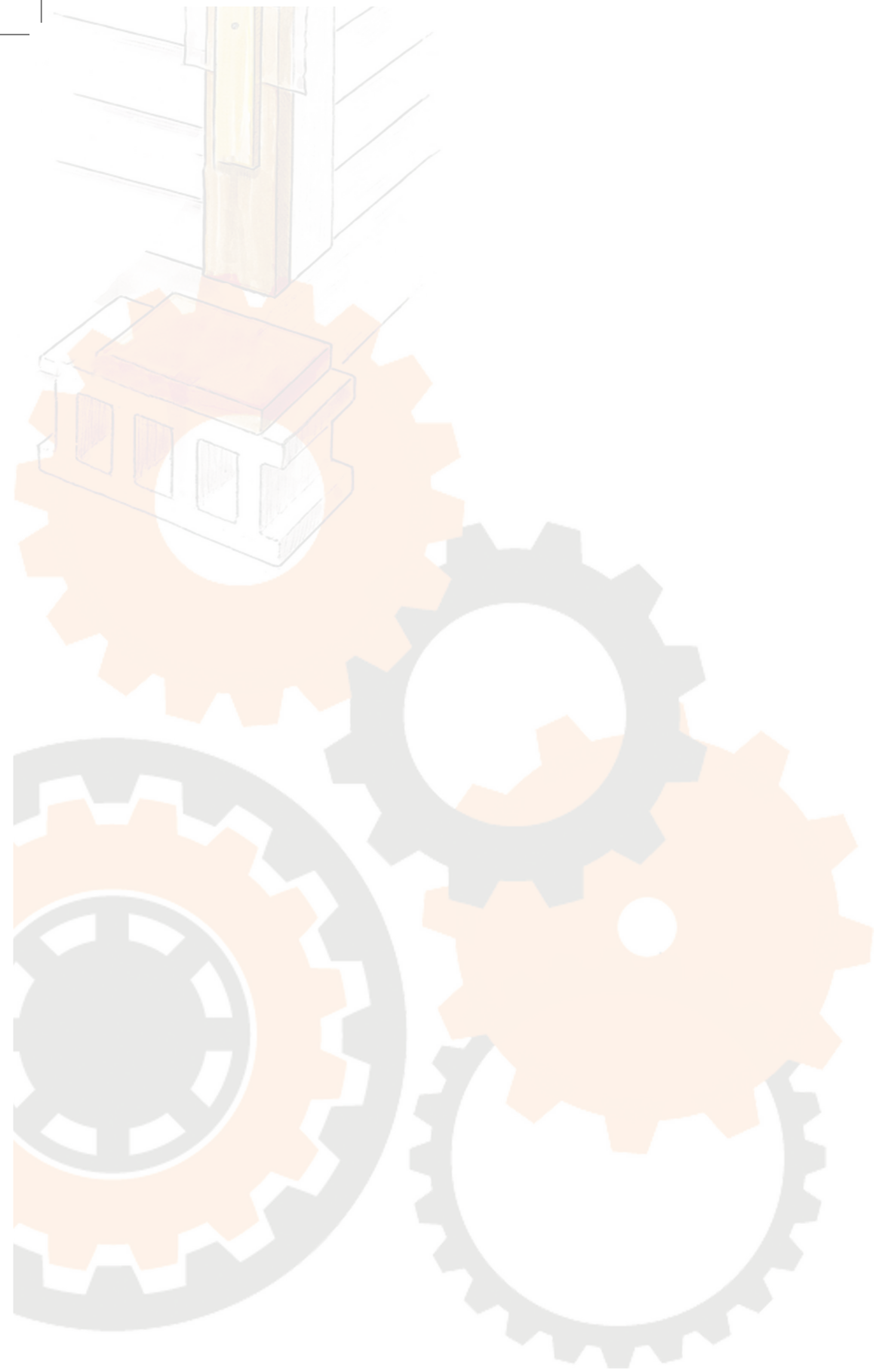
Indian Institute of Technology Madras

2016-2017

No. 1 Engineering Institute in the Country for 2016, 2017 & 2018

As per National Institutional Ranking Framework, MHRD, Govt. of India



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YEAR AT A GLANCE

UG Students on roll **1982**

465 UG Admissions

PG Students on roll **4431**

1316 PG Admissions

Research Scholars on roll **2767**

494 Research Scholar Admissions

Total Students on roll **9180**

2275 Total Admissions

Scholars received the Ph.D. Degree
210

Faculty and Academic Staff **573**

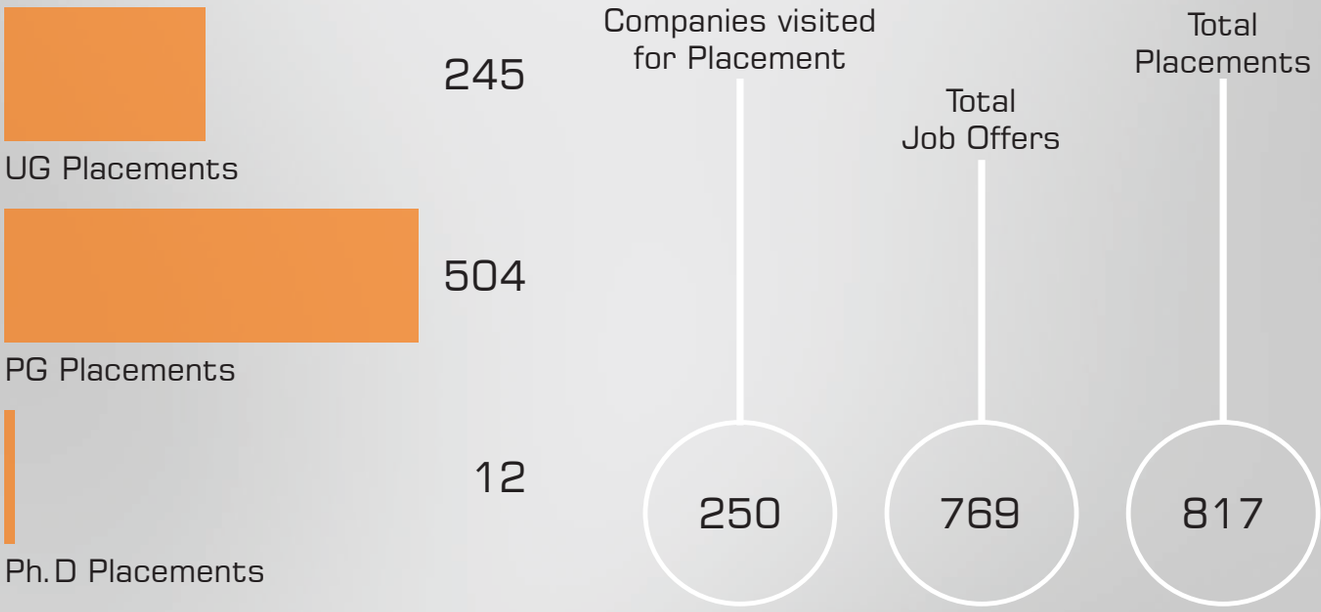
691 Non-Academic Staff

New Faculty members joined the Institute this year **36**

11 Visiting Faculty (including Chair Professors)

Total Partnerships
215

Partnerships with International Institutions
35



Research articles published by the faculty members and researchers of the institute in international journals **1493**

