IIT BOMBAY
ANNUAL REPORT
2014-2015

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Director's Report

Indian Institute of Technology Bombay has a rich tradition of pursuing excellence and has continually re-invented itself in terms of academic programmes and research infrastructure. Students are exposed to challenging research-based academics and a host of sport, cultural and organizational activities on its vibrant campus. The presence of world class research facilities, vigorous institute-industry collaborations, international exchange programmes, interdisciplinary research collaborations and industrial training opportunities help the students of IIT Bombay to excel and be ahead in the competitive professional environment.

I am pleased to state 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 Bachelors, Masters and Doctoral programmes. The institute provides the best and it ensures that its students are also of exceptionally high quality. IIT Bombay continues to be the most sought-after destination for UG and PG studies and attracts the top performers in national examinations such as GATE, CEED, NET, JAM and JEE. Among 16 IITs in the country, 44 out of top 50 rankers and 58 of top 100 rankers in JEE 2014 have joined IIT Bombay. Similar trend is observed for the candidates qualifying in other entrance examinations as well.

IIT Bombay continuously strives to introduce new areas in its academic programmes and innovate in its academic activities, in a bid to generate the kind of intellectual capital that will keep the institute and the nation up-to-date on the technological front. During the year 2014-15, we have introduced a joint Executive – MBA programme (EMBA) with Washington University, St. Louis and a 4-year Bachelor of Design programme.

With our theme - Research that makes a difference, IIT Bombay has made concerted efforts to align its R&D focus with the national goal of achieving technological self-reliance. During last five years, R&D receipts grew at a compound annual growth rate (CAGR) of over 19 per cent. The R&D revenues for the financial year 2014-15 is Rs.243 crores. There were 72 patent applications filed during the year. The Institute has steadily built up a reputation for research and education both in India and abroad. IIT Bombay has set up the Desai Sethi Centre for Entrepreneurship which offers courses in various aspects of entrepreneurship as well as support students by giving a wide range of inputs necessary for launching a technology venture. It has also started Tata Centre for Technology & Design during the year, the centre focuses on developing technologies, processes and systems solutions to deal with the challenges faced by the resource constrained communities within India and across the world. A new centre, Centre of Excellence in Steel Technoloy was started in June 2014. The Institute has signed 25 MoUs with various universities and received governmental and ministerial delegations, from countries across the globe, for exploring areas of collaboration and cooperation.

The Institute has been able to attract outstanding faculty members from not just India but other parts of the globe. The Institute has 585 faculty members on roll with many of them globally acknowledged for their research contributions. The Institute also has furthered links with international and national peer universities, enabling enhancement of research and educational programmes at the Institute.

In the 57 years of its existence, more than 48,000 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.

I would like to place on record the outstanding work done by the faculty and the staff members of the Institute in strengthening teaching, research and outreach programmes.

Prof. Devang V. Khakhar
Director, IIT Bombay

Aspiration

- *To see IIT Bombay among the top ranks of technical universities, known for its outstanding undergraduate programme and for its contributions to research.*
- *Participate in solutions of problems facing the nation and the world by providing new ideas and talent.*

Academic Programmes

IIT Bombay has taken several initiatives in restructuring and strengthening its academic programmes at undergraduate (UG) and postgraduate (PG) levels over the past year: M.Tech.+Ph.D. Dual Degree (DD) programme; M.Tech. in Civil Engineering with specialisation in Ocean Engineering; Four-year Bachelor of Science & a five-year Bachelor of Science and Master of Science (DD) programme in Chemistry, in place of the five-year Integrated M.Sc. in Chemistry.

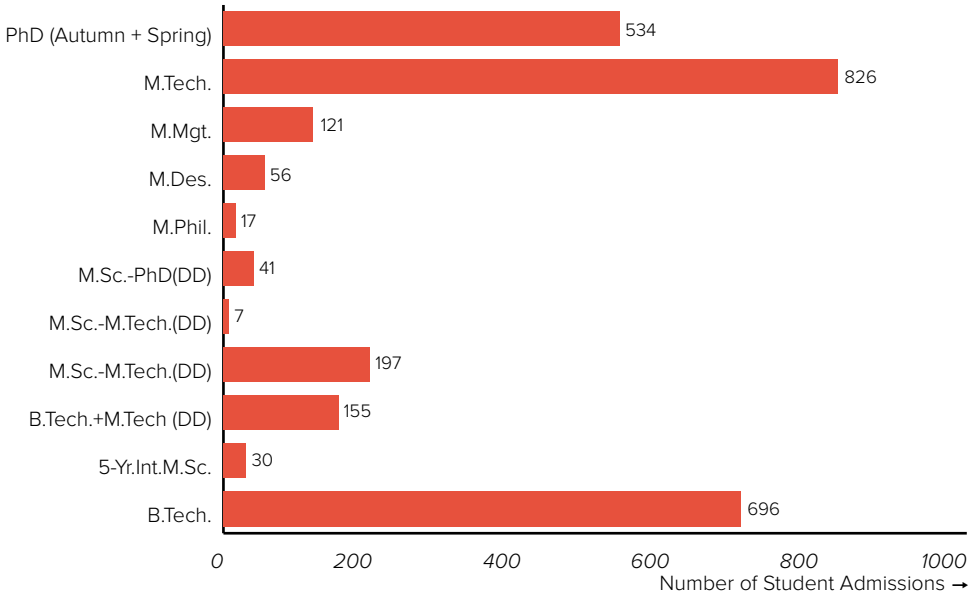
Prof. Devang Khakhar, Director, IIT Bombay and Prof. Mark S. Wrighton, Chancellor, WUSTL, at MoU signing ceremony

New programmes

i.) Executive – MBA jointly offered with Washington University (St. Louis)
ii.) 4-year Bachelor of Design.

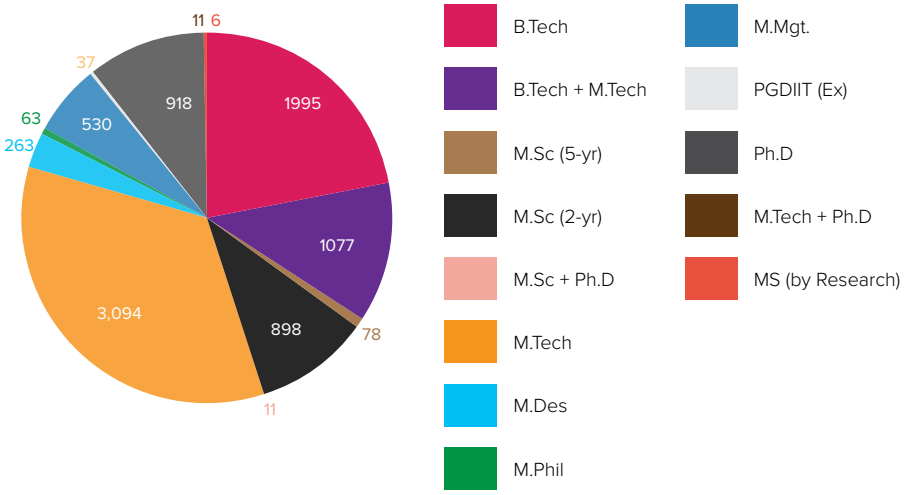
Other new initiatives including the TDSL (Technology and Development – Supervised Learning) projects of CTARA have been made accessible to more students including PG students; a larger number of courses are being made available in video and other modes; and attempts have been made to employ Flipped Classrooms and Peer based learning, at the Institute.

Programme wise Allocation of Admissions for the year 2014-2015.



At the 52nd Convocation 2270 degrees were awarded : B.Tech. - *536,* Dual Degree (B.Tech. & M.Tech.) - *229,* M.Sc. (5 Yr. Int.) -*14,* M.Sc. (2 Yr.) – *200,* Dual Degree (M.Sc.-Ph.D.) - *5,* M.Tech. - *619,* M.Des. - *57,* M.Phil. - *15,* M.Mgt. - *114,* PGDIIT (Exit) – *15* and Ph.D – *216,* M.Tech.+Ph.D. - *6,* MS by Res – *4.*

Degrees Awarded in the last Five Years (2010-2011 to 2014-2015)



The characteristics of the student population at the Institute is undergoing a significant change in the recent times. The on-roll strength in 2009-2010 was 6,359 students of which 2,838 (45%) were UG and 3,521(55%) were PG. During 2014-2015, the on-roll strength has increased to 9,870 of which 4,004 are UG students and 5,866 are PG students. With the existing programmes, the UG population saturated at 4,004 (40 %) in the academic year 2014-2015, while the PG population will saturate at 7,601 (69%) during the year 2018-2019, with a total of 11,062 students in the Institute. The Institute has responded to the large increase in its intake by substantially reorienting itself academically, technologically and administratively and using it as an opportunity to retain its leadership in engineering education.

The Ph.D. student strength has been steadily increasing. We had 771 Ph.D. students on roll in the academic year 2001-02, in the academic year 2011-12 the number rose to 1,879, an increase of over 150% in a span of just 10 years. We are on course to achieve our target of 3,450 Ph.D. students i.e. approx. 30% on roll among 11,062 students in the academic year 2018-19. On the Ph.D. output front, as compared to 123 Ph.D. degrees awarded in 2005, the

number of degrees awarded were 179, 173, 180, 181 and 216 in the years, 2010-11, 2011-12, 2012-13, 2013-14 and 2014-15 respectively. An interesting aspect of our Ph.D output, observed in the recent years, is the fact that around 65% of the degrees are in the engineering disciplines. 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. Besides research scholars, many students have also benefited from this scheme. The annual funding utilised by students is Rs. 4,05,89,800/- this year. With effect from April 1, 2013, the funding for participation in international conferences was enhanced to Rs. 1,00,000/- for North and South America; Rs. 90,000/- for Europe and Rs. 60,000/- for neighbouring countries. During the academic year 2014-15, 553 students were granted financial assistance for attending international conferences as against 294 for the previous year.

This year five M.Tech. students and one M.Des. student were selected for the DAAD Scholarships 2014-15 under the Sandwich System for Master's students compared to two M.Tech. students, selected last year.

Student Mentor Programme: The Student Mentor Programme has been operating successfully for years. The programme provides a support structure for the undergraduates, targeted largely to the first and second year students, and is essentially managed by the senior students under the supervision of a faculty coordinator. This programme has been extended to mentor senior students at the department level.

UG Teaching Assistantship: In an effort to make the senior UG students more self-sufficient and responsible towards academics, UG Teaching Assistantship was introduced during the academic year 2009-2010. This year, 146 UG Teaching Assistants (61 in Spring Semester and 85 Autumn Semester) were appointed to assist the faculty in conducting the various UG courses.

Kontemplat (previously StuDe Club): This is an initiative under the Dean (AP) Office to set up programmes targeting student's overall development. The club conducts motivational seminars by eminent speakers and technical workshops, in addition to publishing its newsletter and maintaining a website.

Statement Showing the Types of Scholarships, Stipend and Financial Assistance Awarded to the B.Tech., Dual Degree, M.Sc. (Integrated) Students for the Year 2013-14

	Types of Scholarships	Amount	No. of students
1.	The Institute Merit-cum-Means scholarship with benefit of free tuition	Rs. 1,000/- for 10 months Rs. 90,000/- tuition fees per annum	868
2.	The facilities of free messing (only basic menu) to SC/ST	Basic Menu Bill plus pocket allowance of Rs. 250/- p.m & exemption from payment of Hostel Room Rent	362

List of Scholarship/Fellowship

Government Fellowship/Scholarship

	Name of Fellowship/ Scholarship	No. of Students	Monthly Fellowship
1.	DAE (Board of Research in Nuclear Science – BRNS): M.Tech.	3	Rs. 20, 000/-
2.	NBHM (National Board of Higher Mathematics): Ph.D.	7	Rs. 28,000/-
3.	AERB (Atomic Energy Regulatory Board): M.Tech.	2	Rs. 20,000/-
4.	DBT-JRF (Department of Biotechnology, Jr. Research Fellowship): Ph.D	4-JRF 7-SRF	Rs. 25,000/- Rs. 28,000/-
5.	ICMR (Indian Council of Medical Research): Ph.D)	2	Rs. 25,000/-
6.	DST-Inspire: Ph.D.	20-B.Tech. 9-M.Tech.	Rs. 25,000/- Rs. 18,000/-
7.	DBT-Binc: Ph.D.	1	Rs. 16,000/-
8.	MPCB (Maharashtra Pollution Control Board): M.Tech.	4	Rs. 8,000/-

	Name of Fellowship/ Scholarship	No. of Students	Monthly Fellowship
9.	MPCB (Maharashtra Pollution Control Board): Ph.D	1	Rs. 25,000/- Rs. 28,000/-

Private Fellowship/ Scholarship

	Name of Fellowship/ Scholarship	No. of Students	Monthly Fellowship
1.	Crompton Greaves: Ph.D	3	Rs. 24,000/-
2.	Dr. Gargi Vishnoi Memorial Scholarship: M.Tech.	1	Rs. 2,000/-
3.	IITB Monash	JRF-70 SRF-65	Rs. 31,000/- Rs. 35,000/-
4.	AREVA	1	Rs. 32,000/-
5.	DBT-TWAS (Foreign National)	1	Rs. 16,000/-

Financial Assistance to Postgraduate students Research Scholars/ M.Tech./M.Des./M. Phil./ and M.Sc. (2-year programme Students)

	Type of Scholarship	Year/JRF/ SRF	Amount per month	No. of Students	
				Institute Schp.	Other Schp.(RA)
1.	Institute Teaching Assistanship *(Ph.D) (*Revised wef 01.04.07)	I & II year :JRF	Rs. 16,000/-	88	06
		III,IV & V year : SRF	Rs. 18,000/-	56	10
		I&II year : JRF	Rs. 18,000/-	189	02
		III & IV year : SRF	Rs. 20,000/-	107	01
2.	Postgraduate Assistantship to:				
	M.Tech. Students (2-yr. programme)	I year	Rs. 8,000/-	424	80
		II year	Rs. 8,000/-	493	84
	M.Des. Students (2 yr. programme)	I year	Rs. 8,000/-	55	—
		II year	Rs. 8,000/-	53	—
	M.Phil. Students (2-yr. programme)	I year	Rs. 8,000/-	07	—
		II year	Rs. 8,000/-	11	—
3.	CSIR Fellowship to:				
	Ph.D Students	JRF	Rs. 25,000/-	43	—
		SRF	Rs. 28,000/-	84	—
	MSc + Ph.D. Dual Degree	JRF	Rs. 25,000/-	3	—
		SRF	Rs. 28,000/-	2	—
	M.Tech + Ph.D Dual Degree	JRF	Rs. 25,000/-	1	—
	Shyama Prasad Mukherjee Fellowship	JRF	Rs. 20,000/-	3	—
		SRF	Rs. 24,000/-	3	—
4.	QIP Scholarship to:				
	M.Tech. Students	I year	Rs. 4,000/-	6	—
		I I year		4	—
	Ph.D. Students		Rs. 9,000/-	25	—

	Type of Scholarship	Year/JRF/ SRF	Amount per month	No. of Students	
				Institute Schp.	Other Schp.(RA)
5.	UGC Scholarship to:				
	Ph.D Students	JRF-HSS	Rs. 25,000/-	72	—
		SRF-HSS	Rs. 28,000/-	88	—
	M.Phil. Students	JRF	Rs. 25,000/-	2	—
	UGC-Engg. & Tech.	JRF	Rs. 25,000/-	5	—
		SRF	Rs. 28,000/-	2	—
	UGC-MSc + Ph.D	JRF	Rs. 25,000/-	3	—
		SRF	Rs. 28,000/-	1	—

Research and Development

The synergy of academics and research has catapulted IIT Bombay into the illustrious circle of world-class institutions. Apart from offering sound science and technology solutions to various government sectors, the industry and to society, IIT Bombay pursues basic research leading to knowledge generation that lays the foundation for empowering us as a nation to be technologically confident and self-reliant.

During the last five years, R&D receipts grew at a compound annual growth rate (CAGR) of over 19 per cent. The R&D revenues for the financial year 2014-15 is Rs. 243 crores. Figure 1 shows the growth of research funds in the last few years.

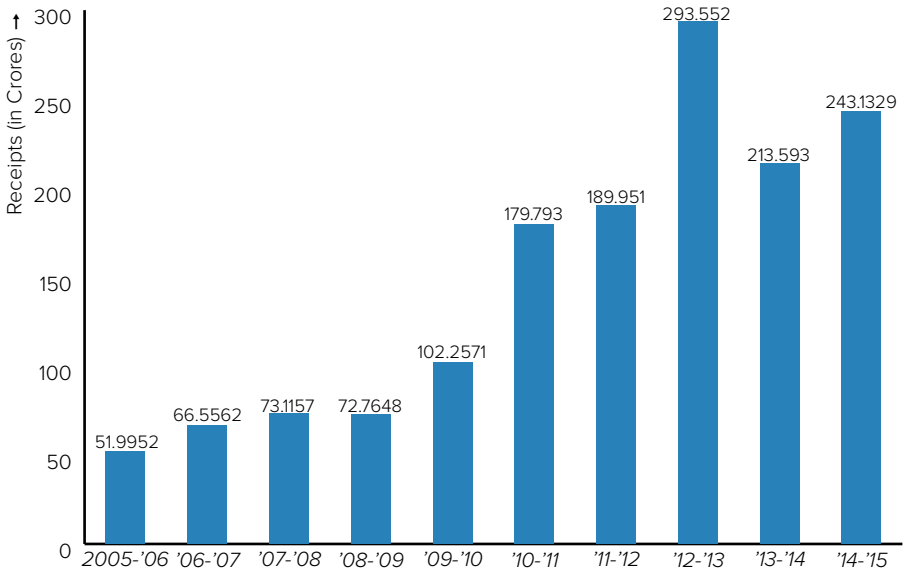


Figure 1: Growth of R&D receipts in the last decade

1. Overview

During the year 2014-15, new R&D projects were initiated in all the areas of science, engineering, management and social sciences, typically ranging from two to five years duration. These included short term consulting projects and longer term sponsored research projects (Table 1).

Table 1: Information on new projects sanctioned during last 3 years

	Sponsored projects		Consultancy Projects	
Year	Number	Sanctioned outlay (Rs. in crores)	Number	Project outlay (`Rs. in crores)
2012-13	240	343.50	517	29.5
2013-14	225	285.20	523	35.2
2014-15	294	165.25	513	32.2

External Grants for R&D

The total money received for R&D activity in 2014-15 was Rs. 249.182 crores (Table 2). This includes grants received in the year for the new projects sanctioned and the ongoing projects.

Table 2: Money received for R&D in 2014-15

Project Type	Number	Funds received (Rs. in crores)
Sponsored Projects	603	213.20
Consultancy Projects	582	29.93
Royalty	-	4.20
Equipment usage	-	1.85
Total	**1,185**	**249.18**

The R&D work continues to be mainly supported by the government entities (Figure 2 and Table 3). Table 4 indicates some of the major sponsors from industry and other organisations.

Figure 2: Distribution of Receipts from Different Agencies

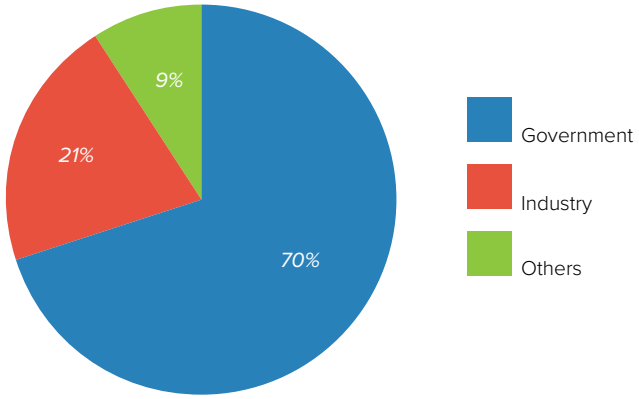


Table 3: Main sponsors of sponsored projects

Agencies	Grant received (Rs. in crores)	Number of new / ongoing projects funded
Ministry of Human Resources Development	40.75	14
Department of Science & Technology	38.65	186
Department of Information Technology	32.67	20
Ministry of New and Renewable Energy	13.97	6
Department of Biotechnology	11.59	55
Rajiv Gandhi Science and Technology Commission	7.09	4
Madhya Pradesh Urja Vikas Nigam Limited	4.00	1
Sir Dorabji Tata Trust	3.56	1
Indo-US Science and Technology Forum	2.73	6
Applied Materials Inc., USA	2.71	6
Board of Research in Nuclear Science	2.70	28
Tata Consultancy Services Limited	2.40	2

Agencies	Grant received (Rs. in crores)	Number of new / ongoing projects funded
Ministry of Earth Sciences	2.40	7
Indian Space Research Organisation/ Department of Space	2.37	4
Ministry of Culture	2.00	1
Infosys Foundation	2.00	1
Tata Teleservices Ltd., Mumbai	2.00	1
The Boeing Company, USA	1.54	1
Council of Scientific and Industrial Research	1.50	37
Ford Foundation, USA	1.35	1
Defence Research & Development Organisation	1.33	15
Municipal Corporation of Greater Mumbai	1.28	3
The Automotive Research Association of India	1.13	2
Tata Institute of Fundamental Research	1.11	2

Table 4: Sponsors from Industry and other organisations:

- Asian office of Aerospace Research and Development, USA
- Bill And Melinda Gates Foundation, USA
- Ford Foundation, USA
- Google, USA
- Intel Corporation, USA
- International Business Machines Corporation, USA
- McDonnell Academy,USA.
- M. Braun Inertgas-Systeme GmbH, Germany
- NVIDIA Corporation, USA
- Renesas Electronics Corporation, Japan
- Research Council of Norway, Norway
- Samsung Electronic Ltd., USA
- Swiss Agency for Development and cooperation, Switzerland
- Synopsys Inc., USA
- The Boeing Company, USA
- University of Illinois, USA
- University of Pompeu Fabra, Spain
- Wellcome Trust, UK
- YAHOO Inc., USA
- Aditya Imaging Information Technologies LLP
- BASF Chemicals India Private Limited
- Cummins Technology India Private Limited
- Hindustan Aeronautics Limited
- Hindustan Petroleum Corporation Limited
- ICICI Bank Limited
- Indian Institute of Packaging
- Infosys Foundation
- Larsen & Toubro Limited
- Madhya Pradesh Urja Vikas Nigam Limited
- Microsoft Research Lab India pvt. Ltd.
- Netapp India Private Limited
- NRB Bearings Ltd.
- Oil & Natural Gas Commission
- Oil India Limited
- Power Grid Corporation of India Limited
- Reliance Industries Limited
- Tata Consultancy Services Limited
- Tata Motors Limited
- Tata Steel Limited
- Tata Teleservices Limited
- The Automotive Research Association of India
- Titan Company Limited
- Wadhwani Foundation

Some major sponsored projects initiated

Assimilation of Open Source software in Science and Engineering
Sanctioned outlay: Rs. 15.99 crores over three years
Funding agency: Ministry of Human Resource Development

Establishment of Design Innovation Centre
Sanctioned outlay: Rs. 10 crores over three years
Funding agency: Ministry of Human Resource Development

DBT Pan IIT Center for Bioenergy
Sanctioned outlay: Rs. 12.93 crores over five years
Funding agency: Department of Biotechnology

A large Ion Collider Experiment (ALICE) Upgrade, Operation and Utilisation
Sanctioned outlay: Rs. 6.11 crores over five years
Funding agency: Department of Science & Technology

Intelligent Microgrids with Appropriate Storage for Energy
Sanctioned outlay: Rs. 5.52 crores over three years
Funding agency: Department of Science & Technology

Research Facility for Sustainable Materials and Technologies in Civil Engineering Applications
Sanctioned outlay: Rs. 5.13 crores over five years
Funding agency: Department of Science & Technology

Photothermal Radiotherapy using Gold coated Nanoparticles (ORANANO-C): A novel theranostic approach for Oral Carcinoma
Sanctioned outlay: Rs. 2 crores over two years
Funding agency: Infosys Foundation

M.Tech Fellowship to undertake research in the development sector
Sanctioned outlay: Rs. 1.52 crores over two years
Funding agency: Hindustan Aeronautics Limited, Bangalore

Efforts were made to disseminate information and provide support to faculty regarding project funding from sponsors (both national and international).

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

Some consultancy projects initiated

- Assessment of Pollution and Action Plan for Control of Water Pollution of Rivers
- Branding and Strategy Development for Design and Development of Handicraft
- Capacity Enhancement of Sulphuric Acid Plant
- Cash Modeling (inventory and routing cash to ATMs/branches) for Bank
- Coastal Monitoring Program
- Condensation and Heat Recovery System
- Corrosion Inhibiting Boating for bead Wires and Thin Corrosion Protection Coatings
- Design & Development of Fuze Setter & Inductive Coil for Time setting in a Electronic Time and Proximity Fuzes
- Design & Development of RF Circuit & Antenna for Electronic Fuze for artillery ammunition
- Design of Solar Aluminium Tubular Air Heaters for Tea Drying and Solar Hot Air Generator
- Development of Polymer Composites for Vacuum Insulation Purpose
- Energy Efficient Dryer for Ayurvedic Medicine Drying
- Establishment of Centre of Excellence in Security System in Campus
- Evaluation of Automatic Traffic Counting Systems
- Evaluation of Paint and Coatings
- Imaging, Analysis and Modeling for Accurate filled Channel Measurement
- IT Systems and Infrastructure Review

- Mapping of Water supply and sewerage tunnels made by MCGM on GIS base map of Mumbai
- Metabolic Modelling and Flux Analysis
- Natural Language Processing
- Opportunities and Challenges of Renewable Energy in Maharashtra
- Process Improvements in Manufacture of Excel Fiber
- R&D Collaboration in Power Systems
- Safe and Arming Device
- Strengthening of Laboratories of Chhattisgarh Environment Conservation Board
- Studies on Climate Changes
- Surface Pre treatment for Automotive Steel
- Switching Transient Studies
- Synthesis and Analysis of Linezolid

Internal Grants for R&D

The Institute provided internal funding for supporting faculty research and student activities. Grants of around Rs.10 crores were sanctioned for these activities, which included the following:

- Seed grant for initiation of research for new faculty and Healthcare Consortium
- Augmenting research resources of faculty recipients of research/ review paper/ Young Investigator awards
- Research internships and fellowships for Ph.D. student
- Student research/competition -- projects such as Automotive Racing, Driver-less Car Challenge, Intelligent Ground Vehicle, MARS Rover and Underwater Vehicle
- Upgradation and maintenance of central and national research facilities
- Leverage grants and bridge grants
- Grants for development of prototypes

R&D Award Grants from External Agencies

The Institute's research was recognised by peers and society in the form of award grants conferred on faculty, students and groups. Faculty Research Awards included Innovation in Science Pursuit for Inspired Research (INSPIRE) grant by the Department of Science and Technology in Electrical Engineering, Innovative Young Biotechnologist Award grant by the Department of Biotechnology in Biosciences and Bioengineering and J. C. Bose Fellowship in Mathematics, IBM Faculty Award in Industrial Design Centre. In addition, BASF Chemicals India Private Ltd. sponsored Post-doc Fellowship in Chemistry and the Federation of Indian Chambers of Commerce and Industry (FICCI) sponsored C.V. Raman Fellowship Award for African Researchers in Aerospace Engineering, Earth Sciences and Industrial Design Centre.

