankings include Budget, Facilities, Awareness, Entrepreneurship, Commercialization, Learning methods and Governance.

- Smoke Detection Using Machine Learning
- CFD of Biofluids in Arteries
- Traffic Impact Assessment and Traffic Management Plan during Construction of Metro Line
- An innovative cooling fan
- Development of C-Band 25W GaN RF Device and requisite GaN manufacturing technology
- Science-of-scale tool and mathematical model to predict rupture in Osmotic Tablet Coatings

- research internships and fellowships for PhD student
- student research/competition/event: projects such as ADVITIY-2nd Student Satellite project, Autonomous Underwater Vehicle (Matsya) - IIT Bombay, IIT Bombay Racing, Barcelona Smart Drone Challenge, Mahindra Rise Driverless Car Challenge, Mars Rover, Exoskeleton for Flight (Exofly), Rakshak, International Aerial Robotics Competition, Robocon, Student Design Competition - 2019 (American Society of Mechanical Engineers)

b) Internal grants for R&D

The Institute provided internal funding for supporting faculty research and student activities. Around Rs. 22 crores were sanctioned for these activities which included the following:

- seed grant for initiation of research for new faculty
- augmenting research facilities and maintenance of central and national research facilities
- augmenting research resources of faculty recipients of Research publication award, Impactful research award, Research dissemination award and Early research achiever award
- leverage grants and bridge grants

c) R&D Awards grants from External Agencies

The Institute's research was recognised by peers and society in the form of award grants conferred on faculty and students. Some of the awards/fellowships received during this year are:

Council of Scientific & Industrial Research awarded

- Shanti Swarup Bhatnagar Prize for Science and Technology, 2019 (Prof. R. B. Sunoj for Chemical Sciences and Prof. Subimal Ghosh for Earth, Atmosphere, Ocean and Planetary Sciences)

Infosys Prize

- Infosys Prize 2019 in the area of Computer Science was awarded to Prof. Sunita Sarawagi

Department of Science & Technology awarded

- J.C. Bose Fellowship for 2019
Prof. Soumen Chakrabarti (Computer Sciences)
Prof. Dulal Panda (Biosciences and Bioengineering)
- SwarnaJayanti Fellowship 2020
Prof. G. Rajaraman (Chemistry)
Prof. Subimal Ghosh (Climatology)
- Women Scientist Fellowship in Chemistry, Physics and Engineering

Department of Biotechnology awarded

- Innovative Young Biotechnologist Award for Biosciences

Indian National Academy of Engineering

- Abdul Kalam Technology Innovation National Fellowship 2020
Prof. Shubhananda Chakrabarti (engineering)
Prof. Rohit Srivastava (Biosciences and Bioengineering)

National Academy of Sciences, India

- Reliance Platinum Jubilee Award for Application Oriented Innovation in

Biosciences

- Young Scientist Platinum Jubilee Award in Engineering
- Scopus Young Scientist Award in Chemistry

2. Licensing Activities

a) Entrepreneurship: (3)

Rights to technology/ intellectual property (3 Nos.) created in the Institute were given to researchers for incubation/ entrepreneurship activity in SINE/ elsewhere during this year are as follows:

- Ayati Devices Pvt. Ltd.
- Clarity Bio
- Haystack Analytics Pvt. Ltd

b) Technology transfers: (18)

Royalties for different IP licensed in the past continued to be received and some technologies were licensed in this year. Some of them are:

- Arsenic removal filter
- Book- Cycle ka Sapna
- Curcumin formulations
- Device to detect tracheostomy tube blockage
- Digital Stethoscope
- Multi use biopsy device
- Software for forecasting load (Web STLF)
- Tube Tube Heat Exchangers
- Waste water vapourizer technology
- Web based software for transmission usage cost and loss allocation (WebNetUse)



Research and Technology Licensing Agreement between IIT Bombay and Murata

3. Dissemination/ Outreach Activities

a) TechConnect 2019-20

TechConnect 2019-20, an R&D exhibition which showcases IIT Bombay's R&D activities was organised by Office of the Dean (R&D) during January 3-5, 2020 as part of TechFest 2019-20 in the academic area of the campus. It showcased R&D exhibits (250 exhibits - working models, demonstrations, products & posters) from 22 academic units/ research centres. The event was inaugurated by Dr. V. R. Lalithambika, distinguished scientist and Director, Directorate of Human Space Programme, Indian Space Research Organisation (ISRO), Bengaluru and Prof. Subhasis Chaudhari, Director, IIT Bombay. In addition, Centre for Distance Engineering Education Programme, Centre for Research

in Nanotechnology and Science, Industrial Research and Consultancy Centre (IRCC) and the Academic Office had set up stalls to disseminate information about the online activities, research facilities available, R&D activities of the Institute and academic programs offered by IIT Bombay respectively. Also, a few incubated companies in Society for Innovation and Entrepreneurship (SINE) and student technical teams showcased their exhibits. Apart from the exhibits, lecture-demo sessions were successfully introduced for the first time in TechConnect this year by a group of faculty members in Department of Computer Science and Engineering. The event attracted very large footfall of students and general public.

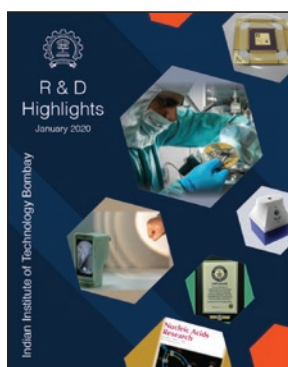


b) Media outreach :

IRCC realizes the need to communicate its R&D efforts with wider society. Towards this, IRCC has collaborated with Gubbi Labs to bring out 27 easily accessible stories conveying IIT Bombay's achievements. These articles have been released in English, Hindi and Marathi languages. Many of these articles have been picked up by mainstream and online media and disseminated further.



Brochures titled '*R&D Highlights*', '*Partner with us*' highlighting the possible modes of interactions between IIT Bombay and Industry and '*Innovations licensed to industry*' highlighting some technologies and products developed and deployed were updated.



These brochures were distributed in various industrial forums like India International Science Festival - 2019 Expo, International Engineering Sourcing Show - IX, TechConnect 2019-20 and various other events and engagements as well as to visitors of the Institute to disseminate information on R&D activities and industry interactions of the Institute.



c) Intellectual Property (IP) Protection Activities

During current year, 153 intellectual property (patent, trademark) applications were filed. List of all Indian and international IPR filings & granted are given in Table 3.

Table 3: Patents & other IPR Applications filed & granted during 2019-20

IP type	Applications filed (No.)	Granted (No.)
Indian Patent	97	42
PCT	13	-
US Patent	6	6
Other foreign patent	5	
Trademark	9	30
Design	23	8
Areas of IP filings: Battery storage system, Biochemistry for therapeutic treatment, Biomedical devices, Blockchain, Chemical process, Chemistry and chemical, Construction, Cryogenics, Drug delivery systems, Membranes, Microfluidics, Network provider, Photovoltaics, Point of care devices, Polymer technology, Proteomics, Recombinant proteins, Sealant, Semiconductors, Sensors, Waste control, Water technology, Wireless network, etc		

As in the previous year, pro-active efforts were taken to assess the possibility of intellectual property in the work of M.Tech/ Dual degree student to file for possible protection. 745 abstracts were reviewed. Out of this, 64 were shortlisted for a possible filing of patent applications and filing process is on now.

Proactive efforts continued for licensing of these technologies, products and designs.

Nearly 100 agreements were finalized and signed during the year including those for research collaboration, licensing, non-disclosure agreements, IP transfer, student sponsorships, endowment, material transfers, etc. with industries, organisations, universities and government, both national and international.

d) Awards for IP and R&D Activity

National Intellectual Property Award 2019

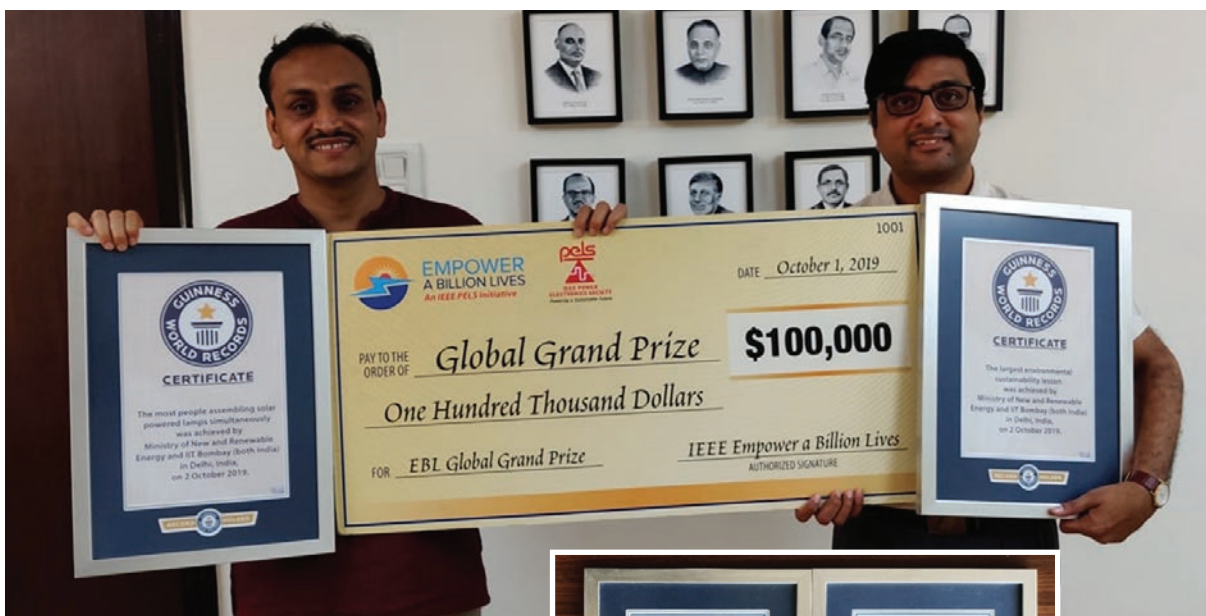
IIT Bombay won the National Intellectual Property Award 2019 under the category of 'Top Academic Institution for Patents and Commercialisation' given by Government of India (Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, and Intellectual Property office, India). The award carries a memento, citation and cash incentive of Rs. one lakh. The award was received by Dean (R&D) on behalf of Institute at the function held at New Delhi on April 26, 2019. During the function, R&D Expo was also organised exhibiting some of the Institute's technology development. R&D highlights brochure was distributed to visitors. IP professionals, government officials, jurists, students and mediapersons attended the award function and visited the expo.



IIT Bombay wins National Intellectual Property Award 2019

Guinness World Records in 2019

Solar Urja Lamp (SoUL) project of IIT Bombay achieved 2 Guinness World Records on October 2, 2019 in the following categories: (i) Most people assembling solar powered lamps simultaneously; and (ii) Largest environmental sustainability lesson. The records were achieved by IIT Bombay along with the Ministry of New and Renewable Energy, GoI involving 6,841 and 4,780 participants respectively. The record attempt was done to pay homage to Mahatma Gandhi on the occasion of his 150th birthday anniversary.



DBT - Biotechnology Product, Process Development and Commercialization Award

This award is conferred to scientists/innovators/ entrepreneurs/ institutions/ companies both in public as well as private sector towards development and commercialization of biotech process/ technology/ product in the different sectors of biotechnology and biological sciences.

IIT Bombay developed and scaled up a process for synthesis of ephedrine and pseudoephedrine, drugs commonly used as stimulants and decongestants. R&D interventions significantly improved reaction yield. Embio Limited was awarded for optimizing this GMO process all the way to a 36 kL scale, making this the largest GMO process in the country.

At this time, the primary export markets are the US, Europe, and Japan.



DBT Biotechnology Product, Process Development and Commercialization Award 2019

Focussed Initiatives

Initiatives were taken to promote and facilitate research and development work and encourage students to focus on R&D. Some highlights are given below:

a. Enhancing Industry Partnership

Institute continued its efforts to enhance its interaction with industry. More than 50 industries visited IIT Bombay to explore cooperation and collaboration in R&D activities. These visits by industries were managed in a seamless manner by facilitating meetings with faculty having specific areas of expertise of interest and continued follow up for initiating projects/ collaboration. Agreements were entered into to establish a formal association.

In addition, brochures titled R&D Highlights,

disseminating some of the outcomes of R&D efforts undertaken at the Institute and Partner with Us, highlighting the interactions with industry and disseminating the possible modes of collaboration, were updated twice.

New projects were initiated with industry partners under the Uchchatar Avishkar Yojana (UAY) and IMPacting Research INnovation and Technology (IMPRINT) schemes launched by the Government of India. Around 300 Indian and international industries approached the Institute for partnering with the Institute through collaborative R&D projects.

Some of the industries and PSUs which visited and/ or approached Institute to explore research collaborations include:

Siemens, Pfizer, Hilti, Honeywell Technology Solutions, Delhivery, Larsen & Toubro, Consumer Electricals Limited (Crompton Greaves), LG Soft, Birlasoft, Bajaj Electricals, Reserve Bank of India, Hindalco Industries, Cognizant Technology Solutions, Viacom18 Media, IBM, CEAT Tyres, Reliance, IonExchange, Bharat Electronics Limited (BEL), Puretronics, Hindustan Aeronautics Limited (HAL), CII, Airbus, Mangalam Organics, Indian Oil Corporation Limited (IOCL), IDBI Bank, Nutanix Inc., Vedanta Limited, TCS iON, TCS, Army Technology Board, Union Bank of India, Hindustan Petroleum Corporation Limited (HPCL), Micron Technology, Adani Group, Kirloskar Pneumatic Company, Weatherford, TATA Motors, Autoliv, Canthus, Hindustan Zinc Limited, Philips, Minda Corporation, Sony Tokyo, JDA Software, Achal Jewels, ITC Limited, UL, Puri Crawford, UPL Limited, SanDisk, Tristar Intermediates, Honeywell Automation, Transasia Bio-Medicals, Alhoty Analytical Services Bahrain, Alpha Equipments, Bharat Petroleum Corporation Limited (BPCL), Bureau of Indian Standards, Infosys Technologies, Machinery Trials Unit – Indian Navy, ACG Pharmacy, AGD Biomedical, Rites Limited, Ecoman Enviro Solutions, Prism Johnson, Modison Metals, Patanjali Peya, Aarti Industries, ISGEC Hitachi Zosen, Dow Chemicals, DavosPharma, Alibaba, Huawei Technologies, etc.



MoU signing with LGSI



Meeting with Siemens



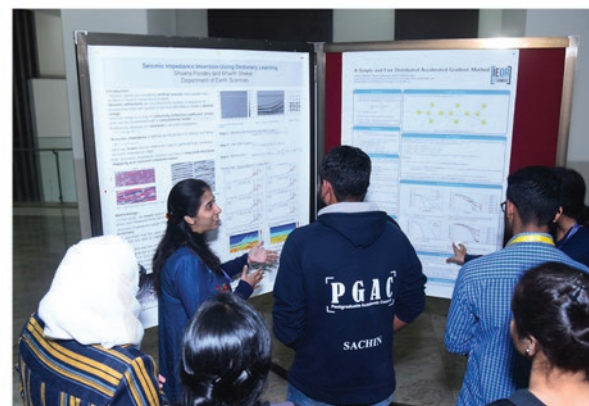
MoU signing with ExxonMobil

b. MInDS workshop

A full-day workshop on Machine Intelligence and Data Science ‘IIT Bombay MInDS Workshop’ was held in IIT Bombay on January 18, 2020 to foster interdisciplinary collaboration between faculty, researchers, students across departments who work in related areas, along with industry partners. Dr. Mayur Datar, Chief Data Scientist, Flipkart delivered the keynote address on *Data Science Applications in E-commerce*.

The event also included short talks that covered the breadth of areas that faculty in IIT Bombay are already working on; poster presentation by students and panel discussion with industry personnel on ‘*How can Academia and Industry collaborate to increase the pace of AI/ML innovation in India*’. The panelists were Dr. Mayur Datar (Flipkart), Mr. Abhishek Shekhar (Executive Director, J P Morgan Services), Dr. Sanjay Bhat (Principal Scientist, TCS), and Mr. Jayesh Pillai (Head - Product Management, L&T-NxT).

The workshop was a success and provided a platform for cross-fertilization of ideas, collaboration across departments and outreach to the industry. Subsequently, a new Center for Machine Intelligence and Data Science (C-MInDS) has been established at IIT Bombay.



COVID-19 mitigation

c. Various projects were initiated towards the mitigation of COVID-19:

Projects with an R&D component were given internal seed funding by IRCC for developing proof of concept and further, they were linked to relevant industry partners (wherever possible) for development / deployment actions. For example, In-situ gel for capture and inactivation of 2019-nCoV; Identification of metabolite biomarkers for targeted therapy; Plasma proteomic analysis towards therapeutic targets; Incinerator for safe disposal of masks/ gloves; and technology and design for portable / wheeled UVC based germicidal units for disinfection.

Projects with immediate deployment for societal use were planned/ funded /supported. For example, low-cost masks are being sold through institute pharmacy and masks and PPEs are being distributed to government hospitals.

IT solutions have been developed and fine-tuned to specific requests. For example, App for quarantine adherence (CORONTINE) has been adopted in Odisha and Meghalaya; tracking and tracing of asymptomatic carriers (SAFE); Privacy preserving contact tracing software released in open source domain; IT solution for user-friendly, customized information access with humans-in-the-loop (World Wide Help) to be made operational at KEM Hospital and IIT Bombay Hospital; Methods to reduce waiting period for purchase of essential items to manage physical distancing being planned.

d. Institute Ethics Committee (IEC)

IIT Bombay Institute Ethics Committee was reconstituted in September 2019 with Dr. Renuka Munshi, Department of Clinical Pharmacology, TN Medical College & BYL Nair Hospital as the Chairperson. In this FY, committee has reviewed 65 proposals. 57 proposals were approved in expedited, full board or exempt mode depending on nature of proposals.



Due to increasing number of proposals and varied nature of research, Institute has decided to set up Institutional Review Board (IRB) which will review proposals having social / behavioural / design research in human participants and are non-interventional in nature. Institute Ethics Committee will continue to review proposals involving biomedical / health related studies in human participants as per ICMR guidelines

e. Institutional Review Board (IRB)

IRB will review research proposals involving social and behavioural studies that are non-interventional and are not related to health and bio-medical arenas for e.g., language studies and application-designing that does not involve direct interventions. Process is ongoing to set up the committee. This committee is expected to be functional in the coming year.

7. Incentives for R&D

IIT Bombay Research and Consultancy awards were instituted at the Institute in the year 2004 by the Institute to encourage and recognise the outstanding research and consultancy works carried out by faculty members. These awards are now called as

- IIT Bombay Research Publication Award
- IIT Bombay Impactful Research Award
- IIT Bombay Research Dissemination Award
- IIT Bombay Early Research Achiever Award

The winners of these awards during the year are as follows:

Award Name	Award Recipient Name
Research Publication Award	Prof. Ranjith Padinhateeri, Department of Biosciences and Bioengineering Prof. Pradeep Kumar P I, Department of Chemistry Prof. S Banerjee, Department of Earth Sciences Prof. S S Pande, Department of Mechanical Engineering Prof. Indrajit Mukherjee, Department of SJM School of Management
Impactful Research Award	Prof. A Kumar, Department of Chemistry Prof. Om P. Damani, Department of Computer Science and Engineering
Research Dissemination Award	N S Punekar, Department of Biosciences and Bioengineering Prof. Amartya Mukhopadhyay, Department of Metallurgical Engineering & Materials Science
Early Research Achiever Award	Prof. Kamendra P. Sharma,, Department of Chemistry Prof. Vikram Vishal, Department of Earth Sciences Prof. Aswani Yella, Department of Metallurgical Engineering & Materials Science

- Prof. Krithi Ramamritham Award for creative research**

The Prof. Krithi Ramamritham Award for creative research was instituted in 2016 at IIT Bombay by Prof. Jayant Ramaswamy Haritsa, Indian Institute of Science, Bengaluru. This is awarded for highly creative and original research contribution made primarily at IIT Bombay by a faculty member in any engineering discipline. The award is intended to be given for a specific accomplishment and not for cumulative career performance. The award carries a citation and a cash incentive of INR 1,00,000 (Rupees One Lakh). Prof. Krithi Ramamritham Award for creative research for the year 2018 was awarded to Prof. Sujit S. Jogwar, Department of Chemical Engineering in recognition of his significant research contributions in the area of 'Predictive modeling of Perovskite solar cells'.



Prof. Sujit Jogwar receiving Prof. Krithi Ramamritham Award for creative research

Also, rewards for research excellence, technology development and transfer efforts, were given in the year and the winners are as follows:

Award Name	Award Recipient Name
S.C. Bhattacharya Award for Excellence in Pure Sciences	Prof. Kanchan Pande Department of Earth Sciences
H.H. Mathur Award for Excellence in Applied Sciences	Prof. Sunita Sarawagi Department of Computer Science and Engineering
Dr. P. K. Patwardhan Technology Development Award	Prof. Shreevardhan A. Soman, Prof. Anil M. Kulkarni, Dr. Rajeev Gajbhiye, Dr. Gopal Gajjar, Dr. Prashant Navalkar, Dr. Kalyan Dasgupta, Dr. Swati Lavand, Dr. Kedar Khandepurkar, Mr. Akhil Raj, Mr. Hemantkumar Goklani, Dr. Papiya Dutta, Dr. Somesekar Rao, Mr. Aditya Nadkarni, Ms. Priyanka Murli, Ms Minal Chougule, and Ms. Pragati Gupta, Department of Electrical Engineering



Prof. Kanchan Pande receiving S.C. Bhattacharya Award for Excellence in Pure Sciences



Prof. Sunita Sarawagi receiving H.H. Mathur Award for Excellence in Applied Sciences

Awards recognition included cash awards, research grants and arranging Institute wide dissemination through lectures and electronic media.

Research Internship awards	<p>Given to bright students across the country to undertake research at IIT Bombay for upto six months, based on national advertisement and selection process. Each selected intern gets monthly stipend of Rs. 10,000 for the internship period subject to not getting any support from parent organization/Government (MHRD).</p> <ul style="list-style-type: none"> • No. of applications received: 428 • No. of Intern selected: 85 • No. of Intern joined: 80 • No. of interns who completed internship: 79 • Other contingency expenditure per intern: Rs. 50,000
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8. Dissemination/ Outreach for IIT Bombay Academic Community

a) Lectures on Winners of the Nobel Prize 2019:

Lectures by domain experts (list given below) on the work of **Winners of the Nobel Prize 2019** were organised at the Institute on October 28, 2019.

Category	Laureate(s) [Prof.] & Awarded work	Speaker [Prof.]
Chemistry	John B. Goodenough, M. Stanley Whittingham & Akira Yoshino <i>"Development of lithium-ion batteries"</i>	C. Subramaniam, Department of Chemistry
Economics (Sveriges Riksbank Prize)	Abhijit Banerjee, Esther Duflo & Michael Kremer <i>"Experimental approach to alleviating global poverty"</i>	G. Haripriya, Department of Humanities & Social Sciences
Literature	Peter Handke <i>"Influential work that with linguistic ingenuity has explored the periphery and the specificity of human experience"</i>	Sudha Shastri, Department of Humanities & Social Sciences
Physics	James Peebles <i>"Theoretical discoveries in physical cosmology"</i> & Michel Mayor & Didier Queloz <i>"Discovery of an exoplanet orbiting a solar-type star"</i>	Vikram Rentala, Department of Physics
Physiology/ Medicine	William G. Kaelin Jr, Sir Peter J. Ratcliffe & Gregg L. Semenza <i>"Discoveries of how cells sense and adapt to oxygen availability"</i>	Rahul Purwar, Department of Biosciences & Bioengineering

A large number of faculty members and students attended the lectures.



Dean (R&D) with the speakers

b) National Education Day Programme – Talk by Shanti Swarup Bhatnagar Prize for Science and Technology for 2019:

National Education Day Programme was organised on November 11, 2019. As part of the programme, the recipients of the Shanti Swarup Bhatnagar Prize for Science and Technology for 2019 in the Institute gave talk (details given below) on their research works that enabled them to get this prestigious award to the IIT Bombay academic community.

Bhatnagar Award category, Speaker & Talk Title:

- Award category: Earth, Atmosphere, Ocean and Planetary sciences
Prof. Subimal Ghosh, Department of Civil Engineering
Talk Title: ‘Land-Atmosphere Feedback in Indian Summer Monsoon’
- Award category: Chemical sciences
Prof. Raghavan B. Sunoj, Department of Chemistry
Talk Title: ‘Chemical Catalysis using Computers’

A good number of students, faculty members and staff members attended the function.