823 Papers presented in Conference

Books published by Faculty **9**

80 Continuing Education Programmes

Sponsored Research Projects with a total funding of ₹ 326.50 Cr.
212

Consultancy Projects with a total value of ₹ 113.57 Cr.
565

Patents Obtained–India **13**

100 Patents Filed–India

Patents Obtained–International **8**

20 Patents Filed–International

Patents Obtained–Total **21**

120 Patents Filed–Total

DIRECTOR'S REPORT

Presented at the 54th Convocation of IIT Madras on 21 July 2017

Chief Guest Mr. Nandan Nilekani, Chairman, Board of Governors, IIT Madras, Dr. Pawan Goenka, members of the Board of Governors, members of the Senate, graduands, distinguished invitees, colleagues and students, it gives me immense pleasure to welcome all of you to the 54th Convocation of IIT Madras. I am personally grateful to Mr. Nilekani for readily accepting our invitation to grace this convocation and address our graduands. It would be difficult to find a better role model for our students than this distinguished IITian himself, and it is their privilege to listen to his address today.

The past academic year has been very rewarding for IITM. It has not only sustained the Number 1 ranking among Engineering Institutes in the NIRF ranking for the second year running, but has also been ranked second in overall performance among all universities in India.

IIT Madras is proud that it has been recognized with the prestigious 2017 IEEE Spectrum Technology in the Service of Society Award for the Solar-DC Microgrid Technology pioneered by Prof. Ashok Jhunjhunwala. This award is presented to the company/institution voted by IEEE Editors as having developed the technology having the greatest potential to provide the most overall benefit to humankind. This recognition strengthens our institute's commitment towards translating the research work carried out in its laboratories to solutions that impact the lives of the common man.

This year we will be awarding 15 B.Tech. Honours, 421 B.Tech., 4,422 M.Tech., nine Dual Degree (B.Tech. Honours and M.Tech.), 317 Dual Degree B.Tech./M.Tech., 22 Dual Degree B.S./M.S, 16 Dual Degree M.S./Ph.D., two Dual Degree M.Tech./Ph.D., 140 M.Sc., 58 M.B.A., 36 M.A., 174 M.S. and 257 Ph.D. degrees, including one joint Ph.D. degree with the University of Passau, Germany.

This convocation will witness the award of the first set of dual Masters' and Ph.D. degrees in the institute for top performers who upgraded from Masters' programmes or got directly admitted to the Ph.D programme.

In 2016-17, the institute added 32 new faculty members, of whom three are women, and 68 staff members, of whom 21 are women. We bade farewell to seven faculty members and 34 staff members who retired after a lifetime of dedicated service to the institute.

IIT Madras has been implementing its Strategic Plan 2014-2020 vision and will continue to recruit world-class faculty members, attract top-ranking students, intensify research collaborations with industry and foreign universities, redouble alumni and CSR contributions, foster entrepreneurship among its students and draw top corporates to its campus for job placements.

I now share with you some snapshots of our achievements during the academic year 2016-17.

Degree Programmes

IIT Madras has, in order to address the needs of our country in emerging areas as well as meet the aspirations of our students, introduced an upgrade path for our undergraduates to an M.Tech.

degree in the emerging inter-disciplinary areas of Data Sciences, Materials and Nanotechnology, Biomedical Engineering, Computational Engineering and Energy Systems. This upgrade path is available to students of all disciplines, and several more such new avenues will be made available to students in the coming years.

The Department of Management Studies launched a two-year part-time non-residential executive programme in Business Administration this year for the benefit of working professionals.

The online M.Tech. programme in Automotive Technology, a tailor-made programme for automotive industries, has been successfully launched and witnessed participation from five automotive companies. Six similar programmes in mathematical methods for aerospace engineers, aerodynamics and aircraft performance, computer science with specialization in information security, communications systems engineering, VLSI circuit design, and industrial metallurgy will be launched soon.

IIT Madras has introduced further flexibility in its curriculum by encouraging students to earn up to 27 credits by taking online courses offered under the Global Initiative of Academic Networks (GIAN) or the National Programme on Technology Enhanced Learning (NPTEL). GIAN, an MHRD initiative introduced in 2015, enables eminent researchers and academicians from abroad visit the institute for teaching short-duration intensive courses and for interactions on collaborative research with faculty and research students. In the year under review, 85 GIAN courses have been conducted at IIT Madras with 2,289 participants.

IITM continues to attract top students to its research programmes. In 2016-17, a total of 93 high-performing Masters' students upgraded to the Ph.D. programme, while 62 toppers were admitted to it directly after their Bachelors' degrees. A further 29 industry professionals also enrolled for their Ph.Ds, indicating a healthy growth in our industry interaction.

Our ever-expanding transnational collaborations have resulted in the formalization of three Joint Doctoral Programs (JDP) with University of Bordeaux, France, Alto University, Finland and Michigan State University, USA, taking the total number of JDPs to 15.

Academic Research

In 2016-17, our faculty and research scholars published 1,453 papers in reputed international journals and 77 in national journals. They have also presented 640 research papers in international conferences and 183 in national conferences.

Snapshots of Research

As an exemplar of the high-quality research carried out by the M.S. and Ph.D. scholars graduating today, I next present a few examples of research carried out by various departments. I am sure these will enthuse the best and brightest in our country to take to research and innovation.

S. Ramgopal of Aerospace Engineering department has developed time-resolved diagnostics towards understanding the mechanism of intermittency of thermo-acoustic oscillations.

As an innovative contribution to energy harvesting from ambient sources Pradeep V. Malaji of the department of Applied Mechanics has developed vibration-based multiple harvesters to generate power over a certain range of frequencies.

Kumar Swamy Reddy N. from the department of Biotechnology has developed some efficient methods for stereo-selective assembly of biologically important spiro-oxindole scaffolds.

Addressing the issue of urban public transportation, Bachu Anilkumar of Civil Engineering Department has developed a model for bus travel time prediction using vehicle location data.

The work of Manigandan S. of Chemical Engineering on amphiphilic colloidal particles has shown that using interfacial thermodynamics and dip-coating technology, micro-particles of various shapes and their self-assembly can be achieved.