2. Licensing Activities

Technology Transfers:

We continue to receive royalties for different IPs licensed in the past. Some of the technologies licensed during this year are:

- A novel gel with superior conductance and solvent retention
- Fuel additives for improving efficiency
- Games Design
- Hierarchical fusion of large number of images
- Omnipresent Ethernet Router
- Polyuethane based gel electrolyte with superior properties using partial cross-linking
- Software for bid matching in power exchange
- Software for computation of sharing of interstate transmission charges & losses
- Super heat recovery water heaters based on Tube heat exchangers

3. Augmentation of Research Infrastructure

As part of creating and upgrading infrastructure for enabling R&D activities, the Institute has been establishing state-of-the-art equipment, based on the recommendations of the Research Infrastructure Funding Committee (RIFC). Under this initiative, procurement of four new equipments worth nearly Rs. 20 crores as Central facility (facility made available to all at the Institute) were sanctioned during the financial year with Institute funds. These facilities are

either 'Central Facilities' which are made available to all at the Institute, or 'Institute Facilities,' which cater to specific needs of major users academic units, or 'Department facilities,' primarily used in teaching laboratory courses and for student projects. A list of the sanctioned facilities is given below:

Central Facility

- Four Dimentional X-ray Microscopy
- Spectroscopy, Dynamics and Imaging for Molecules, Materials and Nano/Micro-devices
- Two-dimenstional Gas Chromatography coupled to a rapid scanning Time of Flight Mass Spectrometer
- Upgradation of the Raman Spectrometer for 2D mapping of simple properties and addition of laser sources

In addition to the above, RIFC recommended 13 proposals received during this year for setting up new facilities (Central/Institute/Department) with a financial outlay of Rs. 42 Crores, to the Institute for its consideration and sanction in the FY, 2015-16.

Also, several equipments and facilities were procured from external grants. Some of these are given below.

- Confocal Raman microscope with AFM and SNOM capability
- Depth sensing indentation module for a SEM
- Digital Image based on-line and off-line Strain Measurement System
- Field Emission Gun Transmission Electron Microscope - 200 KV
- High performance clusters- Rs.10 cores
- Inductively Coupled Plasma RIE system with accessory
- Nanoscale Optical Hyperspectral Microscope
- Quenching and Deformation Dilatometer
- Thermo-mechanical Simulator system

4. Intellectual Property (IP) Protection Activities

During the year, 72 Indian patent applications were filed. The trend of patent filings in the last few years is given in Figure 3 below. Table 5 gives a list of all Indian and international IPR filings.

Figure 3: Growth of Patent Applications from 2010-2011 to 2014-2015

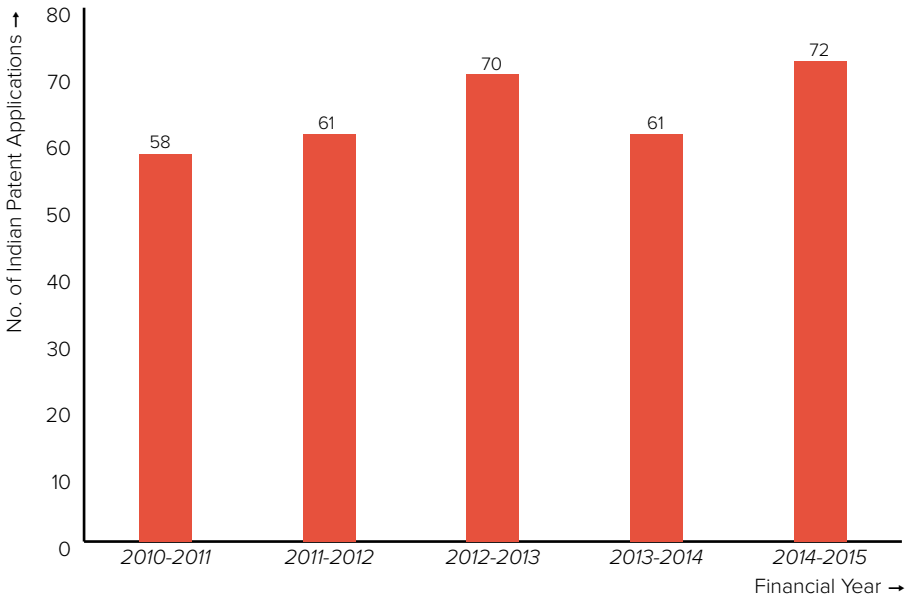


Table 5: Patents Applications filed during 2014-15

	Territory	No. of Applications
Patents	Indian	72
	PCT	6
	US	8
	EU & Canada	2
Trademarks and Design	Indian	1
Copyright	Indian	5

Six Indian patents and 11 US patents were granted during the year. In addition, one Indian Design and two Copyright were registered during this period. Proactive efforts continued for licensing of these technologies, products and designs.

Areas of IP filings included: Aerospace stamping, Antenna measurements, Biomedical, Compression ignition engines, Diagnostics, Drug delivery, Experimental mechanics,Food processing and Preservation, Fungal biotechnology, Lighting and light harvesting, Material Science, Micro Fuel Cell, Microcontrollers, Microfluidics, Micropump, Nanofabrication, Opto-electronic systems, Oral health, Paper sizing, PV module testing and characterisation, Solar Energy, Synthesis, Textile modification,VLSI processors, Wireless Communication and others.

As in the previous year, proactive efforts were made to assess the possibility of intellectual property in the work of M.Tech./Dual degree students to file for possible protection. For this, almost 832 abstracts were reviewed, out of which about 80 were shortlisted for a possible filing of patent applications. Seven patent applications filings have been initiated so far.

Nearly 50 agreements were finalized and signed during the year including those for research collaboration, licensing, non disclosure agreements, IP transfer, student sponsorships, consortia formation, endowment, Material transfers, etc. – with industries, organisations, universities and Government, both national and international.

5. Awards for Intellectual Property Activities

i) Thomson Reuters India Innovation Award 2014

The Institute was awarded with the 'Thomson Reuters India innovation award 2014' in recognition of its innovation and patenting activity, in the category of 'Academic and Research Institutes'. This award was given by Thomson Reuters on December 12, 2014 in Mumbai to honour the most innovative academic institutions and commercial enterprises in India for their spirit of innovation in R&D.

ii) National Intellectual Property Awards for 2015 and WIPO Users trophy

The Institute won the National Intellectual Property Award for 2015 in the categories of a) Top India Academic Institution for Patents and b) Best Commercialization of Patent(s) based product(s)/process(es) in India along with the WIPO Users trophy. These annual awards were given by Indian Intellectual Property Office, Department of Industrial Policy & Promotion, Ministry of Commerce & Industry, Government of India. IIT Bombay received a cash prize of Rs. 2 lakhs for winning the award in two categories. WIPO Users trophy was awarded by the Indian IP Office and the World Intellectual Property Office (WIPO) which comprised a trophy and a citation. The award was presented by Smt. Nirmala Sitharaman, Hon'ble Union Minister of Commerce and Industry, Government of India on April 24, 2015 in New Delhi.

6. Focused Initiatives

Several initiatives have been taken to promote and facilitate R&D activities, especially among students. Some of them are:

Enhancing industry partnership : There have been continued interactions with industries, both national and international, to explore collaboration opportunities in research.

Few Industry visits: BASF, Eaton, Huawei Technologies, LG Soft (India), Philips, Rolta, TATA Chemicals (USA), Titan, Tech Mahindra, Setco Automotive, Voltas.

ONGC-PAN-IIT interaction: A meeting with ONGC and Directors of IITs was held on June 25, 2014 in New Delhi to discuss the possible areas of association with ONGC & ONGC Energy Centre.

- A joint workshop was held on July 17, 2014 in New Delhi to brainstorm on the topics of interest to ONGC, discuss R&D areas of common interest; identify various modes of interaction and develop the framework for collaboration. Seven thematic areas with Coordinators/ Co-Coordinators / Lead faculty from IITs were identified. The themes included Oil & Gas Production and Recovery enhancement; Reservoir characterization, Modeling and simulation; Geological and geophysical studies; Software development; Unconventional energy resources; Engineering solutions / tools and technology development; and Alternate energy.
- A Memorandum of collaboration (MoC) for 5 years was signed on January 19, 2015 between ONGC and the PAN-IIT Forum.
- 6 out of 13 research proposals submitted by the Institute have been taken up by ONGC for further evaluation.

Further to submitting a joint proposal in FY 2013-14 on the Centre of Excellence in Emerging Manufacturing Technologies (CoEEMT) by the Institute and several Industry partners to Department of Heavy Industry (DHI), the following activities were carried out:

- A meeting was held on October 30, 2014 at Udyog Bhawan, New Delhi to review the progress of proposals under the Capital Goods Scheme. A revised Detailed Project Report (DPR) consisting of 15 faculties as investigators from various departments of the Institute and 17 investigators from 12 different industries was presented in the meeting. The DPR proposed development of seven technologies which were identified by the 'Report of the Working Group on Capital Goods & Engineering Sector for the 12th Five Year Plan (2012-2017)'. These technologies were in the field of Surface and material processing; Flow forming; Materials and manufacturing for textile machines; Ultra precision machining tools; Critical alloy development; Advanced powder metallurgy technology; and Advanced steam generator technology.
- The first Screening Committee meeting was held on November 26, 2014 at Udyog Bhawan, New Delhi, followed by an Apex Committee meeting on December 11, 2014 to discuss the possibility of enhancing competitiveness in the Indian capital Goods Sector. After due diligence, Institute was advised to re-approach the Screening Committee with a larger user base in consultation with the Industry and DHI. A progress review meeting was held with the Joint Secretary, DHI at Larsen & Toubro, Powai, Mumbai on January 14, 2015.
- A meeting with The Indian Chemical Council (ICC) was held on November 1, 2014 to promote interactions between Institute and the Chemical Industry.
    - The meeting was attended by Institute authorities, Faculty members and Senior Managers of ICC including delegates from Alkyl Amines, BASF, Dow Chemical International, Evonik, Excel Industries, Heubach Colour and National Peroxide, among others.
    - Mutual interactions interest were identified and a working group consisted of ICC members and Institute faculty was formed to continue interaction by devising a program of interaction through various modes such as projects, workshops, meetings, etc.
    - A meeting was held with Officers from HQ – Integrated Defence Staff (IDS), Ministry of Defence and IIT Bombay faculty at the Institute on August 27, 2014 to strengthen interactions between Defence, Academia and Industry. The main focus of discussion was to enhance and leverage R&D activities in the ICT domain and End point security solutions.

Healthcare Consortium: The activities of Healthcare Consortium included:

- Seed funding activities continued and 3 projects were funded in this year.
- Seed funding for student driven projects(~15 Nos.) were approved to cater to the growing interest amongst students for engaging with clinicians to build low cost devices. As a part of the proposal, a laboratory with common facilities will be set up. The student team have a faculty mentor and clinician.
- D. Y. Patil University and TATA Trust joined the Consortium.

Institute Ethics Committee : The Institute Ethics Committee (IEC) which was established in 2011 and reconstituted in January 2015, continued to review and approve all types of research proposals involving human subjects, with a view to safeguard the dignity, rights, safety and well being of all actual and potential research participants. In this year, IEC reviewed 27 proposals and approved 21 of them.

7. Dissemination/Outreach

Global R&D Summit 2014 : IIT Bombay participated in the R&D Exhibition of 'Global R&D Summit 2014' organised by Federation of Indian Chambers of Commerce and Industry (FICCI), New Delhi at The Lalit Hotel, New Delhi during November 12-13, 2014.

India- U.S. Technology Summit and Knowledgexpo : IIT Bombay participated in the India- U.S. Technology Summit and Knowledgexpo organised by the Confederation of Indian Industry (CII) and the Government of India in partnership with Department of State of the United states during November 18-21, 2014 at Indian Expo Centre, Greater Noida. The summit was aimed to provide a platform to the experts from academia, industry, Government and other organizations to highlight their concerns in various sectors like higher education, innovation, design, intellectual property rights and technology.

Science Expo-2015

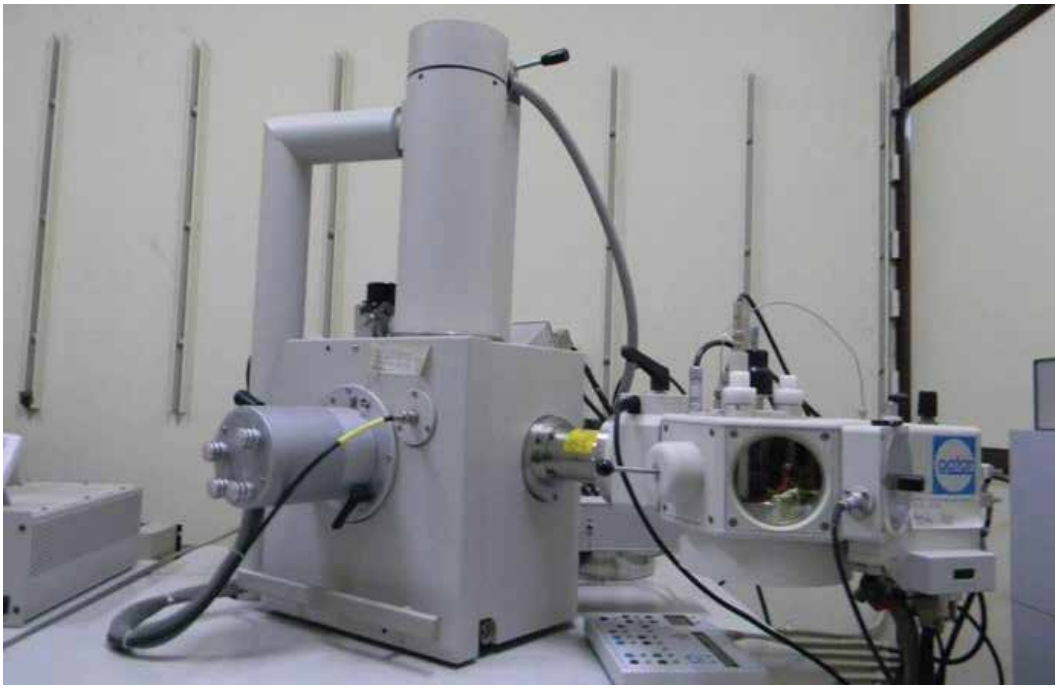
IIT Bombay was one of the participating institutions (along with twelve other leading scientific & research institutions situated in Mumbai-Pune region) in the Science Expo-2015, held at Nehru Science Centre, Worli, Mumbai, during February 4-7, 2015. This expo was aimed to promote and spread scientific awareness to school children and the general public.

Institute displayed a variety of exhibits from various Departments, and Centres in the form of working models, demonstrations, posters and film shows that highlighted research, technology development efforts and illustrated scientific concepts that would interest students.

A workshop on 'Central Facilities' was held on August 5, 2014, where the 25 conveners of central facilities made presentations on technical specifications and capabilities, the types of experiments carried out and the usage. About 110 faculty members and students attended the workshop.

IITB participants at Science-Expo 2015

Lectures by domain experts (institute faculty and outside experts) on the work of winners of the Nobel Prize 2014 were organised at the Institute on November 28, 2014.



Environmental Scanning Electron Microscope

a. ***Review of IRCC Seed Grant :*** Recipients (Faculty members) of IRCC Seed Grant during the year 2006-07 and 2007-08 made presentations to IIT Bombay academic community on February 10-11, 2015. Around 41 faculty members made presentations on the objectives of the projects undertaken, research output, R&D personnel trained, further projects applied and got sanctioned from external funding agencies, publications, patents applications filed & granted, awards & recognition received and so on.

b. ***Safety activities at the Institute:*** Keeping in mind the importance of safety, a video on 'Chemical Safety, Gas Cylinder Safety, Laser Safety and Radiation Safety' were prepared and will be soon circulated to IIT Bombay academic community.

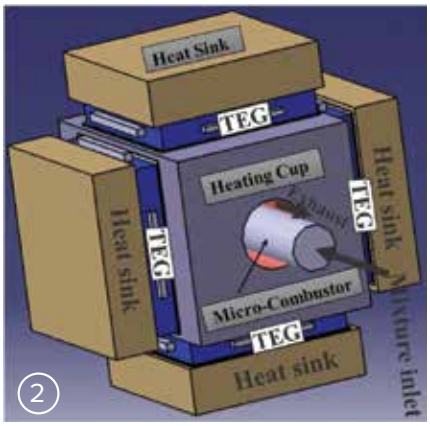
c. ***Online processes:*** Automation of activities related to project management (Acceptance of Funding Agency's terms and conditions, Accepting final version of MoU from faculty, Delegation of work to the project staff), central facility and project staff administration (Adhoc appointment selection committee reports, Biometric attendance display to faculty) continued. Created modules of IRCC staff attendance and delegation of work while on leave, updation of Ethics and Bio-safety committee reports and Student Hostels Rooms retention portal (access given to the Dean (SA)).

d. ***Project Manpower :*** The number of project staff involved in various projects as on March 31, 2015 is 1200. Of them, 701 joined during the financial year 2014-15.

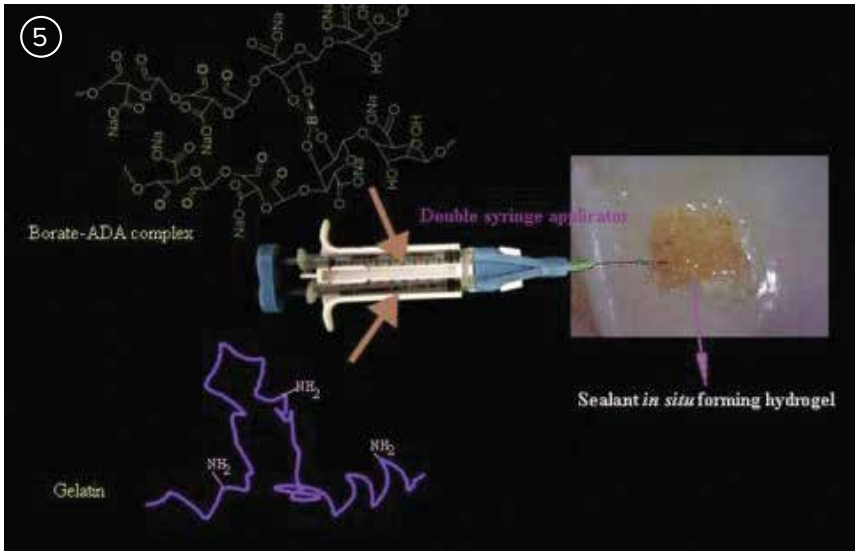
Research Facilities

1. Central Surface Analytical Facility (ESCA)
2. Liquid Helium Plant
3. NMR-500 MHz
4. Microcompunder and mini injection moulding
5. Cryo-FEG-SEM Facility

Glimpses of Research (Projects)



1. 1 MWe solar thermal power plant at Gurgaon
2. Micro Combustor based micro thermo electric power generator
3. Solar Urja Lamp
4. X-Ray to 3-D
5. Injectables for Osteoarthritis



Outreach Programmes

Industries, Academic Institutions and Students have access to IIT Bombay through its Continuing Education Programme (CEP), Quality Improvement Programme (QIP) and the Curriculum Development Programme (CDP). A large number of working professionals, academia and students participated and acquired knowledge from short and long term courses during 2014-15.

The QIP courses are fully funded by the All India Council for Technical Education (AICTE) and are open for faculty members of engineering colleges. In order to provide college teachers an opportunity to interact with industry professionals, special efforts have been made to permit a few industry participants as part of the QIP courses, in the normal CEP mode. The model has been much 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 the CEP courses are now well established worldwide and continue to attract large participation, from India and abroad. The courses on "Urban Drainage Management", "Human Computer Interaction", "Energy Management", "Elements of Chemical Engineering", "Executive Programme in Management", "Leadership Development Centre", "Dynamics and Control in State-Space (DCSS)", "Expo CD and Expo PDI" etc. have all been appreciated by the industry.

The CEP course on "Piping Engineering" has reached another milestone and has crossed its 66th edition in 2014. About 10,000 engineers have registered in the last 25 years. Online version of the course started in July 2009, has continued during the year. It has attracted registration from about 500 participants from across the globe, which is expected to grow further.

In terms of the overall performance of CEP & QIP during 2014-15, a total of 136 CEP courses were conducted with about 2,973 participants from across different disciplines as well as from the industries, organisations and institutions, generating a revenue of around Rs.6.68 crores. Under QIP category, five M.Tech. and four Ph.D. students from AICTE approved colleges/institutes of engineering were admitted. In addition, seven teachers were inducted into Ph.D. programme under the Advance Admission Scheme. Further, 11 short-term courses (STC), sponsored by the AICTE, were conducted and attended by 245 participants from various engineering institutions/colleges. Lastly, one new book-writing proposal was sanctioned under the Curriculum Development Programme (CDP) of QIP, during 2014-15.

Faculty Affairs

During the year, 15 faculty members on regular basis and nine on contract basis were appointed. The number of full-time faculty members on the roll of the institute has risen to 584 comprising 286 Professors, 138 Associate Professors, and 160 Assistant Professors out of which 21 are on contractual basis. In addition, there are 39 adjunct faculty members on the roll. Around 10 faculty members retired – six of whom were re-employed and two resigned.

The institute provided financial assistance to 250 faculty members for participating in international conferences. In addition, 69 faculty members travelled abroad for attending international conferences using external funding and 16 faculty members went abroad on Fellowship for research work.

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. Abhijit Chatterjee, Department of Chemical Engineering, has been honoured with the "INSA Young Scientist Award 2014" for his outstanding contributions in materials informatics for energy systems and catalytic reaction. He has also been selected for the INAE Young Engineer Award 2014.

Prof. A.K. Suresh, Department of Chemical Engineering, has been awarded the "Education Leadership Award" by the World Corporate Universities Congress.

Prof. Alok Porwal, Centre of Studies in Resources Engineering, was appointed Associate Editor of the Journal of Ore Geology Reviews, a highly reputed journal in the field of mineral exploration.

Prof. Amit Agrawal, Department of Mechanical Engineering, was awarded 'DAE-SRC Outstanding Investigator' Award, which also includes significant research funding.

Prof. Anand Khanna, Department of Metallurgical Engineering & Materials Science, has been awarded Lifetime Achievement Award by the National Corrosion Council of India (NCCI) for his achievements over last 25 years in the field of Corrosion and its prevention.

Prof. Atul Shrivastava, Department of Mechanical Engineering has been awarded the Swarnjayanti Fellowship for the year 2013-14.

Prof. B. Krishna Mohan, Centre of Studies in Resources Engineering, was inducted into the Executive Council of Indian Society of Remote Sensing, the highest level body of the Society to represent the academia.

Prof. Bijnan Bandyopadhyay, Systems and Control Engineering, has been appointed as the Technical Editor of IEEE/ASME Transaction on Mechatronics – a joint publication of IEEE Industrial Electronics Society, IEEE Robotics and Automation Society and ASME Dynamic Systems and Control Division, for a period of three years w.e.f. September 2014.

Prof. C. Subramaniam, Department of Chemistry, has been awarded the Young Scientist Gold Award by the International Union of Materials Research Societies (IUMRS) in recognition of his work leading to the development of carbon nanobot-copper electrical conductors with exceptional current carrying capacity.

Prof. Debabrata Maiti, Department of Chemistry, has been awarded "INSA Medal for Young Scientists-2014" for his outstanding contributions to metal mediated organic transformations.

Prof. Debjani Paul, Department of Bio-Science and Bio-engineering, along with her students ***Mr. Ninad Mehendale*** and ***Mr. Ammar Jagirdar*** have been awarded "Grand Challenges Explorations" grant from the Bill and Melinda Gates Foundation

Prof. Deepak B. Phatak, Department of Computer Science & Engineering, was conferred Lifetime Achievement Award 2013 by the Institute on August 9, 2014 in recognition of his outstanding contributions as teacher, researcher and administrator. He has also received the Lifetime Achievement Award on September 5, 2014, from Interlope, Mumbai for his contributions in the field of Information Technology.

Prof. Deepankar Choudhury, Department of Civil Engineering, has been awarded "TWAS Visiting Scholar Fellowship" by the World Academy of Sciences, Italy. He has also been invited to join the Editorial Board of International Journal of Geomechanics (IJOG), ASCE, USA, (http://ascelibrary.org/journal/ijgnai). This IJOG, American Society for Civil Engineers (ASCE) journal is Science Citation Index (SCI) listed journal with impact factor of 1.197.

Prof. Devang V. Khakhar, Department of Chemical Engineering, has been selected for the H K Firodia Award 2014 for Excellence in Science & Technology.

Prof. Dhingra S.L, Department of Civil Engineering, has been adjudged as the outstanding reviewer by ASCE for the journal of Computing in Civil Engineering.