9. Safety activities at the Institute

A workshop on pressure system safety was held on February 1, 2020 to create awareness regarding pressure system hazards and safety precautions for research work. The first session was on pressure system safety which was conducted by Mr. Anil Hiwarkar, General Manager- Environment, Health and Safety (EHS), Blue Star Ltd. Mr. Hiwarkar also talked about laboratory hazards, unsafe behaviours and unsafe conditions, and hazard control measures. Few accident cases related to pressure systems were discussed. Short videos were also shown during the session. The second session was conducted by Mr. Shashikant Juvekar, Godrej and Boyce Ltd. (Retd.) on air conditioning system - refrigerant types and precautions for working with air conditioners. Mr. Juvekar and the Blue Star team conducted a practical session on safety measures while working with air conditioners. A display of personal protective equipment was also arranged in the laboratory. The workshop was jointly organised by Safety Officer, IIT Bombay and Mr. Anil Hiwarkar, Blue Star Ltd. Around 30 students and staff attended the workshop.

10. Online processes (R&D activities)

Online interface of R&D activities (in drona & IRCC website) continued to make it more user-friendly and few of the activities automated in this year are as follows:

- Updated consultancy projects module:
 - To capture details of closure remarks and uploading of outcome of the project while closing of the project (even without disbursement).
 - For sending an automated email to party consultancy project letter, SOW, invoice and Standard Terms and Conditions.

- Project staff Administration portal modified/ updated:
 - In case of superannuation of staff, new facility is provided to end tenure in Drona, and updated status is shown in project staff details page.
 - To capture HRA amount instead of standard 30% HRA.
 - Extension request approval
 - Provided more additional leave approval process.
 - Sending automated extension reminder email and also possibility of exemption to certain category of staff (07IR001).
 - Medclaim administration module was upgraded with additional features.
- Students fellowship attendance module is modified for data porting to SAP interface towards fellowship payments
- Additional features are added in Advance and Honorarium requests.
- Online DBT scholarship submission facility to M.Sc. students & access to Head, Biosciences & Bioengineering Department
- DST approved projects positions (21 designations) and other relevant details like qualification and experience are created and made available to PIs for facilitating recruitment of project staff and Adhoc appointment.
- Development new webpage for displaying COVID -19 related R&D activity.

11. Project Manpower

Number of Project staff/ fellow working in various projects as on 31.3.2020 is 1295. Among them, 514 joined during the FY 2019-20.



Outreach Programmes

The Continuing Education and Quality Improvement Programme (CE & QIP) office at IIT Bombay has been actively reaching out to working professionals from both academia and industry to serve the competency development and training requirements. A large number of working professionals from industry as well as faculty and students from academia have participated and acquired knowledge from short and long-term certificate courses during 2019-20.

A number of short-term training programs (STTP), which are funded by the All India Council for Technical Education (AICTE) as QIP courses, for faculty members of engineering colleges and GIAN training programmes funded by the Ministry of HRD, Government of India were conducted. Eminent faculty from foreign institutions were invited to deliver lectures and tutorials for GIAN courses. In order to provide college teachers an opportunity to interact with the industry professionals, special efforts have been made to permit a few industry participants as part of the QIP courses, in the normal CEP mode. This model has been appreciated by the teachers as well as the industry personnel, and has also helped to improve the overall effectiveness of the various QIP courses.

Many of Institute's CEP courses for the industry are well-established worldwide and continue to attract large participation, both from within as well as from abroad. The courses on "3D

Printing", "Human Computer Interaction", "Energy Management", "Elements of Chemical Engineering", "Executive Programme in Management", "Leadership Development Program", "Expo CD and Expo PDI", "Strategies for Organization's Growth", "Finite Element Method and Application", "Data Analytics", and "Python Programming", have all been appreciated by the industry. The Institute is actively promoting the use of online mode for conducting CEP courses and have already started in-house courses to companies such as Michelin India, L&T and BEL Academy. The CE & QIP office are also promoting two open courses in Machine Learning/ AI scheduled online with weekly slots over a span of 6 weeks, specially designed for working professionals.

In terms of the overall performance of CE&QIP during 2019-20, a total of 201 CEP courses were conducted with about 2932 participants from across disciplines as well as industries, organizations and institutions, with a revenue of around Rs. 9.50 crore. Under the QIP category, 8 PhD students from AICTE-approved engineering colleges were admitted. In addition, 7 teachers were inducted into PhD programme under the advance admission scheme who would be joining the Institute for the regular programme from July 2020. Further, 20 short-term courses (STC) were conducted for college teachers under the sponsorship from AICTE and a total of 621 participants from various engineering institutions/ colleges attended these courses.

International Relations

IIT Bombay assigns significant value to its relationships with various international partners. Over the years, IIT Bombay has steadily built up a reputation for research and education both in India and abroad. This has helped in attracting bright and young researchers from all over the world, as faculty of the Institute.

A good number of international students have also come to the Institute either as full-time or as exchange students. During the year, IIT Bombay has signed 50 MoUs with various foreign universities and received governmental and ministerial delegations from countries across the globe for exploring areas of collaboration and cooperation.

MoUs with Foreign Universities:

- Loughborough University, UK
- Curtin University of Technology, Australia – Dual Doctoral Degree Program
- National Chiao Tung University, Taiwan - Dual Doctoral Degree Program
- The Royal University of Bhutan, Bhutan
- The Korea Advanced Institute of Science & Technology, Republic of Korea
- Politecnico di Milano, Italy
- Institut National des Sciences Appliquées Lyon, France
- University of Houston, USA
- Washington University in St. Louis, USA – Co-supervised Ph.D
- Distance State University, Costa Rica
- Myanmar Institute of Information Technology, Myanmar
- Sciences Po, France
- University of Twente, Netherlands
- Institut Supérieur d'Electronique de Paris, France
- University of Wisconsin-Milwaukee, USA
- University of Wollongong, Australia

- United Arab Emirates University, Dubai
- Concordia University, Canada
- Toulouse INP, France
- University of Alberta, Canada – Co-supervised/Joint Doctoral Degree Program
- The University of Newcastle, Australia – Dual Doctoral Degree Program
- University of New Brunswick, Canada

Visits of International Delegations:

IIT Bombay also received a large number of international delegations for exploring areas of collaboration and cooperation. The major ones are as follows:

- Prof. Cillian Ryan, Pro Vice Chancellor International of Nottingham Trent University, UK visited on July 31, 2019
- Prof. Jennifer Dixon, Deputy Vice-Chancellor (Strategic Engagement), Dr. Caroline Daley, Dean Graduate Studies, Mr. Brett Berquist, Director International Office and Mr. Vinayak Rao, India Recruitment Advisor from University of Auckland visited on August 1, 2019.
- Prof. Dr. Mohammed Abdullah Al Baeli, Vice Chancellor, Dr. Atiq Jekka Al Mansouri, Deputy Vice Chancellor Student Affairs, Prof. Dr. Ali Hamid Al Marzooqi, Dean of the Post Graduate Faculty from United Arab Emirates University visited on August 5, 2019.
- Ms. Sandra Kalidien, Liaison for Innovation, Technology, and Science from Consulate General of The Kingdom of the Netherlands and Mr. Freek Jan Frerichs, Embassy of Netherlands, New Delhi visited on August 19, 2019.
- Prof. Adèle Martial - Gros, Deputy Director of the French Institute in India and Mr. Philippe Guillien, Attache for Cooperation in French Language visited on August 21, 2019.
- Prof. Derrick Bolton, Dean of Knight-Hennessy Scholars Admission and Dr. Rati Godrej, MD Godrej Industries visited on August 21, 2019.



- Dr. Issa Al-Ansari, Rector, Dr. Ali Chamkha, Dean Research & Graduate Studies, Mr. Abdullah Boughannoom, Manager Human Resources, Ms. Rania Sinno, Director Global Engagement and Ms. Shazia Syed, International Faculty Recruitment/Coordinator Global Engagement from Prince Mohammad Bin Fahd University (PMU), Saudi Arabia visited on August 29, 2019.
- Delegation from Shenzhen comprising of Mr. Yang Hong, Member of the Standing Committee, CPC Shenzhen Municipal Committee and Vice Mayor of Shenzhen People's Republic of China, Mr. Zhang Xuefang, Director General, Housing and Construction Bureau of Shenzhen Municipality, Mr. Wang Youpeng, Director General, Urban Planning, Natural Resources Bureau of Shenzhen Municipality, Mr. Yao Liang, Party Secretary, Bureau of Public Works of Shenzhen Municipality, Mr. He Xiaofeng, Principal Staff Member, General Office of Shenzhen Municipal People's Government, Ms. Liu Huiqin, Principal Staff Member, Foreign Affairs Office of Shenzhen Municipal People's Government, Ms. Gloria Gong, Secretary General, China India Exchange Center (CIEC), Mr. Liu Peng, Vice President, China India Exchange Center (CIEC) and Mr. Salil Narang, Chairman, China India Exchange Center (CIEC) visited on September 11, 2019.
- Japanese delegation comprising of Mr. Hiromichi Uchino, Director of Koo International, Ms. Akiko Kato, Miss World Japan Special Jury Prize in 2015, Ms. Rumiko Ishida, anchorwoman from Japanese TV company, Ms. Yumiko Kiminami, a teacher for Japanese Flower arrangement & Japanese traditional paper craft visited on September 18, 2019.
- Dr. Subhas Chandra Mukhopadhyay, Director of International Engagement from School of Engineering, Macquarie University visited on September 19, 2019.
- Delegation from Welsh Government comprising of Mr. Alun Cairns Secretary of State for Wales, Mr. Crispin Simon, Deputy High Commissioner, Mr. Geraint Islwyn Evans (Special Adviser to the Secretary of State for Wales), Ms. Charlotte Louise Cantle (Principle Private Secretary to the Secretary of State for Wales) and Ms. Asiya Ashraff, Country Manager India visited on September 24, 2019.
- Prof. Katsunori Nagano, STSI Program Director and Professor Human Environmental Systems and Associate Prof. Masatoshi Sakairi, Materials Science and Engineering from Hokkaido University, Japan visited on September 27, 2019
- Ms. Sarah Fallon, Head of UK Science and Innovation Network for India, Middle East and Africa visited on October 1, 2019.
- Representatives from Diku - Norwegian Agency for International Cooperation and Quality Enhancement in Higher Education, which is a Directorate under our Ministry of Education Ms. Unni Mjelde Birkeland, adviser and programme manager for UTFORSK Programme and Ms. Camilla Krebs Tetler, adviser and coordinator for Indo-Norwegian cooperation in education along with Ms. Merethe Sandberg Moe, senior adviser from the Research Council of Norway visited on November 4, 2019.
- Prof. Tom Finholt, Dean of School of Information and Ms. Rebecca Pagels, Director of Development and Alumni Relations from University of Michigan visited on November 6, 2019.
- Prof. Jeongyun Heo from Graduate School of Design, Kookmin University visited on November 6, 2019.
- Prof. Robert Allison, Vice Chancellor & President, Prof. Steve Rothberg, Pro Vice Chancellor, Prof. Andy Dainty, Dean School Architecture, Building & Civil Engineering, Mr. Charlie Carter, Director International Office, Mr. Rob Reeves, Regional Manager International Office and Mr. Musa Yusuff, Graduate Management Trainee from Loughborough University visited on November 8, 2019.
- Mr. Yukihiko Kazao, Director General & Ms. Kaori Watanabe, Administrative Officer from STS Forum, Japan visited on November 25, 2019.
- Prof. Yves H. Berthelot Vice-Provost for

International Initiatives, Dr. Sivakumar Raghupathy, Executive Director of CREATE-X from Georgia Institute of Technology along with Mr. Ani Agnihotri, Co-Founder and CEO, Marshall Automation America, Inc. (MAAI) & Managing Partner, USA International Business and Research Center (USIBRC) LLC visited on December 16, 2019.

- Dr. Bruce McPherson, Executive Vice President & Provost, Dr. Gil Latz, Vice Provost - Global Strategies and International Affairs, Mr. Gates Garrity-Rokous, Chief Compliance Officer, Ms. Padmini Roy-Dixon, Executive Director Global Gateways from Ohio State University visited on January 6, 2020.
- Dr. Katja Lasch, Regional Director, Ms. Marja Einig, Deputy Consul, German Consulate Mumbai, Ms. Shubhada Choudhury, Information and Office Manager, Mumbai, Ms. Pooja Midha, Programme Officer, Delhi from DAAD visited on January 13, 2020.
- Prof. Vasu Reddy, Dean and Prof. Schoeman, Professor of International Relations and Deputy Dean of the Faculty of Humanities from University of Pretoria visited on January 20, 2020.
- Prof. Yoshii Masahiko, Executive Vice President in Charge of International Exchange and Evaluation, Kobe University, Japan visited on January 22, 2020.
- French Minister of Culture Mr. Frank Reister and his associates visited on January 27, 2020. Mr. Frank Riester gave a talk on business opportunities while promoting culture titled "How the economy of culture is reshaping the world".
- A delegation from University of Illinois delegation led by Prof. Timothy Killeen, President accompanied by Prof. Edward Seidel, Vice President for Economic Development and Innovation, Prof. Pradeep Khanna, Associate Vice President for Corporate and International Engagement, Prof. Narendra Ahuja, Research Professor and Donald Biggar Willet Professor

Emeritus, Dept. of Electrical and Computer Engineering, Prof. T. Kesavadas, Professor, Dept. of Industrial and Enterprise Systems Engineering, Prof. Rohit Bhargava, Professor, Dept. of Bioengineering and Director, Cancer Center at Illinois, Prof. Bellur Prabhakar, Associate Dean for Technological Innovation and Training, College of Medicine and Prof. Ken Mullikan, Associate Vice Chancellor for Undergraduate Education visited on January 28, 2020.

- Prof. Paul Pettersson, Vice-Chancellor, Dr. Helena Jerregard, Deputy Vice-Chancellor, Dr. Thomas Wahl, Dean of the School of Business, Society and Engineering and Mr. Christer Nygren, Lecture at the School of Innovation, Design and Engineering from Malardalen University visited on January 30, 2020.
- Mr. Stephen Williams, Director Global, Dr. Clare Newstead, College International Manager, Science and Technology, Prof. Phil Breedon, Professor of Smart Technologies and Ms. Vidhi Sahae, Senior Global Partnerships Manager from Nottingham Trent University visited on February 5, 2020
- Prof. Elis Ferran, Pro-Vice Chancellor for International Relations and Prof. Howard Griffiths, Professor of Plant Ecology, Dept. of Plant Sciences from Cambridge University visited on February 17, 2020
- Prof. David Gray, Head of School, Professor Peter Doerner, Director of Internationalisation, Ms. Anne Payne, Director of Professional Services - all School of Biological Sciences, Prof. Pankaj, Dean South Asia, Ms. Amrita Sadarangani, Regional Director, India and South Asia Liaison Office from University of Edinburgh visited on March 6, 2020.
- Mr. Agus P. Saptono, Consul General of the Republic of Indonesia, Mumbai, Mrs. Tennike Erman, Consul - Socio-cultural, Mr. Yadi Suriahadi, Consul - Economics, Ms. Yustinus Budi Hartarto, Official Socio-cultural visited on March 6, 2020.



Delegation from Shenzhen Municipal



Delegation from United Arab Emirates University



Prof. Subhasis Chaudhuri with French Minister of Culture



Delegation from Indonesian Consulate

Contingent visits during 2019-20:

- **From Netherlands:** A group of 15 students studying the Transport Engineering and Logistic track of the Mechanical Engineering, master's program at Delft University visited IIT Bombay on July 22, 2019. As a part of their program, they were in India visiting institutes and companies and doing study-related activities. At IIT Bombay, Prof. Bhalchandra Puranik, Head of Mechanical Engineering department, briefed them on the various activities and research taking place in the Department. They also visited Refrigeration and Cryogenics Lab, Machine Tools Lab and BeTiC.
- **From Tajikistan:** As part of International Youth Exchange Programme between India and Tajikistan, a 10-member youth delegation visited IIT Bombay on October 23, 2019. This delegation comprised of young university students, entrepreneurs and officials from Ministry and Federations from Tajikistan.

There was a vibrant interactive session between this delegation and IIT Bombay students, besides a visit to Central Library and entrepreneurship display by Society for Innovation and Entrepreneurship (SINE).

In addition, several individuals visited IIT Bombay as representatives of their respective universities.

Asian Universities Alliance (AUA) Consortia

The Asian Universities Alliance (AUA) is a consortia of Asian universities. AUA is a regional organization established to jointly address regional and global challenges, specifically related to higher education, economic, scientific and technological development by strengthening collaboration among member institutions. The alliance was established by a core of 15 founding members with the intention of gradual expansion, with IIT Bombay being a founding member university of AUA.

Following activities were organised under AUA consortium:

- **Overseas Study Program - Innovation, Incubation and Entrepreneurship (I2E):** The AUA Overseas Study Program "Innovation, Incubation and Entrepreneurship" (I2E) was organised at IIT Bombay during July 1-7, 2019. The week-long program was designed not only to provide firsthand exposure of the Indian business context but also to introduce the students to the concepts of innovation, incubation and entrepreneurship through a series of interactive sessions, activities and field trips. A diverse set of 18 student participants from nine universities across Asia took part in the program.



Innovation, Incubation and Entrepreneurship (I2E)

- **Online Education Conference in China:** The AUA (2019) Online Education Conference was held at Tsinghua University, China during July 5-6, 2019. More than 20 delegates from AUA member universities participated. Prof. Sridhar Iyer, Department of Computer Science and Engineering and Prof. Sahana Murthy, IDP in Education Technology represented IIT Bombay. The conference had keynote speeches and roundtable discussions on current situations of online education platforms in their respective countries. During the conference, the delegates had the opportunity to visit xuetangX and aixuetang online education platforms as well as attend talks from experts of enterprises related to online education. The conference also held discussion on the latest developments in Chinese online education and education innovation.



Executives' meeting in Sri Lanka

- **Executives' Meeting in Sri Lanka:** The third Asian Universities Alliance Executives' Meeting (AUAEM) was hosted by AUA Executive Presidency 2019-20 at the University of Colombo, in

Colombo, Sri Lanka during November 20-21, 2019. The annual event was attended by over 40 delegates from AUA member institutions. Prof. Prasanna Mujumdar, Deputy Director (Finance and External Affairs) and Prof. Swati Patankar, Dean (International Relations) represented IIT Bombay. The two-day event had sessions to take a review of all AUA activities and programs held during the year. AUA Executives and senior representatives discussing the proposed revisions to the AUA Framework and AUA representatives presenting proposals for AUA activities to take place in 2020-21, including student mobility programs and academic conferences.

- **Overseas Study Program - Sun, Society and Sustainability (S3):** The AUA Overseas Study Program "Sun, Society and Sustainability" (S3) was organised at IIT Bombay during December 9-15, 2019 in Mumbai and Madhya Pradesh, India. The 7-day action packed program drew 14 students from seven AUA member institutions. The program was organized by Solar Urja through Localization for Sustainability (SoULS), a flagship program of IIT Bombay, which has developed interventions, built on the foundation of localization for providing clean, efficient, affordable and reliable energy access to the most rural households across India. The visit to Betul village in Madhya Pradesh was covered in the local television news and the project was much appreciated by the participants.



Sun, Society and Sustainability (S3)



Program at University of Malaya

- **Program at the University of Malaya (UM), Malaysia:** The University of Malaya, a member of AUA, hosted the Asian Universities Alliance program for students of the AUA member institutions during January 15-21, 2020. The theme of the program was "UM Appreciating Diversity through Art, Malaysia". A student from IIT Bombay Mr. Raghav Goyal, Department of Chemical Engineering, participated in this program. He was the General Secretary for Cultural Affairs 2019-20. The program gave participants a unique insight into the different facets of arts and culture in Malaysia.

National/ International visits by IIT Bombay community:

- **Knowledge Summit in France:** A two-day Knowledge Summit was organised by the Embassy of France in India in association with the Union Ministry of Science and Technology and the Ministry of Human Resource Development (HRD) during October 17-18, 2019 at Lyon, France. Around 300 participants from Indian and French academia, competitive clusters and start-ups, corporate houses, research organisations and public authorities attended the summit. The summit comprised of a series of interactive sessions designed to launch concrete initiatives and allow participants to deepen academic and scientific cooperation between two countries. The two-day summit is an essential step to develop and structure India-France collaborations in the fields of education and research, stimulate connection between research and industry and encourage the mobility of students and scholars. Prof. Chandra Sekhar Yerramalli, Department of Aerospace Engineering and Prof. Akshay S, Department of Computer Science and Engineering attended and represented IIT Bombay at the summit.

- **Shastri Indo-Canadian Institute (SICI) Summit, New Delhi:** The SICI Summit on ‘Dynamics of Higher Education in India and Canada: Envisaging Greater Collaborations and Opportunities to Network’ was held during November 25-26, 2019 in New Delhi. The summit was attended by 150 participants from SICI’s member network from Canada and India. About 15 Canadian and 69 Indian institutions participated in the summit. The summit aimed to promote and foster bilateral partnership in the higher education and research sector between India and Canada. Prof. Pushpa Trivedi, Department of Humanities and Social Sciences attended and represented IIT Bombay at the summit.

IIT’s International Relations Conclave 2019:



IIT’s IR Conclave

The All IIT’s International Relations Conclave organised by the Office of Dean (International Relations) was held at IIT Bombay campus on December 2, 2019. The objective of the conclave was to share experiences on various topics such as scholarships for international students including ICCR and Study in India, common admission portals, membership of international alliances, and other issues on internationalization. The meet was a follow-up of the conclave held at IIT Kharagpur in 2019. Recently, the Ministry of Human Resource Development (MHRD) released a common application portal to IITs and IISc for international applicants and 1000 PhD fellowships for the ASEAN countries. All representatives of international relations in the IITs conclave discussed the operational process of the portals and also had an interactive session on umbrella agreements with consortia of universities in France, Finland and BRICS countries.

Visits under Faculty and Staff Exchange Programme:

- The University of Edinburgh (UoE) funded visit of their staff members Ms. Caroline Kier, Publicity and Recruitment Officer, Mr. Alistair Hudson, Global Operations Support Officer and Dr. Conor Snowden, International Development Research Manager to IIT Bombay under the Erasmus+ International Credit Mobility (Erasmus+ ICM) programme in early 2020.
- Asian Universities Alliance (AUA) promotes faculty and staff mobility by providing financial support. Ms. Saori Mukaimachi from University of Tokyo visited IIT Bombay under AUA Staff Exchange program in September 2019. The purpose of these exchanges is to shadow our administrative staff



and get an idea about processes, functioning, etc. The Office of International Relations facilitated interactions with their respective counter parts for the staff who visited under exchange.

- Prof. Nikhat Jamal Siddiqui from King Saud University, Dr. Nuruol Syuhadaa Mohd. from the University of Malaya and Dr. Eric Nelson from The Hong Kong University of Science and Technology visited IIT Bombay under AUA faculty exchange 2019-20.
- IIT Bombay faculty too visited other member universities of AUA under the faculty-exchange programme. Prof. Parinda Vasa (Physics) visited The University of Tokyo, Prof. Sanjeeva Srivastava (BSBE) visited United Arab Emirates University, Prof. Azizuddin Khan (HSS) visited Nazarbayev University and Prof. Raaj Ramasankaran (Civil) visited Tsinghua University during 2019-20.
- IIT Bombay staff too visited other member universities of AUA under the staff-exchange programme. Mr. Hrushikesh Nagwekar (Technical Superintendent, BSBE) visited University of Malaya, Mr. Prabhakara Ramasamy (Senior Sports Officer) visited Nazarbayev University and Mr. Sanjay Shah (Assistant Registrar, Main Administration) visited Peking University during 2019-20.