Rahul Thakur of Computer Science and Engineering has developed an efficient mechanism for power and resource allocation as well as some self-selection techniques in various cellular network environments.

The work of Krishnadas K.R. of the Chemistry department has addressed the reactivity and size control of thiolate-protected gold and silver atomically precise clusters by the combination of synthesis, inter-cluster reaction and mass spectroscopy.

Vignesh R. of Engineering Design has developed some innovative algorithms for collision avoidance of heavy commercial vehicles taking into account vehicle dynamics and heterogeneity of traffic.

Srinivas Rana of Electrical Engineering has successfully designed and developed the concept of floating wiper resistive and inductive displacement sensors which is novel in its approach by making the wiper a contactless floating type. Abhijith Punnappurath from the same department has introduced a first-of-its-kind work that integrates face recognition, super resolution and object segmentation under a unified framework for moving cameras.

The work of Padmaja M. from the department of Humanities and Social Sciences has expanded the understanding of internationalizing strategies of companies from emerging markets.

Kurian John from the department of Management Studies has developed mathematical programming models for comprehensively looking at characteristics of a class of divergent supply chains operating with backorder clearing mechanisms, multiple objectives and order policies.

Working on the problem of finding a system configuration for large heat transfer with minimal entropy, Monisha Roy from Mathematics has contributed meaningfully to the understanding related to heatlines and associated entropy generation in a mixed convection process.

Jagadesh T. of Mechanical Engineering has developed and validated a novel mechanistic model for micro-turning process widely used among various industries. Vineed Narayanan of the same department has developed an advanced mixed refrigerant Joule-Thomson refrigerator technology for temperatures below 77K.

Viswanathan R. from the department of Metallurgy and Material Sciences has designed and fabricated a novel droplet cell microscope which can be used for localised electrochemical studies on metal alloys.

Samarth Dilip Patwardhan of Ocean Engineering has studied the impact of fracture conductivity reduction on productivity of shale gas petroleum reservoirs and has made important recommendations on optimizing the parameters.

Taniya Mandal from the department of Physics has studied important issues around the uniqueness of black hole attractors in N=2 supergravity and made useful contributions to the understanding of black hole attractors in supergravity which, in turn, is important for gaining an understanding of black hole entropy.

Research Centres of Excellence

As part of its Strategic Plan, IIT Madras has been creating multi-disciplinary Centres of Excellence in areas where it has world-class expertise and critical mass. I am happy to report that several of these centres have reached maturity and produced high-impact results. IIT Madras is carving out a unique place for itself in the country due to the stellar efforts of its research centres.

Through its Centre for Battery Engineering and Electric Vehicles, IIT Madras is taking the lead in bringing these critically important technologies to the Indian market and enabling a strong "Make in India" programme. The Head of this Centre, Prof. Ashok Jhunjhunwala, in his capacity as Principal Advisor in the Ministry of Power, Coal, New and Renewable Energy, is charting a vision for making India a 100% electric vehicle nation by 2030. A number of key technologies to enable this vision, such as energy-efficient motors for EVs and efficient battery management solutions, are being developed at the Centre.

The Centre for Decentralised Power Systems, whose solar-DC technology won the IEEE Spectrum Award, has deployed the technology in 4,000 off-grid homes in the districts of Jodhpur and Jaisalmer in Rajasthan, and in 7,200 homes in several districts of Assam. It has also been deployed in Belagavadi in Karnataka, Alandur (Trichy) in Tamil Nadu and some villages in Odisha, Andhra Pradesh and Telangana, besides being deployed in several buildings on the IIT campus.

The Center for Computational Brain Research (CCBR), an interdisciplinary centre at IIT Madras set up with generous support from our distinguished alumnus Kris Gopalakrishnan, explores the interface between neuroscience and several engineering disciplines. Three distinguished Chair Professors, Partha Mitra, Mriganka Sur and Anand Raghunathan are providing the lead in the Centre. An understanding of the brain helps drive significant technological advances in computing, while new engineering tools help analyze and probe neural circuits in the brain.

The Centre of Propulsion Technology (CoPT), a binodal Centre for research on key areas of aircraft and spacecraft propulsion jointly at IIT Bombay and IIT Madras, was established this year with support from DRDO. In the first phase of its activities, 31 research projects in three verticals - small gas turbine engine, solid propellant combustion modelling and morphing wing aircraft technologies - have been taken up, involving many faculty colleagues across five departments at IIT Madras.

The Center for Excellence in Steel Technology (CoExiST) established at IIT Madras with financial assistance from the Ministry of Steel, Government of India is functioning since May 2017. Initial research projects and workshops are in the areas of development of advanced high-strength steels for automotive applications.

The world-class facilities of the National Centre for Combustion Research and Development, including the world's fifth longest micro-gravity drop tower, are now fully operational in a dedicated building. The Centre is engaged in the development of an Ultra-Compact Combustor, a Rotary kiln based municipal solid waste combustor (both in collaboration with industry), a lean direct injection combustor for gas turbine applications, a dual-bed indirect gasifier for steam gasification of high-ash Indian coals, GDI engine technology for low emissions under variable loads for Indian road conditions, and multisensor and deep-learning-based image-processing tools for online control of combustion.

In collaboration with industry, the National Centre for Catalysis Research has developed the process for the production of an important strategic aviation fuel in a single step using eco-friendly and low-cost catalysts. Pilot-scale quantities are being successfully produced, and after testing in the intended engine, production will be scaled up to required levels.

Following the success in Tamil Nadu of its Mobile Eye Surgical Unit (MESU) developed in collaboration with Sankara Nethralaya to perform cataract operations for aged people in remote villages, the Healthcare Technology Innovation Centre (HTIC) established a second unit of MESU in Jharkhand with support from the Tata Trust. The Chief Minister of Jharkhand inaugurated the unit on 31 July 2016 at Jamshedpur. Till date, the MESU has completed 6,000 surgeries in rural areas, demonstrating the value of such innovations for solving difficult healthcare challenges in our country.

The National Centre for Safety of Heritage Structures (NCSHS) in conjunction with UNESCO is working on a conservation project to develop the seismic retrofit scheme in the famous Bagan Archaeological Zone in Myanmar after a strong earthquake affected more than 400 monuments in August 2016. NCSHS is beginning to be recognized as the premier research centre in Asia in its domain.

The Centre of Excellence in Wireless Technology has provided the lead in a national effort to include the Low Mobility Large Cell Requirement in the 5G wireless standards that is critical for ensuring broadband connectivity in rural India. The scientists of the centre have also made important contributions to the 5G standardization effort that will ensure that India's 5G requirements for both Smart Cities and rural areas are met. The centre is a leader in India in the creation of wireless IPR.