Prof. G. Haripriya, Department of Humanities & Social Sciences, has been elected as an Executive Member of the Indian Society for Ecological Economics for the years 2014-16 and selected for the pilot training of the trainers for the worldwide implementation of the System of Environment Economic Accounting (SEEA) by the United Nations Statistics Division, New York. Prof. G. Haripriya, has also been elected as the President of the International Urban Biodiversity and Design (URBIO) network for a period of 4 years. URBIO is an open world-wide scientific network for education and research and is formed as a result of the scientific initiative of the CBD (Convention on Biodiversity, Montreal) under the Major Group "Local Authorities".

Prof. H. B. Singh, Department of Chemistry, has been selected to receive the prestigious J. C. Bose Fellowship in recognition of his outstanding research contributions.

Prof. J. Adinarayana and Prof. Surya S. Durbha, Centre of Studies in Resources Engineering, received the Best Research Team Award for 'ICT in water and pest/disease management for yield improvement in horticulture (Citrus) from the Information Technology Research Academy-Water (ITRA-Water)/MediaLabAsia/DeitY, Govt. of India. Prof. Adinarayana is also inducted as a member into the Editorial Board of Elsevier's Geoderma Regional Journal.

Prof. K. Munshi, Industrial Design Centre, has been invited to be a member of the Confederation of Indian Industry (CII) subcommittee on innovation for the year 2014-2015.

Prof. K.P. Kaliappan, Department of Chemistry, has been selected for "Prof. C.N.R. Rao National Prize in Chemical Sciences".

Prof. K. Ramasubramanian, Department of Humanities and Social Science, has been conferred 'Bhaskaracharya Award' by the Akhil Bharathiya Vidwat Parishad for his scholarly contributions.

Prof. Kannan Iyer, Department of Mechanical Engineering, has been selected for the prestigious "Indian Nuclear Society Outstanding Service Award" under the category of "Nuclear Reactor Technology, including Nuclear Safety" for the year 2013.

Prof. Kannan Moudgalya, Department of Chemical Engineering, has been awarded the Google MOOC Focused Research Award for his proposal "Extending the Offline Capability of Spoken Tutorial Methodology".

Prof. M. Ravikanth, Department of Chemistry, has been elected as a Fellow of the Indian Academy of Sciences in recognition of his outstanding research work.

Prof. Nina Sabnani, Industrial Design Centre, received the Short Film Award for her film "The Stitches Speak" at the International Film Festival on Crafts, France, 2014.

Prof. P. Venkatachalam, Centre for Studies in Resources Engineering (CSRE), has been elected as a Fellow of the Indian Society of Geomatics (ISG) in recognition of her outstanding contributions in the field of Geomatics.

Prof. Prabhu Ramachandran, Department of Aerospace Engineering, has been selected for the Kenneth Gonsalves Award 2014, an annual award constituted by the Python Software Society of India for recognition of substantial and original community contribution towards Python programming by an Indian.

Prof. Prasanna Gandhi and ***Prof. Salil Kulkarni,*** Department of Mechanical Engineering, won the Best Paper Award at the Fluid Mechanics and Fluid Power conference held at IIT Kanpur in December 2014.

Prof. Puja Padhi, Department of Humanities and Social Science and her student Mr. P.K Naik received the Best Paper Award for their paper "Stock market development and economic growth in emerging market economies: dynamic panel evidence," and a trophy of the ICBPEM 2014 held during December 12-14, 2014 by the School of Managment, NIT Rourkela.

Prof. Pushpak Bhattacharya, Department of Computer Science & Engineering has been awarded V.N.M.M. Award by IIT Roorkee for his innovative and creative work in the field of Engineering.

Prof. R. Murugavel, Department of Chemistry, has been elected as a fellow of the Indian National Science Academy (INSA). He has also been selected for the prestigious J. C. Bose Fellowship in recognition of his outstanding research contributions.

Prof. R.B. Sunoj, Department of Chemistry, has been awarded with Chemical Research Society of India (CSRI) Bronze Medal for the year 2014. Prof. Sunoj has been elected as a member of the World Association of Theoretical and Computational Chemists (WATOC) Board. He has also been awarded Chemical Research Society of India (CSRI) Bronze Medal for the year 2014.

Prof. R.K. Shevgaonkar, Department of Electrical Engineering (Director, IIT Delhi), has been conferred the "IEEE WILLIAM E. SAYLE" award for achievement in engineering education.

Prof. Rajneesh Bhardwaj, Department of Mechanical Engineering, has been awarded "IEI Young Engineers Award 2014-15" for Mechanical Engineering. He has also been selected for the INAE Young Engineer Award 2014.

Prof. Ritesh Gautam, Centre of Studies in Resources Engineering, received the Early Career Scientist Fellowship from World Climate Research Programme to attend Climate Symposium in Darmstadt, Germany, October 2014.

Prof. Ravi Poovaiah, Department of Industrial Design Centre has been awarded an IBM Faculty Award for the year 2014.

Prof. Rinti Banerjee, Department of Biosciences and Bioengineering, has been selected for the NASI - Reliance Industries Platinum Jubilee Award (2014) for application oriented innovations. She has also been selected for the Central Drug Research Institute (CDRI) Awards 2015 for Excellence in Drug Research under Biological Sciences.

Prof. Rohit Srivastava, Department of Biosciences and Bioengineering, has been selected for the 2013 VASVIK Award in the category of Biological Sciences & Technology. He has also been selected for the Organisation of Pharmaceutical Producers of India (OPPI) Award for developing "simple and affordable technology for glucose estimation device and strips". Prof. Srivastava, has also been selected for the prestigious "Biotech Product & Process Development and Commercialization Award" by the Department of Biotechnology, Government of India, for the year 2014-2015.

Prof. S.G. Dani, Department of Mathematics, has been nominated by the International Mathematical Union (IMU) to the International Commission on the History of Mathematics (ICHM) for the period 2015 –2018. He has also been elected as the President of the Indian Mathematical Society for the year 2014-2015.

Prof. S. Kotha, Department of Chemistry, has been conferred Prof. W. U. Malik Memorial Award by the Indian Council of Chemists.

Prof. S. Sudarshan, Department of Computer Science & Engineering, has been elected as a Fellow of NASI, Allahabad, for the year 2014. Prof. Sudarshan has also been elected an ACM Fellow for 2014 for his contributions to database education, query processing, query optimization and

keyword queries, by the Association of Computing Machinery (ACM).

Prof. Soumen Chakrabarti, Department of Computer Science and Engineering, has been selected for the Shanti Swarup Bhatnagar Award in Engineering Sciences for the year 2014. He has also been elected as a fellow of the Indian Academy of Sciences, Bangalore in recognition of his outstanding research contributions.

Prof. S.H. Patil, Department of Physics, has been awarded the "INSA Teachers Award 2014" by the Indian National Science Academy, for his consistent excellence in teaching.

Prof. Souvik Mahapatra, Department of Electrical Engineering, has been conferred "Hari Om Ashram Vikram Sarabhai Research Award for 2013" by Physical Research Laborator, Ahmedabad.

Prof. Suryendu Dutta, Department of Earth Sciences, has been selected for the NASI- SCOPUS Young Scientist Award 2014 in the category of "Earth, Oceanography & Environmental Sciences".

Prof. T.I. Eldho, Department of Civil Engineering, has been awarded "Best Lecture Prize- 2013" at India Water Works Association, Mumbai. Prof. Eldho, has been awarded the 2014 Best Theoretical Oriented Paper by Journal of Hazardous, Toxic and Radioactive Waste of American Society of Civil Engineers, EWRI, USA.

Prof. Tarun Kant, Department of Civil Engineering, has been selected for the ICCES Lifetime Achievement Medal for his seminal contributions to composite materials and to the education of generations of students in India.

Prof. U. K. Anandavardhanan, Department of Mathematics, has been chosen by the INSA Council to be one of the founding members of the National Young Academy of Science (INYAS).

Prof. V. Kavitha, Industrial Engineering & Operations Research, Ms. Deeksha Sinha, Student and ***Prof. Abhay Karandikar,*** Department of Electrical Engineering, won the Best Workshop Paper Award in the 12th International Symposium on "Modelling and Optimization in Mobile, Ad Hoc and Wireless Networks".

Prof. V. Ramgopal Rao, Department of Electrical Engineering, has been elected as a fellow of the Indian National Science Academy (INSA). Prof. Rao, has also been selected for the NASI - Reliance Industries Platinum Jubilee Award (2014) for application oriented innovations.

Prof. Virendra Sethi, Centre for Environmental Science and Engineering, has been selected for the VASVIK Award 2014 in the category of "Environmental Sciences & Technology".

Prof. Vivek Agarwal, Department of Electrical Engineering has been elevated by IEEE Board of Directors, as IEEE Fellow, effective from January 1, 2015, for his contributions to typologies and control schemes for solar photovoltaic energy conversion and power quality enhancement.

Student Affairs

The students at IIT Bombay explore their interests in a plethora of activities. There are excellent recreational facilities for sports, including gymnasiums, swimming pools, courts for tennis, basket ball, volleyball, hockey, football and cricket, athletics tracks, and many more. Along with studies, sports activities too are carried throughout the year. All the events are organized by a capable Institute Sports Council headed by General Secretary, under the able guidance of Sports Officers, Chairman Sports and Dean Students Affairs.

Inter-IIT Sports Meet: The Golden Jubilee Inter IIT Sports Meet 2014 was organised by IIT Bombay at its Campus on December 12, 2014 and the Main Meet was held between December 12-19, 2014. Cricketing legend, Mr. Sachin Tendulkar was the Guest of Honour for the occasion. The Inter IIT Sports Meet comprised a total of 12 sports, namely Athletics, Aquatics, Basketball, Badminton, Cricket, Football, Hockey, Table Tennis, Tennis, Squash, Volleyball and Weight Lifting. Over 2,500 students, sports officers and faculty members from the 16 IITs visited the campus and participated in the tournament.

(above) Prof. D.V. Khakhar, Director, IIT Bombay with cricketing legend Mr. Sachin Tendulkar at Inter -IIT Sports Meet

(above right) IIT Bombay's Participants at the meet

The Aquatics Championship was flagged off by Arjuna awardee Mr. Virdhawal Khade, the Chief Guest for the opening ceremony of the Aquatics Meet, which was held between October 1-4, 2014. The event also saw the launch of Mashal - an initiative to endorse and improve primary education among children, inaugurated by Mr. Shreyas Talpade and conducted by Ms. Bhakti Sharma.

Sports Club: New clubs for Athletics, Basketball, Badminton, Cricket, Football, Hockey, Squash, Table Tennis, Volleyball, were formed during the year 2014-15. Summer School of Sports, DRONA, NSA, Camps, Aquatrain, PG NSO, Learning Workshop before every PG Sports, aimed at generating enthusiasm and encouraging participation of PG students in sports and general fitness, were organised

Cultural Activities

Paathshaala: All cultural activities were brought under a single umbrella branded as Paathshaala thus ensuring that these could be publicised and organised in a coherent manner and that people could maximise this opportunity for learning most cultural forms that they might be interested in.

Summer School of Cult (SSoC): Summer vacations provide an ideal opportunity for students who stay back on campus to cultivate their interests in areas beyond just academics. Classes offered in multiple genres including Music, Dance, Film and Fine Arts generated good response.

The Performing Arts Festival (PAF)

This year, PAF saw a close competition, ultimately leading to a tie at the top position. The overall PAF season was overwhelming experience for both the performers as well as participants.

Former President of India Dr. A.P.J Abdul Kalam delivering speech during IITB Techfest

Techfest

IIT Bombay's annual international science and technology festival called TechFest, celebrated its 17th anniversary this year. The event was organised between January 2-4, 2015 and witnessed a footfall of more than 1,35,000 people comprising mainly of the youth from across the nation and an outreach of over 2,500 colleges across India and over 500 overseas universities. Some of the activities organised as a part of Techfest 2015 are as follows:

Competitions: Techfest conducted 22 competitions viz. Apexo, 23rd yard, Magneto, Pixelate, Combat Nautica, Fermat, Cantilivo, ThinkerNet, Striker, Robowars, Codeblitz-Mumbai, Codeblitz-Finale and TICC, in which 246 teams participated. Apart from these, Techfest 2015 also conducted Technight for the freshmen which was attended by more than 40 students.

Lecture Series: The key speakers this year included Bharat Ratna and Former President of India Dr. A.P.J. Abdul Kalam, Father of Internet Dr. Vint Cerf, Indian-American mathematician and the winner of the Fields Medal, often described as the 'Nobel Prize for mathematics' Prof. Manjul Bhargava, and famous lyricist and screenplay writer Mr.Javed Akhtar to name a few.

Exhibitions: About 25 International Exhibits from world renowned universities like ETH Zurich, MIT Media Labs etc., were showcased during the Techfest. Demonstration on rescue operations by the Indian Army and Indian Navy were the major attraction during the fest.

Social Initiatives: A national outreach campaign ASK was launched for awareness about RTI among the youth, in which RTI filing workshops were conducted in 23 cities reaching 500 colleges. The campaign was supported by National Campaign for People's Right to Information (NCPRI)

EVo 3.0 at FS UK 2014, the only Indian Formula Student team to complete the endurance test & participate in all dynamic events

Mood Indigo 2014

Mood Indigo

The annual cultural festival Mood Indigo held during December 26-29, 2014, saw an overwhelming response from the youth of the country who came to IIT Bombay to witness the four day extarvaganza. The festival witnessed more than 200 events and saw a footfall of 1,26,000.

Competitions: Competitions at the festival saw a whole new level of innovation this year. While the flagship competition in dance, music and dramatics stayed the point of attraction, what captivated people's minds were the newly launched competitions in various genres like fashion, digital arts and story-telling. To add a cultural flavour to the festival, various competitions in the folk arts genre were also introduced. Under the "Live Your Passion" campaign, the participants received various incentives which included performances at prestigious stages like the NCPA and the Prithvi Theatre. The competitions saw participation from over a thousand colleges panning across various cities like Delhi, Pune and Bangalore.

Media: The festival was extensively covered by various mainstream and regional media houses. Various news channels also featured the festival on television. In an attempt to explore the new mode of mass communication, social media, the organisers indulged in posting live updates via various social networking sites like Facebook, Twitter and Instagram. In addition, a 12 page newsletter was published in association with Bombay Times which was distributed in over 30, 000 households in Mumbai. The Media Team also explored other avenues of publicity like outdoor hoardings and publicity in cinema houses. It also accomplished on-ground publicity by visiting various colleges across the city.

Popular and Cultural Events: The festival withnessed over 200 national and international artists, continuing the legacy of bringing the maximum number of international artists to a college festival. The events featured eminent personalities like Rajdeep Sardesai, Subramanian Swamy and Amish Tripathi. Other events featured artists like mime artist Hanoch Rossen from Israel. In addition, there were a lot of other international artist groups from Korea and Taiwan who enthralled the audiences at the night shows. The concerts or pronights as they are popularly known, at the festival witnessed a huge crowd which came to see the international band Epica and the Bollywood hearthrobs Adnan Sami and Vishal-Shekhar. Sander Van Doorn performed at the EDM night that filled the youth with utmost enthusiasm during the festival.

Entrepreneurship Cell (E-Cell)

The E-Cell at IITB was founded with a vision to create an entrepreneurial ecosystem by enabling an easy and efficient interaction between students, faculty, aspiring and existing entrepreneurs, mentors and investors. E-Cell has brought in a new era of entrepreneurship in the Institute and has contributed towards an increase in the number of start-ups by students and alumni, in the recent times . The major initiatives of E-Cell were:

Typography Day, March 2015

Eureka!: It is the Asia's largest Business Plan competition that encourages people from across the globe to flesh out their ideas and form global enterprises that combine technology, vision and business acumen. Eureka received over 7,200 registrations and around 240 students from the institute participated. Online and Offline Mentoring sessions were held with a panel of distinguished mentors consisting of investors, venture capitalists and experts in various fields over a period of two months and the final pitching was held during the Entrepreneurship Summit 2015. The winners received huge cash prize and an opportunity to go to Stanford University for entrepreneurship camp.

Entrepreneurship and Business Club (EnB Club)

The vision of the EnB Club is to create a platform of entrepreneurship enthusiasts where students, faculty and professionals can interact on a regular basis for discussions, brainstorming sessions, informal sessions and networking. The team is dedicated to enhance the learning experience of those students who are curious about entrepreneurship and to provide an action-oriented road map for those looking to launch a start-up.

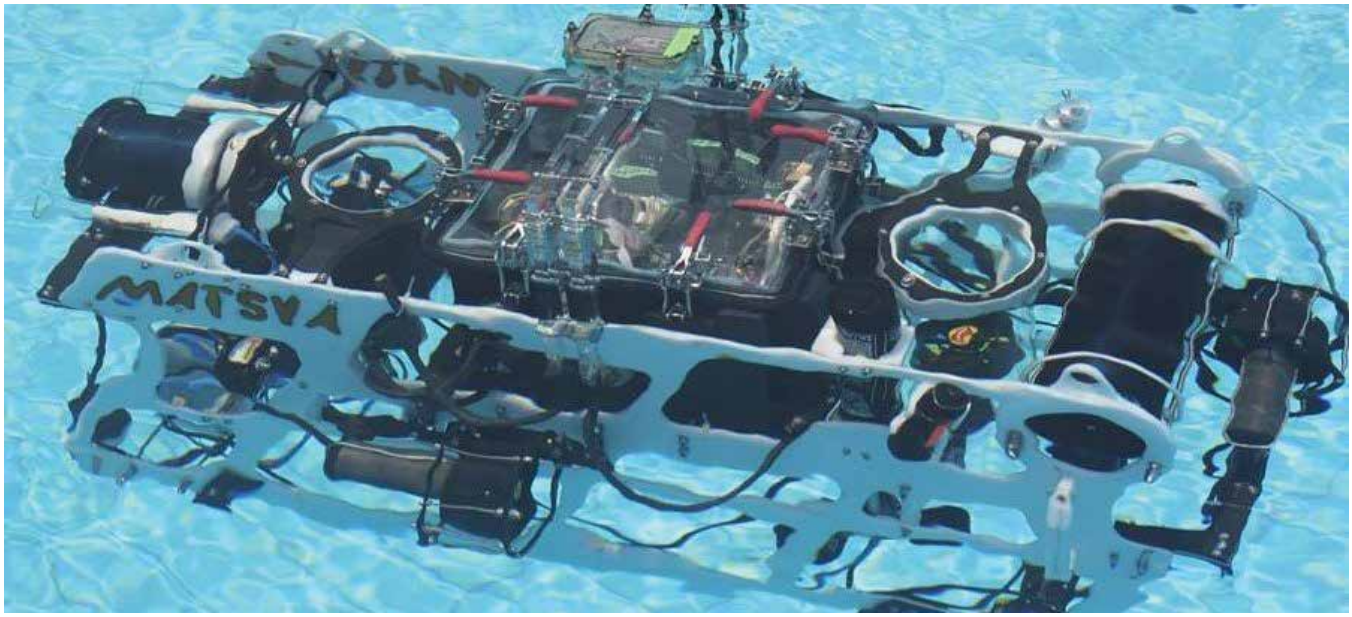
Startup Bootcamp: The EnB Club initiated the process of nurturing ideas and helping them convert into startups. More than 500 people from the institute at various stages participated in the event which resulted in establishment of 11 start-ups out of this Bootcamp.

Workshops such as 'Fast Track Course on Entrepreneurship', 'Illuminate Pre-Eureka Workshop', 'Learn Entrepreneurship and VC Boot Camp', were also organised during the year.

Entrepreneurship Summit: The Entrepreneurship Summit is an initiative by E-Cell, IIT Bombay, to serve as a platform for bringing together budding entrepreneurs, venture capitalists, investors, start-ups and other major contributors to the entrepreneurial ecosystem. E-Summit 2015 witnessed renowned speakers from various domains of the entrepreneurial ecosystem, who shared their own experiences, including Alan Mamedi, Ridham Desai, Amit Agarwal, Jim Beach, Kavin Bharti Mittal, Ravi Gururaj, Neeraj Gupta, Jeff Bulas, Nishith Desai, Paul Sloane, Rashmi Bansal et al. Some of the major competitions organised during the summit included National Bizquiz, IPL Auction, Ideablaze, Crowd Pitch, Apocalypse Management, Investor's Hat, Pitch Please, Investor's Portfolio etc.

Hack-e-thon, Lean Workshop and Networking Arena were some of the highlighted events during the Entrepreneurship Summit 2015.

National Entrepreneurship Challenge (NEC): This is a competition created with the vision to promote entrepreneurship amidst all the college campuses in India. NEC saw a participation of over 200 colleges. NEC involved completing series of structured tasks divided into Awareness, Idea generation, Club activities and Stand up for Society aiming to make a steady progress towards establishing an e-cell in the respective colleges. Several other competitions, workshops and panel discussions were held during E-Summit.



Autonomous Underwater Vehicle (AUV) Matsya 3.0

Student's Technical Activity Body (STAB)

As mentioned earlier, fully-equipped centralized technical lab 'Tinkerer's Lab', was setup using the funding obtained from alumni of 1975 batch, during the year. The lab provides workspace and technical resources for ITSP, Technovation, Department Projects, Techify your Room, Fire hack hardware hackathon, SSTep and all hobby club events.

Society For Innovation And Entrepreneurship

The Society for Innovation and Entrepreneurship (SINE) is an umbrella for promotion of entrepreneurship at IIT Bombay. It administers a business incubator, which provides support for technology-based entrepreneurship, and facilitates the conversion of research activity into entrepreneurial ventures.

SINE has so far incubated 64 companies. This year SINE hosted 21 companies, of which two have graduated and two exited. Of the current companies, seven have received investments from Venture Capital/Angel investments and six are based on technology/knowhow from the institute. The existing companies are from various technologies such as education, cleantech, mechatronics, audio technologies, nanotechnology, engineering software, web security, environment and healthcare.

With a view to expanding its incubation activity, SINE is focusing on promoting pre-incubation and enabling virtual incubation outside Mumbai and start-up ideas from the healthcare sector. SINE has tied up with IIT Bombay Alumni network to leverage the talent pool for mentoring, partnering and funding support for start-ups. SINE is also tapping into CSR funding activities of corporates. It has received interest from a few corporates including some Public Sector Units.

Placement

The formal campus placements involving company interviews for the academic year 2014 was conducted in two phases. Preparations for these phases stated in July 2014. The first phase of IIT Bombay's campus placement in December 2014 saw participation from around 240 companies and 1,000 job offers. Till June, 2015, a total of 310 organizations have taken part in campus placements and have offered 1,118 jobs. Students from Bachelor of Technology (B.Tech.), Master of Science (M.Sc.), Dual Degree (D.D), Master of Technology (M.Tech.), Master of Design (M.Des.), Master of Philosophy (M.Phil.) and Doctor of Philosophy (Ph.D) programs in various fields of engineering, science and technology, design and humanities participated in the placement process. A total of 1,675 students registered for campus placements in 2014-15 the largest number ever. This is up from just 1,100 in 2009-10 and has required Placement Office (PO) to appropriately scale up its approach towards campus placements.

Student registration for campus placements opened in August 2014. Companies were invited from July 2014 to fill up online "Job Announcement Forms" which opened to students registered for placements from early October. Pre-placement talks by some companies, provided an avenue for interaction and familiarisation of students with recruiting organisations and their work profile as a run up to formal placements. The company interview process for the first phase began on December 1, 2014. A small number of eligible students did not actively participate in the placement process due to their other career choices.

December 1, 2014 the first day of formal placements, saw 36 firms, representing some of the most coveted jobs in global industry for our students. An unprecedented 214 jobs were offered on that day reconfirming the commitment of top recruiters to IIT Bombay graduates. Placement season 2014 also saw the presence of many more "core" engineering companies on the first day of campus placements. This year 2014-15, the formal placement process for IDC were conducted separately starting end February 2015 to better synchronize with the academic calendar for final year students at IDC.

Engineering and Technology: Our students continue to demonstrate strong commitment to their core educational background in their choice of employment. Majority of students opted for science, engineering and technology-oriented jobs with the recruiting companies operating in various sectors of the economy.

Data Analytics: The reputation of superior analytical and reasoning skill of IIT Bombay graduates continued to draw recruiters from the rapidly growing field of data analytics. There were 155 job offers from 47 organisations making it one of the biggest recruiters after engineering and information technology. This trend from last few years seems to have taken strong roots at IITB.

Consulting Sphere: Over 31 leading consulting firms, including several global leaders, visited IIT Bombay for campus recruitment this year. These organisations work with large corporations across the world and help them resolve complex business problems. Management Consulting companies especially carry a reputation of being very selective in their choice of campuses and follow extremely high standards in their recruitment process. Over 107 offers were made in the consulting sector.

Financial Services: The financial service sector was a major recruiter this year as well. Many of the top global companies in financial sector visited the Campus and made over 100 offers open to students. The rapid ongoing digitization of financial services sector in India also resulted in strong presence of Indian financial firms in a sector traditionally dominated by multinationals at IITB.

Research & Development: With the economy increasingly striving for high-end products and services, a larger number of companies now develop products on the forefront of technology. IIT B saw an increase in the number of organisations hiring fresh graduates in the Research and Development sector. A total of 15 R&D organisations offered 48 positions this year.

Education: IIT Bombay continues to provide faculty to several educational institutions through campus placement over the past several years. Over 45 students, including some with doctoral degree, have been offered jobs in public and private educational institutions through campus placements.

Start-ups: IIT Bombay continued to attract 'start-up' companies including many started by its alumni. Start-ups have started to challenge more established companies in their quest for hiring talent at IITB. The informal work culture, opportunity to make immediate and visible contributions, chance to own equity etc. seem to attract IITB students to start-ups. Start-up companies different from the more usual e-commerce related have also started making their presence felt in campus placements. A total of 109 job offers were made by start-up companies spanning sectors like IT, education, analytics and engineering. A "job fair" involving start-up companies was also held in the second phase in January 2015 in collaboration with the E-cell, IIT Bombay.