IIT Bombay Students participated in Student Exchange Programs

(under the Memorandum of Understanding) during Academic Year 2019 – 2020

Sr. No.	Name of the University	No. of students/ Programmes
1	Aalto University, Finland	Three dual degree students from Electrical Engineering and one dual degree student from Energy Science and Engineering
2	Augsburg University of Applied Sciences, Germany	Three B. Des students from IDC
3	City University of Hong Kong, Hong Kong	One B.S. student from Chemistry department
4	Technical University of Denmark, Denmark	Two dual degree students from Electrical Engineering department, two B.Tech. students from Chemical Engineering department, one dual degree student from Metallurgical Engineering and Material Science department and one student from Mechanical Engineering department
5	Ecole Centrale de Nantes, France	One dual degree student from Energy Science and Engineering department
6	Ecole Nationale Supérieure Des Arts Decoratifs, France	One B. Des student from IDC
7	EPFL Lausanne, Switzerland	Four dual degree students from Energy Science and Engineering department

Sr. No.	Name of the University	No. of students/ Programmes
8	ETH Zurich, Switzerland	One dual degree student from Mechanical Engineering department and one dual degree student from Electrical Engineering department
9	Hochschule Fur Gestaltung Schwabisch Gmund, Germany	Two B. Des students from IDC
10	Holon Institute of Technology, Israel	One B. Des student from IDC
11	INSA Lyon, France	Two B.Tech students from Civil Engineering department
12	KAIST, Korea	Two B. Des students from IDC
13	Koc University, Turkey	One dual degree student from Mechanical Engineering department and one B. Tech student from Chemical Engineering department
14	KTH Royal Institute of Technology, Sweden	One B. Tech student from Electrical Engineering department and one B. Tech student from Civil Engineering department
15	Katholieke Universiteit Leuven, Belgium	One B. Des student from IDC
16	Kyoto Seika University, Japan	One B. Des student from IDC
17	Loughborough University, UK	One B.Tech student from Civil Engineering department
18	Malardalen University, Sweden	Two B. Des students from IDC
19	Nanyang Technological University, Singapore	Two dual degree students from Electrical Engineering department, one dual degree student from Metallurgical and Material Science and three B. Des students from IDC
20	National University of Singapore, Singapore	Three dual degree students from Electrical Engineering department and three B. Tech students from Computer Science and Engineering department
21	Ontario Universities International, Canada	One dual degree student from Energy Science and Engineering department
22	Swansea University, UK	Two B. Des students from IDC
23	Technische Universitat Braunschweig, Germany	One B. Des student from IDC
24	Technical University of Munich, Germany	One MSc PhD student from Energy Science and Engineering department
25	Universidad Carlos III de Madrid, Spain	One dual degree student from Energy Science and Engineering department
26	University of Agder, Norway	Six Master students from SJMSOM



Sr. No.	Name of the University	No. of students/ Programmes
27	University of Geneva, Switzerland	One dual degree student from Energy Science and Engineering department, one dual degree student from Electrical Engineering department and one B.S Economics degree student from Humanities and Social Sciences department
28	University of Toronto, Canada	One dual degree student from Metallurgical and Material Science department and one dual degree student from Electrical Engineering department

Foreign Language courses:

Following language courses for the students and staff of IIT Bombay were organised in the Autumn and Spring semester:

- French (in association with the Embassy of France, New Delhi)
- Japanese (in association with Koo International Co. Ltd., Japan)
- German (in association with DAAD, New Delhi)
- Mandarin (in association with Embassy of Taiwan, New Delhi)

The courses were conducted by the native speakers of these languages.

Joint Research Workshops:

The office of Dean (International Relations) at IIT Bombay conducts research workshops with various institutes/ universities across the globe. The research workshops are the measures to strengthen the collaboration between the two institutes/ universities. The main objective of these research workshops is to identify collaborators with common research areas and take ahead the collaboration with a joint research student so that it is more sustainable.

IIT Bombay conducted joint research workshops with the following universities during 2019-20:

- Hiroshima University, Japan at IIT Bombay on September 12, 2019
- IIT Bombay – National Chiao Tung University, Taiwan – Delta Electronics, Taiwan – MediaTek Electronics, Taiwan on November 7, 2019
- University of Sydney, Australia during November 18-19, 2019
- IIT Bombay- Sun Pharma – Tel Aviv University, Israel during November 25-26, 2019
- Leibnitz University of Hannover, Germany on December 3, 2019
- Newcastle University, UK on December 9, 2019
- Genomics Research Centre, Taiwan during December 16-17, 2019

Workshops organized at partner universities:

- Newcastle University, UK on March 3, 2020



IIT Bombay-National Chiao Tung University, Taiwan



IIT Bombay-Newcastle University, UK

International Students

A total of 103 International students (from countries like Afghanistan, Australia, Bangladesh, Brazil, Canada, Denmark, Dubai, Ethiopia, France, Gambia, Germany, Hong Kong, Iran, Japan, Kenya, Myanmar, Nepal, Netherlands, Nigeria, Norway, Russia, Sierra Leone, Singapore, Sudan, Switzerland, Syria, Taiwan, Turkey, UK and USA) have registered at IIT Bombay during the financial year 2019-20. They have joined IIT Bombay for course work/ project work/ post graduate studies.



Alumni And Corporate Relations

The Dean Alumni and Corporate Relations (ACR) Office integrates two strategic thrusts for IIT Bombay. One is nurturing alumni relations and other is enhancing relations with corporations. The alumni and corporate donations, that have picked up significantly in the last few years, also provide a great support to the Institute. The Office of Dean ACR performs the important task of nurturing relationship for the benefit of the Institute and raising additional resources from the alumni and other well-wishers of IIT Bombay.

During 2019-20, the Institute received a total donation of Rs.57.26 crores. We express our deep gratitude and appreciation for the constant support shown by our alumni and other well-wishers to IIT Bombay. The major donors for the last financial year, among others, were Bank of Baroda, HPCL, Mangalam Organics, British Petroleum, Goldman Sachs India Pvt. Ltd., Narotam Seksaria Foundation, Ansys, Portescap India Pvt. Ltd., and the major alumni donations were from IITB Heritage Foundation, Mr. Abhay Pande, Dr. Mayur Datar, Mr. Raj Nair, Mr. & Mrs. Shamkant Sarkar and Class of 1993 and 1994. The development and alumni activities of the Institute are not just a role model in India, but have also been appreciated by major international universities.

The major activities for which these donations were received are as under:

Institute Development Fund: This fund primarily caters to the critical needs of the Institute such as those related to modernization and the establishment of new academic, research and campus infrastructure.

Young Faculty Awards (YFA): In an endeavour to enable IIT Bombay attract quality faculty, the alumni have instituted the Young Faculty

Awards programme. The YFA ensures that IIT Bombay offers a more attractive package to achieve better results in recruitment. The “Young Faculty Joining Bonus”, initially a Class of ’82 Legacy Project, has been awarded from 2010 onwards. The class of 1978, ’83, ’84, ’85, ’88, ’89, ’90, ’91, ’92, ’93 and ’94 have also joined this project. The project focuses on supporting young faculty in their academic pursuits in order to attract outstanding young faculty to replace retiring faculty and to augment current faculty as a key element for IIT Bombay to maintain its long-term competitiveness. 119 faculty benefited from YFA in 2019-20.

Chair Professorship: The Chair Professorship is a distinguished academic position of the Institute and is conceived as an academic honour to recognize outstanding teaching/research work and achievements of the permanent faculty in the Institute. It is also used to attract outstanding academicians to join the Institute as visiting faculty. Each Named Chair is supported by an endowment created from a donation to the Institute. It is envisaged that Named Chairs will also lead to establish new areas of specialization through the recruitment of accomplished researchers in specific fields of study. The endowment for a Chair is currently Rs. 1.25 crore. Interest from the endowment will be used to meet expenses of the Chair, which include an honorarium of upto Rs.30,000 per month and contingency expenses. The salary of the Chair Professor and all other benefits (housing, medical, etc.) continue to be borne from Institute funds. Donors have the prerogative of naming the Chairs. The broad area of specialization for instituting the Chair may also be specified by the donor. The total number of Chair Professors for the year 2019-20 was 81, out of which 50 were Institute Chairs and 31 were Donor-named Chairs.

Hostel Development: The Hostel Alumni Team Stewardship (HATS) is an important alumni-driven initiative that aims to channel the affinity and affection that many alumni have for their former hostels. This activity is run exclusively through the alumni support and contributions. The key goals of HATS are as follows:

- (a) Improve hostel infrastructure and facilities
- (b) Assist the current and retired mess workers
- (c) Increase interaction between the alumni and students
- (d) Empower students to improve their living conditions under the aegis of Make Hostel My Home (MHMH) and
- (e) Organize hostel-level reunions in each hostel on the Alumni Day.

The alumni from various batches have initiated projects to provide better facilities to the students for their academic progress.

Student Development:

- (a) **Scholarships:** One way to nurture excellence amongst students is by awarding scholarships to deserving candidates. The scholarships may be named after the donor. The Office of Dean (ACR) also works with students and alumni to identify and apply for relevant external fellowships and scholarships. The amount of scholarship is reviewed with the Institute Scholarship Committee from time-to-time to determine the viability of the same given the prevailing economic conditions. During 2019-20, about 600 scholarships of varying amounts were granted. Desai Sethi, IITBHF Named scholarships, Round Memorial, C'1990, C'1992 and Indira Foundation scholarships are some of the prominent scholarships.
- (b) **Awards and Prizes:** As every year, about 45 awards and prizes of varying amounts and forms (certificates, medals, etc.) were

given away during 2019-20. The awards in the name of Prof. K.C. Khillar, Mr. R.G. Manudhane, Dr. P.V Sukhatme and Mr. Rakesh Mathur, Mrs. Rama Mathur are some of the prominent ones given during convocation.

Major Events:

- (a) **FAN India Symposium and DA India Meet 2019:** The Faculty Alumni Network (FAN) India symposium and the Distinguished Alumni (DA) India Meet was held during April 6-7, 2019 at the Taj Exotica Resort in Goa. The Faculty Alumni Network (FAN) is a community of IIT Bombay faculty and alumni with backgrounds as researchers, university faculty, students and administrators. FAN's goals are to assist IIT Bombay in its efforts to become a world-class research and teaching center. The FAN India Symposium 2019 theme "New and Advanced Materials" was held in the morning session and "Sustainable Chemical Sciences" was held in the afternoon session. Prof. Jayesh Bellare, Department of Chemical Engineering and Prof. R Murugavel, Department of Chemistry were selected to lead the Symposium as conveners. The symposium on "New and Advanced Materials" in the morning session was chaired by Prof. Srikanth Sastry from the Theoretical Sciences Unit, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) and the symposium on "Sustainable Chemical Sciences" in the afternoon session was chaired by Prof. Alisagar Contractor, who has retired from the Department of Chemistry, IIT Bombay. The symposium was attended by over 45 participants in both sessions from academia and industry including alumni from IIT Bombay and subject matter experts (SMEs).

The Distinguished Alumni India Meet 2019 was held on April 7, 2019. It



is an initiative that brings together IIT Bombay's distinguished alumni who have contributed and have been acknowledged by the Institute for their distinguished services to the society at large. The meet is held annually to plan the strategic growth of the Institution in the future years. This year, IIT Bombay is primarily focussing on four priorities including a) enhancing the students' experience b) strengthening faculty and research c) building a culture of innovation and entrepreneurship d) creating a world-class campus.

- (b) **Institute Valedictory Function:** The Valedictory Function for the graduating students was organised on May 3, 2019 at Prof. B. Nag Auditorium in the Victor Menezes Convention Centre of the Institute. Mr. Abhay Pandey, General Partner, A91 Partners and IIT Bombay alumnus of CSE Department, and Mr. Gagan Bhalla, CEO and COO of Apollo Sugar and Apollo White Dental and an IIT Bombay alumnus of Civil Engineering Department, were the Chief Guests on the occasion. The event was graced by the presence of Institute dignitaries; Prof. Subhasis Chaudhuri, Director, IIT Bombay, Prof. Soumyo Mukherjee, Dean (Student Affairs), and Prof. Suhas Joshi, Dean (Alumni and Corporate Relations). The outstanding contribution awards were also given out to felicitate the members of the Student Alumni Relations Cell who have contributed substantially to the Institute as members of Dean (Alumni and Corporate Relations) Office. The awardees were Mr. Karan Mantri, Mr. Samarth Agrawal, Mr. Taveesh Garg, Ms. Vaishali Agrawal and Ms. Mrinal Dharmik.

- (c) **Japan Visit:** A delegation from IIT Bombay including Prof. Subhasis Chaudhuri, Director, Prof. Suhas Joshi, Dean (ACR), Prof. Milind Atrey, Dean (R&D), Prof. K. Momaya, Shailesh J Mehta School of Management, Mr. Sharad Saraf, Chairman, Technocraft and others visited Tokyo in the first week of September. The visit was aimed to get connected with more and more corporates and reach out to the alumni community. The delegation visited the following companies: Murata Manufacturing, Daikin, NEC, FUSO/Daimler Asia Trucks, Sony Corporation, Yahoo, Honda R&D and few others. The delegation also visited Tokyo University.

IIT Bombay Alumni Connect Program:

The meeting was attended by more than 100 alumni from Japan. It appeared that there is a big influx of alumni in Japan during 2016-2018. The event was a great success.

- (d) **Alumination:** The flagship event of SARC, IIT Bombay 'Alumination' was organised during October 12-13, 2019. It is IIT Bombay's largest platform for bilateral exchange between the IIT Bombay alumni and students on a spectrum spanning career guidance, corporate exposure, life learning and motivational talks. Three IIT Bombay alumni including Mr. Arvind C. Bidaye, Scientific Officer at Bhabha Atomic Research Centre, Mr. Amit Mittal, Senior Manager at Aditya Birla Finance Limited and Mr. Zishaan M. Hayath, Founder and CEO of Toppr.com presented their views on working conditions in their respective sector. Talk on the fundamentals of entrepreneurship was delivered by alumnus Mr. Saurabh Garg, the co-founder and CBO of NoBroker.in on October 12. On the final day, the fest concluded with a motivational talk by Mr. Rizwan Koita, co-founder and

CEO of CitiusTech, as he presented an account of his life after graduation and the invaluable insight he gained along the way.

(e) **US and Canada Roadshow by IIT Bombay:**

The IIT Bombay team conducted its annual roadshow to the United States and Canada (this year) during October 10-22, 2019. The team travelled to 6 cities to meet alumni, corporate and university partners across the USA and Canada. The major highlight of the roadshow was the alumni connect events in San Francisco in Bay Area, Seattle, Houston, Toronto and New York.

(f) **Re-union Events in India:** IIT Bombay organized a “Chennai Alumni Reunion” on November 9, 2019 in Mauve Lilac, The Raintree, 636, Anna Salai, Teynampet. The reunion was attended by more than 100 alumni.

The “Jaipur Alumni Reunion” was held on November 16, 2019 in Kewra Lawns, Hotel Diggi Palace, Diggi House, Shivaji Marg. The event was attended by more than 200 alumni.

(g) **Institute Alumni Day and Presentation of Distinguished Service Awards (DSA):**

The annual Alumni Day was held on December 22, 2019. The Alumni Day, saw two of the alumni, who have contributed in a notable and sustained manner to the progress of the Institute, being honoured with the ‘Distinguished Service Awards’. The DSA were conferred on Mr. Aaloke Surie (BTech, 1970, Mechanical Engineering) and Ms. Rekha Koita (BTech, 1992, Metallurgical Engineering and Materials Science). The Chapter Service Awards (CSA), instituted during the Diamond Jubilee year celebrations was conferred on Dr. Sushil Bhatia (BTech, 1966, Electrical Engineering), Mr. Madhusudan Reddy M (MSc, 1974, Applied Geology), and

Mr. Sunil Dhall (BTech, 1985, Mechanical Engineering).

During this event, the respective batches of alumni have pledged a total of Rs. 26.26 crores for the Institute. The Class of 1994 presented their ‘Silver Jubilee Class Legacy Project’ and pledged to contribute a record-breaking amount of Rs. 12.14 crores to the Institute. A Legacy Project is a project adopted by the batch celebrating its Silver Jubilee anniversary, for the betterment of the Institute and of the people associated with it, as a way of giving back to the alma mater and to leave behind a lasting legacy and remembrance of their silver jubilee reunion. Mr. Parasvil Patel from the class of 2009-10 announced the Legacy Project Gift. The decennial batch (Class of 2009-10) pledged a sum of Rs. 1.05 crore to the Institute this year.

Major highlight of the event was the launch of the *Regular Giving Programme* by Prof. Subhasis Chaudhuri, Director, IIT Bombay. The objective of the program is to encourage the students and alumni of the Institute to give back to their alma mater on regular basis which will go towards a number of endeavours, grand and small, in the service of the Institute and the current students.

h) **Alumni Reunions:** Reunions of various batches of the Institute were organised in December 2019:

- Silver Jubilee Reunion of Class of 1994 was held during December 20-22, 2019. The batch of 1994 pledged a sum of Rs. 12.14 cr. towards the Legacy project. They would be looking at deploying the funds in a number of projects largely related to student well-being, including scholarship programs for deserving students, upgradation of study facilities across the hostels, supporting the ongoing institute



efforts for student counselling, amongst other things.

- Class of 1969 celebrated its 50th year reunion in January 2019. Around 107 alumni attended the event along with their families. On the Alumni Day, 10 representatives from the class of 1969 presented the batch contribution of Rs. 13.07 crores to the Institute towards their legacy project. These funds add towards a number of endeavours, grand and small, in the service of the Institute and the current students.
- Decennial Reunion of Class of 2009-10 was held on December 20-22, 2019. The reunion was attended by 151 alumni along with their family. The decennial batch contributed Rs. 1.07 crores to the Institute. The batch also took the time pledge to give their valuable time of 3000 hrs to the students and the Institute. This is first-of-its-kind initiative.
- Ruby Reunion of Class of 1979 was held during December 20 – 22, 2019. 32 alumni attended this reunion with their family.
- Reunion of Class of 1982 was conducted from December 30, 2019 - January 2, 2020. About 63 alums attended the event.

- i) **Foundation Day and Distinguished Alumnus and Young Alumni Achievers Award:** The 61st Foundation Day of the Institute was celebrated on March 11, 2020. During the function, seven alumni were honoured with the Distinguished Alumnus Awards and four Young Alumnus Achiever Awards by the Chief Guest Prof. Ashutosh Sharma, Secretary, Department of Science and Technology, Government of India. The

Distinguished Alumnus Award is conferred on those alumni who have reached positions of eminence in the areas of business, academics, research, government, public service and entrepreneurship. The Young Alumni Achiever Award is presented to those who have shown outstanding achievements in their chosen field of work and are below 40 years of age.

The recipients of the Distinguished Alumnus Award are as follows:

- Prof. Varadarajan Chari, BTech, 1974, Chemical Engineering
- Prof. Janat Shah, BTech, 1980, Mechanical Engineering
- Mr. Surendra Murlidhar Vaidya, BTech, 1983, Metallurgical Engineering and Materials Science
- Prof. Mayuresh Kothare, BTech, 1991, Chemical Engineering
- Prof. Gaurav Sukhatme, BTech, 1991, Computer Science and Engineering
- Prof. Kavita Ramanan, BTech, 1992, Chemical Engineering
- Mr. Abidali Neemuchwala, MTech, 1992, Industrial Management

The recipients of the Young Alumni Achiever Awards are as follows:

- Mr. Shaikh Shah Nawaz Ali, BTech. 2003, Electrical Engineering
- Mr. Ankit Mehta, Dual Degree (BTech+MTech), 2005, Mechanical Engineering
- Mr. Rahul Singh, BTech, 2006, Mechanical Engineering
- Mr. Ashish Bhat, BTech, 2007, Electrical Engineering

- j) **Named Lectures:** The following lectures were organised during the year by the Office of Dean ACR:

N. R. Kamath Chair Distinguished Lecture – N. R. Kamath Chair Distinguished Lecture by Prof. Kaushik Basu, Professor of Economics and the C. Marks Professor, International Studies at Cornell University, and former Senior Vice President and Chief Economist of the World Bank (2012-16) titled “The Economics of Digital Platforms: Theory and Policy Options” was organized on August 2, 2019.

Prof. C. N. R. Rao Lecture - Prof. C. N. R. Rao Lecture on Nanoscience and Nanotechnology by Prof. Ajayan Vinu, Global Innovation Chair Professor and Director of Global Innovative Center for Advanced Nanomaterials, University of Newcastle titled “Advanced Nano-materials for clean energy, environment, and health” was organized on September 26, 2019.

C.V. Seshadri Chair Distinguished Lecture - Dr. Ajit Sapre, Group President (R&T), Reliance Industries Ltd. spoke on “Technology initiatives by Reliance Industries to meet global challenges” on November 29, 2019.

Prof. C. N. R. Rao Lecture – Prof. C. N. R. Rao lecture in Nanoscience and Nanotechnology by Nobel Laureate in Chemistry Professor Grubbs, Victor and Elizabeth Atkins Professor of Chemistry at the California Institute of Technology on “Applications of Organic Chemistry to the solutions of Practical Problems” was organized on January 8, 2020.

Shashwat Panda Memorial Lecture by Pureheart Capital – Inaugural Shashwat Panda Memorial Lecture by Pureheart Capital was held on February 13, 2020. The speaker, Mr. Gurcharan Das, renowned author, commentator and public intellectual spoke on “Making a life vs Making a living”. ‘



Prof. Subhasis Chaudhuri welcoming the speaker Mr. Gurcharan Das, during the inaugural Shashwat Panda Memorial Lecture by Pureheart Capital

Institute Distinguished Lecture (in memory of Prof. K. C. Khilar) – The Institute Distinguished lecture in memory of Prof. K. C. Khilar by Dr. Janhavi Raut, Director, R&D at Unilever R&D Center titled “Microbiomics: Role of Microbe – Microbe and Host – Microbe interaction in shaping microbial communities” was organized on March 12, 2020 in Prof. B. Nag auditorium, VMCC.



Faculty Achievements And Recognitions

During the year, 25 faculty members (9 Assistant Professors - Grade I, three Associate Professors and two Professor on regular basis and 11 on Assistant Professor - Grade II) joined the Institute. The number of full-time faculty members on the roll of the Institute has risen to 681 comprising 335 Professors, 01 Professor (Contract), 176 Associate Professors, 147 Assistant Professors (Grade-I), and 22 Assistant Professors (Grade-II). In addition, there are 56 adjunct faculty members and 118 post doctoral fellows on the roll. Around ten faculty members retired – nine of whom were re-employed and one resigned during the year.

The Institute provided financial assistance to 259 faculty members for participating in international conferences. In addition, 16 faculty members travelled abroad for attending international conferences using external funding.