The Advanced Manufacturing Technology Development Centre (AMTDC), established with the support from Department of Heavy Industry, Government of India, in partnership with six machine tool industries, is developing 5-axis multi-tasking, universal and precision micro-machining centres, apart from energy-efficient and fully automated cutting, grinding and polishing machines.

After its success in West Bengal, AMRIT, the technology developed by the Thematic Unit of Excellence (TUE) on Water Purification using Nanotechnology for removing arsenic and iron affordably, has been expanded to Punjab. While AMIRT has benefitted 6 lakh people, its model fitted with solar pumping units has benefitted 1 lakh people so far. A green capacitive deionization (CDI) technology developed by the centre for brackish water desalination, with reduced water wastage, retention of useful minerals and running on solar electricity, will be available in the market through a start-up by the end of 2017.

The Centre for NEMS and Nanophotonics (CNNP) is now fully operational and has developed a dispersion-enhanced micro-ring resonator with Q-value exceeding 1,50,000, a piezoelectric resonator at 1 GHz, and microfluidics chips for blood plasma separation, sorting of cancer cells and detection of sepsis using acoustic field. It has developed a Near Field Ultrasonic Nanoscopy (NFUN) system for high frequency and sub-wavelength based imaging of MEMS and NEMS structures.

The Indo-German Center for Sustainability (IGCS) will be completing its first phase of six years by December 2017, and has been doing pioneering research in biodiesel characterization, septage management, zero-discharge solar toilets, sustainable water resources management and building resilience in peri-urban areas. A patent filed for zero-discharge toilet by Ligy Philip, K.S. Reddy and their students has won the award instituted by IIT Madras alumni for the year 2017. Funding from industry has led to an interesting solution to the problem of micro-grid islanding and renewables integration. During the recent visit of the Honorable Prime Minister of India to Germany, an agreement was signed to extend the support to the centre by both countries for another five years beginning January 1, 2018.

A new Centre for Urbanization, Buildings and Environment has been set up with generous support from the Government of Tamil Nadu to work on all aspects related to urban infrastructure, smart cities and pollution control. The centre will be a force multiplier for the excellent work being carried out by our faculty till date in their individual capacities.

Research Innovations

Prof. Arun Thittai and his team from the Department of Applied Mechanics have calibrated ultrasound machines with a software program that would blur out the display of certain parts of the images during scanning that prevent the identification of the gender of the foetus.

A data glove, which measures the individual joint angles of all the five fingers to understand the activity of daily living, developed by Nayan Bhatt, a research scholar from the Department of Applied Mechanics, has recently won the Budding Innovators Award given by the Delhi-based National Research Development Corporation (NRDC).

Dr. Swati Choudhary and Dr. Rama Shankar Verma, Department of Biotechnology, have put forth an alternative for diagnosing leukemia and colorectal cancer that is both reliable and cheaper by using fusion proteins that have high specificity and sensitivity.

The Civil Engineering students of IIT Madras have designed a foldable house (52ft in length and 40ft height) made of metal frames and iron panels that can be unfolded and used to accommodate 20 people during natural disasters. The toilet comes as an unfoldable 13 m long and wide box fitted with all the necessary faucets that can be attached to one end of the frame of the whole house. The approximate cost of the house is ₹ 3 lakh.

Prof. Ligy Philip and her students from the Department of Civil Engineering have developed a water analysis and treatment kit to filter water for which they are transferring technology. The kit, designed for rural areas, removes turbidity, organic matter, colour, odour and most bacteriological contamination.

A method for both waste-water treatment and electricity production using LEC/LCD (liquid crystal coated) polaroid glass component of e-waste has been developed by Gangadharan, a research scholar of the Department of Civil Engineering under the guidance of Dr. Indumathi Nambi.

A team from IIT Madras, led by Dr Kavitha Arunachalam, Department of Engineering Design, has prototyped an applicator for treating cancer using hyperthermia. This prototype applicator comprises of an array of body-contacting antennas, which can deposit energy at a depth using microwave radiation.

Dr. Soma Guhathakurta's doctoral thesis guided by Prof. Venkatesh Balasubramanian of the Engineering Design Department has resulted in the development of an indigenous tissue engineered pericardial patch that is capable of regeneration and integration in the body. A first-of-its-kind lifesaving implant for critical cardiovascular patients with anatomical and structural deficiency in the whole of Asia, it was chosen for the Biotech Product, Process Development and Commercialization Award by DBT, Government of India.

Intelliseat, a 24x7 performance monitoring solution, co-developed by the researchers of Department of Engineering Design with M/s. Harita Seating Systems Limited (HSSL) has been launched to monitor the bus or truck driver within the footprint of his regular seat, thereby reducing road accidents caused by driver fatigue.

Prof. G. Venkatratnam and his team of researchers from the Department of Mechanical Engineering have developed a novel, low-cost and high-efficiency nitrogen liquefier that produces about one litre liquid nitrogen an hour using components taken from home appliances.

Prof. Ashis Kumar Sen and Sneha Maria of the Department of Mechanical Engineering have devised a low-cost 2-cm-long microchannel device that employs capillary force to draw blood into the device and to separate plasma from whole blood and test glucose level in diabetic patients.

An integrated optical system capable of detecting and monitoring algal/phytoplankton blooms both spatially and temporally in coastal and open ocean waters has been expounded by a team of IITM researchers at the Department of Ocean Engineering. The Indian National Centre for Ocean Information Services (INCOIS) is currently in the process of making the system operational.

Sripada Raghu, Ananya Gangadharan and Prof. Ramaprabhu of the Department of Physics have been able to enhance the capacity retention of anode material in lithium ion batteries four-fold compared to commercially available lithium batteries.

IITM start-ups have enabled the translation of technologies to products. Beluga, an indigenously developed remotely operated vehicle (ROV), was launched on 18 November by IITM start-up Planys Technologies at IIT Madras. Beluga, specifically designed for oil and natural gas and shipping sectors, offers submersible robotic inspection for offshore structures. The earlier ROV Mike launched by Planys offering only visual inspection has been deployed in several ports of the country. Detect Technologies developed a product called Guided Ultrasonic Monitoring of Pipeline Systems (GuMPS). Kamal Kisan has developed a handy low-cost planter, which can plant most vegetable and fruit saplings with significantly reduced labour and increased process efficiency.

As a significant step towards enhancing and encouraging entrepreneurial thinking amongst students and faculty, IIT Madras has launched the Gopalakrishnan Deshpande Centre for Innovation & Entrepreneurship (GDCIE) along the lines of similar Deshpande Centres functioning in a few universities in North America. Supported by an annual grant of US$ 1 million from our distinguished alumnus and board member Kris Gopalakrishnan and distinguished alumni Desh and Jaishree Deshpande, the centre also benefits from their considerable personal experience and knowledge on the subject.