Diverse Recruiters: While the placement season eventually saw recruiters from the entire spectrum of the industry, the initial part of the season was dominated by firms from sectors like engineering and manufacturing, computer software and hardware, data analytics, management consulting, finance/banking, and FMCG. Most of these firms are world leaders in their respective domains.

Preparing well-rounded students

As in previous years, a key focus of the Placement Office was to prepare the students for placement and internships. A large number of preparatory activities were conducted this year for the graduating students, including refresher lectures on various technical subjects. In addition, preparatory programmes to enhance communication skills, interview skills and group dynamics were also organised. Talks with the alumni working in diverse sectors were also organized to prepare the students about different job requirements. Around 700 preparatory sessions were organised by the Placement Office. Senior and experienced alumni from the corporate sector were available at the Placement Office during December 2014 to counsel and advise students in need.

The successful student placement in 2014-2015 clearly demonstrates the demand of IIT Bombay graduates among the top recruiters in various segments of the economy. A majority of our past recruiters held their faith in the abilities of our students and came to recruit in large numbers. This year several new organisations visited the institute.

Programme-wise placement data 2014-2015:

Academic Programme	Registered	Placed*	Percent placed
B.Tech.	510	396	77.65
Dual Degree (B.Tech.+M.Tech.)	270	216	80.00
M.Tech.	544	402	73.90
5-yr M.Sc.**	21	12	57.14
2-yr M.Sc.**	—	41	—
M.Des.***	—	32	—
Ph.D**	—	22	—

* *All registered students do not necessarily participate actively in campus placements. Some eligible students may have alternate plans like higher education etc. but still register for campus placements. Note that the students also get placed through channels other than campus placements.*

** *For M.Sc. and Ph.D students, higher studies and post-doctoral work can be a priority.*

*** *Large number of M.Des. students are placed post "design-degree show" in mid-June.*

Placement detail sector-wise:

	Sector	No. of Organisations	No. of Offers Received
1	Analytics	47	155
2	Consulting	31	107
3	Education	11	45
4	Engineering & Technology	88	381
5	Finance	20	106
6	FMCG	2	6
7	Public Sector/Government	2	10
8	Research & Development	15	48
9	Services	8	61
10	Software, IT	50	199
	Total	**274**	**1,118**

Placement detail by range of salary offered:

Range of Gross Salary (in Lakh Rupees per annum)	Number of Organisations	Number of Offers Received
Above 11	74	365
Between 9.5 to 11	39	162
Between 8 to 9.5	43	180
Between 6.5 to 8	39	124
Between 5 to 6.5	59	204
Less than 5	20	83
Total	**274**	**1,118**

[*] *A total of 310 organisations participated in the campus placements, 274 organisations offered jobs to students.*

Internship Report

The year saw 1,034 internship offers from around 650 organisations. There were 100 Pre-Placement Offers (PPO) made to students for final placement based on their internships in 2013-14, of which 60 were accepted by students. During the season, 143 start-up companies offered 373 summer and winter internships. The internship season started in July 2014 and continued till mid of May. The students in the 3rd and 2nd years of Bachelor of Technology (B.Tech.), 5 -year and 2-year Master of Science (M.Sc.) and Dual Degree (D.D.) programmes in various departments participated in the internship process. The 2-year M.Sc. Programme was also brought under the internship process from 2014-15.

Department-wise Internship Data (2012-2013 data in brackets):

Department	Number of Internships
Aerospace	65 (66) (53)
Chemical	129 (143) (151)
Civil	99 (90) (102)
Computer Science	157 (154) (169)
Engineering Physics	41 (22) (15)
Electrical	189 (138) (140)
Energy Science	35 (30) (40)
Mechanical	152 (168) (137)

Department	Number of Internships
Metallurgy	101 (77) (90)
Chemistry	21 (24) (12)

Summer vs. Winter Internships:

	Male	Female	Total
Summer internships	722	102	824
Winter internships	180	30	210
Total Internships	**902**	**132**	**1,034**

Companies vs. Universities:

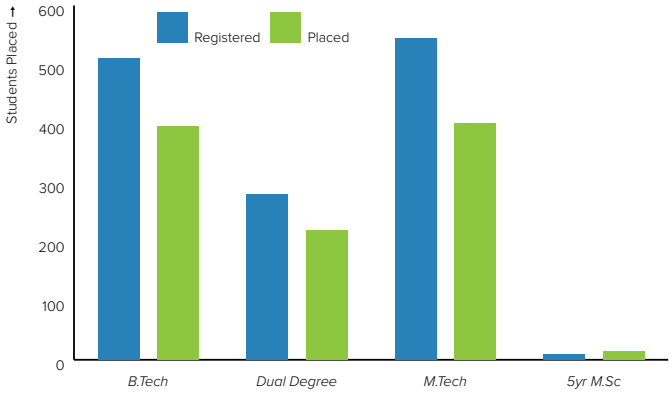
	Male	Female	Total
Company Internships	784	105	889
University Internships	118	27	145
Total Internships	**902**	**132**	**1,034**

Country-wise offers from Companies:

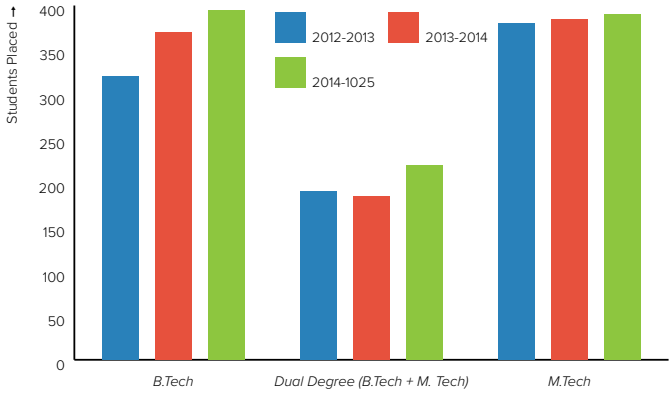
Country	Male	Female	Total
US	0	1	1
Japan	12	0	12
Dubai	17	0	17
Korea	14	0	14
Denmark	1	0	1
France	0	1	1
Total	**44**	**2**	**46**

Country-wise offers from Universities:

		No. of Interns		
Country	No. of Universities	Male	Female	Total
Germany	4	5	4	9
USA	16	24	4	28
Canada	4	18	5	23
UAE	1	1	0	1
Hong Kong	3	7	1	8
Malaysia	1	1	1	2
Australia	2	3	0	3
Austria	1	0	1	1
France	2	2	0	2
Singapore	1	3	1	4
UK	8	28	2	30
Switzerland	2	8	0	8
Israel	1	0	2	2
Italy	1	2	0	2
Taiwan	1	6	1	7
Japan	2	2	0	2
Ireland	1	4	0	4
India	5	6	3	9
Total	**56**	**120**	**25**	**145**

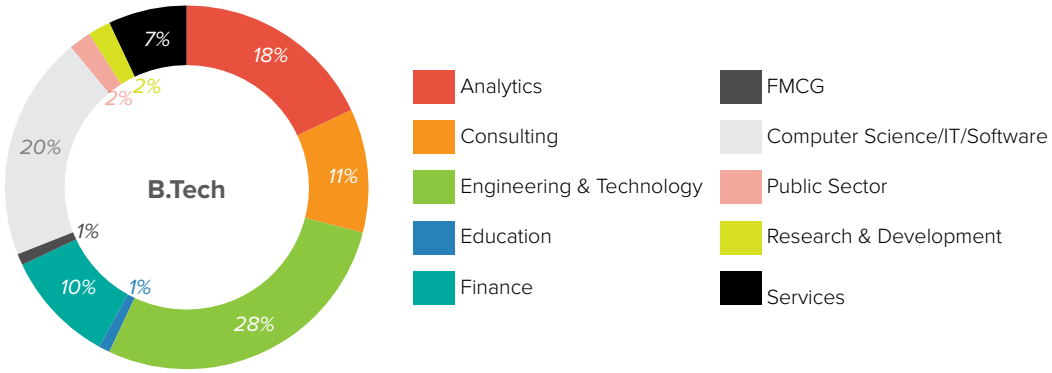


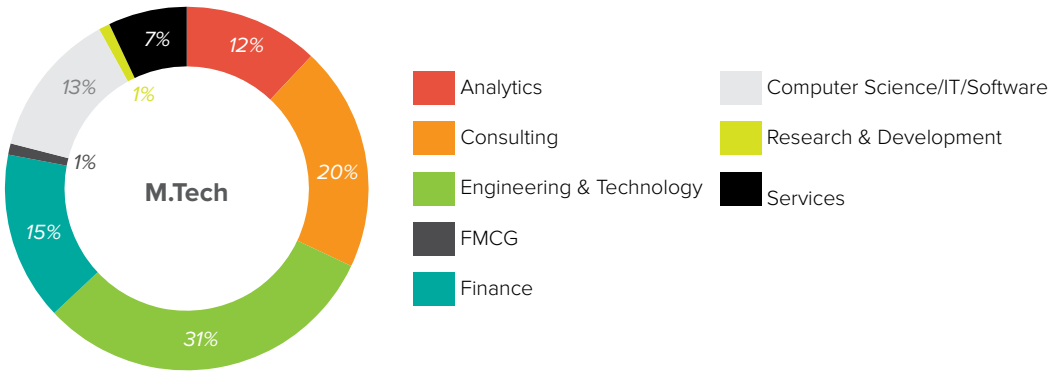
Students Registered Vs. Placed
Campus Placements 2014-2015

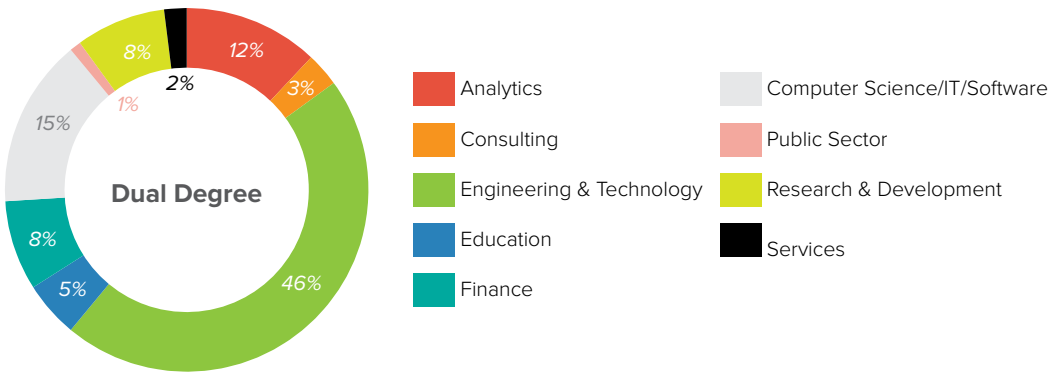


Comparison of Students Placed
2012-2013 Vs. 2013-2014 Vs. 2014-2015

Sector wise Selection of B.Tech, M.Tech and Dual Degree (B.Tech + M.Tech)







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 25 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:

- Lomonosov Moscow State University, Russia
- University of Wollongong, Australia
- Michigan State University, USA
- The University of Nottingham, UK
- Politecnico di Milano, Italy
- Mississippi State University, USA
- Koc University, Turkey
- McMaster University, Canada
- Washington University in St. Louis, USA
- University of California, Berkeley, USA
- The Australian National University, Australia
- Aalto University, Finland
- Fraunhofer Institute for Surface Engineering and Thin Films, Germany
- German Academic Exchange Service, Bonn, Germany
- Consortium of Finnish Higher Education Institutions, Finland
- Loughborough University, UK
- National Tsing Hua University, Taiwan
- German Academic Exchange Service, Bonn, Germany (DAAD RISE scholarship)
- The Hebrew University of Jerusalem, Israel
- Swinburne University of Technology, Australia
- The Ohio State University, USA
- Tianjin University, China
- City University of Hong Kong, HKSAR, People's Republic of China
- National Chung Cheng University, Taiwan
- University of Amsterdam

MoUs with other institutions

- National Institute of Industrial Engineering, Mumbai
- Indian Institute of Tropical Meteorology, Pune
- PES University, Bangalore

Visits of International Delegations

IIT Bombay also witnessed a huge number of international delegations for exploring areas of collaboration and co-operation. The major ones are as follows:

Prof. Ebrahim Parker, Head of Operations Management and Prof. Mario Peter Da Costa, Acting Head of Department, Office Management and Technology from Cape Peninsula University of Technology, South Africa

Dr. Robert Orr, Dean and Ambassador and Pradeep Kapur, Visiting Professor, International Trade, Development & Security from University of Maryland School of Public Policy

Mr. Eugenio Acosta, Director of International Alumni Relations, Mr. Ruben de Jesus C. Medina,

Associate Director, Global Advancement and Ms. Anita Garg (Advisor for India) from University of Notre Dame, USA

Ms. Wenwei Wu, International Development Manager, International Relations, University of Birmingham and Ms. Aprajita Kalra, Country Coordinator, University of Birmingham – India Office

Prof. Zoubeir Lafhaj, Dean of International Affairs and Prof. Genevieve Dauphin-Tanguy, Professor of Control Design from Ecole Centrale de Lille, France

Prof. Armel de La Bourdonnaye, Director and Mr. Thibault Skrzypek, Project Manager, International Relations Department from Ecole nationale des ponts et chaussees, France

Associate Prof. Lina Taylor, Pro Vice-Chancellor International and Ms. Julia Shelley, Senior Regional Manager from University of Western Sydney

Dr. William Brustein, Vice Provost of International Affairs and Global Strategies, Michael Drake, President, Dr. Steven A. Ringel, Director, Institute for Materials Research, Prof. Vishnu Baba Sundaresan, Asst. Prof., Mechanical & Aero Engg. from Ohio State University

Prof. Iain Martin, Vice-President and Deputy Vice-Chancellor, Academic and Mr Keith Johnstone, Director, Diplomatic & Network Relations from UNSW, Australia.

Dr. Oron Shagrir, Professor of Philosophy and Cognitive Science and the vice rector of the Hebrew University of Jerusalem, Prof. Eric Zimmerman, Inter Disciplinary Center, Herzilia and Prof. Joseph Klafter, President, Tel-Aviv University

MoU Signing with Loughborough University, UK on November 7, 2014

Professor Pearson and Ms. Sandra Meiras, from University of Sydney

Mr. Charlie Carter, Director, International Office, Mr. Martyn Edward, Deputy Director, International Office and Professor Robert Allison, Vice Chancellor from Loughborough University.

Jean Chazelas from Thales,Jean-Yves Marzin from CNRS INSIS, Gilles Coppin from CNRS LABSTICC, Chamira Lessigny from CNRS DERCI, Dominique Aymer de la Chevalerie from DERCI – CNRS Office New Delhi and Sandrine Maximilien from SST- French Embassy.

Prof. Liu Jianping, Chairman of University Council, Prof. MA, Jianguo, Dean, School of Electronic Information Engineering and Prof. (Ms.) Zhang, Zhen, Deputy Director, Office of International Cooperation from Tianjin University.

Professor Ian Young, Vice-Chancellor and President, Ms. Angela Watkins, Director, International and Admissions and Mr Alexander Yee, Acting Manager, International Division of Student Recruitment and Admissions from The Australian National University.

Ms. Catriona McCarthy, Deputy Director, International Office, University of Edinburgh and Amrita Sadarangani, Director, University of Edinburgh – India Liaison Office.

A group of fifteen students from Coventry University, UK

A delegation from University of Manchester, UK

Mr. Michael Bright, Head of International Strategy, Economic & Social Research Council and Dr. Nafees Meah, Director, Research Councils UK, India.

A delegation from University of Deusto, Ms. Maria Ortiz-Coronado Lopez, International Tuning

Academy (DITA), Mr. Robert Wageenar and Ms. Edurne Bartolome.

A delegation led by the Consul General of Canada.

Prof. Gautam Saha, Director- South Asia, Rhine-Waal University of Applied Sciences, Germany, along with Prof. Georg Bastian & Prof. Alexander Struck.

Prof. Wellings, Vice-Chancellor and Prof. Chicharo, Deputy Vice Chancellor International from University of Wollongong.

Mr. Mark Pierce, Australian Consul-General and Mr. Joyce Pereira, Executive Assistant & Consular Officer Australian Consulate General, Mumbai.

Ms. Angela Watkins, Director, International and Admissions, Australian National University and Mr. Alexander Yee, Regional Manager, India.

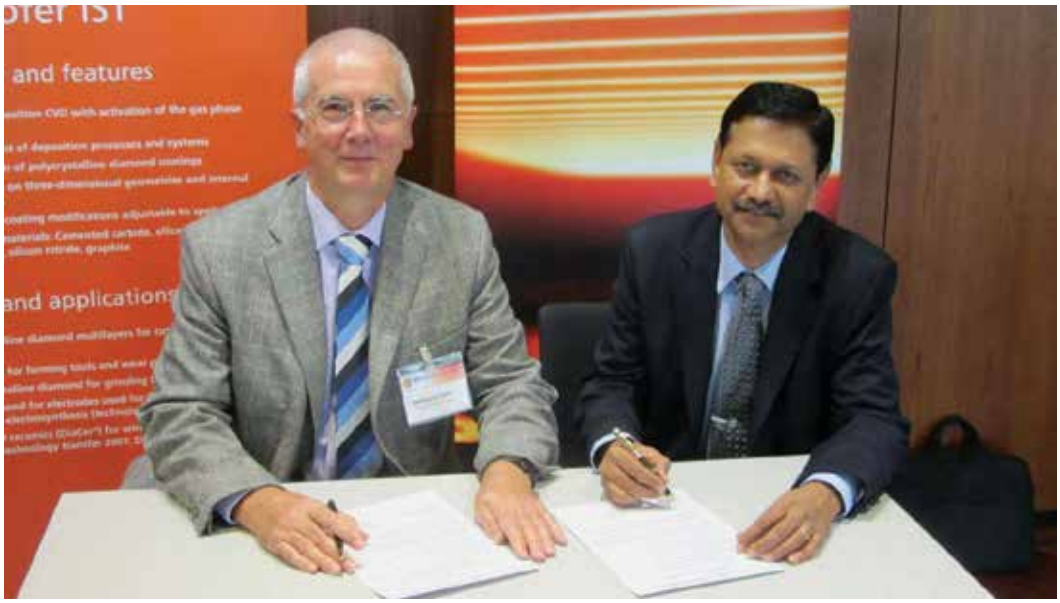
Mr. Andrei U. Zhidkov, Vice-consul of the Russian Federation in Mumbai and Prof. Sanjay Deshpande, Director, Centre for Central Eurasian Studies, University of Mumbai

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

MoU Signing with University of Wollongong, Australia on April 25, 2014

International Students

A total of 42 International Students from Bangladesh, Ethiopia, Finland, France, Germany, Mexico, Nepal, The Netherlands, Singapore, Sweden, Switzerland, Turkey and USA, have joined the Institute for course work / project work / post graduate studies.



MoU signing with the Fraunhofer Institute for Surface Engineering and Thin Films, Germany on October 8, 2014

	Name of the University	No. of students/ Programmes
1	Nanyang Technological Univ, Singapore	Two Dual Degree (DD) students from Electrical Engineering Dept., and One B.Tech. student from Department of Physics.
2	National University of Singapore	One DD student from Chemical, Two DD students from Electrical, One DD student from Department of Mechanical Engg., Three B.Tech. students from Electrical, Mechanical and Metallurgical Engg. & Materials Science, respectively.
3	ETH Zurich	Two Dual Degree students from Metallurgical Engg. & Materials Science and One B.Tech. student from Department of Civil Engineering.
4	Ecole Centrale Paris, France	Two Dual Degree students from Department of Energy Science and Engineering and Two B.Tech. students from Department of Mechanical Engineering
5	The Cooper Union for the Advancement of Science and Art, USA	Two Dual Degree students from Electrical Engg., One Dual Degree student from Chemical Engg. and One B.Tech. student from Civil Engg.
6	Universidad Politecnica de Madrid (UPM), Spain	One Dual Degree student from Dept. of Energy Science and Engineering
7	KTH Royal Institute of Technology, Sweden	Two Dual Degree student from Energy Science and Engineering
8	Rice University, USA	One Dual Degree student from Metallurgical Engg. & Materials Science
9	The Korea Advanced Institute of Science and Technology (KAIST), Korea	One B.Tech. student from Aerospace Engg.
10	University of Toronto, Canada	One B.Tech. student from Physics Dept., and One Dual Degree student from Mechanical Engg.
11	Institut National des Sciences Appliquees de Lyon (INSA Lyon), France	One Dual Degree student from Mechanical Engg.
12	Aalto University, Finland	One Dual Degree student from Mechanical Engg.
13	Technical University of Denmark	One B.Tech. and One Dual Degree student from Chemical Engg.,
14	Telecom Ecole de Management, Paris	One M.Mgmt., student from SJM School of Management
15	Bogazici University, Turkey	One B.Tech. student from Chemical Engg.

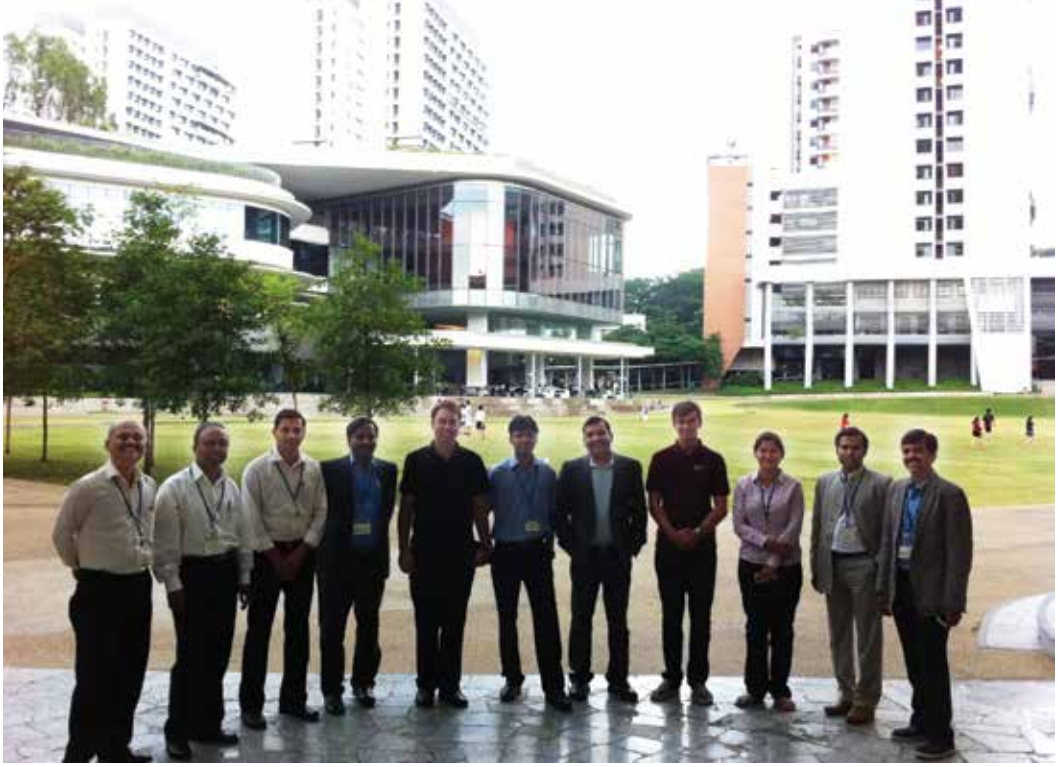
Foreign Language courses: Following language courses for the students and staff of IITB in the Autumn and Spring semester were organised :-

- 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)*
- Italian *(in association with University of Pavia, Italy)*

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

IITB - University of Toronto Workshop

In collaboration with the University of Toronto (U of T), the Institute organised one-day research workshop on January 28, 2015. There were four parallel sessions, held between faculties from U of T and IIT Bombay, including presentations pertaining to current research area at both the institutions. As a result, several commonalities and complementary strengths were identified for possible joint collaboration.



IITB-NUS joint workshop at Singapore

NUS edition of the IITB-NUS joint research workshop was held at NUS during February 25-26, 2015 on 'Energy' and several faculty members from the Department of Energy Sciences and Engineering, Department of Metallurgical Engineering and Materials Science and the Department of Physics from IIT Bombay participated in the workshop. The culmination of this workshop was done by identifying research topics for joint Ph.D. students.

IITB-NCCU Taiwan Workshop

IIT Bombay and National Chung Cheng University, Taiwan, jointly organised a workshop on 'Advanced Manufacturing, Bio Sensing and Smart Grids' on March 2 - 3, 2015 at IIT Bombay. Joint supervision of Ph.D. students was finalized as the mode of collaboration, during the workshop, each Institute promised to support the students for travel and local hospitality.

MoU Signing with the Australian National University, Australia on September 15, 2014

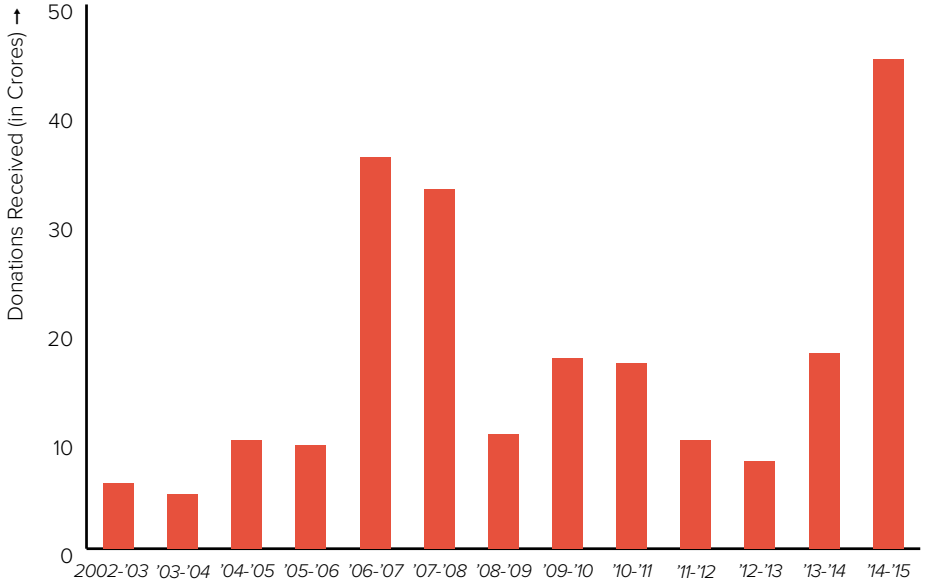
Alumni & Corporate Relations

The Dean Alumni and Corporate Relations (ACR) Office integrates two strategic thrusts for IIT Bombay. One is nurturing and enhancing Alumni Relations and other is the same with Corporations. The Institute requires substantial financial resources for continued modernization of facilities. Although the Government of India continues to be the primary source of funds for the Institute, the Office of Dean ACR performs the important task of raising additional resources from the alumni and other well-wishers of IIT Bombay.