Apart from educational and research pursuits, the faculty of the Institute meet national and global obligations in diverse ways. Many of them have accepted membership of various national committees and editorship of journals. They also review manuscripts for publications. We are proud that their efforts have received recognition in the form of many awards and distinctions, some of which are listed below:

Prof. Amit Agrawal, Department of Mechanical Engineering has been elected as a Fellow of the International Society for Energy, Environment and Sustainability. The fellowship was conferred during the annual conference of the society held at NEERI, Nagpur on November 27, 2019

Prof. Anindya Datta, Department of Chemistry has been nominated to join the Editorial Advisory Board of 2020 Journal of Physical Chemistry for a period of 3 years, from January 2020

Prof. Anirudha Joshi, IDC School of Design has received the 2019 IFIP TC13 award by the International Federation for Information Processing Technical Committee on Human Computer Interaction (IFIP TC13) for his outstanding contributions in human computer interaction (HCI)

Prof. Atanu Ghosh, Shailesh J. Mehta School of Management was invited to join the Board of Governors (BoG) of the two management institutes of Institute of Management Technology (IMT) group of institutions – IMT Hyderabad and IMT Nagpur and accepted these invitations to be on the BoG of the two institutes

Prof. B. K. Das, Department of Mathematics has been selected as Indian Academy of Science Associates for three years from 2019

Prof. Bhaskaran Muralidharan, Department of Electrical Engineering has been awarded the Science and Technology Award for Research (STAR) instituted by Science and Engineering Research Board (SERB) to recognize and reward outstanding performance of Principal Investigators of SERB projects

Prof. Bijnan Bandyopadhyay, IDP in Systems and Control Engineering has been elected for the Fellowship of National Academy of Sciences (FNASc) for the year 2019

Prof. Chetan Solanki, Department of Energy

Science and Engineering has been awarded “Outstanding Green Activist-Jury Choice Award” by the Indian Federation of Green Energy

Prof. D. Manjunath, Department of Electrical Engineering has been elected as Fellow of the Indian Academy of Engineering (FNAE)

Prof. Debabrata Maiti, Department of Chemistry has been admitted to the Fellowship of Royal Society of Chemistry (FRSC), London

Prof. Debabrata Maiti, Department of Chemistry has been invited to join the Editorial Board of ‘Chemistry A European Journal’ for a period four years, starting from January 2020

Prof. Debabrata Maiti, Department of Chemistry has been selected to receive the NASI Scopus Young Scientist Award for the year 2019 under Innovation in Engineering and Physical Sciences category

Prof. Deepankar Choudhury, Department of Civil Engineering has been elected as Fellow of American Society of Civil Engineers (FASCE). He has also been invited to join the Editorial Board of “Soils and Foundations” published by Elsevier

Prof. Devang V. Khakhar, Department of Chemical Engineering has been selected to receive “Shri Om Prakash Bhasin Award 2019” in the field of engineering, energy and aerospace

Prof. G. Rajaraman, Department of Chemistry received Dr. A. P. J. Abdul Kalam HPC Award - 2019 from Dr. Shekhar Mande, DGCSIR and Dr. Madhavan Nair Rajeevan, Secretary, Ministry of Earth Sciences

Prof. Haripriya G, Department of Humanities

and Social Sciences has been invited to join as an Associate Editor of the Journal of “Indian Society for Ecological Economics” for a period of three years

Prof. Hetu Sheth, Department of Earth Sciences has been selected to receive the PRL (Physical Research Laboratory, Ahmadabad) Award for the year 2017

Prof. Irishi N.N. Namboothiri, Department of Chemistry has been elected as Fellow of Indian Academy of Sciences (FASc), Bangalore

Prof. Jayendran Venkateshwaran, Industrial Engineering and Operations Research and **Prof. Chetan Singh Solanki**, Department of Energy Science and Engineering, and Principal Investigator of SoULS for their SoULS Initiative at IIT Bombay has won the 1st Grand Prize in the IEEE’s Empower a Billion Lives (EBL) competition, the Finals of which was held during September 28th - October 1st at Baltimore, USA. The award includes a citation and grand prize of \$100,000

Prof. K. G. Suresh, Department of Physics has been selected to receive the Materials Research Society of India (MRSI) Medal for the year 2020

Prof. Kannan Moudgalya, Department of Chemical Engineering has been acknowledged with “Pt. Deen Dayal Upadhyaya Recognition for Re-Engineering India 2020” in the Farmer Welfare/ Industry/ Institutional Category for having paved the path for multi lingualism by envisaging and curating spoken tutorials in various Indian languages for Education, Employment and Empowerment. It was conferred on him by the Vice President of India on February 14, 2020

Prof. N. N. Viswanathan, Department of



Metallurgical Engineering and Materials Science (MEMS) has been selected to receive 'Metallurgist of the year award – Ferrous category 2019'. The award was instituted by the Ministry of Steel, Government of India.

Prof. Neela Nataraj, Department of Mathematics has been awarded the prestigious INSA Teachers Award (2019). The award has been instituted to recognize and honour teachers who have inspired students to take up careers in Science and Technology

Prof. Neela Nataraj, Department of Mathematics has been elected for the National Academy of Sciences (FNASc) Fellowship for the year 2019

Prof. Phani Tetali, IDC School of Design has been awarded Akhil Bhartiya Kala Gaurav Samman for his outstanding contributions to Animation Film Design Education' by the Maharashtra Cosmopolitan Education Society, Pune on March 2, 2020

Prof. Pushpak Bhattacharyya, Department of Computer Science and Engineering has received the prestigious Abdul Kalam Technology Innovation Fellowship for a period of three years from February 1, 2020

Prof. R. B. Sunoj, Department of Chemistry has been invited to join the Editorial Advisory Board of 'Chemical Sciences' the flagship journal of Royal Society of Chemistry (London) for a period of two years

Prof. Rinti Banerjee, Department of Biosciences and Bioengineering has been elected as Fellow of Indian Academy of Sciences (FASc), Bangalore

Prof. Rohit Manchanda, Department of Biosciences and Bioengineering has been

awarded the prestigious INSA Teachers Award (2019)

Prof. Rohit Srivastava, Department of Biosciences and Bioengineering has been admitted as a Fellow of the Royal Society of Chemistry (FRSC), London

Prof. Rohit Srivastava, Department of Bioscience and Bioengineering have been elected for the Fellowship of National Academy of Sciences (FNASc) for the year 2019

Prof. Rohit Srivastava, Department of Biosciences and Bioengineering has been elected as a Fellow of the National Academy of Sciences, India (NASI)

Prof. Rohit Srivastava, Department of Biosciences and Bioengineering has received the prestigious Abdul Kalam Technology Innovation Fellowship for a period of three years from February 1, 2020

Prof. Ruchi Anand, Department of Chemistry has been elected for the Fellowship of National Academy of Sciences (FNASc) for the year 2019

Prof. S. A. Khaparde, Department of Electrical Engineering has been elected as a Fellow of the Indian Academy of Engineering (FNAE)

Prof. S. Pal, Department of Mathematics has been selected as Indian Academy of Science Associates for three years from 2019.

Prof. Sachin Patwardhan, Department of Chemical Engineering has been elected as a Fellow of the Indian Academy of Engineering (FNAE)

Prof. Sahana Murthy, Interdisciplinary Programme in Education Technology has received the AECT Robert deKieffer International Fellowship Award for 2019, in recognition of her professional leadership in the field of educational communication and technology

Prof. Samir K. Maji, Department of Biosciences and Bioengineering has been selected to receive the NASI-Reliance Platinum Jubilee Award for Application Oriented Innovation for the year 2019 in Biological Sciences

Prof. Samir K. Maji, Department of Biosciences and Engineering has been selected as a fellow for the Tata Innovation Fellowship of the Department of Biotechnology (DBT)

Prof. Santosh Gharpure, Department of Chemistry has been invited to join the Editorial Advisory Board of European Journal of Organic Chemistry (Wiley-VCH)

Prof. Shyamprasad Karagadde, Department of Mechanical Engineering has been selected by the National Academy of Sciences to receive the prestigious 'NASI Young Scientist Platinum Jubilee Award'

Prof. Subimal Ghosh, Department of Civil Engineering has been selected to receive the PRL (Physical Research Laboratory, Ahmadabad) Award for the year 2017

Prof. Subhananda Chakrabarti, Department of Bioscience and Engineering has received the prestigious Abdul Kalam Technology Innovation Fellowship for a period of three years from February 1, 2020

A team comprising of **Prof. Sugandh**

Malhotra and his PhD student Ms. Deepshikha Dash, IDC School of Design has won the prestigious "Joseph Jaworski's Next-Gen Foresight Award" in the Group Special Award category for their project on "Future Design Possibilities for Mobility"

Prof. Supratik Chakraborty, Department of Computer Sciences and Engineering has been elected as Fellow of the Indian Academy of Engineering (FNAE)

Prof. Tarun Kant, Department of Civil Engineering has been selected to receive "INSA Professor Brahma Prakash Memorial Medal 2019."

Prof. Udayan Ganguly, Department of Electrical Engineering has been selected to serve on the Editorial Board of IEEE Electron Device Letters for a period of three years

Prof. Vivek Agarwal, Department of Electrical Engineering has been elected as Fellow of Indian Academy of Sciences (FASc), Bangalore

Mr. Durgesh Tamhane and Ms. Indrani Mukherjee, students from Department of Electric Engineering have won first prize at the IEEE International Sensors and Measurement Student Contest at the 2019 IEEE Sensors Conference at Montreal, Canada. Their project is titled '*Detection of defects in steel sheets*'

Mr. Divakar Kuppan, a student of IDC School of Design has won the Best Animation Student Film at the 8th Mumbai Short International Film Festival for his graduation animation film titled, "*Panangaatu Nari/ The Fox of the Palmgrove*"



Infrastructure Development

During 2018-19, four major infrastructure projects namely construction of Research Park, Hostel No 17, Type 'B' housing 78 flats (Building No. B-25) and combined building for Society for Innovation and Entrepreneurship (SINE), Industrial Research and Consultancy Centre (IRCC) and IDC School of Design are in good progress. The Institute is making sincere attempts to cover the setback received in executing projects from COVID-19 pandemic. Apart from these projects, construction of Vertical extension to School of Management building is nearing completion.

During this year, the new guest house called Padmavihar Guest House and Department of Energy and Environment building have been certified as '4-STAR' and '3-STAR' by the Green Rating For Integrated Habitat Assessment (GRIHA) - an initiative of Ministry of New and Renewable Energy of Government of India, respectively.

Some of the building projects that would be constructed in the near future include construction of: Centre of Propulsion

Technology (COPT) building in Paspoli area, Centre for Entrepreneurship building (adjacent to Institute's Central Library), a new building behind the Department of Humanities and Social Sciences, Structural retrofitting of Main Building and other miscellaneous works in the Department of Energy and Environment building.

Other buildings in pipeline are Central Animal Facility, Nano Centre building (under IOE), Hostel 19 (towards north side of Hostel 18), 400 married students building (behind QIP building), One Type-II staff quarters tower 78 flats and one more new B-Type tower, etc.

In order to counter spread of COVID-19 pandemic and also to safeguard faculty, staff and students, number of hygiene measures, like foot-operated door openers, foot operated sanitizer stands, thorough virus disinfectant measures, etc. are being implemented on war footing basis.

In keeping the campus surroundings clean and hygienic, spitting is banned in the campus and offenders (will be) penalized promptly.



Central Library

The Central Library, IIT Bombay housed in a huge 3-storey building having central air-conditioned facilities with state-of-the-art amenities provide a vibrant ambiance to the students, faculties, staff, alumni and corporate/ member users for study, research and access to library resources. The services of the library are backed by efficient and courteous staff. It holds a vast collection of books, back volume of journals, monographs, standards, reports, thesis/ dissertation and current journals/ magazines etc., in the varied areas of engineering, sciences, technology, humanities and social sciences both in print and electronic format.

The institutional repository of IIT Bombay publications attracts large number of

users from around the world throughout the year which has 25,278 publications.

The library collection was used by 11,000 members during the year. The institutional repository of IIT Bombay has over 22,258 records. During this year, 709 Master's degree dissertations, 26 MPhil dissertations, 416 PhD theses, and 183 Dual Degrees dissertations were submitted online.

The Central Library continues to provide access to more than 20,000 e-journals and e-resources and has added about 3568 volumes including books, theses, reports, standards, pamphlets, e-books and other reading materials during the year. All the library collection can be accessed through online-public access catalogue.



The Central Library also render user-services like reference, consultation, document delivery services, book lending, arranging materials from other libraries through inter-library-loan, providing the book bank facility for IIT Bombay students belonging to economically and socially weaker sections of the society and organizing the user awareness programmes to enhance their awareness about library resources, services and activities. The library allows users to self check-out books as well as renew borrowed books online. It facilitates inter-library-loan facilities of books and other informational documents for its members as and when required. It also provides internship facilities to Library Science graduates. It handled over 79,593 circulation transactions of books and other documents for its members during the year. Central Library also offers services

to industry and corporates, IIT Bombay alumni and engineering (educational) institutions, professional members and has earned over Rs. 14.65 lakh for the services rendered.

The library is open from 0900 to 2300 hrs on all working days and from 1000 to 1700 hrs on holidays (except three national holidays and two festival holidays). The library remains open till 0100 hrs on all days during examinations. Round-the-clock air-conditioned reading hall facility with 150 seating capacity for the bonafide users of the library is also available. Even during the COVID19 global pandemic, access to the entire digital resources has been through remote access and the library staffs are proactively providing online reference services through email, social media, whatsapp and mobile calls.

User Education Programmes: Central Library had organised following workshop for the benefit of Institute researchers during the year:

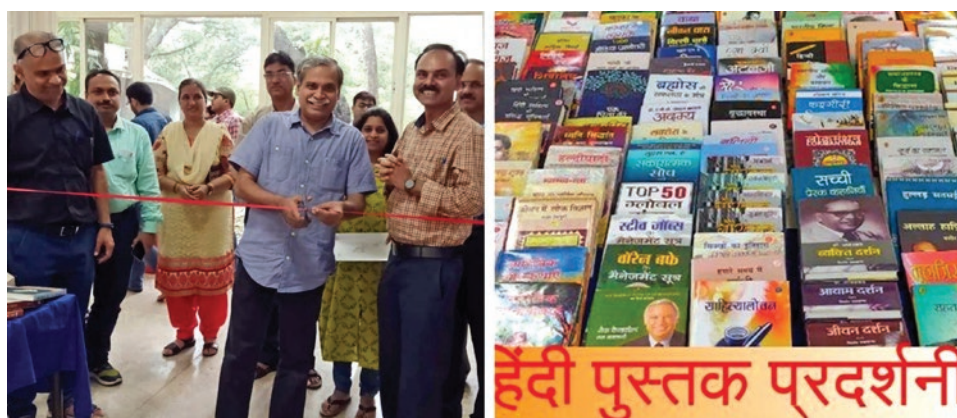


Participants during Author's Workshop Event

- 'IOP Author's Workshops' on September 4, 2019 with speakers Dr. Antigoni Messaritaki and Dr. Jennifer Sanders from IOP Publishing, UK.
- Workshop on Elsevier's Scopus, Engineering Village, Reaxys and Mendeley on September 11, 2019
- 'Research Writing and Science Communication' workshop on September 13, 2019 with speakers Prof. Arnab Bhattacharya, Department of Condensed Matter Physics and Materials Science, Tata Institute of Fundamental Research, Mumbai; Dr. Shivane Shah, Senior Managing Editor, Impact Science, Cactus Communications – Medical Communications; and Ms. Harini Calamur, Content Director, Editage and Impact Science
- 'Springer-Nature Author Workshop' on February 26, 2020 with speaker Ms. Swati Meherishi, Executive Editor, Applied Science and Engineering at Springer

Hindi Pakhwada

Central Library celebrated 'Hindi Pakhwada' by organizing Hindi book exhibition during September 12-13, 2019 to encourage faculty, staff and students to read Hindi books. The exhibition displayed latest Hindi books from three book suppliers and 118 books recommended by users were procured.



Prof. Anirudha Joshi, Convener and Library Committee members inaugurated Hindi Book Exhibition on September 12, 2019

Library Visitors: Around 1000 visitors visited the Central Library from various schools/ colleges/

institutes from India and abroad during 2019-20.



Select photos of Library visitors during 2019-20

Librarian's Day Celebration

The Central Library celebrated Librarian Day which is Dr. S. R. Ranganathan's 127th Birth Anniversary on August 13, 2019. Dr. S. R. Ranganathan is known as father of library movement in India. The celebration was graced by the presence of Prof. Subhasis Chaudhuri, Director, Prof. Anirudha Joshi, Convenor, Library Committee, Dr. R. Premkumar, Registrar and other functionaries. Following new services were launched by the Director Prof. Subhasis Chaudhuri on the occasion: Launch of Books Issue from Children Collection; Launch of E-reader Service (Kindle) for Children from Diamond Jubilee Fund. Prof. Anirudha Joshi and Dr. Premkumar, Registrar, and Library staff donated books to Prof. Parag Bhargava who is managing library (free-of-cost) for underprivileged people staying near Powai. The celebrations included various activities like quiz for campus children, essay writing competitions and skill test for library staff. The winners in the competitions were felicitated during the event.



Launch of E-reader Service (Kindle) by Prof. Subhasis Chaudhuri, Director, Prof. Anirudha Joshi and Dr. R. Premkumar, Registrar

Dr. Manju Naika, Chief Library Officer attended the Librarians Day/ Librarian's Appreciation Day event

organized by Wiley, Royal Society of Chemistry and American Chemical Society and received highest publications and highest usage awards. He also delivered invited talk on “Importance of Resources for Institution Ranking and Reputation” at Wiley Library Award 2019 function in New Delhi.



Prof. Subhasis Chaudhuri, Director, IIT Bombay handing over the prizes to essay competition winners



On the occasion of Librarian Day, Prof. Anirudha Joshi and Dr. Premkumar, Registrar donated books to the library for underprivileged in Powai managed by Prof. Parag Bhargava



Dr. Manju Naika, Chief Library Officer receiving an award from Wiley Publishers for highest number of publications in Wiley Journals from IIT Bombay



Dr. Manju Naika, Chief Library Officer receiving an award from RSC publisher for the highest number of OA publications in RSC Journals from IIT Bombay



COMPUTER CENTRE

Computer Centre Activities toward enabling online semester Autumn 2020

Direct Initiatives:

- 1) Rolling out Single Sign On (SSO) with two factor authentication (2FA): IIT Bombay network will interface with outside world at a significantly enhanced level due to the online semester activity. As a security feature for CC Services, SSO will ensure that users connecting from outside are legitimate. From users point of view, a single sign on will enable them to use various services without the need to logging in again.
- 2) Rolling out of G Suite for Education integrated with IIT Bombay SSO at Institute level: This facility brings Google's features and services at the fingertips of IITB users, including enhanced space in Google, drive, richer features in Google Meet, etc. Faculty can use Google Meet for online classes
- 3) Rolling out of Microsoft Azure for Education integrated with IITB SSO at Institute level: Same as above but for subscription services of microsoft being available to all users. Faculty can use MS Teams for online classes
- 4) Cisco's Webex learning centre for Higher Education: This purchase will enable each faculty member and student an account for conducting online classes
- 5) Reverse Proxy with SSO authentication for access of ASC server (all academic records of IITB) from outside campus network: Since large number of connections will take place from outside, and to secure data in ASC, reverse proxy server implemented so that accessing from external networks is more secure.
- 6) New web portal for validation of new student IITB network access account for Autumn 2020: All new master and PhD students had to connect from outside, which required new websites to be created
- 7) Enhanced VPN access: New VPN services have been rolled out which can allow up to 1,500 simultaneous VPN connections to IITB network
- 8) Enabled VPN access for concurrent network license servers for technical computing software: In order for students to use our software from outside, CC enabled VPN access. Indirect Initiatives
- 9) Enhanced monitoring of traffic on all network switches: To ensure that faculty members can teach from their residence or department, all switches are being monitored for downtime in a continuous fashion
- 10) Enhanced cybersecurity monitoring: All activities on outward facing servers of IIT Bombay are being monitored for any unusual activity

Society For Innovation And Entrepreneurship

The Society for Innovation and Entrepreneurship (SINE) has completed 16 successful years as a technology business incubator. Set up in 2004, SINE provides start-to-end support to technology-based entrepreneurs and facilitates the conversion of research activity into entrepreneurial ventures. As an incubator, SINE runs programs which include prototyping grants, entrepreneur fellowships, bootcamps for innovators and early-stage entrepreneurs. In 2019-20, SINE hosted 53 companies, of which, 32 are new companies that got incubated and 16 have graduated. SINE's incubation program incubates technology entrepreneurs from various streams like Cleantech, Agritech, Material, IOT, Fintech, Manufacturing, Retail, Med-tech and healthcare etc., for over 3-5 years in both physical and virtual formats. It also runs accelerator programs with corporate partnerships.

In the last 16 years, SINE has gained a leadership position in business incubation community in India. SINE has been selected as "Centre of Excellence" by the Department of Science and Technology, Government of India (DST-GOI). In addition, DST has also selected SINE as an implementation partner to run its nationwide program for funding innovators for prototyping their ideas. SINE has also been approved by BIRAC and the Department of Biotechnology, Government of India (DBT-GOI) for setting up a BIO-Incubator (BIONEST) to encourage the MedTech entrepreneurs. MeitY-GOI (Ministry of Electronics and Information Technology) also supports SINE. SINE has been identified as the implementing agency of Centre for Augmenting WAR with COVID-19 health

crisis (CAWACH) by NSTDEB for supporting innovations offering comprehensive solutions to address/ mitigate Covid-19. Many SINE start-ups viz. Ayu Device, Haystack Analytics, Endimension Technologies, Combat Robotics, Vytal Healthtech, Ubicare's, EmerTech Innovations, Aubotz Robotics, Patanjali Pharma, Abstract Ideas, Ideaforge, Allincall, and Medprime etc., have come up with unique and effective solutions that can ease many problems faced by frontline workers combating the pandemic. From screening to diagnostics, informative platforms, PPE kits, food supply chain to surveillance, these start-ups offer it all with their new technologies. SINE is one of the five implementing incubator partners for "Innovations for Defence Excellence (iDEX) – a defence start-up initiative of the Ministry of Defence, aimed to create an ecosystem to foster innovation and technology development in Defence and Aerospace and solve some of the most critical technological problems being faced by the Indian Defence Establishment.

SINE in its journey of 16 years has incubated over 168 startups founded by 550+ entrepreneurs who in turn created more than 4000 employment opportunities. It has facilitated more than 350 innovators under various programs. Nearly 26% of its start-ups are based on IPs spun out of IIT Bombay. Majority of its incubated companies have received external funding, and many have expanded the ventures into international markets.

SINE actively collaborates for various initiatives with corporates, government, institutions and International organisations. SINE, while engaging with corporates, not



Participants At Dialogue with Stakeholders event

only involves them in various activities like joint accelerator and mentoring programs, but also in product/ service/ idea validation of incubatees. SINE also works with corporates for their CSR initiatives.

SINE, along with Desai Sethi School for Entrepreneurship (DSSE), IIT Bombay, successfully hosted an event called “Dialogue with Stakeholders” to celebrate the spirit of entrepreneurship and as mark of 15th anniversary of SINE and five years of DSSE and their immense contributions to the emergence and growth of a thriving entrepreneurial ecosystem inside IIT Bombay. The event

brought together various stakeholders such as academicians, policy makers, industry leaders, investors, business incubators and aspiring entrepreneurs from across the nation.

SINE, this year, has entered into various collaborations with industry giants at national and international level for the benefit of its start-ups. These are Mahindra & Mahindra, Petroleum Conservation Research Association (PCRA), Shell, Bank of Baroda, Maharashtra State Innovation Society, All India Institute of Medical Sciences, AIIMS and international collaborations with the University of Toronto and Bhutan Government.

IIT Bombay Research Park Foundation

The IIT Bombay Research Park Foundation (IITB RPF) is a non-profit organization incorporated by IIT Bombay (IITB) in 2016. The primary objective of the Research Park (RP) is to deepen the interaction between industry and IIT Bombay through physical proximity by bringing industry research and development centres on IIT Bombay campus. The IIT Bombay Research Park is a single window through which industry and academia can interact, in an environment where academic research complements technology development and productization, to make an impact on businesses, society and India.

IIT Bombay Research Park started with eight member companies in 2017, and currently, it has 13 member companies onboard that are actively interacting with IIT Bombay faculty. MuRata, NCIIPC, DRDO, and ideaForge have enrolled as member companies of IIT Bombay Research Park during 2019-20, and a few companies have also expressed interest to join IIT Bombay Research Park.

During 2019-20, the focus of IIT Bombay Research Park was mainly to engage strongly with the student community and evolve mechanisms for IIT Bombay Students to interact with Research Park companies closely. IIT Bombay Research Park client Ubisoft had organised 'Ubisoft Game Jam' on October 6, 2019 - a competitive event designed to bring together young, entrepreneurial game enthusiasts to try their hand at Game Development through a rigorous two-day workshop. The event was designed to be a crash course on Game Development – packed with sessions with Ubisoft experts, and handheld guidance and mentor training sessions. This edition of the Game Jam was organised solely for IIT Bombay students. To display the best

work by the participants, Ubisoft hosted a small exhibition along with an award ceremony.

The first edition of RESEARCHx was held on October 20, 2019. This was a day-long event organised by IIT Bombay Research Park in collaboration with the Undergraduate Academic Council. The event comprised student exhibitors from IIT Bombay showcasing their research and technical projects carried out under professors and a few industry internships. The exhibition also had industry representation. The IIT Bombay Research Park companies Applied Materials and Tata Power SED had stalls displaying their products and research work.

Apart from the exhibition, two competitions were also held for students aiming to solve real world societal problems in IIT Bombay viz. the water shortage and the disorganised traffic in front of IIT Bombay campus.

Two keynote lectures were delivered by IIT Bombay Research Park clients **Mr Vishal Bhasin**, Senior Vice President, Viacom18 on “Digital Transformation” and by **Dr Nitin Kale**, Co-Founder, Nanosniff Technologies on “Microsensors and Instrumentation for detecting chemicals and biochemicals”.

Another exciting activity during ResearchX event was a very engaging panel discussion on the topic “Industry and Academia” with IIT Bombay professors Prof. B. Ravi, Department of Mechanical Engineering and Prof. Rajesh Zele, Professor-in-Charge, IIT Bombay Research Park, representing academia and two industrialists Dr. Raghavan Muralidharan, Chief Technology Officer, Tata Power SED and Mr Rahul Singh, Co-Founder & VP Engineering, ideaForge representing the industry perspective. Another talk on “Transforming Technology to Business”

was delivered by Sust Labs incubated at SINE, IIT Bombay. The overall aim of the event was to bring the student community and the member companies of IIT Bombay Research Park on one platform to showcase the pioneering research carried out by them.