New Research and Fabrication Facilities

IIT Madras continues to focus on upgrading and enhancing the research facilities and infrastructure for its scholars.

The Applied Mechanics Department has augmented its laboratories with the Phase Doppler Particle Analyzer, Nanoindenter and a Stack Particulate Emission Instrumentation development and validation facility.

An advanced Microflow Reactor, Atomic Absorption Spectroscopy and Motorized Microscope arrangement have been set up in the Department of Chemical Engineering.

A state-of-the-art seismic testing facility with support from NCSHS and Central Water Commission's World Bank-funded Dam Rehabilitation and Improvement Project (DRIP) has been commissioned in the Structural Engineering Laboratory of the Department of Civil Engineering.

A Zero Liquid Discharge (ZLD) research laboratory has also been set up in the Civil Engineering Department with a generous grant from Sanmar Group. The laboratory has the necessary test beds

for developing and evaluating various new/modified technologies related to ZLD implementation for target industries.

A National Facility for atomic-scale materials characterization using remotely-operable Atom Probe Tomography (NFAPT) has been commissioned in the Department of Metallurgy and Materials Engineering. This facility will be shared by a large number of institutions via the National Knowledge Network. A TITAN Transmission Electron Microscope with unique magnetic shielding that reduces the magnetic field to under 30 nano Tesla makes the IITM installation one of the best in India.

The Department of Mechanical Engineering has added a Transient Dynamometer for Engine Experimentation under actual road conditions.

An integrated sensor-mounting cage for underwater deployment of instruments on cruise and a Volume Scattering Meter (VSF) that enables measurement of angular scattering pattern of an underwater light field have been added in the Department of Ocean Engineering.

An electrochemical workstation and RPC detector development facility have been created in the Department of Physics.

Academic Distinctions Secured by our Faculty Members and Students

In recognition of their academic achievements, our faculty, staff and students have been bestowed several academic distinctions, honours and awards, fellowships of academies and professional societies, and memberships on editorial boards of journals. Notable among the awardees are Dr. A. Jayakrishnan who was elected as Fellow of INSA, Dr. Ligy Philip who was elected as a Fellow of The Royal Society of Chemistry, Drs. R. I. Sujith, S. Sankararaman and Sundargopal Ghosh who were elected as Fellows of the Indian Academy of Sciences, Dr. R. Sarathi who was elected as Fellow of INAE; Drs. P. Anbarasan and Santanu Sarkar who won the NASI - Young Scientist Award, Dr. Krishna Nandivada who won Cray's Dr.APJ Abdul Kalam HPC Award, Dr. V. Kamakoti who won the IBM Faculty Award, Dr. Prabhu Rajagopal who won NDRF's National Design Award and National Young NDT Scientist Award, Dr. Ethayaraja Mani who won IIChE's Amar Dye-Chem Award, and Dr. Satya Sundar Sethy who won ICPR's Young Philosopher Award.

Six of our young faculty, Dr. Vignesh Muthuvijayan, Arun Menon, Rupesh Nasre, Boddeti Kalyan Kumar, Mathangi Krishnamurthy and Manu Jaiswal, have won the Young Faculty Recognition Award of the institute for the year 2016, while Prof. A. Ramesh won the Srimathi Marti Annapurna Gurunath Award for Excellence in Teaching for the year 2016-17. Prof. R. Krishnakumar was awarded the Lifetime Achievement R&D Award of our institute; Drs. G. Sekar and Krishnamoorthy Sivalingam have been awarded the Mid-Career R&D Award; while Drs. Radhakrishna Ganti, Ashish Kumar Sen, Jitendra S. Sangwai and Niket Kaisare have been awarded the Junior-Level R&D Award.

As per the recommendations of the Peer Review Committee, seven more senior professors have been recognized as Institute Chair Professors this year, taking the total number to 22.

An exhaustive list of laurels won by our faculty and students is given as an Annexure to this report. IIT Madras is prompt, active and well connected on social media to publicise the achievements of its faculty and students. Apart from Facebook and LinkedIn, ReachIITM is also ahead of the curve with its presence across other platforms such as Instagram, Google Plus and Pinterest.

Industrial Consultancy and Sponsored Research

In 2016-17, 212 ministry-sponsored projects for a total value of ₹ 326.50 crore and 565 industrial research and consultancy assignments amounting to ₹ 113.57 crore have been sanctioned. This represents an all-time high in extra-mural research funding for the institute. This year, 88 collaborative agreements and 10 license agreements have been signed with various global and national companies.

The institute has earned ₹ 1.85 crore from technology transfer fees and royalties during the year 2016-17. The Intellectual Property Management Cell has enabled filing of around 120 patents during the year, of which 20 are international patents, representing an increase of 20% over last year. Twenty-one patents have been granted of which eight are international patents. IITM topped the IITs in the country with the higher number of patent filings.

The Research Fund of ₹ 50 crore created a few years ago has been utilized this year for seven R&D awards at ₹ 1.8 crore, 43 exploratory research projects with a 'breakthrough' idea at ₹ 3.36 crore, research initiation grant for 35 new faculty members at ₹ 1.75 crore, and to operate and maintain instruments shared across the institute at ₹ 1.57 crore.

Of the 23 projects sanctioned to IIT Madras under the Ucchatar Avishkar Yojana (UAY) programme, two major projects are for development of iQuant, a platform for affordable automated immunodiagnostics by the Department of Electrical Engineering at a cost of ₹ 14 crore, and Fuel Flex Microturbine for Clean Power by the Department of Mechanical Engineering at a cost of ₹ 10 crore.

IIT Madras was sanctioned a project for standalone electrification of 306 villages in Assam using our innovative solar-DC Inverterless System with a funding of ₹ 33 crore from APDC.

Research Park and Incubation

IIT Madras Research Park (IITMRP), the first-of-its-kind in India established in 2010, has not only set new benchmarks for industry-academia collaborations, but has also shared its experience and helped in the setting up of similar university based research parks in India. Phase-I of the Research Park is fully occupied with more than 70 companies, and 30% of the Phase-II with 0.8 million sq.ft. of built-up area that is nearly complete is already operational.

IITMRP is home to all of IITM's incubators and has emerged as India's leading technology start-up hub with innovation and impact as key differentiators/drivers.

IITM Incubation Cell (IITMIC), the nodal incubator, links and synergizes sector-specific incubators (Rural Technology and Business Incubator, Bioincubator and MedTech incubator), student pre-venture initiatives (Centre for Innovation and E-Cell), and translational research at IITM. IITMIC provides 'concept to scale-up' support to start-ups through a holistic ecosystem with access to world-class R&D infra at IITM, business support services, seed and early funding and mentoring in technology/design and market entry.