This year a sum of Rs. 48 crores was received by the Institute through donations from alumni and corporations. The major donors, among others, were Sir Dorabji Tata Trust, HAL, BFL, AMAT, and Class of 1989.

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

Institute Development Fund: This fund primarily caters to the needs of the institute, such as modernisation 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, which provides a grant of Rs. 1 lakh per year for the first four years to newly recruited young faculty members. This grant acts as an incentive to the prospective faculty.

Chair Professorship: The Chair Professorship is a distinguished academic position of the institute. Besides acting as a recognition for the permanent faculty of 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. At present, more than 25 named Chairs are endowed by the donors along with the Institute 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.

Student Development

a. ***Scholarships:*** One way to nurture excellence amongst students is by awarding scholarships to deserving candidates. The scholarships funded by the alumni, trusts and corporations supplement the scholarship available from government funds and enable the institute to provide support to a larger number of deserving students. During the year 2014-15, 230 scholarships of varying amounts were granted.

b. ***Awards and Prizes:*** As every year, 50 awards and prizes of varying amounts and forms (certificates, medals, etc.) were given away during 2014-15.

Major Events:

a. ***Alumni Day:*** The Alumni Day, celebrated on December 28, 2014, saw five of the alumni, who have contributed in a notable and sustained manner to the progress of the institute, being honoured with the Distinguished Service Award. Their names are :

- Mr. Raj Laad, B.Tech. (1982), Electrical Engineering
- Mr. Shankar Narayan, M.Tech. (1992), Energy Systems
- Mr. Saumil Majmudar, B.Tech. (1993), Metallurgical Engineering and Materials Science
- Mr. Atul Narkhede, M.Tech. (1993), Computer Science & Engineering
- Mr. Abhishek Mangalick, B.Tech. (2004), Mechanical Engineering

Awardees with Prof. Devang V. Khakhar, Director, IIT Bombay

The Silver Jubilee Batch of 1989 expressed their desire to help attract young faculty, support retired faculty and provide additional financial assistance for underprivileged students through their Legacy Project and handed over a ceremonial cheque of Rs. 3 crores, on the occasion. The Ruby Jubilee batch (1974) and the Decennial batch (2004) also addressed the meet.

b. ***Foundation Day:*** The Foundation Day of the Institute was celebrated on March 10, 2015. During the function, 13 alumni were honoured with the Distinguished Alumnus Award (DAA) and six alumni with the Young Alumni Achievers Award (YAAA). The DAA is conferred on those alumni who have reached positions of eminence in the areas of Business, Academics, Research, Government, Public Service and Entrepreneurship. The YAAA is presented to those who have shown outstanding achievements in their chosen fields of work and are below 40 years of age.

The recipients of the Distinguished Alumnus Award are as follows:

- Prof. Srinivasan Raghunathan, M. Tech. (1966) & Ph.D (1970), Mechanical Engineering
- Prof. Ajit Rangnekar, B.Tech. (1968), Chemical Engineering
- Prof. R.V. Hosur, M.Sc. (1973), Chemistry

DAA and YAA awardees with Chief Guest Prof. S.P. Sukhatme, Former Director of IIT Bombay and Former Chairman of Atomic Energy Regulatory Board and Prof. Devang V. Khakhar, Director, IIT Bombay

- Dr. Vijaya Korwar-Gallagher, B.Tech. (1976), Electrical Engineering
- Prof. Gautam Barua, B.Tech. (1976) & M.Tech. (1978), Electrical Engineering
- Prof. George Varghese, B.Tech. (1981), Electrical Engineering
- Prof. Ketan Mulmuley, B.Tech. (1981), Electrical Engineering
- Prof. S. Ramakrishnan, M.Sc. (1982), Chemistry
- Mr. Harish Badami, B.Tech.(1985), Chemical Engineering
- Prof. Srikant Sastry, M.Sc. (1986), Physics
- Lt. Gen. Dr. Ravindra Singh Panwar, M. Tech. (1988) & Ph.D (1992), Computer Science & Engineering
- Dr. Dharmendra Modha, B.Tech. (1990), Computer Science & Engineering
- Prof. Subhash Khot, B.Tech. (1999), Computer Science & Engineering

The following were presented with the Young Alumni Achievers Award:

- Mr. Gagan Bhalla, B.Tech.(1996), Civil Engineering
- Mr. Ursheet Parikh, B.Tech. (1998), Computer Science & Engineering
- Prof. Devavrat Shah, B.Tech. (1999), Computer Science & Engineering
- Mr. Vishal Gupta, B.Tech. (2000), Electrical Engineering
- Prof. Sachin Katti, B.Tech. (2003), Electrical Engineering
- Mr. Zishaan Hayath, B.Tech. + M.Tech. (2005), Civil Engineering

c. ***Valedictory Function:*** Dean ACR Office, in association with the IIT Bombay Alumni Association and Dean of Student Affairs, organised the Valedictory Function for the graduating students on May 3, 2014. Prof. Dipan Ghosh, Department of Physics, addressed the graduating class of 2014. On the occasion six core team members of the outgoing Student Alumni Relationship Cell team were honoured by the Dean of Student Affairs Prof. Urjit Yajnik, for their outstanding work and contribution to alumni and corporate relations throughout the year.

d. ***Student Alumni Meet:*** Started in 2011, Student Alumni Meet (SAM) is a flagship event of the Student Alumni Relations Cell (SARC), which acts as a platform to facilitate Student-Alumni interactions and enable students to avail the benefits of IIT Bombay's pool of experienced alumni. Mr. Bharat Kewalramani, delivered the keynote address and talked about various ways students deal with success and failure. A large number of alumni participated and interacted with the current students on campus during the meet.

e. ***Joint Workshop of IITB-MIT:*** The first 5-day workshop of the Tata Centre for Technology and Design, IIT Bombay and Massachusetts Institute of Technology, organised jointly, was held in August 2014. The workshop was attended by about 200 students and faculty members from MIT, and IIT Bombay, industry experts and social entrepreneurs.

f. ***Yale – IIT Alumni Leadership Conference:*** IIT Bombay in collaboration with Yale University, organised the Alumni Leadership Conference on the theme "how to create and sustain alumni organizations for the benefit of the Institute", on January 12, 2015. Senior officials and around 30 alumni leaders from Yale University, and Deans, alumni leaders and students from older IITs, participated in the conference. The participants shared the best practice that foster alumni communities, or "friends for life", in a session at the conference.

g. ***CSC Leaders for Students programme:*** CSC Leaders is a partnership between international leadership development programme "Common Purpose" and HRH The Duke of Edinburgh's Commonwealth Study Conferences (UK Fund). CSC Leaders for Students are leadership development programmes held in major Commonwealth cities where significant numbers of students from across the Commonwealth study. The programme took students off the campus to spend time with leaders in a city, gaining insights into how the city operates through discussion, debates, case studies and group work. CSC Leaders for students organized a leadership summit from August 4-7, 2014, at IIT Bombay. Around 80 students participated in the programme.

h. ***FAN Meet & Distinguished Alumni Meet:*** IIT Bombay's first ever Faculty Alumni Network (FAN) India Symposium entitled 'Energy and Climate' was organised at Hotel Taj Exotica in Goa on January 17, 2015. The keynote address was delivered by Prof. Mark Wrighton, President, Washington University in St. Louis, USA. A two-day Distinguished Alumni Meet, focused on creating a World Class Institution with Indian Heritage, Strengthening Engagement with Corporate Sector and Alumni as Lifelong Stakeholders, was also held at the venue during January 17-18, 2015.

i. ***US Roadshow by IIT Bombay delegation:*** An official delegation from IIT Bombay consisting of Prof. D.V. Khakhar, Director, Prof. H.S. Pandalai, Deputy Director (Finance & External Affairs), Prof. Ravi Sinha, Dean (Alumni & Corporate Relations), Prof. J.K. Verma, Dean (Faculty Affairs), Prof. R.O. Dusane, Dean (International Relations) and Prof. P.M. Mujumdar, Dean (Research & Development), visited several universities, research organisations and companies, during October 8-21, 2014. The major highlights of the roadshow are given below:

1. The Faculty Alumni Network (FAN) Symposium, held during the US Roadshow, was hosted at Santa Clara, California, on the theme "Data Management, Mining and Analytics" and was attended by around 50 alumni members. During the symposium, the delegation held interactions with the participants, and clarified their doubts regarding the academic activities at IIT Bombay and the expectations from new faculty members.
2. Meetings with Universities: During the roadshow, the delegates visited the University of Washington at Seattle, University of Washington at Bothell, Northwestern University, University of Notre Dame, Cooper Union, Ohio State University, Wayne State University, George Mason University, University of Taxas at Dallas, University of Texas at Arlington, Washington University in St. Louis, Stanford University and University of California at Berkeley, and held meetings to discuss the university leadership, review of MoU, interactions with alumni and graduate students who may be interested in faculty positions at IIT Bombay.
3. Meetings with Companies & Research Organisations: The IIT Bombay delegation participated in meetings with a large number of companies and research organisations during the roadshow. These include Motorola Solutions, Microsoft Research Lab., LG Chem, General Motors, Ford Motor Company, SundbergFerar, Emergent Systems, Noblis, Alion, DARPA Defense Sciences, 1776, Seimens Product Lifecycle Management Software, McDonald's Innovation Center, AT&T Foundry. The faculty interests with the topics of interest to these organisations are being mapped as well as faculty interactions are being facilitated.
4. Alumni Chapter Events: Chapter meetings involving alumni get together were organised by the following chapters during the roadshow: Boston, Seattle, Chicago (Evanston), New York, Detroit, Dallas, Washington DC and Santa Clara (Bay Area Chapter). During the chapter meetings, an update of the current activities of the Institute was presented. The

opportunities of engagement of the alumni with the Institute were also highlighted during the chapter meetings. There was tremendous interest among the alumni to participate in the development of the Institute. The opportunities that were discussed included interactions/mentoring students, offering internship opportunities to students, partnering faculty members in their research activities and delivering expert lectures at IIT Bombay.

5. Meeting with Distinguished Alumni: During the roadshow, the delegation also held meeting with Institutes Distinguished Alumni. They met with Mr. Parag Saxena, Mr. Suresh Shenoy, Mr. Sudhakar Shenoy and Mr. Pratim Biswas. The distinguished alumni reiterated their support to IIT Bombay and their desire to leverage their knowledge for the benefit of the Institute.

j. ***Lecture Series:*** The following lectures were organised with the involvement of Dean ACR Office.

Professor K.C. Khillar Lecture Series: The Professor K.C. Khillar Memorial lecture was delivered by Dr. Makarand Phadke, Senior Vice President, Innovations, Reliance Industries Ltd., Pune, in April 2014. The title of the lecture was: "Chemical Engineering – Evolution To-date & Journey Forward".

TechniGraphicS Lectures: TechniGraphics Lecture was delivered by Mr. Sajjan Jindal, Chairman and Managing Director, JSW Group on "JSW – The Rise of the Phoenix" on September 24, 2014.

Indira Foundation Distinguished Lecture: The Second Indira Foundation Distinguished Lecture was delivered on October 29, 2014, by Prof. Uriel Frisch, Lagrange laboratory, Observatoire de la Cote d'Azur, University of Nice, on 'Cauchy's almost forgotten Lagrangian formulation of the Euler equation for 3D incompressible flow'.

Institute Events

52nd Convocation

The 52nd Convocation of the IIT Bombay was held on August 9, 2014. Dr. R. A. Mashelkar, National Research Professor and the President of Global Research Alliance, National Chemical Laboratory, was the Chief Guest and delivered the Convocation Address.

Chief Guest Dr. R.A. Mashelkar with Dr. Anil Kakodkar and Prof. D.V Khakhar, awarding the President of India Gold Medal to Raaz Dwivedi.

At the 52nd Convocation 2270 degrees were awarded : B.Tech. - 536, Dual Degree (B.Tech. & M.Tech.) - 229, M.Sc. (5 Yr. Int.) -14, M.Sc. (2 Yr.) – 200, Dual Degree (M.Sc.-Ph.D.) - 5, M.Tech. - 619, M.Des. - 57, M.Phil. - 15, M.Mgt. - 114, PGDIIT (Exit) – 15 and Ph.D – 216, M.Tech.+Ph.D. - 6, MS By Res – 4.

Medals

The President of India Medal was awarded to *Raaz Dwivedi*, and Institute Gold Medal was awarded to *Rahul Sharma*, Silver Medalists for Dual Degree Programme were:- *Bendarkar Mayank Vasant*, Aerospace Engg.; *Patkar Shalmali Suresh*, Chemical Engg.; *Soumil Agrawal*, Civil Engg.; *Tejas Naphade*, Electrical Engg.; *Aakash R. Jhaveri*, Energy Science & Engg., *Pinkesh Malhotra*, Mechanical Engg; *Sheshank Kumar*, Metallurgical Engg. and Materials Science; *Rahul Sharma*, Engineering Physics; Bachelor of Technology Programme:- *Akshay Shetty*, Aerospace Engg.; *Akanksha Thawani*, Chemical Engg; *Singh Namrata AC*, Civil Engg; *Vipul Singh*, Computer Science & Engg; *Raaz Dwivedi*, Electrical Engineering; *Mehta Malhar Saurabh*, Mechanical Engg.; *Mandaliya Aditya Manhar*, Met.Engg. & Mat. Science; *Chirag Modi*, Engineering Physics; Master of Science Programme: Chemistry- 2 yr. M.Sc- *Ashesh Ghosh*; 5 yr. Int. M.Sc.- *Pritha Verma*; Earth Sciences- Applied Geology- *Anima Mahanta*, Applied Geophysics- *Vaibhav Jain*; School of Bioscience & Bioengg- Biotechnology- *Gadre Purna Sham*; Mathematics- *Jyoti Dasgupta*, Applied & Stat. & Informatics- *Dibyo Ghosh*; Physics- *Richa Mitra*.

56th Foundation Day

IIT Bombay celebrated its 56th Foundation Day on March 10, 2015. Prof. S.P. Sukhatme, Former Director of IIT Bombay and Former Chairman of Atomic Energy Regulatory Board (AERB), was the Chief Guest. The Institute honoured 13 of its alumni with the Distinguished Alumnus Award-2015 and six with the Young Alum Achiever Award-2015. The "Prof. S.C. Bhattacharya Award for Excellence in Pure Sciences–2014" was conferred on Prof. M.S. Balakrishnan, Department of Chemistry, and The "Prof. H.H. Mathur Award for Excellence in Research in

Prof. D.V. Khakhar presenting memento to Prof. Sukhatme

Applied Sciences–2014" was presented to Prof. S. Sudarshan, Department of Computer Science and Engineering, and Prof. Vivek Agarwal, Department of Electrical Engineering.

Teacher's Day

The 56th "Teacher's Day" was celebrated on September 5, 2014. Prof. R. Ramaswamy, Vice Chancellor, University of Hyderabad, was the Chief Guest. The "Excellence in Teaching Award–2014", "IRCC Research & Industrial Consultancy Award– 2013" and the "Dr. P. K. Patwardhan Technology Development Award-2013" were presented on the occasion.

Awards for Excellence in Teaching (2014), were presented to

- Prof. Paulomi Chakraborty, Humanities & Social Sciences
- Prof. C. D. Sebastian, Humanities & Social Sciences
- Prof. V. M. Gadre, Electrical Engineering
- Prof. V. K. Singh, Chemistry
- Prof. Dinesh K. Sharma, Electrical Engineering
- Prof. Ranjith Padinhateeri, Biosciences & Bioengineering
- Prof. Prakash Nanthagopalan, Civil Engineering
- Prof. Sanjeeva Srivastava, Biosciences & Bioengineering
- Prof. B. V. Limaye, Mathematics
- Prof. T. K. Biswal, Earth Sciences

Dr. P. K. Patwardhan Technology Development Award (2013) was awarded to:

- Prof. N.G. Shah, Centre for Technology Alternatives for Rural Areas and his team.
- Prof. S.M. Mahajani, Department of Chemical Engineering and his team.

IIT Bombay Research Paper Award (2013)

- Prof. S.K. Maiti and D.P. Patil, Department of Mechanical Engineering.
- Prof. Anuradda Ganesh, Department of Energy Sciene and Engineering (and Piyali Das, Promod Wangikar, Chemical Engineering)
- Prof. Anirban Sain, Department of Physics (and Biplab Ghosh)
- Prof. M. Ravikanth, Department of Chemistry (and M. Rajeswara Rao, Shaikh M. Mobin)

IIT Bombay Review Paper Award (2013)

- Prof. Chebrolu Pulla Rao, Department of Chemistry (and Roymon Joseph).
- Prof. P.I. Pradeepkumar, Department of Chemistry (and Siddarth Shukla, Chintan S. Sumaria)

Smt. Smriti Z. Irani, Hon'ble Minister HRD interacting with IIT Bombay Students

IIT Bombay Young Investigator Award (2013)

- Prof. P. Vedagiri, Department of Civil Engineering
- Prof. Debraj Chakraborty, Department of Electrical Engineering

IIT Bombay Industrial Impact Award (2013)

- Prof. Milind D. Atrey, Department of Mechanical Engineering

His Excellency Ali bin Masoud bin Ali Al Sunaidy, Minister of Commerce & Industry of the Sultanate, Oman, interacting with students.

Vanamahotsav 2014

Vanamahotsav 2014 was celebrated on July 19, 2014. Saplings were planted at the Hill Top (behind Ananta Building), at the IIT Bombay campus.

Centre of Excellence in Steel Technology (CoEST)

A new centre, Centre of Excellence in Steel Technology was inaugurated by Shri G. Mohan Kumar Secretary, Ministry of Steel, Government of India, at IIT Bombay on June 20, 2014.

Conferences/Colloquia/Lectures/Seminars

Many conferences and lectures were organised during the past year. Some of them have been mentioned earlier and few are listed below:

Prof. Vikas Chitre, Honarary Fellow and president, Indian School of Political Economy, Pune, spoke on "Voters Response to Economic and Governance Outcomes and Electoral Trade-off between Inflation and Growth: Evidence from 2009 Lok Sabha Elections", at an Institute Colloquium on April 7, 2014

Dr. Sriram Parasuram, Musician, Musicologist, Performing Musician, spoke on "Raga – A Design Idea", at an Institute Colloquium on July 24, 2014.

Prof. Rakesh Agarwal, Winthrop E. Stone Distinguished Professor, School of Chemical Engineering, Purdue University, USA, spoke on "Engineering a Sustainable Energy Future", at an Institute Colloquium and Institute Distinguished Lecture (in memory of Professor C.V.

Mr. Eberhard van der Laan, Mayor of Amsterdam, with Prof. R.O. Dusane, Dean (IR), IITB

Seshadri) on October 9, 2014.

Prof. H.K. Gupta, FNA, FTWAS, National Geophysical Research Institute, Hyderabad, spoke on "Triggered Earthquake in Koyna region", at Professor Daulat Singh Kothari Memorial Award Lecture of the Indian National Science Academy on October 30, 2014.

Prof. Nitash P. Balsara, Professor of Chemical Engineering, University of California, Berkeley, and Faculty Scientist, Lawrence Berkeley National Laboratory, University of California, USA, spoke on "Nanostructured Block and Biofuels Purification", at an Institute Lecture on November 10, 2014.

Dr. Paul A. Rosen, NASA-ISRO Synthetic Aperture Radar, (NISAR) Project Scientist Jet Propulsion Laboratory, NASA, Los Angeles, California, USA, spoke on "The Shuttle Radar Topographic Mission: A 3D view of Earth for the New Millennium", at an Institute Colloquium on November 22, 2014.

Prof. Riti Singh, Emeritus, Cranfield University, United Kingdom, spoke on "Advanced Gas Path Diagnostics" Opportunities & Challenges in Gas Turbines", at an Institute Lecture on November 25, 2014.

Prof. Michel Waldschmidt, CNRS Professor, University of Paris VI, France, spoke on "Multiple Zeta Values", at an Institute Lecture on November 26, 2014.

Dr. Herbert W. Roesky, Emeritus Professor, Institute for Inorganic Chemistry, University of Goettingen, Germany, spoke on "Interstellar Space", at an Institute Lecture on December 8, 2015.

Prof. V. Chandrasekhar, Director & Professor, National Institute of Science Education and Research, Bhubaneswar, spoke on "Single Molecule Magnets (SMMs)", at an Institute Lecture on December 12, 2014.

Dr. David Wisler, GE Aviation, Chief R & Technologist, (formerly GE Aircraft Engines) – retired, MIT CDIO Engineering Education Initiative, United States, spoke on "Rethinking Engineering Education", at an Institute Colloquium on December 19, 2014.

Prof. M.S. Raghunathan, Distinguished Visiting Professor and NASI Platinum Jubilee Chair, Department of Mathematics, IIT Bombay, spoke on "India's mathematicians in the post-Ramanujan era", on the occasion of the National Mathematics Day celebrations on December 22, 2014.

Prof. Krzysztof Matyjaszewski, J.C. Warner University Professor of Natural Sciences, Professor of Chimistry and Director, Center for Macromolecular Engineering, Carnegie Mellon University, USA, spoke on "Nanostructured Multifunctional Hybrid Materials via Macromolecular Engineering using Atom Transfer Radical Polymerization", at an Institute Lecture on January 5, 2015.

Prof. Akeel Bilgrami, Sidney Morgenbesser Chair in Philosophy, Professor, Committee on Global Thought, Director, South Asian Institute, Department of Philosophy, Columbia University, New York, USA, spoke on "The Political Enlightenment and its other", at an Institute Lecture on January 13, 2015.

Prof. Vijay Govindarajan, Coxe Distinguished Professor at Tuck School at Dartmouth and Marvin Bower Fellow at Harvard Business School, spoke on "Reverse Innovation", at an Institute Colloquium on January 15, 2015.

Prof. Anthony K. Cheetham, FRS, Goldsmiths' Professor of Materials Science, Department of Materials Science and Metallurgy, University of Cambridge, UK, spoke on "Flexibility and

Defence Minister Manohar Parrikar during Alumni Day celebrations

Phase Transitions in Metal-Organic Frameworks", at the inaugural talk of the Professor C.N.R. Rao Lecture Series on Nanoscience and Nanotechnology on January 19, 2015.

Prof. Michel Danino, Visiting Faculty, IIT Kanpur and IIT Gandhinagar, spoke on "Science in Ancient India", at an Institute Lecture on January 27, 2015.

Mr. Sajjan Jindal, Chairman & MD, JSW Steel Ltd., visits Treelab at IIT Bombay

Prof. Nitin Nitsure, Professor of Mathematics, Tata Institute of Fundamental Research, Mumbai, spoke on "Euclidean Geometry, Analysis and Physics", at an Institute Colloquium on January 29, 2015.

Prof. Murugappan Muthukumar, Polymer Science and Engineering, University of Massachusetts, Amherst, USA, spoke on "Menagerie of Viruses", at an Institute Colloquium on February 11, 2015.

Prof. S.D. Mahanti, Michigan State University, USA, spoke on "Thermoelectricity, History, Renaissance, and Challenges" at an Institute Lecture on March 11, 2015.

Prof. B.M. Deb, INSA Senior Scientist and Scholar-in-Residence, Visva-Bharati University, Santiniketan, spoke on "Glimpses into Classical Indian Art", at an Institute Colloquium on March 18, 2015.

Prof. Bill Angelakos, Associate Dean - Design Programs, School of Applied Technology, Humber College, Canada, visited IDC

IIT Bombay and Volvo Research and Education Foundation (VREF) and Center for Excellence for Sustainable Urban Freight Systems, Rensselaer Polytechnic Institute, Troy, NY, jointly organised a workshop on "Urban Freight Transport: A Global Perspective" during April 9-10, 2014.

FOSSEE, IIT Bombay, organised a one-day workshop on "Oscad" on April 12, 2014.

MHRD-TEQIP-KIT in collaboration with ABHYUDAY, the social festival of IIT Bombay, organised Sammilan – The first annual Conference on Urban Rural Divide Bridging the Technology gap, during August 16-17, 2014.

The ***Department of Computer Science and Engineering*** organised a two-day ISTE main workshop on "Computer Networking" from June 30 – July 5, 2014.

The ***Department of Earth Science and Civil Engineering*** organised a two-day MHRD-TEQIP-KIT workshop on "Ocean and Atmospheric Sciences – Current Trends" during July 18-19, 2014.

FOSSEE, IIT Bombay organised the "Scilab India Conference 2014" and an International Conference SciPy India 2014 on 'Python for education and scientific computing' during December 3-7 and 5-7, 2014 respectively.

The ***Department of Biosciences & Bioengineering*** organised the Sixth annual meeting and International Proteomics Conference on "Proteomics from Discovery to Function" from December 5-7, 2014.

The ***Department of Humanities and Social Sciences*** organised an International Conference on "Knowledge and Moral Identity" during January 13-16, 2015.

The ***Department of Humanities and Social Sciences, Centre for Urban Science and Engineering, IIT Bombay, and Centre for Urban Studies, University of Amsterdam,*** jointly organised a two-day symposium on "Sustainable Urban Development: Practices, Problems and Prospects", during March 25-26, 2015.