On December 11, 2019, IIT Bombay Research Park organised “Research Park - Clients Day”. The purpose of this event was to facilitate interactions between member companies of Research Park as well as to familiarise them with other modes of engagements with the IIT Bombay ecosystem. The Dean of Research & Development of IIT Bombay Prof. Milind Atrey gave an overview of the research activities carried out at IIT Bombay in different areas. He had an informative discussion with the member companies on Intellectual Property Rights and Technology Transfer at length. The incubation activities at IIT Bombay were presented by Ms

Ganga, Head, Operations, SINE.

Besides these, IIT Bombay Research Park hosted the first meeting of “Association of Indian Universities Research Parks” on January 11, 2020. The event witnessed participation from Research Parks of IIT Kanpur, IIT Kharagpur, IIT Guwahati, IIT Delhi, IIT Hyderabad and IISc Bangalore. The purpose of the meeting was to bring together the academic research parks and share the best practices and learn from one another. During 2019-20, IIT Bombay Research Park has been able to attract an overall additional funding of INR 250+ lakhs for industry-sponsored research at IIT Bombay. About 30 students were hired for internships/full-time employment at Research Park companies. IIT Bombay Research Park has been striving to grow exponentially while the building construction is still underway. The building construction has also made a significant progress in the past year.



Centre For Distance Engineering Education Programme

The Centre for Distance Engineering Education Programme (CDEEP) continued its functioning as a support unit to various ‘outreach’ activities of the Institute. During the year, CDEEP recorded 34 courses, covering 14 disciplines at IIT Bombay.

During the year, CDEEP provided 13 semester long courses content to National Programme on Technology Enhanced Learning (NPTEL) which are offered as Massive Open Online Course (MOOC). The Centre has an archive of 329 full semester long courses.

This year, contents of 24 courses were supplied to 17 individuals on demand. The viewership (enrolled) of courses through web stood at 2046 for 288 active courses.

The Centre continues to offer (recorded) current semester courses with certification

showing grades by the course faculty to distant participants as individuals or as a group.

The Centre covered Institute events such as Annual Convocation, Foundation day, which were webcast live having more than 9000 viewers. The Centre covered other 130 events including Institute colloquia, seminars and talks by distinguished speakers on campus.

During the lockdown period due to COVID 19 pandemic in March 2020, CDEEP offered its online services to create video courses for the current semester and shared it with IIT Bombay students. A detailed documentation for “making course videos”, “sharing videos with students” and “different distance learning tools for online student interaction” were/ is made available on CDEEP website.



Institute Events

57th Convocation: The 57th Convocation of IIT Bombay was held on August 10, 2019. Shri. Ramesh Pokhriyal 'Nishank', Hon'ble Minister of Human Resource Development, was the Chief Guest and delivered the Convocation Address. During the 57th Convocation ceremony, 2407 students were awarded the degrees.



The degree of Doctor of Science (*Honoris Causa*) was conferred on Mr. Nandan Nilekani, Co-founder and Chairman, Infosys Technologies Limited, Bengaluru and former Chairman, UIDAI, Government of India. Hon'ble Minister of Human Resource Development Shri. Ramesh Pokhriyal 'Nishank' inaugurated Hostel No. 18 and planted a tree in the IIT Bombay campus during his visit and also interacted with all the IITs through NKN on "Navbharat Ka Nirman, IITs Ke Saath".

61st Foundation Day: IIT Bombay celebrated its 61st Foundation Day on March 11, 2020. Prof. Ashutosh Sharma, Secretary, Department of Science and Technology, Government of India was the Chief Guest for the function. The Institute celebrated 61st anniversary on the Foundation Day by honoring its select alumni for their achievements in diverse fields. The Institute honored seven outstanding

alumni this year with the Distinguished Alumnus Awards and four with Young Alumnus Achievers Awards. The 'Prof. S.C. Bhattacharya Award for Excellence in Pure Sciences' was conferred on Prof. Kanchan Panda, Department of Earth Sciences. The 'Prof. H.H. Mathur Award for Excellence in Applied Sciences' was conferred on Prof. Sunita Sarawagi, Department of Computer Science and Engineering.

Teacher's Day: The 61st Teacher's Day was celebrated on September 9, 2019. Prof. Varun Sahni, Vice-Chancellor, Goa University was the Chief Guest. The "Prof. S.P. Sukhatme Excellence in Teaching Award" and the "Dr. P. K. Patwardhan Technology Development Award" were presented to select faculty members in recognition of their contributions in the field of teaching and research on the occasion.

International Day of Yoga: IIT Bombay celebrated the International Yoga Day on June 21, 2019 at the Institute's badminton court in the gymkhana ground. Ms. Anu Aggarwal, Founder Director of Anu Aggarwal Foundation and Mr. Tushar Pradhan, CIO, HSBC, were the chief guests of the event. The celebrations included second edition of Yog Pratiyogita on March 23, 2019 and a workshop on "Power and Yin Yoga" on May 3, 2019; "Flexibility & Stretching" on May 15, 2019; "Pranayam" on May 21-24, 2019; "Introduction to Iyengar Yoga with Yog-asana Demonstration" on June 1, 2019; "Heartfulness Meditation" on June 7-9, 2019 and a symposium on "Research on Yoga Based Practices" on June 15, 2019.

Van Mahotsav 2019 was celebrated on July 13, 2019. About 2000 saplings of 15 varieties were planted on the hill slope beyond the pipeline at rear side of Hostel 3 and 4 on the IIT Bombay campus.

58th Interim Convocation: IIT Bombay awarded degrees to 192 students at its 58th Interim Convocation on February 28, 2020. Dr. Lalit S. Kanodia, Chairman, Datamatics Global Services Limited was the chief guest for the interim convocation function. The degrees

were conferred upon those students who have completed all the requirements during the period from August 2019 to January 2020 and had requested for the degree to be awarded earlier than the 57th Convocation.

Matribhasha Diwas: IIT Bombay celebrated Matribhasha Diwas (Mother Language Day) on February 20, 2020 to promote the use of mother tongue in the Institute.

The event was organised under the chairmanship of Prof. Tapanendu Kundu, Dean (Student Affairs). Various linguistic associations of the Institute showcased the importance of different languages spoken across India during the function.

Marathi Rajbhasha Day: IIT Bombay celebrated Marathi Rajbhasha Day on February 28, 2020, as part of "Ek Bharat Shreshtha Bharat" event. The celebrations included a lecture on "Experiencing Marathi culture through its literature" by renowned Marathi writer, Editor-in-chief for the Marathi Encyclopaedia and Padmashree awardee Dr. Vijaya Wad. Padmashree Prof. D.B. Phatak, Chairman, Board of Governors, IIT Indore and former faculty, IIT Bombay was special guest on the occasion.





Institute Lectures/ Colloquia

Prof. T. Pradeep, Deepak Parekh Institute Chair Professor and Professor of Chemistry, DST Unit of Nanoscience and Thematic Unit of Excellence, Department of Chemistry, Indian Institute of Technology Madras, spoke on “From materials to clean water: Science, Technology and Industry”, at an Institute lecture on June 6, 2019

Prof. Peter Molnar, Distinguished Professor, Department of Geological Sciences, University of Colorado, Boulder, Colorado, USA, spoke on “The growth of the Himalaya and Tibet and the evolution of Asian climate”, at an Institute lecture on July 19, 2019

Prof. Kaushik Basu, Professor of Economics and the Carl Marks Professor of International Studies at Cornell University, Ithaca (New York) as well as the former Chief Economist of the World Bank and Chief Economic Adviser to the Indian Government, spoke on “The Economics of Digital Platforms: Theory and Policy Options”, at the N. R. Kamath Chair Distinguished Lecture on August 2, 2019

Dr. Geeta Narlikar, Professor of Biochemistry and Biophysics, Lewis and Ruth Cozen Chair I, University of California, San Francisco, USA, spoke on “Beyond the genetic code: how a shape-shifting genome controls cell fate”, at an Institute lecture on August 19, 2019

Dr. Vinod Nowal, Deputy Managing Director, JSW Steel, spoke on “Role of Indian Steel Industry in US\$ 5 Trillion Economy”, at Steel Colloquium lecture on September 18, 2019.

Prof. Ajayan Vinu, Global Innovative

Center for Advanced Nanomaterials, The University of Newcastle, Australia, spoke on “Advanced Nano-materials for clean energy, environment, and health”, at Prof. C. N. Rao Lecture for Nanoscience and Nanotechnology on September 26, 2019

Prof. Michael L. Klein, FRS Laura H Carnell Professor of Science and Dean of Science and Technology, Temple University, Philadelphia, USA, spoke on “Wetting-Dewetting Transitions & Nature’s Exquisite Sensing Machines: Unveiling the Molecular Mechanism of Pain?”, at an Institute lecture on October 3, 2019

Prof. Axel Kleidon, Research Group leader, Biospheric Theory and Modelling Group, Max-Planck- Institute for Biogeochemistry, Jena, Germany, spoke on “Using thermodynamic limits to infer climate and global climate change”, at an Institute lecture on October 9, 2019

Prof. Michael Jordan, University of California, Berkeley, spoke on “Machine Learning: Dynamical, Statistical and Economic”, at the 7th Annual Indira Foundation Lecture on November 4, 2019

Prof. Justin Wark, Department of Physics, Oxford University and Fellow, Trinity College, UK, spoke on “Science with X-Ray Free Electron Lasers”, at an Institute lecture on November 15, 2019

Dr. Ajit Sapre, Group President (R&T), Reliance Industries Ltd., spoke on “Technology initiatives by Reliance Industries to meet global challenges”, at an Institute Distinguished Lecture in Chemical

Engineering (in memory of Professor C.V. Seshadri) on November 29, 2019

Prof. Rukmini Bhaya Nair, Professor Emerita, Department of Humanities and Social Sciences, IIT Delhi, spoke on “Five Ideas of The University The 21st Century: Towards a ‘Stem And Leaf’ Model of Interdisciplinary Research Cooperation”, at an Institute lecture on December 2, 2019

Prof. Slobodan Simonovic, Professor Emeritus, Department of Civil and Environmental Engineering, Director of Engineering Works, Institute for Catastrophic Loss Reduction, The University of Western Ontario, London, spoke on “Resilience – Imperative of the Society Under Global Change”, at an Institute lecture on December 6, 2019

Prof. Richa Nagar, Professor of College of Liberal Arts, Chair of Russel and Elizabeth M. Bennett Chair of Excellence, Beverly and Richard Fink Professor in Liberal Arts, University of Minnesota-Twin Cities, spoke on “Academic Knowledge and People’s Struggles”, at an Institute lecture on December 9, 2019.

Prof. Oliver Hart, recipient of Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2016, spoke on “A

New Approach to Contracts”, at an Institute lecture on January 14, 2020

Prof. Joachim Frank, Nobel Laureate in Chemistry (2017), Columbia University, New York, spoke on “Single-particle cryo-EM: Visualization of biological molecules in their native states”, at an Institute lecture on January 17, 2020

Mr. Frank Riester, Minister of Culture, France, gave a talk on business opportunities while promoting culture titled “How the economy of culture is reshaping the world” on January 27, 2020

Prof. Yann LeCun, Director, AI Research at Facebook, Silver Professor of Computer Science, Data Science, Neural Science, and Electrical and Computer Engineering, New York University, spoke on “Self-Supervised Learning: the Next Step in AI”, at an Institute lecture on February 14, 2020

Dr. Janhavi Raut, Director, Research and Development, Unilever R&D Center, Bangalore, spoke on “Microbiomics: Role of Microbe-Microbe and Host-Microbe interaction in Shaping Microbial Communities”, at an Institute lecture (in memory of Professor K. C. Khilar) on March 12, 2020



Conferences

10th ACM/ SPEC International Conference On Performance Engineering

The Department of Computer Science and Engineering, IIT Bombay hosted the 10th ACM/ SPEC International Conference on Performance Engineering (ICPE) on “Performance Engineering in the AI Era”, at the Victor Menezes Convention Centre during April 7-11, 2019. Prof. Varsha Apte, Department of Computer Science and Engineering was the organizing co-chair of the conference (along with Prof. Antinisca Dimarco of University of L’ Aquila, Italy).

Prof. Kishor Trivedi, Hudson Distinguished Professor, Department of Electrical and Computer Engineering, Duke University, USA, Prof. Evgenia Smirni, Sidney P. Chockley Professor, Department of Computer Science, College of William and Mary, USA, and Dr. N. Muralidaran, Managing Director & CEO of NSEIT Limited, Mumbai were the keynote speakers at conference.

15th World Conference on Transport Research (WCTR)

The Transportation Systems Engineering Group, Department of Civil Engineering, IIT Bombay conducted the prestigious 15th World Conference on Transport Research (WCTR) during May 26-31, 2019. The WCTR is the flagship activity of World Conference on Transport Research Society (WCTRS). The opening ceremony of the conference was held on May 27, 2019. The conference provided a forum for the interchange of ideas among transportation fraternity from all over the world, from a perspective which is multi-modal, multi-disciplinary and multi-sectoral. The conference provided a platform

to the academicians, practitioners, managers, and policymakers together from all parts of the world to share cutting-edge research and advanced state-of-practice.

Prof. K. V. Krishna Rao, Department of Civil Engineering was the Conference Director of the WCTR. Over 1000 delegates from over 60 countries attended the conference. More than 1200 presentations on the topic of transportation were made during the conference in several technical and special sessions. As part of the event, WCTRS Young Researchers’ conference was held on May 26, 2019.

11th APCTP-IACS-IIT Bombay Joint Conference on Emergent Phenomena in Novel Oxide Materials and Low Dimensional Systems

11th APCTP-IACS-IIT Bombay Joint Conference on Emergent Phenomena in Novel Oxide Materials and Low Dimensional Systems was jointly organized by the Department of Physics at IIT Bombay, the Indian Association for the Cultivation of Science (IACS), Kolkata, and the Asia-Pacific Center for Theoretical Physics (APCTP) during November 28-30, 2019 at IIT Bombay. The purpose of the conference was to bring together theorists as well as experimentalists working in the area of novel oxide materials and low dimensional systems that includes multiferroic oxides, oxide heterostructures, frustrated magnetism, Graphene, topological insulators etc. The highlighted topics covered during the conference were Topological insulators, Transition metal oxides, Novel superconductors, Two-dimensional materials and Multiferroic materials

SciPy India 2019

The FOSSEE (Free/ Libre and Open Source Software for Education) project at IIT Bombay organised SciPy India 2019 - An annual international conference on “Python for Education and Scientific Computing”, during November 29-30, 2019. The conference provided opportunities to spread the use of the Python programming language in the Scientific Computing community in India. It provided a unique opportunity to interact with the “Who’s who” of the Python for Scientific Computing fraternity and learn, understand, participate, and contribute to Scientific Computing using Python.

7th International Conference on Advances in Energy Research

The 7th International Conference on Advances in Energy Research was organised by the Department of Energy Science at IIT Bombay during December 10-12, 2019. A panel discussion on “Energy Transitions and Energy Security” with the panellists including Mr. Anil Kumar Jain, Secretary, Ministry of Coal, Government of India; Mr. Karthik Ganesan, Research Fellow, Council on Energy, Environment and Water; Dr. Anuradda Ganesh, Director, Research & Innovation at Cummins; Dr. Keith Lovegrove, Managing Director of ITP Thermal Pvt. Ltd., Australia; and Mr. Soeren Huittinen, Head of Products R&D, India for Siemens was also held during the conference on December 12, 2019.

INDSTATS 2019 - Innovations in Data and Statistical Sciences

The Department of Mathematics, IIT Bombay organised a 5-day International Conference titled “INDSTATS 2019 - Innovations in Data and Statistical Sciences” at IIT Bombay during December 26-30, 2019. The 2019 IISA Conference at Mumbai was aimed to

bring together statisticians worldwide from academia, industry, government, and research institutions to explore the latest developments and challenges in the era of Data Science and Statistical Learning. Recent advancements in the fields of Statistics, Biostatistics, and Probability were also discussed in the conference.

IDC Golden Jubilee – Design Conference and Alumni Meet

The IDC School of Design at IIT Bombay organised “IDC Golden Jubilee – Design Conference and Alumni Meet” during January 6-8, 2020. The keynote speaker during the conference include Dr. Punya Mishra, Associate Dean of Scholarship and Innovation, Arizona State University; Mr. Pankaj Jhunjha, Head of Mobility Services, Tata Motors; Ms. Devina Kothari, Indian Industrial Designer, Strategist and an Entrepreneur; Mr. Rajeev Prakash, Art Director, Delhi Press, Uttar Pradesh; Mr. Abhishek Verma, national award winning director and animator; Mr. Abhimanyu Kulkarni, Studio Director Philips Experience Design, India; Ms. Chandni Rajendran, Chandni is a social entrepreneur and designer; and Prof. Uday Kumar, Associate Professor and Head of Department of Design, IIT Guwahati.

TCTD Symposium 2020

The Tata Centre for Technology and Design at IIT Bombay organised TCTD Symposium titled “Take Idea to Scale” on January 9, 2020. The highlight of the symposium was the posters and prototypes exhibition which displayed almost all of TCTD’s research projects and their readiness for field test or market-connect. The event was aimed to bring together academic researchers, field implementation agencies, social entrepreneurs, NGOs, government policymakers and CSR partners for discussion



with expert speakers and panellists on relevant challenges and alternatives to overcome them.

2nd International Conference on Entrepreneurship and Family Business [ICEFB 2020]

The Shailesh J. Mehta School of Management, IIT Bombay and the College of Business, University of North Texas, USA jointly organised the 2nd international conference on “Entrepreneurship and Family Business” [ICEFB 2020] during January 9-11, 2020 in Mumbai. The conference provided an opportunity to explore, expound on, and extend the rich heritage of research on entrepreneurship and family business. We expect to witness vibrant scholarly sessions underscored by a profusion of thought-provoking ideas.

5th International Conference on “Management of Intellectual Property

Rights and Strategy”

The Shailesh J. Mehta School of Management and IPR Cell at IIT Bombay in collaboration with the National Institute of Industrial Engineering (NITIE), Maharashtra National Law University (MNLU) Mumbai and the Society for Innovation and Entrepreneurship (SINE), IIT Bombay organised 5th International Conference on “Management of Intellectual Property Rights and Strategy” on Abstract Booklet MIPS 2020 during January 24-25, 2020

4th Doctoral Consortium – Advances in Management Research: Role in Emerging Economies

The Shailesh J. Mehta School of Management organized 4th Doctoral Consortium 2020 during February 21-22, 2020 at IIT Bombay on the theme “Advances in Management Research: Role in Emerging Economies”.

Workshops

ICPE 2019: 2nd workshop on Education and Practice of Performance Engineering (WEPPE)

The Department of Computer Science and Engineering at IIT Bombay organized ICPE Workshop - the 2nd workshop on Education and Practice of Performance Engineering (WEPPE) and two ICPE tutorials were held on April 8, 2019. The workshop saw three unique co-located events on April 7-8, 2019 viz the TCS-TIFR Quantum Computing Symposium, the First India Performance Workshop and a first Performance Modeling and Simulation Hackathon Training Event.

Workshop On Scilab

The Teaching Learning Centre (ICT) under the 'Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNTT)' supported by the FOSSEE and the SpokenTutorial projects conducted a one-day 'Coordinators Workshop on Scilab' on April 16, 2019. The workshop was a blended training programme that used A-VIEW for live interactions and Spoken Tutorials to learn Scilab. The workshop was inaugurated by **Prof. A K Suresh**, Deputy Director (AIA), **Prof. Kannan Moudgalya**, Principal Investigator, TLC (ICT), Spoken Tutorial & FOSSEE briefed the participants about the workshop schedule and the Spoken Tutorial methodology. **Prof. Madhu Belur**, Department of Electrical Engineering explained the participants about the capabilities and advantages of using Scilab. More than 160 remote centres participated in the workshop.

Massive Scaled Linux Workshop from Myanmar

The Teaching Learning Center (Information Communication Technology), IIT Bombay

organised Linux Workshop from Myanmar on August 23, 2019, funded by the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNTT), MHRD, Government of India. Prof. Kannan Moudgalya, Principal Investigator, TLC (ICT), Spoken Tutorial & FOSSEE, visited MIIT in Myanmar to explore how effectively the benefits of the education technology can be transferred to Myanmar. He addressed more than 3500 college teachers across 120 remote centres in India from MIIT, Mandalay through A-View software as a technology demonstration.

World's First Massive Hardware Workshop Using eSim

The Teaching Learning Center (Information Communication Technology), IIT conducted the first-of-its-kind hardware workshop on September 21, 2019 for more than 3500 college teachers through more than 120 remote centers spread across India, including one in Myanmar using a free software named "eSim", developed by the FOSSEE project, under the aegis of Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching, MHRD, Government of India.

Prof. Kannan Moudgalya, Principal Investigator, TLC (ICT), Spoken Tutorial & FOSSEE inaugurated the program. Mr. N. K. Mohapatra, CEO, Electronic Skills Sector Council of India (National Skill Development Corporation) was the guest of honour. Prof. Pramod Murali, Department of Electrical Engineering, the eSim course Instructor, gave the introductory remarks.

The topics covered in the workshop includes "Schematic creation and simulation; simulating an astable multivibrator", "mapping components



and footprints; setting parameters for PCB Design” and “Create Gerber files”.

Workshop on Renewable Energy from Ocean: Potential along Indian Subcontinent

The Department of Civil Engineering at IIT Bombay organised a nation workshop on “Renewable Energy from Ocean: Potential along Indian Subcontinent” during September 30 - October 1, 2019. The workshop was a kick-start event for various academic, research and knowledge dissemination activities as part of the project funded under Scheme for Promotion of Academic and Research Collaboration (SPARC) launched by MHRD (Ministry of Human Resource Development, Government of India). The workshop highlighted different aspects of marine renewable energies, including identifying potentials, selection criteria for suitable existing or innovate sustainable technologies adoptable to Indian conditions and to understand the environmental, ecological & socio-economic impacts.

Experts from University of Edinburgh and UK’s sustainable energy company spoke about innovative technologies of wave and tidal energy converters and success case studies during the workshop. Talks from experts from various research & academic institutes and other Indian industry stakeholders, such as MoES, NIOT, NIO, IITs, NITs, ONGC were also organised during the workshop.

Global Student Solar Assembly workshop was held on October 2, 2019

A Global Student Solar Assembly workshop involving over 1 million students from 100 countries across the world was organised at IIT Bombay on the occasion of 150th birth anniversary of **Mahatma Gandhi** on October

2, 2019. IIT Bombay campus hosted around 1400 students from various schools and institutions who assembled with their own lamps and took a pledge to become student solar ambassadors towards protecting the environment.

Lakhs of students simultaneously participated in the event across the country at multiple locations including hospitals, beaches, schools, NGOs, jails, etc. apart from the 1000s of schools across India and in 100s of countries across the world. **Dr Srikumar Banerjee**, Ex-Chairman, BARC was the chief guest for the event at IIT Bombay. The event marked the culmination of Gandhi Global Solar Yatra (GGSY) initiated by Prof. Chetan Singh Solanki, Department of Energy Science and Engineering.

17th NAMIS Workshop Nano and Microsystems for fundamental, medical and industrial applications

The Indian Institute of Technology Bombay and CNRS jointly organized 17th NAMIS International Workshop 2019 during November 25-27, 2019 at IIT Bombay. The workshop covered talks by eminent international researchers in the domain for collaborative discussions and exchange of ideas.

International Workshop on “QCD with Electron-Ion Collider (QEIC)”

The Department of Physics, IIT Bombay organized international workshop on “QCD with Electron-Ion Collider (QEIC)” during January 4-7, 2020 at IIT Bombay

Hindi Cell

Hindi Cell is actively engaged in providing support for implementation of Hindi in the Institute. The Institute's circulars, office orders, registers, forms, visiting cards, signboards and degree certificates are prepared in bilingual form. Hindi workshops were conducted during the year for staff of the Institute. The cell continues to send Hindi synonyms of the administrative terms through the Institute's email.

"Hindi Pakhawada" was celebrated during September 1-14, 2019, where competitions in Hindi essay writing and translation were organised for the student and staff members of the Institute.

Hindi Book exhibition was jointly organized by the Central Library and Hindi Cell during September 3-5, 2019 to encourage reading

habit of the Hindi books of all the staff and students of the Institute. Smt. Sunita Sakhare, Head of the Department of Hindi was the Chief Guest of the Hindi Diwas. Prof. A.K. Suresh, Deputy Director (AIA), IIT Bombay felicitated the winners of the competition in Hindi with certificates and cash awards.