IITMIC's pioneering efforts to support India's start-up activities were recognized by the Department of Science and Technology's National Award for Best Emerging Technology Business Incubator in May 2017.

To accommodate the growing entrepreneurial footprint, one lakh square feet of space has been allocated in Phase-II of IITMRP. The new IIT Madras Incubation Cell was inaugurated by Honourable Minister Nirmala Sitharaman in the presence of Mr. Amitabh Kant on 6 March 2017.

Spearheaded by IITMIC, IITM is empowering entrepreneurs to address national challenges through successful, self-sustaining companies. Some major highlights on incubation at IITM: 130 tech start-ups incubated till date of which 37 have IITM Faculty as co-founders or minority shareholders; 28 companies have raised total investment of Rs 642 crore from angel investors/VCs. A total of 52 companies are in the market with cumulative revenue of Rs 90 crore in FY 2015-16 and 2,500 direct jobs created, while 43 companies have graduated till date.

IITM-incubated start-ups were also recognized widely in 2016-17 by prestigious awards from India and abroad. These include Entrepreneur Award 2016 by Takeda Foundation, Japan given to marine robotics and inspection start-up Planys Technologies Private Limited; Economic Times Start-up Awards 2016, where four of the five finalists under Best on Campus category were all IITMIC start-ups - Ather Energy, Planys Technologies, Hyperverge and Detect Technologies - with the eventual winner being Ather Energy Private Limited; and TIME's Top 10 Next Generation Leaders from across the globe was awarded to Uniphore. The Annexure contains the other recognitions won by our start-ups.

Continuing Education and our Contributions to the National Educational System

IIT Madras through its Centre for Continuing Education (CCE) offers extensive outreach programmes that cater to the needs of teachers, practicing engineers and researchers. This year CCE has organized 19 short term training programmes for engineering college faculty and 80 continuing education programmes for industrial and R&D establishments. These programmes have benefitted about 59,000 participants in 2016-17 and resulted in revenue of around ₹ 5.5 crore.

IITM is assisting and mentoring other engineering institutions in the country with their curriculum, laboratory upgradation, faculty career development and implementation of TEQIP programmes. Under the Quality Improvement Programme (QIP), we have a total of 38 QIP scholars – 30 pursuing Ph.D. and eight M.Tech. of which 10 Ph.D. and one M.Tech. are women.

The Teaching Learning Centre (TLC) of IIT Madras, a first-of-its-kind faculty-training centre that stepped into its fifth year, has received a funding of ₹ 4.5 crore from MHRD for training faculty of other higher learning institutes. It has also launched a programme to train final-year Ph.D. and M.Tech. students who aspire for a teaching career.

The National Programme on Technology Enhanced Learning (NPTEL) coordinated by IIT Madras provides the world's largest free-to-access repository of high-quality courses in engineering and science with more than 1,200 courses in engineering, science and technology. NPTEL, under the massive open online courses (MOOCs), has offered 234 courses in the year under review that had student enrollment of over 9 lakh and exam registration of 75,000, of which 50,000 students were certified by means of proctored examinations. These courses can be taken for credit as per AICTE/ UGC norms, and NPTEL is negotiating with industry bodies for recognizing the certificates for recruitment in the IT industry.

IITM Summer Fellowship Scheme, which provides a unique opportunity for summer research internship to top-ranking engineering and science students across the country, supported 230 students this year.

IIT Madras continues to provide support to Rashtriya Aavishkar Abhiyan (RAA) and Ishan Vikas programmes launched by the Government of India, and has provided training to around 180 students and 25 teachers from 39 schools this year.

International Collaborations

IIT Madras has been active in furthering its international collaborations and during 2016-2017 signed 35 MoUs with eminent international universities worldwide to facilitate student exchanges and faculty collaborations, taking the total number of active MoUs to 215, JDPs to 15 and Joint Supervision Programs to 50.

The number of exchange students at the Indian Institute of Technology Madras has risen from 90 in 2011 to 145 in 2016, a jump of 61% and an indication that the institute is improving its international relations and gaining global impetus. IITM has seen a steady increase in students going abroad for exchange programs from 18 in 2012 to 150 in 2016. A notable summer internship opportunity available for IIT Madras students is the Purdue Undergraduate Research Experience (PURE) that witnessed participation of nine IITM students and the IITM-RWTH Indo-German programme that benefitted four students.

RWTH Aachen University and IIT Madras were awarded a joint grant from DAAD and UGC as part of the Indo-German Partnerships in Higher Education Programme (IGP), with funding of 500,000 euros over a four-year period. IITM is an active participant in consortia such as AOTULE (Asia-Oceania Top Universities League in Engineering) and WTUC (World Technology Universities Congress), and in Erasmus projects such as Heritage and Svagata.

Human Resources

IIT Madras has conducted several systematic programmes throughout the year to train our technical and administrative staff and help them upgrade and acquire new knowledge, skills and professional orientation through a variety of learning experiences. In the year under review, about 139 staff members benefitted from four in-service and 14 offsite training programmes. Apart from this, as many as 57 officers/staff have been provided Hindi training.

The awardees for the Non-Academic Staff Recognition Awards for 2016-17 are Ms. P.K. Sheba Sabari and Ms. B. Sundari under the Administrative category, and Mr. K.R. Ravindranath and Mr. S. Dhanabalan under the Technical category.

Quality and Process Improvement Initiatives

IIT Madras was ISO certified for its academic support processes as early as 1999 and for administrative support processes in 2001. The ISO certification for all the units was upgraded as per the ISO 9001:2015 standard in February 2017. The institute hospital was ISO certified this year. The Central Electronic Centre has also been NABL-accredited for its Testing and Calibration Laboratories since 2004.

Infrastructure Development

We are thankful to the Government of Tamil Nadu for allotting 163 acres of land in Thaiyur B Village, Kancheepuram district for establishing our satellite campus. At a special function in the Chief Minister's office on 27 April 2017, the Honourable Chief Minister handed over the government order for the transfer. IIT Madras is planning to establish large Centres of Excellence at its satellite campus.

The year 2016-17 witnessed the completion of a number of construction projects – National Centre for Combustion R&D; two new class room complexes, Raman and Ramanujan Blocks, for the I Year

classrooms replacing the Chemistry and Physics Lecture Theatres; an additional floor over the Engineering Design building; Nilgiri, a new student dining facility with a seating capacity of 900; and an Annexe building for IC&SR.

Some projects that are nearing completion are the Bio-Technology and Centre for Sustainability buildings with G+6 floors with support from the Mehta Family Foundation; New Academic Complex with G+6 floors that will house the Departments of Metallurgical and Materials Engineering, Chemical Engineering and Mathematics along with some Research Centres; and 96 B Type quarters with G+8 floors.