Hindi Cell

Hindi Cell is actively engaged in providing support for implementation of Hindi in the Institute. The Institute's circulars, registers, forms, visiting cards, signboards, and degree certificates are prepared in bilingual form. Hindi workshops titled "correspondence in Hindi", "Noting and Drafting in Hindi" etc. were conducted during the year for staff members of the Institute. The cell continues to send Hindi synonyms of the administrative terms through the Institutes email (GPO).

"Hindi Pakhawada" was celebrated during September 14-30, 2014, where competitions in essay writing, Dictation and Hindi translation were organised. Awards to institute employees for significant contributions in Hindi implementation were conferred during the event. A session on poetry recitation by eminent poets was also organised during the Pakhawada. Staff members were encouraged to use Hindi in their routine work, and were honoured for their significant contributions.

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.

Departments/ Centres/ School and Interdisciplinary Groups

Science & Engineering Departments: The engineering departments at IIT Bombay offer undergraduate and postgraduate programmes leading to B.Tech, M.Tech or Ph.D degrees. The five-year Dual Degree programme pioneered by the Institute in 1996, offers a B.Tech degree in a basic discipline and an M.Tech degree with specialization in a field on its completion. This programme is now offered by all engineering departments. The Science departments at IIT Bombay were set up to provide basic grounding in Science and Mathematics to engineering students. However, apart from providing core courses in undergraduate programmes, these departments also offer postgraduate courses which lead to MSc or Ph.D.

- Aerospace Engineering
- Biosciences & Bioengineering
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Science and Engineering
- Earth Sciences
- Electrical Engineering
- Energy Science and Engineering
- Mathematics
- Mechanical Engineering
- Metallurgical Engineering and Material Science
- Physics

Arts and Humanities Department: The Arts and Humanities Department at IIT Bombay was set up to familiarize the students of science and technology studies with the broader social, cultural, economic, ethical and humane concerns underlying social change. The advanced courses offered at the PG level aim at cultivating critical thinking and enhancing the analytical capabilities of students engaged exclusively with the study of these concerns. However, these departments offer postgraduate courses which lead to M.Phil, M.Des., and Ph.D.

- Humanities and Social Sciences
- Industrial Design Centre

School: The school offer postgraduate programmes in new, emerging areas and aim to expand the scope of the academic programmes in the Institute. They have been set up with substantial support from IIT Bombay alumni and industry.

- Shailesh J. Mehta School of Management

Centre/Interdisciplinary Groups: The centres and interdisciplinary groups offer postgraduate programmes and reflect the Institute's multi-disciplinary approach and emphasis on staying with cutting-edge technologies in its academic approaches.

- Centre for Environmental Science & Engineering
- Centre of Studies in Resources Engineering
- Centre for Technology Alternatives for Rural Areas
- Centre for Formal Design and Verification of Software
- Centre for Urban Sciences and Engineering
- Centre for Research in Nanotechnoloogy and Science
- Education Technology
- Industrial Engineering and Operations Researchers
- Systems and Control Engineering
- Corrosion Science and Engineering
- Climate Change Studies

Department of Aerospace Engineering

Established in 1966-67 as the Department of Aeronautical Engineering, this department was renamed as the Department of Aerospace Engineering in 1992. The department has a total of 18 faculty members. The academic programs of the department focus mainly on science and engineering/ technology behind flight vehicles and their sub-systems. The curriculum focuses on fundamentals of fluid dynamics, propulsion, structural mechanics, vehicle dynamics, control and guidance etc. as well as applications of these fundamentals to the analysis and design of aerospace vehicles.

Academic Programmes: The department runs strong undergraduate and post graduate programs in Aerospace Engineering and carries out basic and applied research as well as continuing education activities in various sub-disciplines of Aerospace Engineering such as Aerodynamics, Propulsion, Structures, Dynamics and Control, Design and Systems Engineering. The academic programs include the four year B. Tech degree program, the five year Dual Degree program, the two year M. Tech program and the Ph.D. program. The department has around 350 students, out of which about 120 are post graduate students and 230 are undergraduate students.

	Student Intake	Degrees Awarded
B.Tech	56	42
M.Tech	40	53
DD(B.Tech-M.Tech)	—	21
Ph.D	15	2

R&D Activities: During the year 2014-2015, the department has been actively engaged in teaching, research and other professional activities e.g. workshops, seminars, industry interactions, projects, professional development course modules etc.

	New Projects	Ongoing	Completed
Sponsored Projects	6	12	11
Consultancy Projects	7	71	48

During the year 2014-2015, the department has supported many student technical activities such as Mars Rover, Student Satellite etc. Students have also been engaged in national and international competitions as participants / organizers. Notable among the various activities that have been carried out during 2014-2015, are: Methodology for generating optimized contoured end walls in an axial flow compressor cascade, developed by Ph.D student Mahesh Varpe working with Prof. A.M. Pradeep, and New model for turbulent heat flux prediction for application to supersonic and hypersonic flows with shock waves, by Researchers from the Hypersonic CFD group, working under the guidance of Prof. Krishnendu Sinha.

Department of Biosciences & Bioengineering

The Department of Biosciences and Bioengineering comprises two broad areas representing Biotechnology and Biomedical Engineering. The Department aims to create an ambience for the efficacious pursuit of scholarly activity in research and education, and endeavours to produce the leaders of tomorrow in this field.

Academic Programs: The academic programs currently consist of the DBT supported M.Sc Biotechnology program, M.Tech in Biomedical Engineering program, and the Ph.D. program. All these programs are well regarded nation-wide.

	Student Intake	Degrees Awarded
M.Sc	23	27
M.Tech	23	23
DD(B.Tech-M.Tech)	3	—
Ph.D	21	12

The department has introduced a new Introductory Biology course, BB101, for all first year UG students. The course was in its 2nd edition in 2014-15.

R&D Activities: Research in the department encompasses both basic biology and applied bioengineering topics. Three CEP programs were conducted and 30 different S&T events were conducted / participated in.

	New Projects	Ongoing	Completed
Sponsored Projects	31	25	85
Consultancy Projects	—	5	2

Several new cutting edge facilities were added over 2014-15, such as Biosafety level-2 facility, High Field NMR, Confocal Laser Scanning Microscope, to name a few.

Extensive interactions with various groups in Electrical Engineering, Chemical Engineering, Aerospace Engineering, Computer Science, Chemistry and Mathematics made the departmental research activities truly interdisciplinary.

Department of Chemical Engineering

One of the original departments to be established in 1958, the department has evolved from having a classical chemical engineering technology flavour to a current chemical engineering science flavour. The department is one of the largest departments in the Institute in terms of number of faculty members, students enrolled and research funding received. Currently, the department has in its roll 39 core faculty, 8 Adjunct/Visiting faculty, 12 Post-doctoral fellows.

Academic Programmes: The academic programmes offered by the Department are the B.Tech. (4-years), M.Tech (duration 1.5 years), Dual Degree (5-year) and Ph.D. programme (8-year). The department has a total of 757 students (486 B. Tech/ Dual Degree, 79 M. Tech and 192 Ph.D students), 26 Staff and ~150 research assistants.

	Student Intake	Degrees Awarded
B.Tech	120	75
M.Tech	63	27
MS (by Research)	—	1
PGDIIT(Exit)	—	1
DD(B.Tech-M.Tech)	—	42
Ph.D	56	13

R&D Activities: The Department has a strong focus on excellence in education and research. The diverse research areas of the department, including Biological Systems Engineering, Soft Matter Engineering, Process Systems Engineering, Catalysis and Reaction Engineering, Thermodynamics & Molecular Simulations and Energy, Environment & Sustainability. The Department has a strong focus in the subjects relating to Healthcare, Energy and Materials.

	New Projects	Ongoing	Completed
Sponsored Projects	35	87	15
Consultancy Projects	12	42	13

During 2014-15, the department received research grant from government and private agencies to the tune of Rs. 4.17 Crore with 34 new Sponsored projects.

Department of Chemistry

From a small department that started in 1965, the Department of Chemistry at IIT Bombay has grown into a major centre for teaching and research in the area of chemical sciences in India. The department celebrated its Golden Jubilee Year during 2014-15. Today the Department has 35 faculty members with expertise in various areas of chemistry and allied subjects and a large number of motivated young students assisting the faculty in their research.

Academic Programmes: The department offers B. Tech., Masters in Chemistry (2-years), Integrated Masters in Chemistry (5 years), Ph.D. Program and Integrated Masters + Ph.D. program. The department has introduced four new BS programmes in the golden jubilee year. The General Chemistry program of the department, consisting of 2 theory and 2 laboratory courses in the core curriculum of the first year B.Tech./Dual Degree M.Tech. programmes has received much praise for the molecular level understanding it provides to all areas of technology. The department also offers an additional course to third year B.Tech./Dual Degree M.Tech. (Chemical Engineering) students. Furthermore, the department has three well established academic programmes leading to M.Sc., M.Sc.-Ph.D. dual degree and Ph.D. degrees: 2-year M.Sc. for post B.Sc. students & M.Sc.-Ph.D. dual degree with entrance through JAM, 4-year BS with entrance through JEE, and Ph.D. in Chemistry.

	Student Intake	Degrees Awarded
BS (4 Year)	20	13
MSc (2 year)	39	33
DD (M.Sc. + Ph.D)	5	—
Ph.D	41	19

R&D Activities: The Department of Chemistry is involved in research problems of both basic and applied nature in frontier areas through sponsored research projects, and as part of the M.Sc. and Ph.D. programmes. Major areas of research activities carried in the department include Biophysical Chemistry, Coordination Chemistry, Bio-inorganic Chemistry, Organometallic Chemistry, Bio-organic Chemistry, Chemistry of Natural Products, Synthetic Organic Chemistry, Photochemistry and Spectroscopy, Polymer Chemistry, Thermodynamics, Electrochemistry, Solid state Chemistry and Physics Catalysis.

	New Projects	Ongoing	Completed
Sponsored Projects	32	75	25
Consultancy Projects	3	14	4

Inorganic and Organic In-house Symposium was organized on October 16-17, 2014. The department also hosted "Professor Herbert W. Roesky-80 Symposium", in December 2014 and Prof. C.N.R. Rao's lecture also was arranged by the department.

One day symposium was organized on "Trends in Physical Chemistry" during March 13-14, 2015.

Department of Civil Engineering

The Department of Civil Engineering has been a part of IIT Bombay since its inception in 1958. Over the years, the department has grown tremendously, and is now recognised as one of the major engineering department in the country. It has developed strong links with the building and construction industry and the academia, both inside and outside the country. Besides high quality teaching and instruction at both UG and PG levels, the department is actively involved in basic and applied research. With its multifaceted faculty, it provides technical advisory support through various R&D projects and consultancy to infrastructural industry, academic and research institutions.

Academic Programmes: Department is running M.Tech and Ph.D programmes with its traditional B.Tech programme in Civil Engineering. The department is planning to start M.Tech programme in the much needed area of construction technology and management in the near future.

	Student Intake	Degrees Awarded
B.Tech	114	112
M.Tech	66	41
M.Tech + Ph.D	—	2
DD(B.Tech-M.Tech)	—	17
Ph.D	36	12

R&D Activities: The department has strong focus in the research areas of Structural Engineering, Geotechnical Engineering, Water Resources Engineering, Transportation Systems Engineering, Remote Sensing, and Ocean Engineering. Department has 17 high end teaching and research laboratories in all these areas. The department is actively involved in basic and applied research and consultancy and provides high quality technical advisory support through various R & D projects and consultancy to various organizations.

	New Projects	Ongoing	Completed
Sponsored Projects	32	75	25
Consultancy Projects	302	505	336

During the year 2014-15 the department has conducted 11 quality improvement and continuing education programmes for the academicians and field engineers. The 11th International Conference on Transportation Planning and Implementation Methodologies, TPMDC-2014, which saw a participation level of over 300 was successfully conducted during December 10-12, 2014.

Department of Computer Science and Engineering

The Computer Science and Engineering (CSE) department at the Indian Institute of Technology (IIT) Bombay is the largest among CSE departments in any institute in India.

Academic Programmes: The department offers Bachelor of Technology (B. Tech.), Master of Technology (M. Tech.), Dual Degree (B.Tech.-M. Tech.) and Doctor of Philosophy (Ph.D.) programmes in Computer Science. The M. Tech. and Ph.D. are post-graduate programmes, the B. Tech. is the undergraduate programme, while the "Dual Degree (B.Tech.-M.Tech.)" is a programme in which you come in at undergraduate level, stay for five years, and are awarded both a B. Tech. and an M. Tech.

	Student Intake	Degrees Awarded
B.Tech	96	88
M.Tech	115	103
Ph.D	28	11
MS (by Research)	—	1

R&D Activities: The research and teaching in the department spans a wide spectrum of areas including algorithms, animation, artificial intelligence, compilers, combinatorial optimization, computer and medical vision, data mining, embedded systems, formal methods, functional programming, e-commerce, graphics, databases, image processing, machine learning, mobile computing, natural language processing, object oriented systems, parallel and distributed processing, programming languages, reinforcement learning, query processing and optimization, real time systems, security, software engineering, systems, theoretical computer science, wireless and sensor networks, and verification.

	New Projects	Ongoing	Completed
Sponsored Projects	13	77	14
Consultancy Projects	18	45	21

Department of Earth Sciences

The Department of Earth Sciences was constituted in 1982 from the erstwhile Geology Section of the Department of Civil Engineering of IIT Bombay (where an M.Sc. programme in Applied Geology was offered since 1964). The Department draws strength from the reputation of its 20 faculty members with specializations covering a wide spectrum of research areas in Geosciences including both Geology and Geophysics. The faculty are actively engaged in both teaching and research and contribute in reputed international scientific journals and interact with international and national scientific organizations. The close links that the department enjoys

with the industry and research organizations, has worked towards elevating the level and quality of research work and facilities. The department boasts of sophisticated and excellent state-of-the-art laboratories and research facilities including two major national facilities -40Ar/39Ar Mass Spectrometer for Geochronology and Electron Probe Micro Analyzer (EPMA) for Mineral Chemistry. The department is a fine blend of Geology and Geophysics and offers academic programmes in various branches of Geosciences which attract the best students across the country making the Department a leading and much sought after for education and research.

Academic Programme: The Department offers academic programmes leading to M.Sc. (Applied Geology), M.Sc. (Applied Geophysics), M.Tech. (Geo-exploration),M.Tech.(Petroleum Geoscience) and Doctoral Degrees. An M.Sc-Ph.D. dual degree programme is also offered in Geology and Geophysics respectively. The department annually admits about 45 students in its M.Sc. Programmes, about 38 in its M.Tech. programmes and about 20 students in its Doctoral programme. All the core and elective courses included in the Geoscience programs have been specifically designed to meet industry standards and research requirements. The department also works towards building the social and moral character of the students.

	Student Intake	Degrees Awarded
MSc (2 year)	30	32
M.Tech.	31	18
PGDIIT (Ex)	—	10
Ph.D	28	8

R&D Activities: The department has total of 61 Research publications. It has received 15 new projects with a sanctioned outlay of Rs.2,45,73,242/-. Total Income generated from sponsored and consultancy projects Rs.1,62,19,969.7/-

	New Projects	Ongoing	Completed
Sponsored Projects	15	28	11
Consultancy Projects	42	72	49

Department of Electrical Engineering

Since its inception in 1958, the Department of Electrical Engineering at IIT Bombay has been active in teaching and research. Currently, the department has 63 faculty members

Academic Programmes: Initially the department began with three programs to award degrees, namely, Bachelor of Technology, Master of Technology, and Doctor of Philosophy. Since 1996, the department is offering a five year dual degree (Bachelor of Technology and Master of Technology) in the two specializations -- Communications and Signal Processing, and Microelectronics. Since 2009 the department is offering admissions to a new, dual degree (M.Tech + Ph.D) program. This program is designed to induct bright students who have completed their B.E./B.Tech./M.Sc. degrees directly to the doctoral program. Total student strength at present is 1300 out of which about 400 are pursuing Ph.D program.

	Student Intake	Degrees Awarded
B.Tech	66	59
M.Tech	180	109
M.Tech+Ph.D	—	2
PGDIIT (Ex)	—	1
DD(B.Tech-M.Tech)	70	48
Ph.D	67	26

R&D Activities: The research areas of the department include Communications and Signal Processing, Control and Computing, Power Electronics and Power Systems, Microelectronics and VLSI design, and Electronic Systems. In addition it has a strong Department Academic

Mentorship Programs (D-AMP), under the aegis of the Institute Student Mentor Program (ISMP). D-AMP is responsible for helping out Electrical Engineering students who face academic problems. Recently EE Students started new activity namely "Students Reading Group at Electrical Engineering" to improve R&D environment in the department and improvement in communication and presentation skills of the students.

	New Projects	Ongoing	Completed
Sponsored Projects	29	132	21
Consultancy Projects	22	55	23

The department is equipped with the state-of-the-art experimental and computational facilities for undertaking research in various fields. There is a strong collaboration with industry and a number of laboratories are established through such collaboration. Research collaborators also include researchers from several national and international universities, and research organizations.

Department of Energy Science and Engineering

Energy Systems Engineering was founded in 1981 as an interdisciplinary group at IIT Bombay, offering M.Tech and Ph.D programmes. In 2007, the Board group of Governors of IITB approved the growth of Energy Systems Engineering into a Department of Energy Science and Engineering. The department aims to provide manpower and research inputs that are critical for the growth of India's energy sector, and also aims to provide innovative energy technologies and systems to mitigate the global problem of climate change. Currently the department has 20 core faculty and about 30 associate faculty members from other Departments and 380 students.

Academic Programmes: The Department of Energy Sci. & Engineering (DESE) offers Dual-Degree B.Tech-M.Tech programme (intake through JEE), Dual-Degree M.Sc-Ph.D programme (intake through JAM), M.Tech programme in Energy Systems Engineering, Ph.D programme, and Minor programme in Energy Engineering

	Student Intake	Degrees Awarded
DD(B.Tech-M.Tech)	27	22
M.Tech	24	26
DD(MSc.+ Ph.D)	10	—
MSc (2 year)	—	1
PGDIIT (Ex)	—	1
Ph.D	13	4

R&D Activities: The Department's research areas included renewables (Solar PV, Solar thermal and biomass), batteries and storage, power systems and power electronics, energy integration and energy efficiencies and nuclear energy.

	New Projects	Ongoing	Completed
Sponsored Projects	9	33	10
Consultancy Projects	3	7	1

During the year, the 1MW Solar thermal power plant developed by the department team was handed over to the National Institute of Solar Energy, after successful completion of the project. The department faculty were involved in leading several large national projects like the National Centre for Photovoltaics Research and Education, the Solar Energy Research Institute for India and the United States (SERIIUS), Stability and Performance of Photovoltaic (STAPP-Indo-UK) Intelligent Micro-Grids and Advanced Storage of Energy (IMASE-Indo-UK).

Prof. Solanki through his project 1 Million SoUL programme, designed assembled and distributed 7 lakh solar lamps to school children. 800 people were trained in assembling these lamps in over 8,000 villages.

Department of Mathematics

From its inception to the present, the Department of Mathematics has evolved and grown in several directions. The department has 38 faculty members including two emeritus fellows. The department is involved in the formation of a National Centre for Mathematics (NCM) and National Programme on Differential Equation (NPDE). NCM is a collaborative venture of IIT Bombay with the Tata Institute of Fundamental Research designed to promote research and instructional activity for doctoral students and researchers throughout the country . Its apex committee include three faculty members of the department.

Academic Programme: The Department offers two Master's Programme, one in Mathematics and the other in Applied Statistics and Informatics, and also a Ph.D programme. There are also minor programmes for undergraduates offered in both Mathematics and Statistics, in addition to the core undergraduate curriculum.

	Student Intake	Degrees Awarded
BS (4 year)	2	1
M.Sc	58	53
Ph.D	6	3

R&D Activities: The research pursued in the department includes a wide spectrum of interest in both Mathematics and Statistics. The department features a vibrant atmosphere for research, which is further bolstered by collaborative interactions with Mathematics and Statistics department in leading universities and research organisations across the world.

	New Projects	Ongoing	Completed
Sponsored Projects	—	31	1
Consultancy Projects	—	—	—

Department of Mechanical Engineering

The Department of Mechanical Engineering is by far the largest department at IIT Bombay. It has a total of about 50 faculty members involved in teaching and research and more than 200 enrolled Ph.D students.

Academic Programmes: The department offers, besides the flagship B.Tech. program in Mechanical Engineering, M.Tech. and Ph.D. programs. The M.Tech. programs offer specializations in Thermal & Fluids Engineering, Design Engineering, and Manufacturing Engineering. The department has introduced new elective courses; these include Moving Boundary Problems in Solidification, and Energetic Materials. A new Measurements Laboratory has been set up for the undergraduate students.

	Student Intake	Degrees Awarded
B.Tech	129	80
DD (B.Tech + M.Tech)	24	35
M.Tech	105	74
M.Tech. + Ph.D	—	1
PGDIIT (Ex)	—	2
Ph.D	48	14

R&D Activities: Over the last decade, the department has focused on science based research and development, to evolve technological innovation in the areas of Thermal, Fluid, Design and Manufacturing Engineering (Figure 1 and 2). The department has established state-of-the-art research facilities after procuring massive external funding from the Government agencies and private industries. The department also offers an industry-sponsored M.Tech. program in Materials, Manufacturing and Modeling (MMM), in collaboration with the Department of Metallurgical Engineering and Materials Science, and the Department of Mathematics at IIT Bombay.

	New Projects	Ongoing	Completed
Sponsored Projects	22	72	18
Consultancy Projects	22	55	20

A new center, Biomedical Engineering and Technology Incubation Centre (BETIC), was established by Prof. B. Ravi. The center is funded by Government of Maharashtra and Department of Science and Technology, Government of India. The goal of this center is to take up medical device development projects that fulfill four criteria: involvement of committed expert physicians, significant local need, clear scope for innovation, and appropriate technology, along with R&D capability.

Department of Metallurgical Engineering & Materials Science

The department continues its quest for excellence in research and teaching in the areas of metallurgical engineering and materials science. The research output has increased significantly, both in quantity and quality. This has been possible due to substantial funding received from government and non-government agencies. The Centre for Excellence in Steel Technology, funded by the Ministry of Steel, has initiated a number of projects in different thrust areas. Many researchers are visiting the department and faculty is involved in extensive collaborative research. Several faculty members have been conferred with awards and recognitions for their work. Department has recruited several young faculty members and continues to look for bright researchers to join the department.

Academic Programme: An academic review of the M. Tech programme was conducted and the modified curriculum suggested, was accepted by the senate for implementation from the academic year 2015-16.

	Student Intake	Degrees Awarded
B.Tech	86	55
DD(B.Tech-M.Tech)	25	38
M.Tech	61	49
MS (by Research)	—	2
Ph.D	40	11+3 (Corrosion Sci.)

R&D Activities: The department undertook 48 jobs generating Rs.85,40,604/-. The total number of faculty involved was 10.

	New Projects	Ongoing	Completed
Sponsored Projects	17	57	14
Consultancy Projects	42	114	46

Department of Physics

The Department of Physics started in June 1958, as one of the science departments in the Institute at that time. It has a tradition of vibrant teaching and offers many research programmes.

Academic Programmes: The department offers B.Tech in Engineering Physics, Master of Science degree in Physics as well as a Ph.D. Keeping in line with the national science initiative on nanomaterials and nanotechnology, the department started a five year dual degree programme leading to B.Tech and M.Tech degree in Engineering Physics with specialization in nanotechnology and nanomaterials. The department along with Material Science and Metallurgy has started a dual degree programme of M.Sc. in Physics and M.Tech. in Material Science.

	Student Intake	Degrees Awarded
B.Tech	33	25
DD (B.Tech + M.Tech)	10	6
M.Sc.	31	30
DD (MSc + Ph.D)	8	5
Ph.D	19	8
(MSc + M.Tech) [PMS (Phy. Mat. Sci.)]	7	—

R & D Activities: At present the department houses cryogenic facilities like a helium liquefier catering to more than 15 low temperature equipment across the institute, a workshop supporting in house small scale instrumentation, ultrafast optical spectroscopy setup, NMR, high resolution XRD, a clean room for thin film and semiconductor device fabrication and several material growth facilities like CVD, PLD, etc. Many of these facilities are utilized by researchers across several departments.

	New Projects	Ongoing	Completed
Sponsored Projects	12	30	13
Consultancy Projects	1	5	1

Department of Humanities and Social Sciences

Founded in 1958, the Department of Humanities and Social Sciences (HSS) has six disciplines, namely, Economics, English and Linguistics, Philosophy, Psychology, Sanskrit and Sociology. Its faculty offers a wide spectrum of courses at the B.Tech, M.Tech, M.Phil. and Ph.D. levels. The *raison d'être* of the HSS dept stems from the belief that a holistic science and technology education necessitates the inclusion of the study of the liberal arts, economics, and the social and behavioral sciences, so that the application of the sciences for the improvement of the quality of life is informed by an awareness of humanitarian and social concerns.

Academic Programme: Since 1973, the department has been offering a doctoral programme in all its disciplines with emphasis on inter-disciplinary topics. In1993 the department launched a four-semester interdisciplinary M.Phil. programme in Planning and Development. Facilities of the department include a Library, Computer Laboratory, a Psychology Laboratory and Language Laboratory.

	Student Intake	Degrees Awarded
M.Phil.	17	15
Ph.D	37	14

The department has also placed emphasis on establishing collaborations with the outside world through industry, business houses and NGOs.

	New Projects	Ongoing	Completed
Sponsored Projects	3	13	2
Consultancy Projects	—	5	1

During the year 2014, following key events were organized by the department:

- Indo-Japanese International Symposium on "Memory and human well-being: Interdisciplinary perspectives" in November 2014.
- Indo-Dutch International Workshop on "Geographies of fisher response to new claims on coastal space and resources in India" in April 2014.

Industrial Design Centre

Industrial Design Centre (IDC) at IIT Bombay offers an excellent environment for academics, research and applications in the field of design. The centre interacts with industries and institutions for promotion and awareness of design. These are in the form of organizing seminars, conducting short-term courses and workshops. In the area of design practice, IDC offers professional design consultancy and advisory services to industries and other organizations. The potential for innovation at IDC lies fundamentally in terms of solving real world problems.