Regular meetings of the Official Language Implementation Committee of the Institute were conducted during the year for increasing the use of Hindi in official work. Smt. Suniti Sharma, Director (OL), MHRD inspected the implementation of Official Language Hindi in the Institute on January 21, 2020. A one-day workshop was also organised by the Hindi cell for the senior officers of the Institute to promote the use of Hindi in official work.



Student Activities

Sports Council

1. Inter IIT

The 54th Inter-IIT Main Meet, co-hosted by IIT Kharagpur and IIT Bhubaneswar from December 14, 2019 to December 22, 2019 saw a participation of 23 IITs across 14 sports. The Aquatics meet had already concluded earlier in October, with IIT Bombay obtaining 4 points. The highlights of the main meet included Gold for the TT Men's and Squash Women's team, Bronze for Chess, Volleyball Men's, Badminton Women's and Table Tennis Women's, and fourth place for Lawn Tennis Women's team. Notable individual performances came from Kaushik Konwar who clinched a bronze medal in the under 69 kgs weight category, providing the first medal to IIT Bombay, and fourth place positions to Tushar Uike in 100m, RomshaJaipriya in 1500m, and 4x400m Men's relay.

Overall, IIT Bombay scored a total of 37 points, which put us in the 7th position in the overall standings. Although this is a drop from last year's performances, things look promising for the future. Almost all teams made the quarterfinals and narrowly missed out on proceeding to the semifinals. Considering that many teams consisted of new players, this is a good sign for the future. With the new sports officers setting in and consistent practice, things are all set to improve next year.



2. Aavhan

The fourth edition of IIT Bombay's Annual Sports Fest Aavhan was all set to return from March 27-29, 2020 but due to the current COVID-19 situation, it is postponed until further notice. Aavhan 2020 promises to raise the bar and redefine college sports as 4000+ participants from all over India battle it out in 17 different sports.

Providing IIT Bombay's state-of-the-art sports facilities, Aavhan strives to create the best possible platform for the hardworking players from different parts of the country to prove their mettle amongst some of the finest sportsmen. This edition will witness Carrom for the first time, along with the newly-added Kabbadi and Powerlifting. This sports fiesta will also suffice as an opportunity to the institute teams to play against the best talents and gain substantial experience.

3. IIT Bombay Half Marathon

The third IIT Bombay Half Marathon, a mammoth event brought a whiff of fresh energy and invigorated campuses and Mumbaikars. In spite of an incessant monsoon season, the Half Marathon drew 3000+ participants from across the entire city, with a vast multitude of runners looking forward to the event eagerly.

Organized in association with Fitizen India, the mega-event carried the tagline “Every drop counts”, contributing to PM Modi’s ‘Jal Shakti Abhiyan’. In a bid to reduce waste generation, IIT Bombay Sports collaborated with Team Zero Waste and used reusable and biodegradable kulhads for water distribution.

4. UG + PG Orientation

Sport is an integral part of one’s life, and IIT Bombay provides the best of facilities for students to hone their skills. Following a slew of orientations for freshers regarding campus life, IIT Bombay Sports aced the UG and PG Sports Orientation. Freshmen were given an insight into the events and camps conducted by the sports council, a glimpse of the sports culture and a glance at the opportunities at hand for glory. SAC in charge, Dr. K.K. Sengupta introduced them to the highly-acclaimed Inter-IIT Sports Meet, the biggest sporting event for IITians.



The introduction of the sports council drew a round of applause from the audience, and a barrage of questions was launched at them post the orientation. Delighted to see the zeal from their juniors, the council members promptly assisted all the students.

5. MAC (Mountaineering Adventure Course) + BMC (Basic Mountaineering Course)

A mountaineer must not only learn climbing but should also understand the language of mountains. With this being the major objective, IIT Bombay Sports organised Mountaineering Adventure Course, MAC from May 9 to 23, 2019 at Sanasar, Jammu. Further, with a power-packed itinerary of mapping down the distances of Mcleodganj, Bharmour and Manimahesh, Basic Mountaineering Course, BMC was kicked off on June 11, 2019.

The packages proved to be a perfect conjunction of training activities like rappelling, rock climbing, river crossing, camping, ascender climbing and recreation. There was an everyday schedule to be followed which taught various aspects of punctuality and discipline to the trainees as they started the ascent.

Base camp at 9000 feet, lake at around 14500 ft. and everyone filled with gushing enthusiasm - BMC was a perfect experience to hold on. "A frozen lake surrounded by a Vista of mountains covered in fresh snow; definitely a sight to behold" - said one trainee. They termed it as an unparalleled experience which helped them to overcome their fears. It also helped them in improving their physical fitness and the difficulties faced helped them better their mental strength. The course turned out to be more of a memory and something to get people out of their semester blues.

6. Swimathon

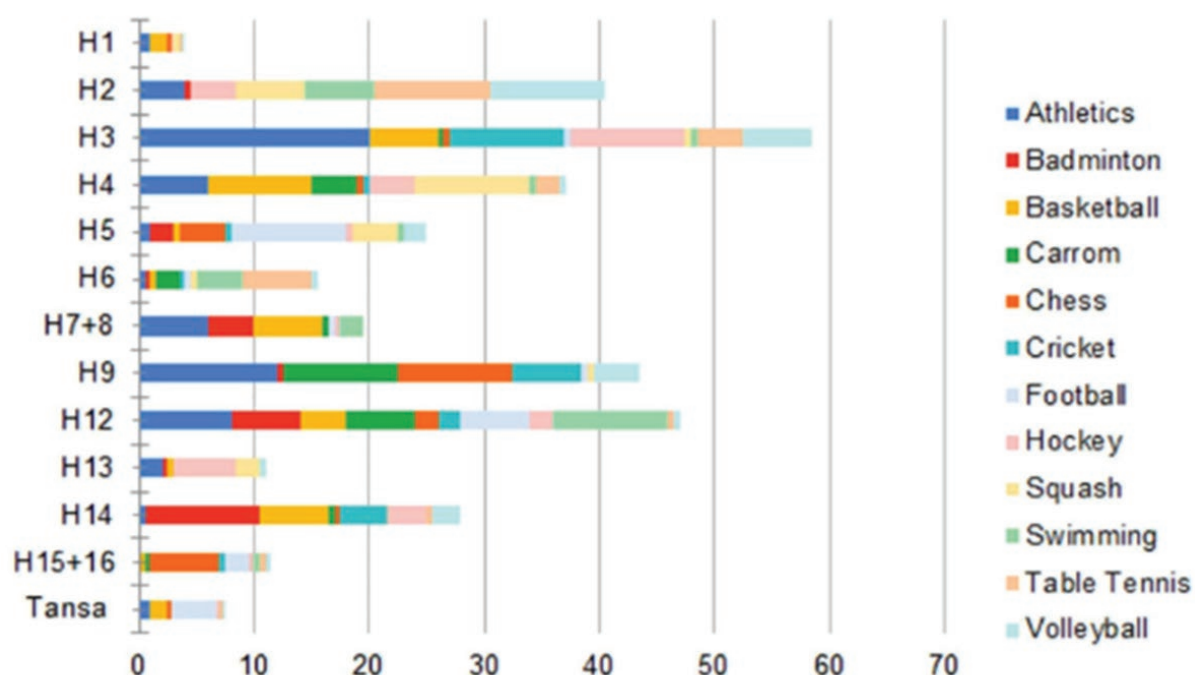
An event which demanded everything from its participants - skills, patience, and endurance. A 12-hour swimming marathon which exhausted the contestants physically, mentally, and emotionally.



To complete this event, the participants were disbarred from exiting the swimming pool for the entire duration of the event. Covering 12 km is also considered as having completed the event. An astounding total of 26 participants completed the event. Overall champion Ayush Thakur completed a staggering 27.5 km in 12 hours while Girls Champion Mridula Bagul covered an impressive distance of 20.1 km.

7. General Championship

The General Championship dates back to the time hostels were built. Many legacies and rivalries have been created by this tournament, which has grown over time. Each hostel bands together in support of their best sportsmen, where players gruel it out and where players win titles not just for themselves but for their hostels as well.



The GC's are inter-hostel tournaments, spread widely throughout the entire year, with each sport adding prized points to a hostel's total tally. These tournaments provide a platform to showcase talent, win hearts and possibly find a way into the reputed Inter-IIT contingent. The hostels are segregated into groups, to ensure equitable distribution of strength. This splitting of the hostels into groups promises tight and competitive matches, with plenty of cheering and motivating from audiences. The current standings of various hostels in different GC's is shown pictorially here in this graph.

Cultural Council

- **Culturals Website and App:**
 - ♦ Improved existing admin portals and the app UI interface.
 - ♦ Revamped the resume verification portal and updated blogs, P2P portal.
- **Cultural Meet 4.0:**
 - ♦ IIT Bombay successfully conducted the 4th Cultural Meet (December 20 – 22, 2019).
 - ♦ 24 IITs took part in the Cultural Meet 4.0 with more than 54 competitions.
 - ♦ IIT Bombay bagged the **runner's up trophy** at the event.

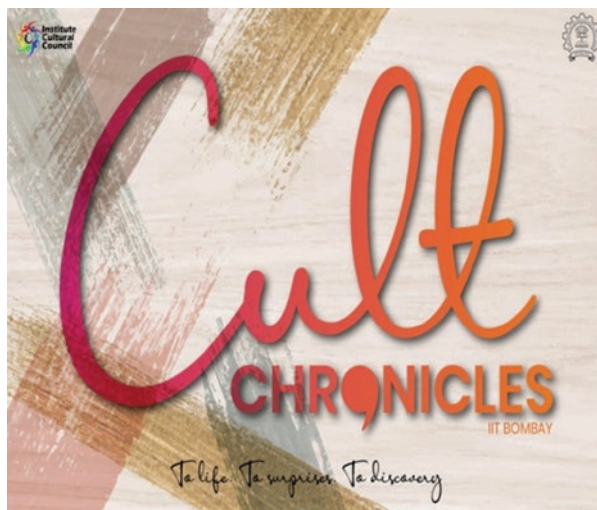


- **Enigma (ICSP):**
 - ♦ Ideated and executed the first ever cultural lookback magazine during the summers, under ICSP (Institute Cultural Summer Project).
- **Movie-Madness:**
 - ♦ Movie Screenings were conducted under the Banner of IIT Bombay Filmfest.
 - ♦ Chhichhore, Noblemen, The Tashkent Files, Unreserved have been screened till now and all of them were followed by a talk session.



- **Cult Chronicles & Click Beetles:**

- ♦ The respective seniors have been contacted to submit their write-ups, contents and pictures as per the requirements for the Instagram post.

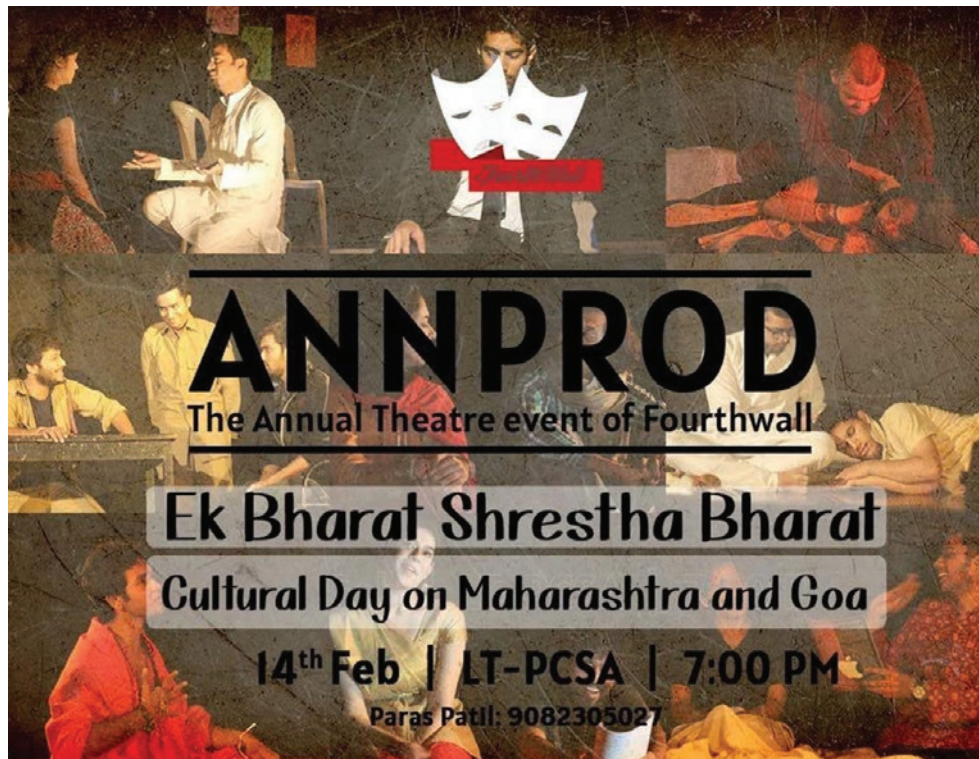


- **Prom Night:**

- ♦ Organised “Prom Night 2019” for the passing out seniors of the Institute.
- ♦ Collaborated with the location-based social search mobile app and Web application “Tinder” for photo booth and informal activities.

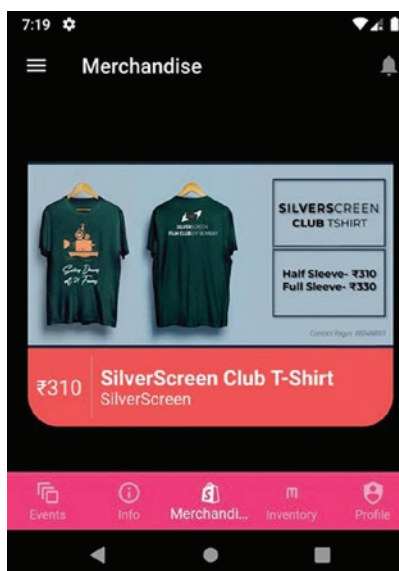
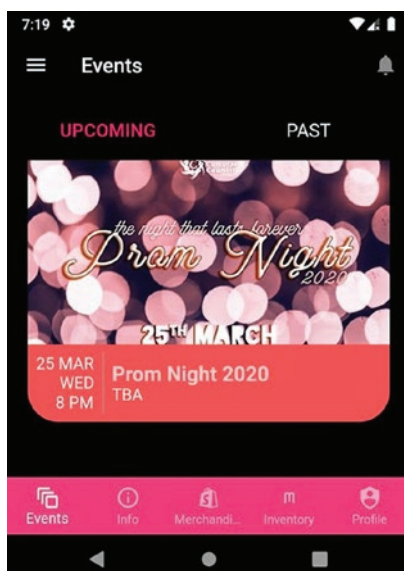


- **EBSB:** Various events were conducted under the banner of EBSB (as requested by the MHRD). Every month witnessed 1 major and 7 minor events featuring the culture of various states in India.



- **Culturals App**

- ♦ Created a Culturals App compatible with Android & iOS devices.



- **Performing Arts Festival**

- ♦ Conducted PAFs on three days, in the month of April, 2019.
- ♦ Saw participation from 15+ hostels and 250+ students from all the genres.



- **Showstopper**

- ♦ Introduced a fashion show-case in Convocation Hall.
- ♦ The event was performed in January, including pre-event photoshoots.



- **Annual InSync Dance Show:**

- ♦ AIDS was organised in February 2020. The event witnessed dance performances across various genres and also highlighted social issues like rape and suicide among the youth.



- **Comedy Cons Flagship**

- ♦ Introduced a stand-up show featuring performances by our students and two of the very famous stand-up artists in the Mumbai circuit.



- **Theatrefest**

- ♦ Conducted the well known, dramatics flagship - Theatrefest.
- ♦ The event was graced by some major bollywood (cast of Ujda Chaman).



- **Salsa Night**
 - ♦ Conducted an open Salsa night workshop for college students.

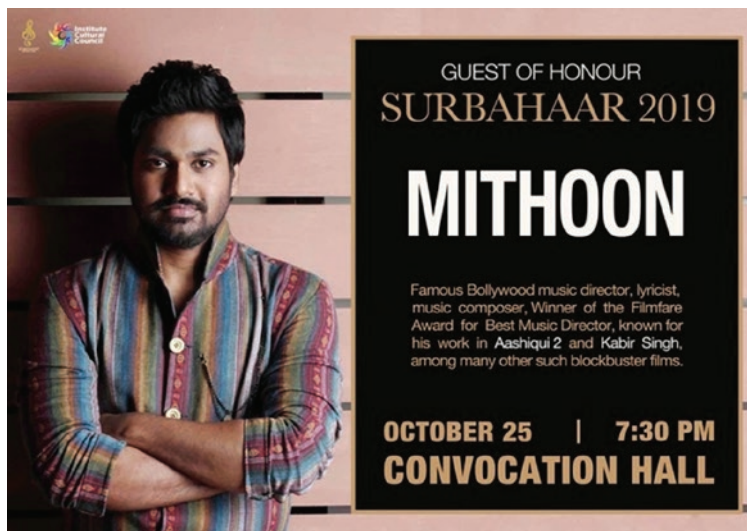


- **Dandiya Night**
 - ♦ Conducted Dandiya night as a festive celebration for college students.



- **Surbahaar**

- ♦ Conducted the musical flagship (Surbahaar) for students and faculty.
- ♦ The event was graced by the very famous Mithoon (music composer).



- **Virasat**

- ♦ Organized the classical night packed with various music and dance performances in the LT-PCSA.
- ♦ All the artists were national award winners in their respective fields.

Abhyuday

Following year-long activities were conducted by **Abhyuday** 2019 -20 with the focus on creating social awareness and impact.

Campaigns:

- **Career Counselling Campaigns (CCC)** were conducted for 8000+ students from 80 BMC schools in one day with the help of 250+ volunteers from IIT Bombay. The students were told about the myriad career opportunities and were also made aware of the various harmful effects of Climate Change.



- Achieved milestone of reaching out to 18,000+ students of BMC schools in one session of through video-teleconferencing telling them about career opportunities and answering their queries regarding subjects and various prospects.
- **2 Powai Lake Mega Clean-Up Campaigns** were held on June 5, 2019 for World Environment Day and on November 3, 2019. The campaign was done in collaboration with BMC. Together, the two campaigns saw a total turnout of more than 600 enthusiastic volunteers from the institute and garbage collection of over 3 metric tonnes.
- **Volunteer Visits** - Organised volunteer visits on weekends through the year consisting of **Masti Ki Paathshala** - 10, slum & old age home visits - 10, **Food Distribution** with Robin Hood Army- 16, Versova Beach Cleanup - 2, Mithi River Cleanup campaign - 4.



- **Slum Adoption Campaign** started with the collaboration with Pranays NGO. Volunteers took a survey of about **180+** students in a slum in Ghatkopar. Two interactive sessions of Masti ki Pathshala followed by 2 Awareness sessions of Drugs and Alcohol use were conducted in the slum.
- Abhyuday conducted various communal beneficiary activities including 1 blood donation camp with 400+ participation, free health checkup camp catering 200+ people, CPR Workshop, self-defense workshop for IIT Bombay women and a fire-safety workshop for residents.



Events:

- **Youth Empowerment** - Organized lectures on topics covering Power of Thinking, Leadership, Smartwork, Emotional Intelligence by renowned speakers **Ashish Vidyarthi, Dr. Radhakrishnan Pillai, Dr. Ujjwal Patni, Anand Munshi** and more empowering the youth towards the difficulties faced in everyday life.
- **Socio-X Series** - Series of Lectures part of Annual Fest focusing on key areas of concern of society including Health, Environment, and Technology for rural development. **Dr. Sheetal Amte, Padmabhushan Dr. KK Talwar, Tahira Kashyap Khurrana** are some of the renowned speakers delivered the lectures
- Abhyuday's **Annual Social Fest** encompassed a wide spectrum of events dealing with burning social issues, along with which self-awareness and solutions were presented. Several renowned personalities including **Sonam Wangchuk**, actress **Dia Mirza**, IAS officer **Tukaram Mundhe**, **Mayank Gandhi**, **Atul Khatri**, BMC Commissioner **Praveen Pardeshi**, Former ISRO Chairman **Dr. AS Kiran Kumar** and many more talked on pressing issues including Climate Change, Youth in Governance, Girl Safety, Cyberbullying, Nation Building, Space Entrepreneurship, etc. An exhibition on Agrotech was also held.

Competitions:

Action Plan - Challenges the youngsters across the country to come up with feasible and optimistic solutions to tackle social issues present in Indian society. This year 500+ teams from all over India participated in the competition and 20 teams were invited to present their solutions in front of a panel of 16 Incubators and investors.

PIL competition on Road Safety - Introduced a new competition to promote student involvement in laws and policies related to social issues by providing a fair and competitive environment for an exchange of thought and to strive and develop participant's knowledge related to them. The competition saw participation from 250+ students in 85+ teams.

- **Technical Affairs**

TINKERERS' LAB

To tackle the problem of redundant electronics being disposed of, TL Donation Drive was initiated to recycle gadgets. Training sessions were held for some machines in TL every weekend to give students basic training on how to use them. TL had been a part of the organizing Team of the Smart India Hackathon 2019 in collaboration with MHRD. TL Talks on new technology, innovation & entrepreneurship were conducted by **Prof. Moriwaka**, CEO Silicon Valley Ventures and **Rahul Prajapat**, STAB OC (2014-15) & Co-founder, Tvarit AI. A semiautomatic vertical milling machine was bought by TL.



CLUBS

24 workshops, 11 competitions and hackathons and 35 talks were organised by all the clubs together reaching an audience of over 2000 students. To establish an online presence, weekly problems and updates on technology were delivered via newsletters and social media. Some clubs also participated in national competitions like *Skyrush*, *Boeing Competition*, *Techfest Drone Challenge* and *International Meshmerise Challenge*.

Placement talks were conducted followed by some technical workshops in collaboration with industries. Student Reading Groups were formed to share knowledge. Industry visits were planned to gain insights on the operations and increase awareness regarding the utility as well as safety. Documentary and movie screenings proved to be an effective medium of learning. Group discussions were held as a continuing tradition to promote knowledge sharing. The clubs launched various projects to engage the students productively during the holidays.

PROJECTS

In **Institute Technical Summer Projects (ITSP)**, first-year students are mentored to engineer their dream projects or use technology to solve real-world problems. Rural and agriculture-based projects were introduced with the help of the CTARA department. More than 40 projects were selected. Under Technovation, project proposals were invited under the following categories - Campus sustainability, rural technology, autonomy and robotics and open domain, with support from the Tinkerer's Lab.

Summer of Science, (SoS) by MnP, matches enthusiasts with diverse interests to student mentors. SoS took off with 435+ mentees and 120 mentors. Seasons of Code (SoC) by WnCC had 16 projects, with 63 students and 21 mentors, and spanned topics like Machine Learning, Augmented Reality and Network security. Sustainability Cell collaborated with the Institute Technical Council and floated funded technical projects, guided by professors, aimed at solving issues related to sustainability in our institute.

8th INTER IIT MEET

This year, **IIT Roorkee** hosted the 8th Edition of the Inter IIT Tech Meet from December 20-22, 2019. This vision was carried further by the problem statements that were released in various fields like robotics, automation, social innovation etc. Overall, we achieved an overall 8th Position this year with 1 gold, 2 silver and 2 bronze medals. The results reflected some lack of preparation. However, the team displayed a good amount of teamwork and zeal. They are continuing working on the projects even after the Inter IIT Tech Meet.



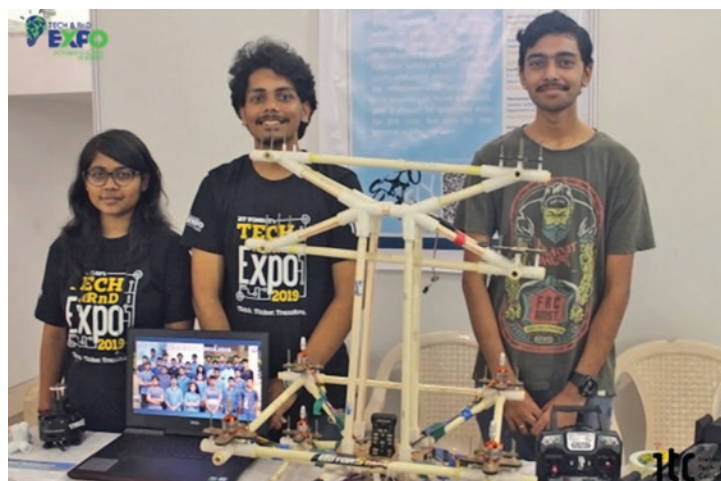
GENERAL CHAMPIONSHIPS

9 intra-hostel general championships were conducted over the year. These GC's saw participation from 10 hostels and involved around 1000 students to represent their hostels.