The successful commissioning of the 1 MW solar PV system has resulted in the launch of an additional 2 MW solar PV system funded by a CSR grant from Rural Electrification Corporation Limited, and a 120 kW system funded by alumni. With this installation, the IITM campus will have a total of 3.2 MW of solar capacity thereby significantly reducing the peak load demand from TANGEDCO.

The 4 MLD sewage treatment plant and installation of a dual piping system for all hostels and high-rise residential buildings enable effective recycling of 1.4 MLD that not only meets the requirements in the washrooms, but also leaves surplus for gardening. IITM has been praised as a unique role model for effective water usage in a city with acute water shortage.

IITM will be hosting the Inter-IIT sports meet this year and towards this, we are augmenting the sports and recreation facilities on campus. On 2 May 2017 Mr. N. Sankar, Chairman, Sanmar Group as part of their Golden Jubilee celebration inaugurated the renovated K. S. Narayanan Centre for Cricketing Excellence. On 3 May, the synthetic track at the Manohar C. Watsa stadium was inaugurated by the donor and distinguished alumnus Mr. Prem Watsa, Chairman and Chief Executive of Fairfax Holdings.

Keeping in mind our increasing bandwidth and cyber-security requirements, the core switches and firewall have been upgraded to a performance level ten times better than before.

Student Co-Curricular and Extra-Curricular Activities

SAARANG, the annual cultural festival of IIT Madras, witnessed yet another leap in standard and scale by becoming the first cashless event on campus. This year's theme Enchanted Forest brought to life the idea of a mystical land through its large-scale ambience project. With a footfall of over 63,000, 90 competitive events, 200 informal events, 14 lecture demonstrations, seven world cultural show acts (like sand art, street dancing, etc.) and six professional shows, Saarang was invigorating. The stall for Digital Payment System awareness drive conducted as a part of VISAKA was a hit.

SHAASTRA, the annual technical festival of IIT Madras, with theme AUGMENT not only served as a platform to display talent and ingenuity, but also provided a learning experience in the world of science and technology. Accessibility Summit that held the first-ever hackathon for the visually impaired and the Formula Drone, India's first ever drone racing event, were this year's additions. SYNK, a social initiative for waste management, has developed a new technique of construction using discarded PET bottles with filled sand instead of bricks. This will help in rural sanitation. The first such 'bottle' toilet is going to come up in Bandikavanoor in Sholavaram taluk in Thiruvallur district.

The second edition of institute's literary festival SAAHITYA was a celebration of all literary forms such as oratory, word games, theatre, writing and quizzing.

The EXTRA MURAL LECTURE (EML) series, a long-standing student initiative, was vibrant as ever. Following a kick-off lecture by Dr. Kiran Bedi, EML featured distinguished speakers from varied fields: Dr. Tiziano Camporesi of CERN, Mr. Seth Dallaire of Amazon, former Union Finance Minister Mr. P. Chidambaram, HDFC Chairman Mr. Deepak Parekh, former tennis sensation Mr. Ramesh Krishnan, Telangana IT Minister Mr. K. T. Rama Rao, Bharatanatyam exponent Ms. Bala Devi Chandrashekar, to name a few. Dr. A. S. Kiran Kumar delivered the annual Abdul Kalam Memorial Lecture this year.

RESEARCH CONNECT is an initiative that aims to link industrial R&D experts, IIT Madras research scholars and faculty and acts as an enabler in translating laboratory research to industry. It was launched as part of the fifth edition of the annual Research Scholars' Day (RSD) Celebrations.

In the 32nd INTER-IIT AQUATIC MEET, IIT Madras won both the Men's and Women's Swimming Championship. In the 51st INTER-IIT SPORTS MEET, the Women's team clinched the championship, winning a gold medal each in basketball and tennis. Our Men's team did very well in athletics by winning three gold medals, while securing third position overall.

The CENTRE FOR INNOVATION (CFI) had a great year with all its 13 clubs bubbling with activity and great performance in competitions. It mentored other institutions in the country for setting up similar centres. CFI hosted multiple visitors from various backgrounds, from students and professors to the Education Minister of Tamil Nadu. The WebOps club of CFI in collaboration with the Government of Tamil Nadu conducted a nationwide hackathon to strengthen 108 ambulance services. The success of the CFI can be estimated by the accolades our projects and teams won at various events this year.

Team Sahaay that focusses on accessibility had two of its projects recognized. The toilet sanitation project won the GYTI award at the President of India's Festival of Innovation. The electrolarynx project to aid those who have lost their voice box due to illness was selected as an exhibit for an exhibition organized by ICMR.

Team Raftar, the formula racing team, that has been consistently improving and bettering their record, secured overall second position in Formula Bharath 2017 out of 55 teams while emerging first in categories such as fuel efficiency and endurance. They are representing IIT Madras in FS-Italy this month. Team Anveshak has worked relentlessly on their Mars Rover to become one of the few teams from India to clear the critical design review at the University Rover Competition at Utah in June. Team Abhiyaan has finished in the top 13 for its innovative solutions and algorithms for autonomous guidance and lane detection in the Intelligent Ground Vehicle Challenge 2017 held at Michigan. Team Nimbus came 2nd in India and 14th in the world in the SAE Aero Design Competition, the largest aero design competition in the world at university level, held at Fortworth, Texas.

Nirmaan, the pre-incubation programme, saw four incubated start-ups - Tvasta Manufacturing in the 3D printing field, Zup in the app field, and Crion Tech and GhostVR in the virtual reality domain.

IITMSAT is the student-led satellite initiative of IIT Madras to launch a Space-based Proton and Electron Energy Detector (SPEED). The payload combines scintillators, optical fibres and high-speed electronics in a compact nanosatellite form factor. The satellite has been fully built ground up by our students and is currently undergoing intensive testing at IITM and ISRO, targeting an ISRO PSLV-based launch later this year. A satellite tracking ground station has also been set up on campus by our students.

The Leisure Time Activity programme (LTAP) has provided an opportunity for students to pursue their interest outside academics. The positive impact of LTAP is discernible from the participation of 3,000 unique students in various events and the registrations of various clubs doubling this year.

Student Welfare

The wellness of students is one of the key concerns of our institute, which has a planned and dynamic Wellness Network. MITr and SAATHI, formed for the well-being of the student community, are serving as the guidance and counseling units that provide emotional support to students through professional counselors and experts who are available 24x7. While SAATHI is proactive in its activities, MITr is the reactive front. A continuous monitoring programme to follow-up with students who have had stressful and anxious moments is also in place.