Academic Programmes: IDC has a well-established Master of Design degree (M. Des.) programme in Industrial Design, Visual Communication, Animation Design, Interaction Design, Mobility and Vehicle Design & Minor courses as well as a Ph. D. programme in Design. The department in 2015 onwards started a four year, eight semester Bachelor of Design (B. Des.) programme for which the admission is carried through the undergraduate Common Entrance Examination for Design 2015 (UCEED) and a five year, ten semester dual degree B. Des. + M. Des. Programme. Both these programmes are credit-based and thus offer the flexibility to progress at one's own pace.

	Student Intake	Degrees Awarded
M.Des.	56	57
Ph.D	6	1

R&D Activities

	New Projects	Ongoing	Completed
Sponsored Projects	22	34	3
Consultancy Projects	12	35	10

Industrial Design Centre, IIT Bombay organised an international conference on Typography "Typography Day 2015" in March 2015. This year's conference focused on 'Typography, Sensitivity and Fineness' which included national and international speakers. A one day design workshop was also organised for students on various aspects of typography. Typoday also hosted an exhibition of typographic works by students and faculty members from different design institutes

Shailesh J. Mehta School of Management

Today, Shailesh J Mehta School of Management has occupied its distinct place in the globe as an institute of excellence in management education and research. The School currently has 23 full-time faculty members in all core fields of management, 3 Adjunct Faculty and many Visiting Faculty.

The year 2014-15 was marked by further strengthening and consolidation of the academic programmes of the School. The School has started a joint Executive Masters in Business Administration (E-MBA) programme with Washington University, 1st of its kind, for the professionals with a minimum of seven years work experience. The programme is spread over duration of 18 months, where classes are held four days in a month in Mumbai and it will end with a two-week capstone experience at Washington University at St. Louis.

Academic Programmes: The school of management offers Doctoral program (Ph. D.) in Management, full time Master of Management, Executive MBA: Jointly by the Shailesh J. Mehta School of Management IIT Bombay India and Olin Business School Washington University in St. Louis USA, Certificate Programmes for Executive Education: Short and long duration in-house and open Management Development Programmes for the Corporate Executives/Professionals of all fields, and B.Tech. (Minor Courses in all areas of Management)

	Student Intake	Degrees Awarded
M.Mgt.	121	114
Ph.D	12	13

R&D Activities: Faculty members of the School are engaged in many research/consultancy projects in all fields of management. Management Development Programmes (MDPs) exclusively for the corporate houses as well as open for all professionals are always on at the School and reshaping the managers, executives and entrepreneurs as future leaders.

	New Projects	Ongoing	Completed
Sponsored Projects	3	16	—
Consultancy Projects	2	7	5

Centre for Environmental Science & Engineering

The Centre for Environmental Science and Engineering (CESE) was established in 1985. The Centre has a core group of 12 faculty members (11 regular and 1 emeritus) with multi-disciplinary background and diversifying research interests. Apart from this, the professionals from consultancies and government organizations come for delivering the lectures time to time.

Academic Programme: The centre has started a dual degree M.Sc. – Ph.D. programme since July 2010 in addition to already existing M. Tech. and Ph.D. programmes. In addition to these three programmes, the centre is running a minor in Environmental Science and Engineering for undergraduates studying in other departments at IIT Bombay. In near future, a dual degree B. Tech.- M. Tech. programme will also be started. In addition to the above listed programmes, CESE offers an Institute core course "Environmental Studies: Science and Engineering" to undergraduates and M. Sc. – Ph. D. students. Besides, the centre runs several elective courses for sensitizing students across all disciplines towards the urgent need for protection and restoration of environment by adapting environment friendly life styles.

	Student Intake	Degrees Awarded
M.Tech.	23	20
DD (MSc. + Ph.D)	7	—
M.Sc. (2-year)	—	3
Ph.D	—	2

R&D Activities: The ongoing research activities of the Centre are focused towards addressing the priority areas (local and global) set by major national agencies like MHRD, CPCB, SPCB, MNRE, DBT, MoEF, CSIR, DST. In addition, the Centre has already established strong links and collaborations with leading industries, academic institutions and national/international agencies by conducting sponsored research and offering consultancy and technical services. The research activities of CESE are supported by excellent experimental and computational facilities, competent and dedicated technical staff and high quality students. The centre is also actively engaged in organizing workshops and CEP courses for benefiting the professional from other academic institutions, industries and governmental sectors.

	New Projects	Ongoing	Completed
Sponsored Projects	5	12	2
Consultancy Projects	10	20	4

Centre of Studies in Resources Engineering

The Centre of Studies in Resources Engineering is a teaching academic unit of IIT Bombay. Thrust areas at the centre are natural resources like water, minerals, vegetation, ocean and atmosphere, environmental and disaster management, coastal and marine environment, agriculture and agro-informatics, tools and techniques such as image processing, geographic information systems, global positioning systems, machine learning, multispectral, hyperspectral and microwave remote sensing, decision support systems, and so on. The Centre has 12 faculty members and three adjunct faculty members.

Academic Programme: In addition to Undergraduate Minor in Geoinformatics for B.Tech. and dual-degree undergraduate students of the Institute, the centre offers M.Tech. and Ph.D

program. It has about 110 students in Master's and doctoral programs.

	Student Intake	Degrees Awarded
M.Tech.	24	18
Ph.D	7	2

R&D Activities: The Centre added a 6-node High Performance Computing system worth Rs. 45 lakhs to its infrastructure for teaching and research. New projects worth nearly Rs. 1.5 crores have been taken up with CSRE faculty members as PI's or Co-PIs in the last year.

	New Projects	Ongoing	Completed
Sponsored Projects	4	17	3
Consultancy Projects	4	13	3

A patent application was filed for An Interoperable on-site processing and analysis platform for WSN (Patent File number: 2236/MUM/2015) for the innovative work by Prof. S.S. Durbha and Prof. J. Adinarayana.

Centre for Technology Alternatives for Rural Areas

The Centre for Technology Alternatives for Rural Areas (CTARA) was set up in 1985 to cater to the technology needs of rural areas.

Academic Programme: The centre offers M.Tech. program in Technology and Development and a Ph.D. program. It also offers Technology and Development Supervised Learning (TDSL) courses to B.Tech. students across the Institute. The course work provides an over view of development issues, resource analysis, rural needs assessment, technological interventions and impacts, and has a strong field component. Teaching and research is aimed at providing relevant solutions to the rural areas. In order to do this effectively, CTARA has developed linkages with NGOs, government departments and ministries, and industry.

	Student Intake	Degrees Awarded
M.Tech.	36	9
Ph.D	12	1

R&D Activities: The major research area at the centre are the sectors of Agriculture and Food, Appropriate Technology, Drinking water, Energy, Environment, Health, Planning and Policy and Governance.

	New Projects	Ongoing	Completed
Sponsored Projects	7	17	3
Consultancy Projects	2	4	—

Centre for Formal Design and Verification of Software

The centre, over the past 16 years, has established itself as a national R & D Centre in the area of formal verification of high-integrity software and hardware. The Centre has contributed to several R&D programs in formal verification, and has taken up sponsored industrial projects from various Government organizations like VSSC, ADA, DRDL and DRDO, and also from high-profile private organizations like Intel, Microsoft Research, Texas Instruments, General Motors, etc. Tools and techniques developed at CFDVS have been applied successfully to small and medium sized problems, both from the academia and industry. The Centre is now focussing on automated techniques for larger real-life systems, and to make the resulting technologies available to the end-user community in India.

R&D Activities: The Centre carries R&D activities in the area of quality software development, with a special focus on formal verification techniques for safety-critical applications. The

activities can be broadly classified in the category of Logic, Symbolic Simulation, Model checking and Theorem Proving, Trusted Translation Systems, Static Assertion Checking Tools, and Tools and Techniques for GALS Systems and SoCs.

Centre for Urban Science and Engineering

The Centre for Urban Science & Engineering (C-USE) at IIT Bombay is an interdisciplinary centre for research, teaching and skilled manpower development with the primary mandate of improving urban quality of life. The Centre aims to combine science and technology with sustainable, equitable and human-friendly design to deliver innovative and holistic services to improve the life of the rapidly urbanizing population in the developing world.

	Student Intake
Ph.D	5

R&D Activities: The research activities of the Centre focus on new products and solutions related to housing, transport, water management, energy efficiency, urban informatics, health, governance, urban poverty and citizen science while mitigating the effects of natural disasters and climate change.

Science Expo 2015: C-USE participated in Science Expo-2015, coordinated by IRCC, IIT Bombay and held at Nehru Science Centre, Worli during February 4-7, 2015 for school children and public. A persuasive C-USE demonstrated Technology Prototype for Solid waste management in urban areas.

C-USE Open House: The Open House was conducted on 16th Feb 2015, at C-USE premises. Various posters that reflected C-USE research work were presented at the Open house. Following topics were discussed widely during the event:

- Pedestrian Friendly IIT Bombay Campus: Bike Sharing.
- Analytics for a controlled experiment to determine optimal thermal insulation for building envelope
- Exploiting solar energy in urban areas
- Towards An 'Affordable' And 'Socially Inclusive' Privatized Healthcare.
- Designing Informative Virtual Environments (IVEs) To Promote Pro-Environmental Behaviour (PEBs) In Educational Campus.
- Urban form and extreme precipitation events.

Centre for Research in Nanotechnology and Science

IIT Bombay is one of the leading institutions in the country for research in the area of Nanotechnology. IIT Bombay has recently consolidated its Nanotechnology research activities through the formation of a Centre for Research in Nanotechnology & Science (CRNTS). The formation of this centre has been made possible through a generous grant from the Department of Science & Technology (DST), Govt. of India

Academic Programme: The centre offers Ph.D. programme in Nanotechnology.

	Student Intake	Degree awarded
Ph.D	8	1

R&D Activities: The centre is one of the leading centres in the country for research in the area of Nanotechnology. At IIT Bombay, over 45 faculty members from 9 different departments/ schools are working together in the broad areas of Nanotechnology, with support from various government agencies are private industries. This research has resulted in over 400 high quality publications in the last 5 years in international journals and conference proceedings and a large number of patents. Some of the research activities at IIT Bombay in the Nanotechnology area are on par with some of the best institutions in the world. IIT Bombay has also been selected as one of the two institutions in the country for setting up a 'Centre of Excellence in Nanoelectronics' by the Ministry of Communications & Information Technology (MCIT), Government of India.

	New Projects	Ongoing	Completed
Sponsored Projects	—	3	1
Consultancy Projects	8	3	—

Education Technology

The Inter-Disciplinary Programme in Education Technology started in the Institute in 2010-11. In addition to Institute courses at a Ph.D level, the group organizes short-term intensive courses on effective teaching-learning and educational research methodologies through QIP and CEP and the Teach 10,000 Teachers project. Faculty members and research scholars of the group play a significant role in the organization of IEEE conference on Technology for Education (TFE), carry out sponsored projects for the National Mission on Education through ICT (NMEICT) and provide consultancy to educational technology industries.

Academic Programme: The group offers Ph.D programme in Educational Technology. The Ph.D students include engineering college teachers from colleges in and around Mumbai. The group continues to offer core courses and elective in educational technology content and methods. These Courses have had enrollment from B.Tech and Ph.D students in other academic programmes within the Institute.

	Student Intake	Degree awarded
Ph.D	22	—

R&D Activities: The main areas of focus of the R&D activities of the group are: Technology-enhanced learning environments for thinking skills, which are pan-domain cognitive skills such as, engineering design, problem-posing, estimation, algorithmic thinking, modeling, data representation & analysis; Frameworks for teacher use of educational technology tools strategies and development of AI & ICT based tools for teaching-learning goals such as automated content generation and assessment.

Industrial Engineering and Operations Researchers

Industrial Engineering and Operations Research (IEOR) at IIT Bombay is an interdisciplinary programme that offers Ph.D. and M.Tech. degrees in IEOR and an M.Sc.-Ph.D. Dual Degree in Operations Research. IEOR has seven faculty members and one emeritus fellow. Together with other institute faculty members who are associated with the programme in research and teaching, IEOR has a depth and breadth in capability that makes the programme unique in the country. Dr. Ashwin Arulselvan, University of Starthclyde, visited the department for an advanced lecture series on integer proprramming for a month.

Academic Programme: Two new post-graduate courses: "Polyhedra and Combinatorial Optimization" and "Advanced Stochastic Processes for Operations Research" were introduced this year. IEOR is also participating in the IITB-Monash Academy Ph.D. programme, with one of its research scholars in the joint Ph.D. programme The programme currently has 18 Ph.D. scholars, 41 M.Sc.-Ph.D. Dual Degree students and 44 M.Tech. Students.

	Student Intake	Degrees Awarded
M.Tech.	23	19
DD (MSc. + Ph.D)	6	—
M.Sc. (2-year)	—	4
Ph.D	3	2

R&D Activities: Faculty members served as referees for several journals and international conferences. The department hosted 12 visitors from academia and industry in the year. Faculty members visited various universities to pursue joint research. A new computational cluster was set up in Ph.D. lab for research in computational methods of Operations Research.

	New Projects	Ongoing	Completed
Sponsored Projects	7	17	3
Consultancy Projects	1	2	1

Systems and Control Engineering

The Systems and Control group formed in 1977, is a unique interdisciplinary program in the country that offers post-graduate education (M. Tech./Ph. D.) in the broad area of Systems and Control. The group has 8 core faculty members and about 11 associated faculty members from other academic units of the institute.

Academic Programme: The group offers post-graduate education (M. Tech./Ph. D.) in the broad area of Systems and Control. The average doctoral strength is around 25 and the M. Tech. intake every year is around 15.

	Student Intake	Degrees Awarded
M.Tech.	12	14
M.Tech + Ph.D	—	1
Ph.D	7	4

R&D Activities: The research focus of the core group is in the areas of nonlinear control, robotics, path-planning, embedded control, coordination of autonomous vehicles, multi-agent systems, sliding mode control and applications, fractional-order modelling and control, optimization and optimization-based control, stochastic processes, game theory, stochastic control, optimization, economics, information theory and combinatorial coding theory. In addition, research in the areas of process control, identification, behavioural theory, matrix computation, automotive control are being pursued by the associate faculty members.

The experimental lab at Systems and Control is geared towards introducing students to hardware and software that implement control theories learnt as part of coursework.

Climate Change Studies

The Interdisciplinary programme in Climate Studies was initiated at the Indian Institute of Technology Bombay, in January 2012, as one of the first doctoral programmes in India addressing research related to climate change. Over 30 faculty participants are drawn from 12 departments across IIT Bombay, with expertise in climate science, technology assessment and policy.

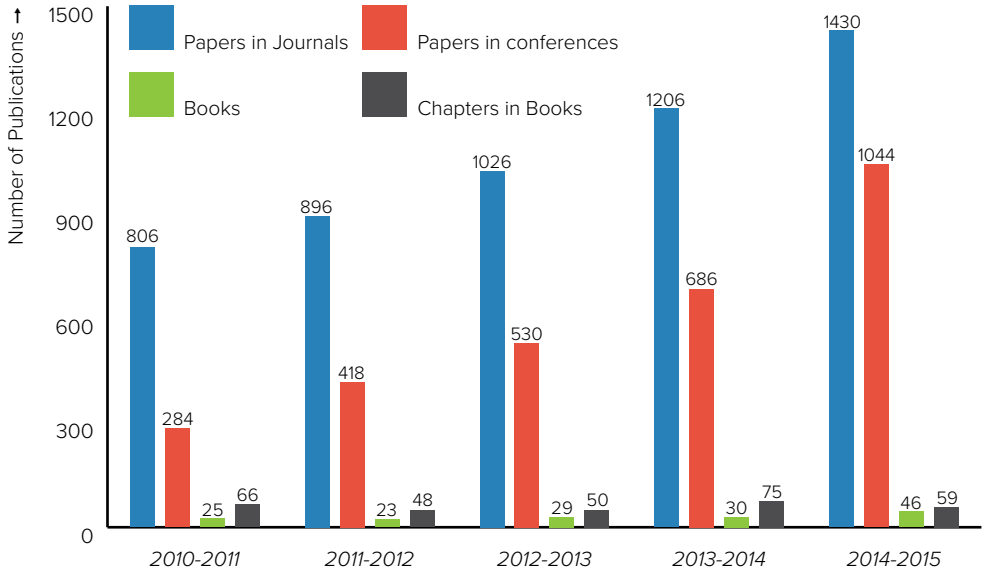
Academic Programme: The group aims to evolve an interdisciplinary curriculum on Climate Studies for training of doctoral and undergraduate students and continuing education professional. Six Ph.D students were admitted during the year and one International Student Exchange Visits was recorded.

	Student Intake	Degree awarded
Ph.D	7	—

R&D Activities: The group focuses on the research areas of Prediction of climate extremes, Factors affecting the Indian monsoon, Aerosol radiative processes, effects on clouds and rainfall, LES of cloud processes, Causality analysis and data assimilation, Impacts on hydrology and water resources, and Climate change impacts on ocean processes.

Publications

The number of publications by faculty members of IIT Bombay are steadily increasing. From 806 papers published in national and international journals during the year 2010-11, there is an improvement of 50 % in mere five years, taking the total number of papers published to 1,430 in the year 2014-15. Similar trends can be observed for the papers presented in conferences, books and chapters in books authored by the Institute's faculty, in the graph given below:



Year	Papers in Journals	Papers in conferences	Books	Chapters in Books
2010-2011	806	284	25	66
2011-2012	896	418	23	48
2012-2013	1,026	530	29	50
2013-2014	1,206	686	30	75
2014-2015	1,430	1,044	46	59

Facilities

IITB-Monash Research Academy

Infrastructure Development

The infrastructure projects that were completed and functional during the year include 'Hostel 16' (1,000 student capacity), Refurbishing and complete outfitting of 350 seat capacity multi-purpose P.C. Saxena Auditorium, Student's Gymkhana building (Built-up area 5,194 SqM, Outdoor Covered Sports Facilities (Built-up area 6,651 SqM) and Development of Entrance Gates.

Some projects started earlier year, namely 'Hostel 10 Extension' (792 rooms), 'IITB-Monash Research Academy', 'Computer Science & Engineering Department & Computer Centre Building' and Type-H1 Staff quarters' (60 flats) are nearing completion.

Construction of Guest House No.3 with 96 rooms and 48 utility apartments, with a 300 seat capacity dining hall with kitchen facility is in full swing.

Contracts for construction of Common building for 'Department of Energy Science and Engineering' and 'Centre for Environmental Science and Engineering' and Retrofitting Students' Hostel no.1 & Staff Hostel have been awarded.

Many other projects such Married Students Apartments (400 units), Hostel 17 and 18 (1000 capacity each), Type 'A' housing for senior faculty (30 flats) and 'National Centre for Mathematics' are at various stages of planning and pre-execution. All new projects are being designed and built on GRIHA-3 standards.

Apart from these, building projects that would be constructed in the near future include Rahul Bajaj Technology Innovation Centre, Building for Society for Innovation and Entrepreneurship (S.I.N.E.), and Industrial Research and Consultancy Centre (I.R.C.C.), Steel Centre, development of Workshops, Central Animal Facility and Common building for Estate Office, National Centre for Aerospace Innovation & Research, Tata Centre for Technology & Design, DS Foundation Centre for Entrepreneurship and Bio-medical Engineering Technology Incubation Centre. The Design Consultants for these projects have been appointed after undertaking a 'Concept Design' competition.

Building projects that would be constructed in the near future include Type B-Faculty housing Buildings A, B & C (78 Flats each), Type H1 at Lakeside (60 Flats), Lakeside Community Centre (500 seat capacity) and Shopping and Food Court at Hill side, for which process for selecting a design consultant has been started.

Main Gate Entrance

Central Library

IIT Bombay's Central Library is user-focused, innovative, and excellence-driven. It manages knowledge, both in print and digital formats, ensures seamless discovery and access to these scholarly resources, and provides faculty, students, and staff with professional support to find, evaluate, manage, and use such resources. It provides high-quality ambiance for both reflective and collaborative work and study.

The library collection of about 5.49 lakh items were used by more than 13,248 members and others who made 3,55,644 visits to the library during the year. In addition, over 2.25 million downloads were made from the collection of over 40,000 e-journals, e-books, and databases. The institutional repository of IITB publications which now has over 15,126 records also attracted more than 4,45,552 hits during the year.

The library subscribed to 1,523 Journals (over 90 per cent of its journals in online-only format) and added about 5,346 volumes including books, journals, theses, reports, standards, pamphlets and other reading material during the year. It also acquired 447 e-books during the year. All the library collection can be accessed through On-line-Public-Access Catalogue, which received 2,91,215 hits during the year.

The library continued to render services like reference and consultation, document delivery, arranging material from other libraries through inter-library loan, helping students belonging to weaker section of the society borrow textbooks from the book bank and organizing information literacy/user education programmes to enhance awareness about various resources and services of the library. The library allows self check-out of books as well as online renewal of borrowed books. It handled over 2.10 lakh loan transactions of books and other documents for its members during the year. It also offers services to industry and corporates, IITB alumni and engineering (educational) institutions, professional members and has earned over Rs.40 lakhs for the services rendered.

The Central Library maintains a full-text database of over 12,314 items submitted since 1999-2000 on Intranet. During the year, 1,000 M.Tech. dissertations and 249 Ph.D. theses were submitted on-line.

The library communicates with its users mainly through its homepage which was updated during the year to make it more user friendly. The homepage – a popular interface between users and the library, acts as a single window to all its resources and services. The library extensively used social media for improved communication and interaction and has created a blog to post current and interesting information and news items. Users can also follow us on the Facebook and Twitter.

The renovation of the library building phase II, is nearing completion. Air conditioner reading hall with 150 seating capacity has been made available for the benefit of bonafide students of the institute. The renovated library building will meet the changing needs of library staff, students and faculty in the use of library resources and services.

Computer Centre Building

Computer Centre

The Computer Centre continues to provide computational, network infrastructural facilities and services to the IIT Bombay user community.

Network and Connectivity

The Centre manages the campus network and is responsible for the availability of intra-campus connectivity of all the departments, hostels, residential complexes and internet connectivity of Institute with the outside world. The following activities were undertaken during the year:

- The network connectivity to the new students' hostels (Hostel 10A and 15) has been completed.
- The total Internet bandwidth for campus users has been increased from 3250 Mbps to 4250 Mbps. For optimum utilisation of internet, following has been implemented:
- BGP routing to connect to the three ISPs through simple load balancing using open source software.
- Internet access is by NATting via four Class C address ranges recently acquired from APNIC.
- Web access is through proxy and "direct access" where a legitimate user authenticates the IP address.
- Separate web access accounts for users, other than employees, at residences.
- Transport layer security has been purchased via digital certificate from GeoTrust.
- About 700 WiFi access points have been deployed on campus to cover large part of the academic area, Guest Houses and Central Library.

High Performance Computing Facility

The old computing cluster CORONA continue to function as before with 130 user accounts. Given the space constraint, the cluster continues to be housed in the premise of the Chemistry Department. The cluster 'Spacetime Supercomputing' facility consisting of 380 nodes built using the Intel quad core processors has been operational on the ground floor of the old Computer Science and Engineering Department building.

The installation of Building Management System (BMS) for the Spacetime HPCC facility has been undertaken to bring complete automation of the peripheral equipment. It is expected that the DG-Set together with the automation offered by BMS will provide a better and smoother operation of the HPCC facility in terms of reducing the possibility of hardware failures and data being lost due to unexpected power failures. Enhancement of data storage facility is being undertaken, to improve the SAN device performance and to address the increasing number of research groups using the Spacetime resources.

Hostel 10

National Knowledge Network

IIT Bombay continued to be a member of the National Knowledge Network (NKN) during the year. This multi-gigabit network initiative started by the National Informatics Centre (NIC) is being used by CDEEP to conduct distance education programmes. Staff from the Computer Centre also participated in the the national level meet of the NKN.

Grid Computing Facility GARUDA

The grid computing facility GARUDA is also supported by the Computer Centre allowing the users of the Institute to access the available resources on the National Grid.

Hardware/Software Infrastructure

All service offerings at the Computer Centre are based on OPEN SOURCE Software Systems. Computer Centre has registered as official mirror for various flavors of Linux Operating Systems on its anonymous FTP server which is available to the user community at large.

The Institute continues to be a member of Microsoft Developer Network Academic Alliance (MSDNAA) software licensing programme. This allows the user community to use most of the Microsoft software products in a non-production environment. Campus-wide license of AVG anti-virus software has also been in operation.

Software packages meant for scientific and technical computation such as ANSYS, MATLAB, MATHEMATICA, MAPLE, Dytran / NasTran / Partan, Tecplot and Libraries from Numerical Algorithm Groups (NAG), AutoCAD, Labview, OriginLab etc that are available through appropriate licenses schemes are procured, upgraded and administered by Computer Centre as per the requirements of the students, faculty, scientists and staff.

The Computer Centre encourages and has installed Open Source Software Systems for Office Automation in about 800 PCs deployed in the various Administrative sections of the Institute, which has eliminated the spread of computer virus on computers to a great extent.

The Computer Centre continues to play a secondary role by providing technical support to run the IP-based Security Surveillance Systems for the Security Section. The verifocal fixed direction IP (10/100 BaseT ethernet interface) cameras 'for indoor use only' (25 nos) have been installed at the entry points of various departments, Main Building and Convocation Hall to monitor and record human activities as well as object movements. Similarly, verifocal fixed direction IP-based Day and Night cameras (10 nos.) with IP66 certified 'for outdoor use only' installed at the Main Gate, Y-Point Gate, and Lakeside Gate continue to monitor and record the inward and outward traffic movements of the campus.

PTZ IP Surveillance cameras (5 nos.) having automatic Pan, Tilt, Zoom for 24/7 operation, PTZ control over network. minimum 270 degree Pan with auto flip and 180 degree tilt, Day and Night functionality with 0.5 lux in color, minimum 18x optical zoom, 12x digital zoom have been installed at the Guest House, Hostel 12 & 13, QIP Building and Ananta to keep an eye over the fencing of the campus.