- Jhatka GC
- Astrophotography GC
- Eye in the sky++ GC
- Coding GC
- PhysX GC
- Think inside the box GC
- Logic GC
- Glider GC
- Documentation GC

TECH R&D EXPO

Tech & RnD Expo was organised on October 12 and 13, 2019. The exhibition consisted of **30+ exhibition stalls** with presenting students ranging from undergraduates to postgraduates. The exhibition was complemented by talks and events which ran parallel with the expo. The exhibition was conducted from 10:00 am to 5:00 pm on both days. Both professors and students participated.



Miscellaneous

INTER IIT Bootcamps: 7 workshops designed to provide a broad understanding of various domains in engineering and technology were conducted to prepare the contingent for the meet. Chemistry Club was introduced on a pilot basis where enthusiasts conducted two events and received decent participation. Controls and Dynamical Systems-Student Reading Group was held with the primary aim of exposing students to the exciting world of control systems. Developers' Community (DevCom) released InstiApp for iOS as well as Cerium, which uses SSO login and emulates Google Forms.

Mood Indigo

Mood Indigo 2019, IIT Bombay's annual cultural festival and Asia's largest college cultural festival, took place from December 26-29, 2019. Attracting a footfall of over 1,45,000 people from around 1700+ colleges pan India, Mood Indigo entertained the visitors with an incredible array of artists, both national and international. The four-day fiesta centred around the theme of "A Ballad of Ecstasy" served the visitors with best festive feelings.

The 49th edition of Mood Indigo was the grandest ever and laid a strong base for the upcoming Golden Jubilee of the festival. Mood Indigo even conducted various Pre-MI events for the students of IIT Bombay. As a part of the Institute Night in OAT, Mood Indigo invited **Guru Randhawa**, a national pop-sensation. A special screening of the film *Chhichhore* was organised at the Convocation Hall exclusively for the residents of the campus.

Mood Indigo 2019 saw a conglomerate of over 230 events spanning across multiple genres. With the presence of over 250 national and international artists, we continued our legacy of providing the most assorted and entertaining experience to the crowd.

Proshows:

Eloquence featured interactive sessions with eminent personalities like **Deepika Padukone** on a campaign against acid attacks against women. It also featured panel discussions by **Yami Gautam** and **Rajeev Masand**, **Siddhant Chaturvedi**, **Adah Sharma** on breaking out in bollywood. Adding to the star-studded lineup, we had famous Bollywood singers **Akasa**, **Tony Kakker** and **Leslie Lewis**. With a purpose to celebrate and cherish good cinema we had, IIT Bombay alumni **Nitish Tiwari** with **Fatima Sana Sheikh** relived the famous *Dangal* movie. Adding to the Slam Poetry touch to our Eloquence, we invited **Jidnya Sujata**, **Kopal Khanna** **Simar Singh** to which the youth went



crazy. **Subramanian Swamy** gave an inspirational talk on relevance of management education in technical institutes. **Prithviraj Chavan**, the former chief minister of Maharashtra and **Devdutt Pattanaik** also graced this year's Eloquence. Stand-up sensations, the much-renowned **Zakir Khan** and **Rahul Subramaniam**, were the major highlights of our Humorfest treating the crowd with their insane performance along with the evergreen **Jitendra Kumar**, **Biswapati Sarkar**, **Gajrao Rao**, **Nidhi Bisht** and **Arunabh Kumar**. Youtube sensations and a part of the renowned YouTube channel Timeliners **Barkha Singh**, **Ritvik Sahore**, **Ayush Mehra**, **Gagan Arora**, **Shreya Mehta** and **Rashmi Agdekar** also graced the HumorFest. For the first time ever at Mood Indigo, we had a comedian poet **Rajat Sood** perform at the festival. The International Music Festival had crowd relishing the performances from international artists and bands like **Celtica**, **Morrissey and Marshall**, **James Robinson**, **HI-5**. Increasing the magnificence of IMF by adding an Indian touch to it, we had Indian youth sensations like **Rekha Bhardwaj**, **Taba Chake** and **The Revisit Project** and **Alif** amaze the crowd with their brilliant performances. In addition to this, Mood Indigo saw performances from artists belonging to various cultures from Taiwan, Japan, Belgium, Malta, Spain, Slovenia etc. Increasing the takeback value for the crowd, we included 50+ interactive and DIY workshops ranging from book writing, parkouring to mural arts, tango etc. to make the festival more memorable.



Pronites:

The concerts at Mood Indigo have always been known for the perfect blend of unique, up and coming talent and the most renowned names in the industry. Living upto the legacy of International acts, **MAGIC!** The Canadian reggae band with their famous single 'Rude' with over a billion views, attracted huge crowds from all parts of India to watch the band live. Fusion Nite has always been known to feature rare and exclusive talent and 2019 was no different. Ace drummer **Darshan Doshi** and his collective with Indian sensations **Mame Khan** and **Vijay Prakash** headlined the night with a great set. EDM Nite featured the famed dutch American DJ **Bl3nd** and India's electronic sensation **Lost Stories** featuring **Jonita Gandhi** and **Zaeden**. Popular Nite saw a full house crowd to witness the contemporary singer of our times, a man who has defined the 90s and 2000s of Bollywood and etched his songs to our hearts forever - **KK** along with the stars of today's indie pop music - Yellow Diary to add charm to the night. For the first time at Mood Indigo, a heavy stage production was used along with 3D Interactive visuals which made the concerts more engaging and interactive for the crowd.





Competitions:

Known to attract the best student talent from across the country, Mood Indigo saw competitions in the field of dramatics, dance, film and photography, music, debating and creative writing, and informal events with a quirky twist. The competitions were judged by industry stalwarts like **Kavita Seth, Pawni Pandey, Nidhi Bisht and Biswapati Sarkar** and also received online appreciation from **Shakti Mohan** and **Navin Polishetty**. The grandest dance competition '**Choreonite**' saw thousands of people lining up to get entry into the Convocation Hall to watch some of the best dancing groups of the country. The event was also embraced by dancing greats of DID - **Shantanu** and **Kunwar Amarjit Singh**. The relentless energy at the jam-packed convocation hall radiated throughout the venue. This year saw the introduction of a winners' showcase at the end of all finals through '**Best of Competitions**' at the famed convocation hall in the presence of celebrities like **Mamta Sharma, Dalip Tahil, Sunny Singh, Sonnali Seygall**. To put a perfect end to the battle between contingents that lasts for months, the college with most winning points was crowned the '**Mood Indigo Champion**'. Entry of competitions in niche fields like improvisational theatre, rap, photography and folk dance increased participation by 15%.

Under the "**Live Your Passion**" campaign, the participants received various incentives like a casting opportunity from **TVF**- the leading online content creator, a music distribution opportunity by **Hungama Artist Aloud**, professional dance training by **NrityaShakti** dance academy, display of artwork at **Jaipur Intl Film Festival**, video streaming by **Humaramovie** and various recording and showcase opportunities. The

competitions saw participation from over a thousand colleges panning across various cities like Mumbai, Delhi, Jaipur, Hyderabad, Ahmedabad, Kolkata and Bangalore. The multicity campaign, our on-ground eliminations, expanded its reach to 15 major cities including associations with some of the top regional festivals in India.

Media and Publicity:

A great deal of media houses and online and offline partners helped in carrying out the publicity of the festival. We had an extensive coverage deal from our partners for the publicity of the festival on all platforms including TV, Facebook, Twitter and Instagram. Amazon Prime Video was associated as the Title sponsor of the festival and as a result, a great deal of publicity was carried out on it. This year also saw the launch of a Competitions. MoodI page on Instagram to showcase the performances and works of our participants, which was highly appreciated by the audience. Our associations with local newspapers and magazines helped us in penetrating into regions where Mood Indigo wasn't present before. In order to reach out to colleges in Mumbai, a college publicity drive along with a contingent leader meet was conducted to engage with the crowd first-hand and achieve better information flow.

Techfest

Techfest is IIT Bombay's annual college festival and is widely recognised as Asia's largest science and technology festival. The 23rd edition of Techfest was a grand success with website hits of 4.7 Million+ and a footfall of more than 1,75,000 among other highlights.

BOLT: Strengthen Your Bones:

On the occasion of World Osteoporosis Day, Techfest, IIT Bombay organized Bone Health Awareness and Free check-up camps across India as a part of our Initiative: BOLT - strengthen your bones. With camps across cross 8 states that conducted over 3,000 Bone Health Checkups and over 10,000 affected, Techfest 2019-20's Social Initiative: BOLT generated massive awareness on the pressing issue of Osteoporosis and Bone Health



Dasho Tshering Tobgay at Techfest:

Techfest is known for its mind-boggling lineup of Lecture series every edition, which attracts children and adults alike. The 23rd edition was no different. Former Prime Minister of Bhutan, **Dasho Tshering Tobgay** enlightened an audience of **2500+** with his words on how Bhutan's environmental consciousness sets an example to the world. Other highlights from the Lectures series were **Zaheer Khan, Vidya Balan, BS Dhanoa, Suresh Prabhu, NR Narayana Murthy** and Nobel laureates including **Dr John C. Mather, Prof. Sir Richard J. Roberts**



Techconnect (IIT Bombay RnD Expo):

Promoting the enormous amount of research work happening in IIT Bombay has always been one of the prime motives of Techfest. Techconnect was executed on a larger scale attracting huge crowds of more than **1,35,000** people across the three days. It showcased exhibited various flagship **281 exhibits** of IIT Bombay with around 110 stalls including IIT Bombay Racing (more than 50% increase compared to last year)



Exhibitions:

The 23rd edition saw various unique first-of-its-kind exhibitions like **RoboThespian**, **Einstein Robot**, **AeroHans** and **NHK Enterprise**. For the first time in India, Techfest brought Hanson Robotics' humanoid emulating Albert Einstein: the Einstein Robot! The latest human sized Einstein Robot from Hanson Robotics, the android was made using cutting edge mechatronics and AI

International Full Throttle:

The third edition of International Full Throttle was held with an international arena setup, in which drivers with world **rank 13**, 9 time Australian National Champion and 4 time World Championship Finalist: **Kyle McBride** took part. A total of 20+ Indian teams participated in this third edition.



International Robowars:

Robowars witnessed participation of 9 international teams from 8 countries including USA, South Korea, Austria, Brazil, Malaysia, Nepal, Bangladesh and UK. Techfest has one of the largest battle arenas in Asia and the best robots from all over the world converging to battle it out to decide who takes the glory. In this third edition, 8 kg category was introduced along with 15 kg and 60 kg.



Technoholix:

Technoholix Gymkhana Concert Night, the grand finale of Techfest was witnessed with magnificent lineup of artists, Nina Suerte for the opening act and Julius Nox - supporting the phenomenal AFISHAL on the TREMOR in bringing the 23rd Edition of Techfest, IIT Bombay to its grand conclusion. A new series of events was introduced at day time known as day Techx featuring Sri Lankas' Got Talent Semi-Finalist: Ramod Malaka.



Ozone:

With incredible artists performance, Maria Margiyeva: the hoop artist, Krzysztof Riewold: Circus artist, Juggler, Juan Pablo: the illusionist and Gaia Ma: the hats juggler and futuristic gaming setups with latest technology of AR and VR, ozone features a fun element of Techfest 2019-20.



E-Cell

- 1) Three startups received on-spot funding in this year's edition of 'The Ten Minute Million' with total funding of INR 48 Lakhs



- 2) Eureka Offline mentor's meetup took place for 3 whole days, wherein the 80+ participating teams got to interact with some of the leading investors and startup mentors.



- 3) Established a closed community of IIT Bombay startups for the development of the entrepreneurial ecosystem of the institute.
- 4) This year, we had the maximum number of foreign speakers (25+) at the E-Summit'20 from various corporates like Mastercard, Pinterest, etc.



- 5) E-Summit 2020 hosted **Rishad Premji, T.V Mohandas Pai, Mr. Bharat Desai, Ashish Chanchlani** as the highlight speakers along with India Heads of leading global firms like Twitter, Bain & Company, etc.
- 6) Conducted a social initiative with the aim of spreading awareness regarding Autism to over 800 people across Mumbai.
- 7) To promote entrepreneurship among the school students, initiated the b-plan competition Eureka! Junior conducting training workshops in more than 30 schools for classes of 6-10.
- 8) Reached out to 700+ colleges around India to establish E-Cells in their institutes under the National Entrepreneurship Challenge.
- 9) Ideated and executed “Seed Stars”, a one-of-a-kind pitching cum networking event to aid the development of seed-funded startups and help them increase their network with some of the top venture capitalists in town.
- 10) For the first time, ideated and executed “Content Creation Conclave” by inviting the best content creators in the country catering to a huge audience.

PLACEMENT

The presence of world-class research facilities, vigorous institute-industry collaborations, international exchange programs, interdisciplinary research collaborations and industrial training opportunities help the students of IIT Bombay to excel and be ahead in the competitive professional environment. The placement drive at IIT Bombay was a year-long event, which started in the month of July 2019 and ended on June 30, 2020. The placements were successfully completed in two phases and clearly demonstrated the demand of our graduates among the top recruiters in various segments and sectors of the economy. In the backdrop of general uncertainty due to global pandemic, economic slowdown and recessionary trends in job creation, IIT Bombay students confidently participated in the placement season 2019-20 with necessary preparatory activities such as assessments, career fair and PCAT test series during the intervening months.

Interview procedure of phase 1, the main event

of on-campus placements, was conducted during December 1-16, 2019, which witnessed participation of over 300 companies including firms that gave Pre-Placement Offers (PPO). A total of 1784 students registered for final placements and 2028 students registered for internship opportunities. The registered students belonged to engineering, science, humanities and design departments of IIT Bombay in bachelor's, master's and PhD programs. The phase 2 was conducted from January 15 to June 30, 2020.

The first event was the “orientation” held in July, during which the Professor-in-Charge of Placement Cell Prof. Viren Menezes and staff along with the placement managers addressed the students giving information of the complete placement procedure. Next, there were preparatory activities conducted by the placement cell, in collaboration with assessment agency. Company officials started approaching the office during July and August months to commence discussions of their job offerings. Companies started filling

up the “Job Announcement Forms” (JAF) in August. Completed JAFs were released to the students to start applying in late September. Pre-Placement Talks (PPT) and Career Fair event were organized to facilitate interactions between the registered students and the companies. A few companies conducted extra screening levels prior to the interviews. For the students of IDC School of Design, the interviews were conducted during December 9-15, 2019 in phase 1.

December 1, 2019, the first day of campus placements, witnessed some of the giant corporates offering coveted jobs across sectors and recruiting in large numbers, which was pivotal for the success of the placement season 2019-20. Placement of 291 students took place on day one including the pre-placement offers and PSU jobs, re-affirming the faith of top recruiters in IIT Bombay graduates. The highest number of offers was rolled out by the Engineering and Technology sector, ascertaining the technical proficiency of IIT Bombay students. In a record for the number of students being placed during phase 1 of placements at IIT Bombay, the Institute secured 1,176 selections (including Pre-Placement Offers or PPOs).

Student Preparations

The key focus of the placement office is to prepare students for their placement and internships. Keeping the students well prepared for what they are likely to face in the corporate world is the responsibility of every academic Institute, and the team at IIT Bombay takes every necessary step to train and guide the students. Students are exposed to challenging and research-based academics, and host of sports along with cultural and organizational activities on this vibrant campus. The first event conducted in this endeavour was “Boot Camps”, in collaboration with Career Cell, for profiles

of coding, consultancy, finance, analytics etc. In addition, preparatory programmes were arranged to enhance the communication skills, group dynamics and interview skills. Overall, these programs provided an insight into the job domains and prepared the job aspirants to face the challenges of the future. The students were assigned mentors for guidance and a series of aptitude tests were conducted to improve the problem-solving skills. The preparatory activities sourced information from various alumni, where the alumni background was mapped according to student preference. Various department level activities were conducted to cater to individual domain requirements.

Placement Common Aptitude Test (PCAT)

The placement office strived to facilitate the recruitment process in the most convenient and optimal manner possible. This year, IIT Bombay’s Placement Common Aptitude Test (IIT Bombay-PCAT) was conceptualized to step-up the quality and provide objectivity in assessments during the placement process. Every year, hundreds of students at IIT Bombay write about 80 company-aptitude tests during their placements. These aptitude tests are quite exhaustive and stressful when conducted in parallel with the regular curricular activities of the Institute. On an average, a student gets a break of 2-3 hours before each day of placement, where the increased stress levels can affect the performance in the interview, adversely. IIT Bombay-PCAT is a standardized test, designed to minimize the number of aptitude tests conducted by the recruiting companies. Placement Common Aptitude Test (i.e. PCAT) was introduced in the previous season as a substitute for the company recruitment tests to reduce student stress and save time. PCAT witnessed an improved credibility as nearly 50 organizations accepted PCAT scores for initial shortlisting of candidates. Increase in acceptance of PCAT scores suggests the confidence of



recruiters in the test as an effective metric for evaluation.

Standardization of IIT Bombay-PCAT:

The IIT Bombay-PCAT is on par with the aptitude tests conducted by third parties for recruitment across campuses. Professor-in-Charge of IIT Bombay Placements oversees the conduct of the test. The test had operating procedures and standards similar to those of JEE and GATE, conducted by IITs in the country. The recruiting companies were invited to subscribe to PCAT, and the test scores are shared with the interested companies through the Job Announcement Forms (JAF).

- The test assessed a student's ability in three domains namely Quantitative aptitude, Logical Reasoning/ Data Interpretation and Verbal aptitude.
- Each of these sections (domains) are timed separately to assess the relative performance.
- The students are given an opportunity to attempt three PCATs during a placement season. The best performance (best of three tests) in each of the sections is disclosed as the final score to the subscribing recruiter. This gives a more reliable index of a student's performance as against a single score normally obtained from a company test.
- Each subscribed recruiter was asked to submit a preferred weightage for the three sections (Quantitative, Verbal and Logical) based on their shortlisting criterion. The final weighted score is calculated and the student-shortlist were prepared for each firm, offering flexibility as that of the third-party test.

Career Fair

Career fair is a useful resource for candidates to find information about potential employers. One of the main reasons to attend a career fair

is to increase student awareness. The Placement Cell organized Career fair in the foyer of Victor Menazes Convention Center (VMCC) at IIT Bombay where potential employers set up booths with members from their human resources (HR) team along with new employees and senior management and provide information to students about their company, and their application process.. Those attending a career fair were free to ask any questions to prospective employers and take notes on their answers, as well as being able to take any promotional material or freebies that are offered by the firm. If that's not enough of a reason, there was a chance for students to network and capitalize on the vast experience of the team to have interesting and productive conversations. Structure of career fair was simple, companies had 20 minutes to brief about their company in the VMCC auditorium followed by a much detailed interaction in their information booth. For the employers, career fair was a much better opportunity to interact with students on a one-to-one basis ensuring exchange of quality content with maximum student attention as compared to the conventional Pre - Placement Talks. The event witnessed a footfall of above 1100 students with every student spending at least 30 minutes at the event. Replacing PPTs with career fair would help in increasing student awareness by demanding a higher quality of interaction. This could be a win-win situation for everyone as students would avail much more information compared to PPTs and companies would be better-off creating a much better brand impact.

Diverse Recruiters

While the placement season has seen recruiters from the entire spectrum of the industry, the initial part of the season was dominated by a variety of firms from sectors like engineering and technology, oil and gas, IT/ Software, electronic hardware, data analytics, consulting,

finance/ banking and Fast Moving Consumer Goods (FMCG). There were opportunities provided by the firms with vast learning, travelling experience and varied work culture. Most of these firms are world leaders in their respective domains. We also had some of the major start-ups as recruiters, which were screened based on the financial and technical status. The informal work culture, opportunity to make immediate and visible contributions, chance to own equity etc. seemed to be the attractions offered by such start-ups.

Engineering and Technology

All 428 engineering students selected from IIT Bombay have expressed a strong commitment to core companies in the choice of employment. This is primarily attributed to the highly challenging work profile and remuneration package offered to IIT Bombay graduates by the recruiters.

IT/ Software

IIT Bombay students known for programming skills have continued to attract recruiters through campus placement over the past several years. This trend was strong this year. Around 212 students have been offered IT/ Software jobs by over 58 companies through the campus placement.

Consulting

Over 85 consulting offers were made by several global leaders, who visited IIT Bombay for campus placement this year. These organizations work with large corporations across the world, helping them resolve complex business problems. With high quality of recruits these companies took last year, their return to the campus was marked by a renewed vigor.

Research & Development

With an increased demand for high-end products and services, a large number of companies strive to develop cutting-edge products. The placement season witnessed an increase in the number of organizations hiring fresh graduates for research and development sector. This sector has observed a steady growth where 103 positions were offered by 18 organizations in 2019-20.

Data Analytics

The outstanding analytical and reasoning skills of IIT Bombay graduates continued to draw recruiters from the rapidly growing field of data analytics. There were 133 job offers from 35 organisations, making the sector one of the biggest recruiters after engineering and information technology. This trend, observed over the last few years, seems to have taken strong roots in the Institute.

Financial Services

The financial, banking and fintech companies were prominent recruiters. With many of the top global companies of this sector preferring IIT Bombay, the sector saw participation of prestigious companies to recruit the brightest and the best from the campus. A variety of profiles were opened up in the sector as these companies admire the analytical and computational skills of the IIT Bombay graduates. Over 98 offers were made by 24 financial service firms this year.

IIT Bombay received a total of 159 international offers from different countries like USA, Japan, UAE, Singapore, Netherlands, Hong Kong, Taiwan and South Korea. The Placement Office has taken additional efforts to expand the global outreach and invite more foreign organizations.

Conclusion: The overall placement percentage is around 84 % this year. The graduating



students of IIT Bombay have taken the next step in their lives. They have joined the top recruiters in various segments of the economy. The firms participating in the placement season appreciated the efforts put in by the students to deliver their best. Efforts shall be required to foster long-term relationship with all these organizations in the near future and we look forward to strengthening our relations with them over the years to come. The months of training that students endured were fruitful with the efforts of the placement office including the student placement team, combined with excellent academic system and the opportunity for all-round development. The Placement Office has taken additional efforts to expand the global outreach and invite more foreign organizations. The importance of the efforts, which were put are reflected well in the QS World Ranking and NIRF Ranking of IIT Bombay as well, since placement is an important contributing factor.

Analysing the increased corporate competitiveness, heightened student aspirations, a rapidly changing job market and an increasingly insecure global economy, it is clear that campus placements will be more intensely sought by both students and companies. In conclusion, the recruiters have shown that they want to capture and nurture the fresh minds of students, which is also why the number of job offers were very encouraging this year. Placement team has achieved higher milestones and overall selections has remained excellent with our constant endeavours to facilitate a good placement season. Despite the challenging situation presented due to COVID-19, the participating companies have honoured the maximum job offers. This clearly shows the confidence, the corporates have in the Institute.

OVERALL STATISTICS

A comparison of offers received and accepted over the last three years is given below:

Table 1. Placement Statistics for last three years:

Year	Pre-Placement Offers		Campus Placement Offers		Total Offers in Phase 1	
	Received	Accepted	Received	Accepted	Received	Accepted
2017-18	142	100	1014	923	1156	1023
2018-19	168	125	1102	997	1270	1122
2019-20	164	116	1155	1056	1319	1176

Table 2: Distribution of offers made in different sectors of economy:

Sr. No.	Sector	Number of Offers
1	Engineering & Technology	428
2	IT/ Software	212
3	Finance	98
4	Analytics	133
5	Consulting	85
6	Research & Development	103
7	Services	75
8	Education	32
9	FMCG	31
10	Public Sector Undertaking	10
Total		1207

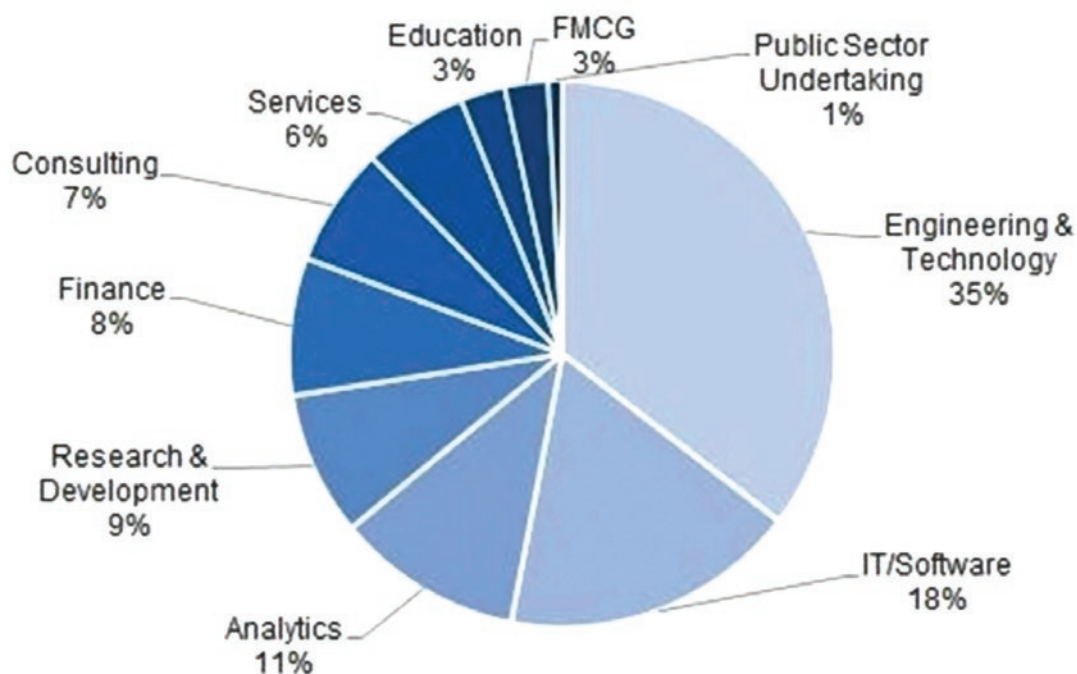


Table 2: Program-wise statistics:

Some students in pursuit of their career might initially register for campus placement and then decide to convert their academic program to PhD or Dual Degree. All the registered students do not necessarily participate actively in campus placements, opting for higher studies abroad or in different streams. It is important to note that students also get placed through channels other than campus placements. The program-wise placement data is provided in Table-3 and Figure-2.

Note: Participated count excludes students, who opted for higher studies or had other career options, and hence de-registered from the placement process.

Table 3: Programme-wise placement data 2019-20

Programme	Registered	Participated	Placed	Percent placed
BTech	601	534	492	92.13
Dual Degree (BTech+MTech)	166	141	133	94.33
MTech	575	502	423	83.43
2-yr MSc	144	96	52	54.17
BDes	28	15	11	73.33
MDes	60	48	42	87.50
4-yr BS	11	6	5	83.33
Other Programmes*	199	97	49	50.51
Total	1784	1444	1207	83.58

*Includes 5-yr. Integrated MSc, BS+MSc, MTech+PhD, PhD, MSc+PhD, MPhil, IDDD, MS by Research (Exit) degree

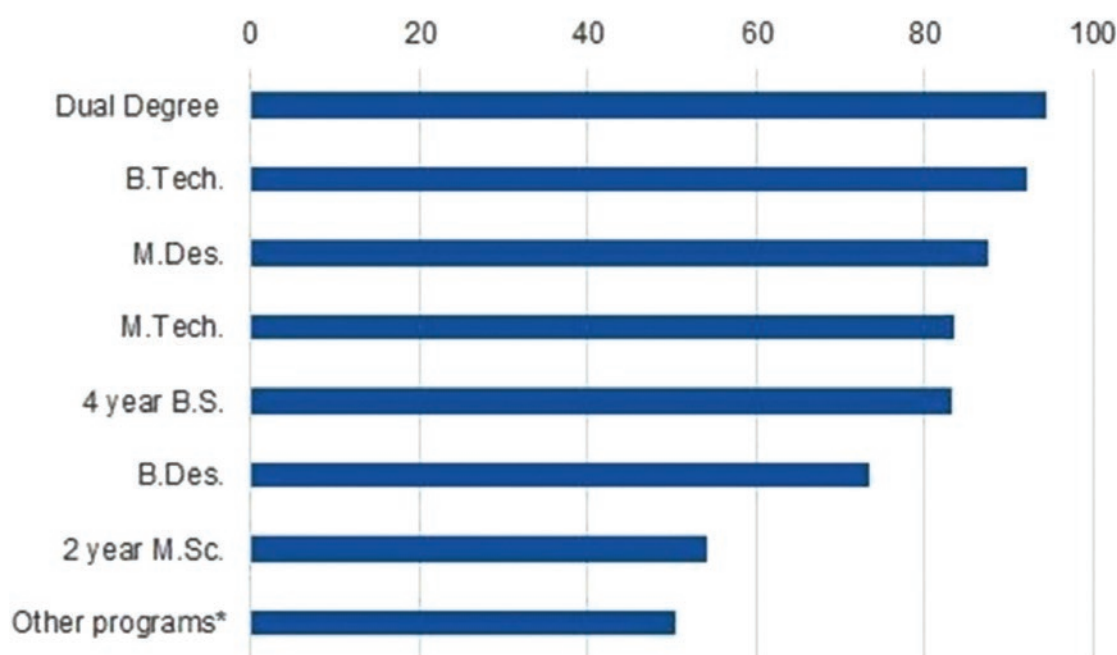


Figure 2. Program-wise placement percentage.

Department-wise statistics

IIT Bombay provides engineering education across 23 different departments, spanning students from under-graduation to PhD. The placement team endeavors to get companies from core as well as non-core sectors for students. The placement statistics of students across departments including all domains of jobs offered during the placement season 2019-20 are shown in Table-4.

Table4. Department-wise classification of offers

Departments	2017-18	2018-19	2019-20
Aerospace Engineering	53	50	71
Chemical Engineering	92	122	122
Chemistry	17	27	18
Civil Engineering	111	102	100
Computer Science & Engineering	174	207	186
Electrical Engineering	185	196	202
Mechanical Engineering	179	148	173
Metallurgical Engineering & Material Science	104	97	97
Energy Science & Engineering	33	34	30
Physics	15	10	4
Mathematics (Applied Statistics and Informatics)	24	19	22
IDC School of Design	35	59	59
Bioscience & Bioengineering	13	15	21
Other Programmes	82	100	102
Total	1117	1186	1207

Salary-wise statistics:

The jobs offered by recruiting organizations are divided into various categories based on the gross compensation packages. Factors other than compensation package like job profile, past association etc. may sometimes influence the classification of a company. Salary-wise classification of total offers made in the year 2019 - 20 is shown in Table 5 and Figure 3.

Table 5: Placement details based on compensation

Range of Gross Salary (in lakh rupees per annum)	Number of Companies	Number of Offers
Above 16	61	246
Between 13.5 to 16	42	204
Between 11.5 to 13.5	60	315
Between 9.5 to 11.5	58	184
Between 7.75 to 9.5	48	158
Between 6.25 to 7.75	26	72
Between 5 to 6.25	15	25
Between 4 to 5	3	3
Total	313*	1207

**Some organisations may have offered jobs in multiple salary categories.*

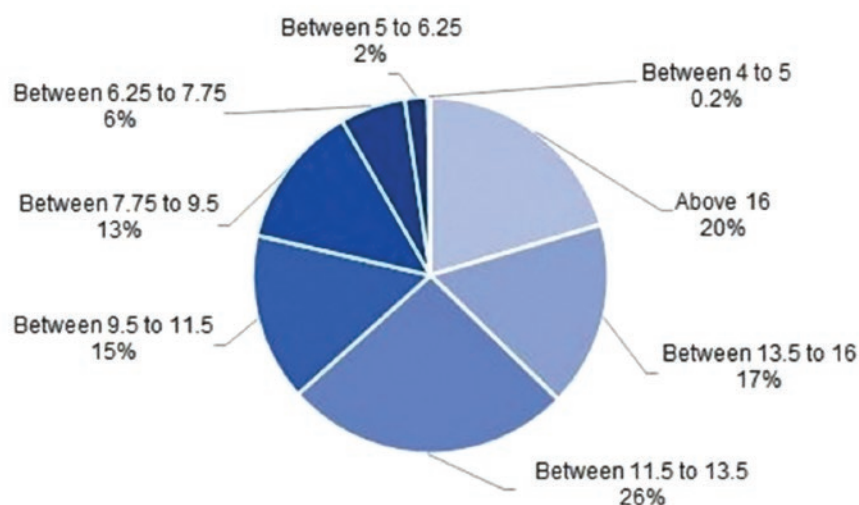


Figure 3. Compensation-wise distribution of offers. (in Lakhs P.A.)

Comparison of average salary, international and pre-placement Offers:

The Average Gross Salary offered was Rs.16.06 lakhs and the average CTC was Rs.20.08 lakhs. Total number of Pre-Placement Offers (PPO) was 113. The number of international offers was 159, including PPOs. This suggests an increasing and a positive trend in the pay package offered by various organizations (Refer to Table 6).

Table 6: Average salary, international and Pre-Placement offers details:

Description	2018-19	2019-20
Average Gross Salary (in LPA*)	14.11	16.06
Average CTC (in LPA*)	17.49	20.08
Total number of International Offers	108	159
Total number of Pre-Placement Offers	131	113

* LPA – Lakhs per annum (in rupees)

Year-wise Placement Comparison

Despite the challenging market situations over the years, IITB managed to attract good recruiting firms in the job market. Table 7 and Figure 4 present the comparison of students placed over the last three years.

Table-7: Comparison of students placed in last three years

Program	2017-18	2018-19	2019-20
BTech	438	475	492
Dual Degree (BTech+MTech)	157	151	133
MTech	403	402	423
Others	119	158	159
Total	1117	1186	1207

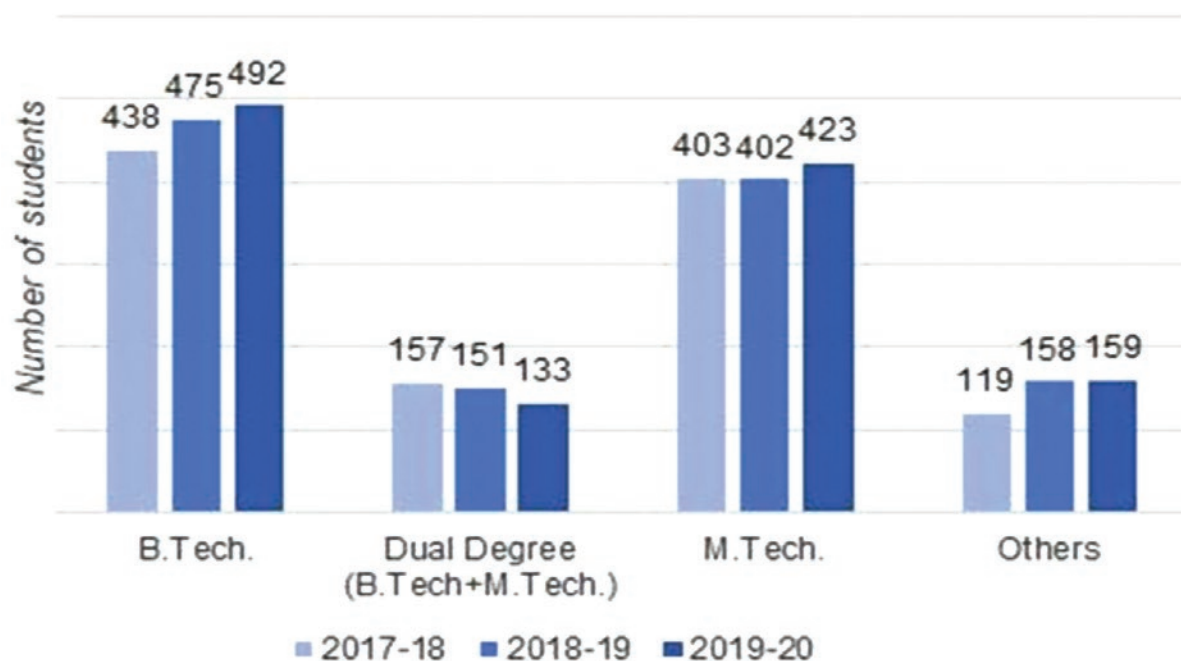


Figure 4. Comparison of student placement over the years.

Sector-wise statistics for different programs

BTech and MTech students maintained almost the same demand amongst companies of various sectors. Sectors like Education, and Engineering and Technology expressed greater interest in students of IIT Bombay than the previous year. Sector-wise statistics for different programs are shown in Table-8 and Figures 5, 6 and 7.

Table-8: Sector wise statistics for different degree courses

Sector	BTech	Dual Degree	MTech
Analytics	57	10	46
Consulting	60	18	4
Education	2	3	9
Engineering & Technology	149	39	205
Finance	53	23	7
FMCG	23	4	4
IT/Software	99	9	81
Public Sector Undertaking	4	5	1
Research & Development	23	12	56
Services	25	10	10

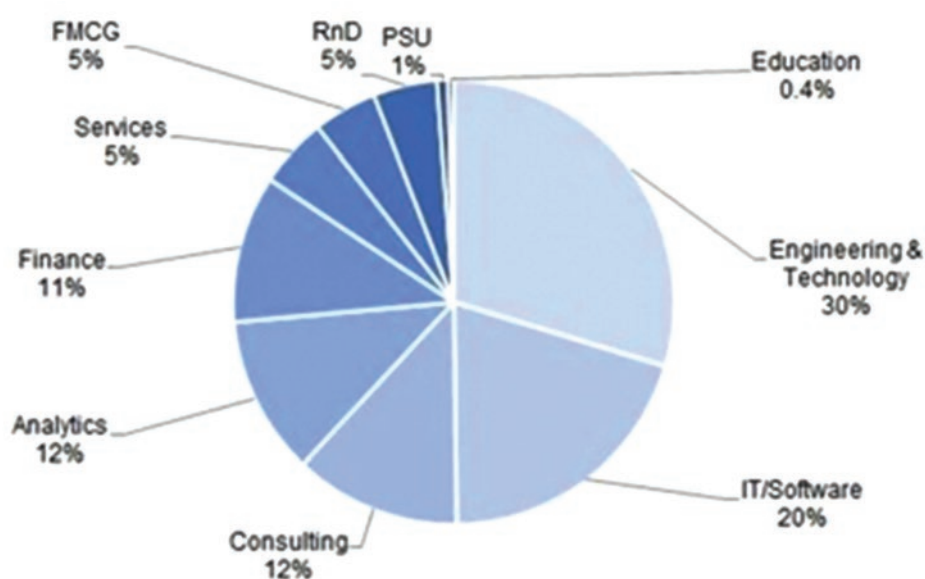


Figure 5. Sector-wise demand for BTech

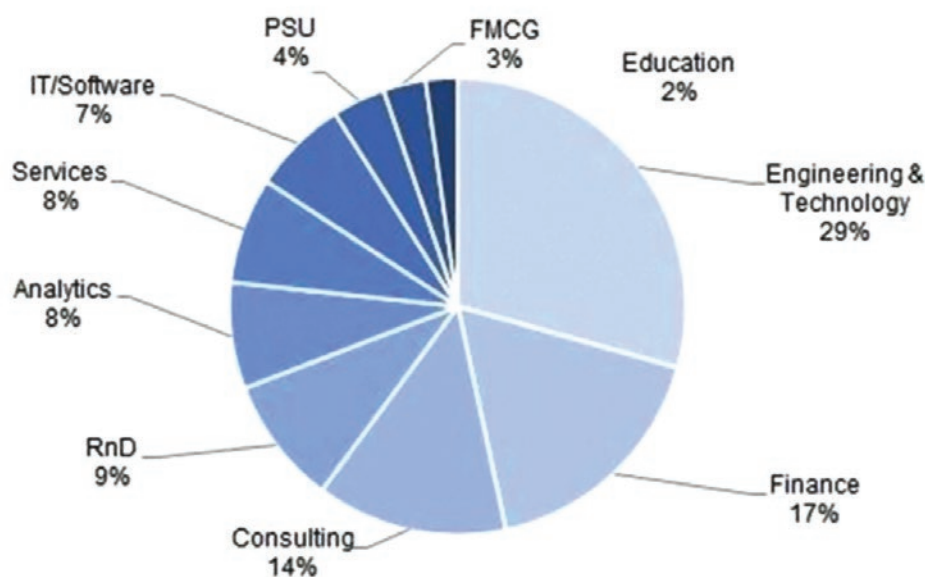


Figure 6. Sector-wise demand for Dual Degree (BTech +MTech)

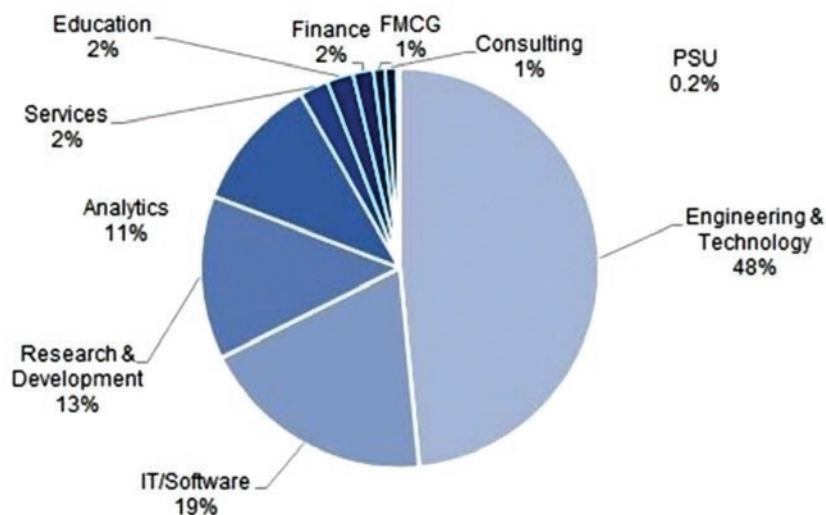


Figure 7. Sector-wise demand for MTech

Internship Report 2019-20

Industrial exposure and practical experience play a significant role while attempting to enter the corporate world. Internships have thus become really important as they not only provide this exposure and experience but also help in one's personal growth and development.

Students from their second and third year of Bachelor's, and first year of Master's programmes appear for the internship recruitment. Keeping the diversity of students in mind and the importance of internships in context, the Placement Office strives hard to provide students with the best of the opportunities in their field of interest. Placement Office also encourages research by providing students the research internship opportunities at esteemed universities.

Department-wise Internship offers:

Students from all departments were in demand by firms and universities alike for internship positions. A lot of trends, which were seen in the previous years, continued this year as well. The demand for students from departments such as Computer Science, Mechanical and Electrical Engineering was high. A slight increase in the number of MSc and Design internships was also observed in comparison with the previous year. Figure-9 presents the department-wise distribution of internship offers made over the past 3 years.

Table 8: Department-wise internship offers over past three years :

Department	2017-18	2018-19	2019-20
Aerospace	34	49	41
Chemical	131	137	109
Chemistry	21	25	14
Civil	111	100	60
Computer Science	220	203	207
Electrical	176	133	139
Engineering Physics	17	23	22
Energy	23	18	17
Mechanical	158	166	132
MEMS	88	89	59
Others	96	98	101
Total	1075	1041	901

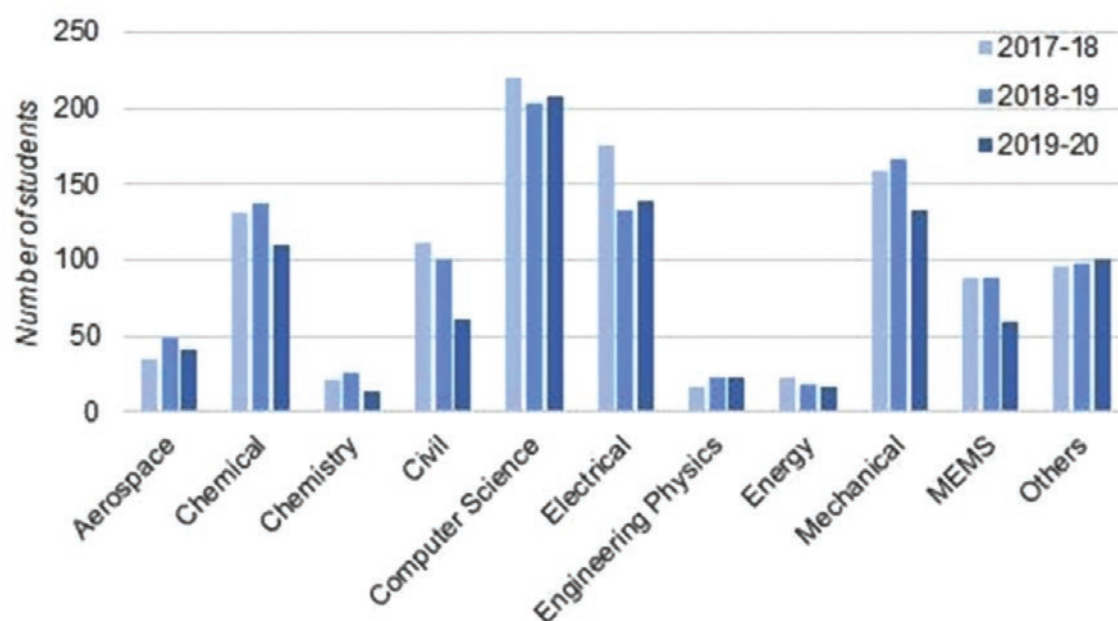


Figure 8. Department-wise internship offers over years



Summer vs. Winter Internship offers:

Summer internships usually begins in May and end in mid-July, whereas winter internships are pursued in December. The number of summer internship offers exceeds the number of winter internship offers, which is attributed mainly to the longer duration available in summer.

Table 9. Summer vs. Winter internship offers:

Total Number of Internships	Summer Internships	Winter Internships
901	703	198

Companies vs. Universities internship offers

Companies of various business sectors offer internship positions to the students. This option presents an opportunity to gain industrial exposure and broaden one's skill-set in the domain of interest. This year, the Institute started the much-awaited credit-based internship programme, by means of which the students could leverage the performance in their internship towards the academic credit requirement.

Table – 10: Companies Vs. Universities Internship Offers

Total Number of Internships	Company	University
901	791	110

Country-wise internship offers

Reputed foreign universities and firms have an affinity towards IIT Bombay-students. The Table 12 and Figure 9 show the country-wise internship offers from different foreign firms and universities. Students have received the greatest number of internship offers from the USA followed by Germany, Japan and other countries in the world. This indicates the preference of IIT Bombay-students in other countries.

Table 12: Country-wise international internship offers from Universities and firms:

Country	Number of Internship Offers
USA	25
Germany	15
Japan	13
France	8
South Korea	7
Australia	6
Denmark	5
Canada	5
Taiwan	5
Malaysia	3
Austria	2
Slovenia	2
Switzerland	1
Italy	1
Amsterdam	1
Hong Kong	1
Luxembourg	1
England	1

Figure 9. Country-wise distribution of International internship offers from universities and firms





Concluding Remarks

I feel pride and joy to see so many bright individuals graduating from IIT Bombay, transformed by their stay at the Institute and ready to face the challenges of the world.

On behalf of the Institute, I offer my warmest congratulations to all the graduating students who will receive their degrees today. Congratulations to proud parents and family members of the graduating students on this happy day. We acknowledge all the sacrifices you have made to see your wards achieve this success.

Dear students, the education you have received at IIT Bombay is comparable to the best in the world. You are now ready to take on greater challenges and overcome them. I know that each one of you will excel and we all look forward to the significant contributions you will make in the years ahead. These are exciting times to begin a career, given the immense opportunities provided by the changes taking place in all sectors and the challenges facing the world. What you have learned in the Institute is only a foundation. Your stay at IIT Bombay was not just for the degree that you are receiving today. We tried to provide you an education. And by education we mean the manifestation of perfection already in you – borrowing from the words of Swami Vivekananda. So, continue to develop your character, knowledge and skills and always keep in mind how you can help the society and the nation through your work.

Integrity, merit, excellence and freedom of thought are the values at the core of the success of the Institute and its alumni. I hope you will cherish and uphold these values in the years ahead.

Although you will graduate and leave the Institute today, please remember that alumni are important stakeholders of the Institute and we cherish our links with them. As fresh alumni, I urge you to maintain strong ties with your *alma mater* and participate in the future growth and evolution of IIT Bombay. On behalf of the Institute, I wish you all the success in your future endeavours. Let the motto of IIT Bombay “Gyanam Paramam Dheyam” be your guiding light!

Jai Hind!



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