The computer network set up by the Computer Centre enables the Electric Maintenance

Gymkhana grounds and building

Division to monitor the Power Distribution Systems, check the status of various Lifts, functioning of UPS Systems, etc. in the Institute. The Telephone Exchange also runs few IP telephones (Voice over IP) using the computer network of the Institute.

Projects for the Near Future

Expansion planned for WiFi access: Steps are being taken towards smooth integration of all communications services (phones, cellular, TV and Internet). Process for providing additional 400 wireless access points for the academic for "blanket coverage", 200 specialised APs (access points) for the classrooms, and 300 wireless access points in the common areas of hostels and open areas in cooperation with 4G service providers, have been planned for near future.

The HPC roadmap: Current infrastructure is about seven years old and upgradation of this facility is planned in west wing on the Ground Floor of the Old CSE building.

Space for about 100 racks divided into three parts viz. Central HPC facility of the Institute; Data Centre for the Computer and backup services for the different services in IITB (mail servers of departments, data from ASC, IRCC, Academic Office, etc).; and Bring Your Own Hardware facility: Resources to house high performance computing hardware acquired by different research groups through their funding sources. These will be provided housing, power, cooling and networked access.

Email and storage: Following are some of the proposed facilities that would be available in the near future for email and storage.

- An integrated mail and calendar system for the Institute
- Extend IMAP service to all departments
- Increase storage allocation for email and BigHome.
- Lifetime email to alumni and all faculty/staff.

Centre for Distance Engineering Education Programme

The Centre for Distance Engineering Education Programme (CDEEP) continued its endeavour to look for new technologies and have adopted a few, like recording in HD. The courses are now streamed using the widely accepted .mp4 format. The course videos can now be viewed on multiple devices including smart phones. During the year, has recorded and transmitted 21 semester-long courses of IIT Bombay, covering 13 disciplines. It has an archive of 302 full semester-long courses out of about 1,200 senate approved courses of IIT Bombay. CDEEP provided 70 recorded courses to individuals at nominal service charge of Rs.300/- per course. It also provided access to its recorded courses through web to 4,996 registered candidates.

The centre, as its continued parallel activity, covered 92 events, including 52nd Annual Convocation, 56th Foundation day, Institute Colloquia and talks by distinguished speakers on campus.

It has a total of 75 institutions all over India connected, as Remote Centers (RC) of IIT Bombay. The Centre continued its support to various distance education and educational outreach related projects being executed at IIT Bombay.

Organization

Dr. Anil Kakodkar
Chairman, Board of Governors

Prof. D.V. Khakhar
Director

Prof. H.S. Pandalai
Dy. Director (Finance & External Affairs)

Prof. Subhasis Chaudhuri
Dy. Director (Academic & Infrastructural Affairs)

Prof. N. Venkataramani
Dean (Infrastructure Planning & Support)

Prof. U.A. Yajnik
Dean (Student Affairs)

Prof. Ravi Sinha
Dean (Alumni & Corporate Relations)

Prof. Y.M Desai
Dean (Administrative Affairs)

Prof. R.O. Dusane
Dean (International Relations)

Prof. P.M. Mujumdar
Dean (Research & Development)

Prof. J. K. Verma
Dean (Faculty Affairs)

Prof. Narayan Rangaraj
Dean (Academic Programme)

Dr. R. Premkumar
Registrar

IIT Council

The Minister In-charge of Technical Education in the Central Government	1.	**Smt. Smriti Zubin Irani,** Hon'ble Minister of Human Resource Development, Government of India, Shastri Bhavan, New Delhi – 110 001.	Chairman
Chairman of Each Institute (Ex-officio)			
Kharagpur	2.	**Dr. Srikumar Banerjee,** Chairman, BoG, IIT Kharagpur (DAE Homi Bhabha Chair Professor, BARC Central Complex, Bhabha Atomic Research Centre,Trombay, Mumbai).	Member
Bombay	3.	**Dr. Anil Kakodkar,** Chairman, BoG, IIT Bombay (Homi Bhabha Chair Professor, Department of Atomic Energy, 7th floor, Central Complex, BARC, Trombay, Mumbai – 400 085).	Member
Madras	4.	**Dr. Pawan Goenka,** Chairman, BoG, IIT Madras. Chennai – 600 036 (Executive Director and President, Mahindra & Mahindra, Mahindra Towers GM Bhosale Marg, Worli, Mumbai).	Member
Kanpur	5.	**Prof. M. Anandakrishnan,** Chairman, BoG, IIT Kanpur, Kanpur – 208 016.	Member
Delhi	6.	**Dr. Vijay P. Bhatkar,** Chairman, BoG, IIT Delhi, New Delhi – 110 016.	Member
Guwahati	7.	**Dr. R.P. Singh,** Chairman, BoG, IIT Guwahati, Guwahati – 781 039.	Member
Roorkee	8.	**Prof. Ashok Misra,** Chairman, BoG, IIT Roorkee Roorkee – 247 667 (69 Adarash Vista, Basavanagar, Bangalore – 560 037).	Member
Bhubaneswar	9.	**Shri S. K. Roongta,** Chairman, Board of Governors, Indian Institute of Technology, Bhubaneswar, Bhubaneswar (Odisha).	Member
Gandhinagar	10.	**Dr. Baldev Raj,** Chairman, Board of Governors, Indian Institute of Technology, Gandhinagar President Research PSG Institution PSG College of Technology Campus, New Administrative Block, Peelamadu, Coimbatore, T.N. 641004.	Member
Hyderabad	11.	**Dr. B. V. R. Mohan Reddy Chairman,** Board of Governors, Indian Institute of Technology, Hyderabad. (A.P.)	Member
Jodhpur	12.	**Prof. Goverdhan Mehta,** Chairman, Board of Governors, Indian Institute of Technology, Jodhpur, Jodhpur.(Raj.)	Member
Indore	13.	**Shri Ajay Piramal,** Chairman, Board of Governors, Indian Institute of Technology, Indore, Indore (M.P.)	Member
Mandi	14.	**Prof. M. Natarajan,** Chairman, Board of Governors, Indian Institute of Technology, Mandi, Mandi (H.P.)	Member
Patna	15.	**Shri Ajai Chowdhry,** Chairman, Board of Governors, Indian Institute of Technology, Patna (Bihar)	Member
Ropar	16.	**Prof. V. S. Ramamurthi,** Chairman, Board of Governors, Indian Institute of Technology, Ropar (Punjab)	Member
Varanasi	17.	**Dr. Lalji Singh,** Chairman, BoG, IIT(BHU), Varanasi and Vice-Chancellor, Banaras Hindu University, Varanasi -221 005 (U.P)	Member
Director of each Institute (Ex-officio)			
Kharagpur	18.	**Prof. Partha P. Chakrabarti,** Director, IIT Kharagpur, Kharagpur – 721 302.	Member
Bombay	19.	**Prof. D.V. Khakhar,** Director, IIT Bombay, Mumbai – 400 076.	Member
Madras	20.	**Prof. Bhaskar Ramamurthi,** Director, IIT Madras, Chennai – 600 036.	Member

Kanpur	21.	**Prof. Indranil Manna,** Director, IIT Kanpur, Kanpur – 208 016.	Member
Delhi	22.	**Prof. R.K. Shevgaonkar,** Director, IIT Delhi, Hauz Khas, New Delhi – 110 016.	Member
Guwahati	23.	**Prof. Gautam Biswas,** Member Director, IIT Guwahati, Guwahati – 781 039.	Member
Roorkee	24.	**Prof. Pradipta Banerji,** Member Director, IIT Roorkee, Roorkee – 247 667.	Member
Bhubaneswar	25.	**Prof. Madhusudan Chakraborty,** Member Director, Indian Institute of Technology, Bhubaneshwar, Samantapuri (Rear side of Hotel Swosti Plaza), Jaydev Vihar, Bhubaneswar – 751 013, Odisha.	Member
Gandhinagar	26.	**Prof. Sudhir K. Jain,** Member Director, Indian Institute of Technology, Gandhinagar, Vishwakarma Govt. Engg. College (VGEC) Campus, Chandkheda, Visat-Gandhinagar Highway, Ahmedabad – 382424.	Member
Hyderabad	27.	**Prof U.B. Desai,** Director, Indian Institute of Technology, Hyderabad, Ordnance Factory Estate, Yeddumailaram – 502205, Andhra Pradesh	Member
Jodhpur	28.	**Prof. C.V.R Murty,** Director, Indian Institute of Technology, Jodhpur, IIT Rajasthan Camp Office Department of Computer Science & Engineering MBM Engineering College, Jodhpur – 342 011.	Member
Indore	29.	**Prof. Pradeep Mathur,** Director, Indian Institute of Technology Indore, Institute of Engineering and Technology, DAVV Campus, Khandwa Road, Indore – 452 017.	Member
Mandi	30.	**Prof. Timothy Gonsalves,** Director, Indian Institute of Technology, Mandi, PWD Rest House, 2nd Floor, Near Bus Stand, Mandi – 175 001. (Himachal Pradesh)	Member
Patna	31.	**Prof. Partha P. Chakraborti (Addl. Charge),** Director, Indian Institute of Technology, Patna, Govt. Polytechnic, Pataliputra's Colony, Patna – 800 013.	Member
Ropar	32.	**Prof. M.K. Surappa,** Director, Indian Institute of Technology, Ropar, Nangal Road, Rupnagar, Punjab – 140 001.	Member
Varanasi	33.	**Prof. Rajeev Sangal,** Director, Indian Institute of Technology (BHU), Varanasi – 221005 (UP)	Member
Chairman, University Grants Commission (Ex-officio)	34.	**Prof. Ved Prakash,** University Grants Chairman, Commission University Grants Commission, (Ex-officio) Bahadurshah Zafar Marg, New Delhi – 110 002.	Member
Director-General, Council of Scientific & Industrial Research (Ex-officio)	35.	**Dr. P.S. Ahuja,** Director General (DG)Council of Scientific & Industrial Research (CSIR), Govt. Of India, Anusandhan Bhawan, 2, Rafi Marg, New Delhi – 110 001.	Member
Chairman of the Council Of the Indian Institute of Science, Bangalore (Ex-officio)	36.	**Dr. K. Kasturirangan,**Chairman, National Institute of Advanced Studies, Indian Institute of Science Campus, Bangalore – 560 012.	Member
Director of the Indian Institute of Science, Bangalore (Ex-officio)	37.	**Prof. P. Balaram,** Director, Indian Institute of Science, Bangalore – 560 012.	Member
Three Nominees of the Central Government			
To represent the Ministry concerned with Technical Education	38.	**Shri Ashok Thakur,** Secretary, Ministry of Human Resource Development, Department of Higher Education, Shastri Bhawan, New Delhi.	Member
To represent the Ministry of Finance	39.	**Shri R.S. Gujral,** Secretary (Expenditure), Ministry of Finance, Department of Expenditure, North Block, New Delhi – 110 001.	Member

To represent any other Ministry	40.	**Shri J. Satyanarayana,** Secretary, Department of Information Technology, Electronics Niketan, CGO Complex, Lodhi Road, New Delhi – 110003.	Member
Nominee of the All India Council for Technical Education (AICTE)	41.	**Dr. S.S. Mantha,** Chairman, All India Council for Technical Education (AICTE), 7th Floor, Chanderlok Building, Janpath, New Delhi – 110 001.	Member
Nominees of the Visitor (minimum three) (maximum five)	42.	**Prof. Ashok Jhunjhunwala,** Professor, Department of Elect. Engineering (Te Ne T) Group, Indian Institute of Technology – Madras Chennai – 600 036 (T.N.)	Member
	43.	**Dr. T. Ramasami,** Secretary, Department of Science & Technology, Ministry of Science & Technology, Technology Bhawan, New Mehrauli Road, New Delhi -110016.	Member
	44.	**Prof. Ashok Mishra,** Chairman – India, Intellectual Ventures India Consulting Pvt. Ltd., # 701- Raheja Paramount, 138-Residency road, Bangalore – 5600025.	Member
	45.	**Prof. S.K. Joshi,** 250- National Physical Laboratory, Dr. K S Krishnan Marg, South Patel Nagar, Pusa, New Delhi – 110012	Member
	46.	**Prof. R.C. Budhani,** Director, Director's Secretariat, National Physical Laboratory, Dr. K S Krishnan Marg, South Patel Nagar, Pusa, New Delhi – 110012	Member
Three Members of Parliament (Two from Lok Sabha) (One from Rajya Sabha)	47.	**Shri Deepender Singh Hooda,** Hon'ble Member of Parliament (Lok Sabha), Pandit Pant Marg, New Delhi – 110 011.	Member
	48.	**Shri Janardhana Swamy,** Hon'ble Member of Parliament (Lok Sabha), 137, South Avenue, New Delhi – 110 011.	Member
	49.	**Smt. Vasanthi Stanley,** Hon'ble Member of Parliament (Rajya Sabha), C-501, Swaran Jayanthi Sadan, Dr. Bishamber Dass Marg (Near R.M.L), New Delhi-110001.	Member
	50.	**Smt. Amita Sharma,** Additional Secretary (TE), Ministry of Human Resource Development, Department of Higher Education, Shastri Bhawan, New Delhi.	Member
	51.	**Shri Yogendra Tripathi,** Joint Secretary & Financial Advisor, Ministry of Human Resource Development, Department of Higher Education, New Delhi.	Member

Members of the Board of Governors

Nominated by Visitor	**Dr. Anil Kakodkar,** Homi Bhabha Chair Professor, Department of Atomic Energy, 7th floor, Central Complex, BARC, Trombay, Mumbai – 400 085.	Chairman
Ex-officio	**Prof. D.V. Khakhar,** Director, IIT Bombay, Powai, Mumbai – 400 076	Member
Council Nominees (Four)	**Dr. S. Sivaram,** CSIR Bhatnagar Fellow, National Chemical Laboratory, Dr. Homi Bhabha Road, Pune – 411 008.	Member
	Dr. Ajit Ranade, Chief Economist, Aditya Birla Group, Aditya Birla Centre, Worli, Mumbai – 400 030.	Member
	Prof. Shobho Bhattacharya, A-416, Department of Condensed Matter Physics and Material Science, Tata Institute of Fundamental Research, Homi Bhabha Road, Navy Nagar, Mumbai – 400 005	Member
	Prof. Dinesh Singh, Vice Chancellor, University of Delhi, New Delhi – 110 007	Member
State Government Nominees (Three)		
MAHARASHTRA	**Secretary,** Higher & Technical Education, Government of Maharashtra, Mantralaya, Mumbai – 400 032	Member

DADRA & NAGAR HAVELI	**Shri Bhupinder S. Bhalla,** IAS, Hon'ble Administrator U.T. of Daman & Diu and Dadra & Nagar Haveli, Silvasa	Member
GOA	**Shri Ramachandra (Dinar) Balkrishna Bhatkar,** First Floor, Vaikunth Niwas, Near Youth Hostel, Miramar, Panaji, Goa - 403001	Member
Senate Two	**Prof. S. Durani (from 1/01/2014),** Professor, Department of Chemistry, IIT Bombay, Mumbai 400 076	Member
	Prof. S. Biswas (from 1/01/2014), Professor, Department of Computer Science & Engineering, IIT Bombay, Mumbai - 400 076.	Member
Ex-officio	**Dr. Premkumar (from 17/07/2014),** Registrar, IIT Bombay Dr. Indu Saxena (upto 16.07.14), Offg. Registrar, Powai, Mumbai – 400 076	Secretary

Members of the Finance Committee

Dr. Anil Kakodkar, Chairman, Homi Bhabha Chair Professor, Department of Atomic Energy, 7th floor, Central Complex, BARC, Trombay, Mumbai – 400 085	Chairman
Prof. D.V. Khakhar, Director, IIT Bombay, Powai, Mumbai – 400 076	Member (Ex-officio)
Shri Amarjeet Sinha (from 1.11.2014), Smt. Amita Sharma IAS (upto 31.08.2014), Additional Secretary, Ministry of Human Resource Development, Deptt. of Higher Education, Government of India, Shastri Bhavan, New Delhi – 110 115	Member
Shri V. B. Aras, Vice President – Internal Audit, L & T Finance Services, L & T Finance Ltd., The Metropolitan, 4th Floor, C-26/C-27, E- Block, Bandra Kurla Complex, Bandra (East), Mumbai – 400 051	Member
Shri Yogendra Tripathi, IAS, Joint Secretary & Financial Advisor, Ministry of Human Resource Development, Deptt. Of Higher Education, Technical Section-1, Government of India, Shastri Bhavan, New Delhi – 110 115.	
Prof. H.S. Pandalai, Dy. Director (Finance & External Affairs), IIT Bombay, Powai, Mumbai – 400 076.	
Dr. R. Premkumar (from 17.07.14), Registrar, IIT Bombay Dr. Indu Saxena (upto 16.07.14), Offg. Registrar, Powai, Mumbai – 400 076	Secretary (Ex-officio)

Building and Works Committee

Prof. D.V. Khakhar, Director, IIT Bombay, Powai, Mumbai – 400 076.	Chairman
Superintending Engineer, Office of the Supdt. Engineer, Mumbai Central Circle-1, CPWD, 5th Floor, Old CGO Building, 101 MK Road, Mumbai – 400 020	Member
Superintending Engineer, Mumbai (P.W.) Circle, 25 Murzban Road, Fort, Mumbai – 400 001	Member
Shri K. Srinivas, Head, Architectural & Civil Engg. Division, BARC, North Site, Trombay, Mumbai – 400 085	Member
Shri Vidyadhar K. Phatak, Retired Principal Chief, Town and Country Planning Division, Mumbai Metropolitan Region Development Authority, 1/304, Kairav, GE Link, Ram Mandir Road, Goregaon (W), Mumbai – 400104	Member
Prof. N. Venkataramani, Dean (Infrastructure Planning & Development), IIT Bombay, Powai, Mumbai – 400 076	Member
Dr. R. Premkumar (from 17.07.2014), Registrar, IIT Bombay Dr. Indu Saxena (upto 16.07.2014), Offg. Registrar, IIT Bombay, Powai, Mumbai – 400 076	Member-Secretary (Ex-officio)

Heads of Departments

Aerospace Engineering
Prof. Ashok Joshi (from 15.05.2014)
Prof. S.D. Sharma (upto 14.05.2014)

Biosciences & Bioengineering
Prof. Rohit Manchanda

Chemical Engineering
Prof. K.V. Venkatesh

Chemistry
Prof. R. Murugavel

Civil Engineering
Prof. K.V. Krishna Rao

Computer Science & Engineering
Prof. S. Sudarshan

Earth Sciences
Prof. G. Mohan

Electrical Engineering
Prof. Abhay Karandikar

Humanities & Social Sciences
Prof. D. Parthasarathy (from 25.06.2014)
Prof. K. Narayanan (upto 24.06.2014)

Mathematics
Prof. Sudhir R. Ghorpade

Mechanical Engineering
Prof. R.P. Vedula

Met. Engg. & Mat. Science
Prof. N. Prabhu

Physics
Prof. Prabhakar P. Singh

Energy Science and Engineering
Prof. Santanu Bandyopadhyay

Heads of Centres

Industrial Design Centre
Prof. B.K. Chakravarthy

Centre for Research in Nanotechnology and Science & SAIF
Prof. Indradev Samajdar

Centre of Studies in Resources Engineering
Prof. (Ms.) P. Venkatachalam

Centre for Environmental Science and Engineering
Prof. A.K. Dikshit

Centre for Formal Design and Verification of Software
Prof. G. Sivakumar

Centre for Aerospace Systems Design and Engineering
Prof. P. M. Mujumdar

Centre for Technology Alternatives in Rural Areas
Prof. Rangan Banerjee

Centre for Distance Engineering Education Programme
Prof. V.M. Gadre

Centre for Urban Science and Engineering
Prof. Krithi Ramamritham

Centre for Excellence in Steel Technology
Prof. N.B. Ballal

Heads of School

Shailesh J. Mehta School of Management
Prof.S. Bhargava (from 24.06.2014)
Prof. G.K. Adil (upto 23.06.2014)

Convenors of Interdisciplinary Programmes

Industrial Engineering & Operations Research
Prof. N. Hemchandra

Systems & Control Engineering
Prof. Ravi Banavar

Education Technology
Prof. V.M. Gadre

Climate Change
Prof. Chandra Venkataraman

Summary of Accounts

MAIN ACCOUNT

Balance Sheet as at 31/03/2015

(Amount-Rs)

Particulars	Schedule	Current Year	Previous Year
LIABILITIES			
Corpus/Capital and Other Funds	1	11,21,20,23,201	9,24,60,88,521
Reserves and Surplus	2	-10,13,18,73,246	-22,20,59,519
Earmarked/Endowment Funds	3	5,02,90,99,599	4,25,80,47,613
Secured Loans and Borrowings	4	0	0
Unsecured Loans and Borrowings	5	0	0
Deferred Credit Liabilities	6	0	0
Current Liabilities and Provisions	7	14,05,16,14,782	5,15,03,50,041
Total (A)		**20,16,08,64,336**	**18,43,24,26,656**
ASSETS			
Fixed Assets	8	10,47,26,40,671	8,62,46,30,557
Investments From Earmarked/ Endowment Funds	9	0	0
Investments – Others	10	6,46,18,93,889	6,44,74,97,141
Current Assets, Loans, Advances Etc.	11	3,22,63,29,776	3,36,02,98,959
Total (B)		**20,16,08,64,336**	**18,43,24,26,657**

Income & Expenditure for the Eary Ended 31/03/2015

Particulars	Schedule	(Amount-Rs) Current Year	Previous Year
INCOME			
Income From Sales/Services	12	14,06,35,768	12,06,61,964
Grants/Subsidies(Irrevocable Grants and Subsidies Received)	13	2,99,93,59,775	2,59,93,44,145
Fees/Subscriptions	14	68,18,26,304	42,51,70,926
Income From Investments	15	0	0
Income From Royalty, Publication Etc.	16	0	0
Interest Earned	17	66,90,22,102	78,24,03,208
Other Income	18	23,39,79,728	41,21,30,827
Increase/(Decrease) In Stock Of Finished Goods & Work in Progress	19	0	0
TOTAL (A)		**4,72,48,23,677**	**4,33,97,11,070**
EXPENDITURE			
Establishment Expenses	20	3,72,98,34,276	2,38,72,28,248
Other Administrative Expenses Etc.	21	2,15,84,82,583	1,79,75,93,565
Expenditure On Grants Subsidies Etc.	22	0	0
Interest	23	0	0
Transfer to Donation Fund		8,43,79,220	24,72,97,088
Transfer to Ircc Fund		18,04,21,857	3291,82,888
Writeoff (Schedule 8)		38,52,440	0
Depreciation (Schedule 8)		44,06,80,628	34,44,86,687
TOTAL (B)		**6,59,76,51,004**	**5,10,57,88,476**
Balance Being Excess of Income Over Expenditure (A-B)		-1,87,28,27,327	-76,60,77,406
Adjusted From Capital Fund (Depreciation)		44,06,80,628	34,44,86,687
Adjusted From Capital Fund (Write Off)		38,52,440	18,33,800
Balance Being Surplus/(Deficit)		-1,42,82,94,259	-41,97,56,919
Actuarial Valuation for Past Period (Leave Encashment, Gratuity &Nps)		-8,48,15,19,468	

Note: *The Value of 1,42,82,94,259/- is arrived after adding deficit of Rs.43,54,45,690/- (Non Plan and Plan) and Rs.99,28,48,569/- Actuarial Value in r/0 Leave Encashment, Gratuity and NPS*

Receipts and Payments for the period from 01/04/2014 To 31/03/2015

Receipts	Amount in Rs	Receipts	Amount in Rs
I Opening Balances		**I Expenses**	
a) Cash in hand	6,67,994	a) Establishment Expenses	2,09,09,80,273
b) Bank Balances	22,29,77,737	b) Administrative Expenses	1,61,90,32,154
II Grant Received		**II Investment and deposits made**	
a) From Government of India	4,31,34,00,000	a) Out of Earmarked / Endowment Fund	
b) Grant in aid due in 2013-14 received in 2014-15	13,13,00,000	b) Out of Own Funds	8,16,75,00,000
c) From State Government			
d) From other sources		**III Expenditure**	
		a) On Fixed Assets and Capital	1,79,05,65,922
III Investment Encashed	9,10,59,86,338	b) Work-in-progress	55,36,14,922
		c) Support for Capital Expenditure	37,54,879
IV Interest Received			
a) On Bank Deposits	48,20,93,090	**IV Other Payments**	
b) Loans, Advances etc		a) Grant from other organisations	26,11,49,472
		b) Advances Account	99,90,93,463
V other Income		c) Other Adjustable Account	79,43,10,692
a) Fees from Students	29,00,13,962	d) Refundable Deposits	11,86,79,688
b) Other Receipts from Students	8,47,23,211	e) Recoverable Deposits	1,13,69,290
c) All India Entrance Examination Receipts	31,28,39,958	f) Sundry Creditors	11,47,64,475
d) Continuing Education Programme	0	g) Endowment Scholarship	0
e) Miscellaneous Receipts	24,13,34,674	h) Surplus transfer to Endowment	0
		I) Stock	0
VI Any Other Receipts		**V) Other Payment (Project)**	4,67,63,26,051
a) Grants from other Organisations	35,88,72,092	**VI) Donation Account**	12,35,37,671
b) Advances Account	35,00,57,886	**VII) Closing Balances**	
c) Other Adjustable Accounts	2,70,99,24,077	a) Cash in hand	5,85,207
d) Refundable Deposits	13,44,61,585	b) Bank Balances	45,73,59,669
e) Endowment Scholarship	0		
f) Recoverable Deposits	5,42,287		
g) Sundry Debtors	1,52,13,392		
h) Accrued Interest	21,72,609		
I) Support for Capital Expenditure	0		
j) Guest House Receipts	69,09,150		
VII Project and Consultancy	2,54,73,48,550		
VIII Donation Account	47,17,85,237		
TOTAL	**21,78,26,23,829**	**TOTAL**	**21,78,26,23,828**

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