YourDOST, an online emotional wellness platform, aims to increase awareness regarding mental wellness and break the prevalent social stigma attached to seeking psychological help on campus. The mechanism has been introduced for students who are more comfortable on an online forum compared to the existing face-to-face system.

In order to enable freshers to settle comfortably and feel at home away from home, various informal programmes such as treasure hunt, friendship day contest, orientation programme and academic buddy programme have been organized. Several programmes and workshops on relaxation, meditation, yoga, leadership and gender sensitization, among others are organized regularly to foster physical, social, emotional and intellectual well-being of our students.

Placement

As a result of reaching out to around 1,628 core and non-core companies this year, 250 companies visited IIT Madras for placement, of which 127 were from core engineering verticals. Focus was placed on contacting various Fortune 500 and other leading companies.

Despite disruption of placements due to cyclone this year, a total of 769 students were placed through Placement Office, of whom a large fraction (364) joined core engineering companies. This number is similar to last year's. A significant number of our graduands get placed through their guides or pursue higher studies. From the exit data collected from the graduands attending the convocation, I am happy to note that almost everyone here has either been placed or is pursuing higher studies in India and abroad.

The internship office has enabled placement of 296 third-year students into internships in 86 companies in the year under review.

Alumni Matters

The Office of Alumni Relations continues to provide a vibrant interface between the institute and its alumni. Social media platforms are being leveraged extensively for enabling this, as evidenced by the LinkedIn membership crossing 11,000. The love and regard the alumni have for their alma mater is evident from the enthusiastic and increased participation during AlumNite, alumni reunions and chapter meetings both in India and abroad.

IIT Madras has been honouring select alumni with Distinguished Alumnus Awards since 1997 in recognition of outstanding achievements in the areas of entrepreneurship, leadership and

management, academia and research, social and technological innovation, and service to humanity at large. The awardees for this year are:

1. Dr. K. Virupaksha Reddy, President and Founder, PriTel Inc., Illinois, USA (1972/MSc/CY)
2. Dr. Ramayya Krishnan, Dean, H. John Heinz III College and William W. and Ruth F. Cooper Professor of Management Science and Information Systems, Carnegie Mellon University, USA (1981/BT/ME)
3. Mr. V. Shankar, Founder, CAMS Private Limited, Chennai (1981/BT/ME)
4. Dr. Vivek De, Intel Fellow and Director of Circuit Technology Research, Intel Corporation, Oregon, USA (1985/BT/EE)
5. Mr. Satish Pai, Managing Director, Hindalco Industries Limited, Mumbai (1985/BT/ME)
6. Dr. Sethuraman Panchanathan, Chair Professor and Executive Vice President, Arizona State University, Arizona, USA (1986/MT/EE)
7. Dr. Pradip Dutta, Professor, Department of Mechanical Engineering, Indian Institute of Science, Bengaluru (1987/MT/ME)
8. Dr. S. Sudarshan, Professor and Subrao M. Nilekani Chair Professor, Department of Computer Science and Engineering, IIT Bombay (1987/BT/CS)
9. Dr. P.V. Venkitakrishnan, Director, ISRO Propulsion Complex (IPRC), ISRO, Mahendragiri, Nagercoil (1989/MT/ME) and (2006/PhD/ME)
10. Dr. M.R. Madhavan, President, Institute for Policy Research Studies, New Delhi (1990/BT/ME)
11. Mr. Venkat Viswanathan, Founder and Chairman, LatentView Analytics, Chennai (1992/BT/CE)
12. Dr. Anand Raghunathan, Professor, School of Electrical and Computer Engineering, Purdue University, Indiana, USA (1992/BT/EE)

The institute's alumni play a vital role in the development of their alma mater and its outreach. In 2016-17, fundraising scaled new heights, reaching ₹ 55 crore for the first time, and the number of first-time donors rose by 70% over 2015-16, again to an all-time high of 1857. Crowd-funding for short-term projects that are placed on a social media platform has become a significant source of attraction to new donors. More than 200 new donors have been so attracted and ₹ 75 lakh pooled.

J. Mitra and Co. Private Limited sponsored ₹ 7 crore towards the activities of the Healthcare Technology Innovation Centre. Kris Gopalakrishnan, Gururaj Deshpande and Jaishree Deshpande sponsored the Gopalakrishnan Deshpande Centre for Innovation and Entrepreneurship (GDCIE) with a donation of $1 million per year over the next five years as mentioned earlier in the report; the Mehta Family Foundation has been generous in continuing to fund the construction of the second BioSciences Building with an additional contribution of ₹ 3.5 crore. Venky Harinarayanan and Anand Rajaram, our Distinguished Alumni, endowed a Visiting Chairs programme in Computer Science and Engineering with a gift of $1 million, while four Institute Chairs were endowed with grants of ₹ 50 lakh each.

CSR contributions received from Indian industries exceeded ₹ 17 crore with several companies contributing to support scholarships and incubators, as well as faculty R&D projects with social impact. The Mr. Ramanan and Khanchandani Scholarships were sponsored in the memory of Late R. Ramanan and Late Deepak Khanchandani by their families.

Twenty-seven Leadership Lectures featuring alumni have been held last year. More than 228 students and 25 faculty members were provided travel grants to support conference presentations and collaboration activities. The total payout exceeded ₹ 87 lakh. More than 1,300 students have benefited from travel grants over the years.

Acknowledgements

An endeavor on the scale of this institute and its entire gamut of activities takes place with the whole-hearted participation and support of all stakeholders - our faculty, students and staff, agencies and industries sponsoring R&D and consultancy projects, professionals from other organizations who assist us in various capacities, and our alumni for their generous support to our various activities. In particular, I would like to thank office-bearers such as Heads of Departments, Deans, Chairpersons, Wardens, Advisors and Professors-in-charge of various Cells and Centres for the selfless work they put in to keep the institute ticking. I would also like to specifically place on record our gratitude to the outgoing Registrar, Ms. V. G. Bhooma, for the stellar service she has rendered during her deputation at IIT Madras. The institute is grateful to the Ministry of Human Resources Development, Government of India, for its continued and sustained encouragement and support. I also wish to thank the Government of Tamil Nadu for all the support it continues to extend in multiple ways.

I wish to thank Dr. Pawan Goenka, our Chairman, Board of Governors, and all board members for their wise counsel, support and guidance, enabling us to scale new heights. Our Chairman is constantly holding us to a goal-oriented approach aimed at exceeding our promises and Strategic Plan objectives. I take this opportunity to thank the outgoing board members Mrs. S. Madhumathi, Mr J. Ashok Kumar and Dr. K. Vijayakumar, and welcome Mr. Rajendra Ratnoo, Dr. Tariq Thomas and Dr. K. P. Indiradevi who have been nominated in their place.

I would like to once again thank our Chief Guest, Mr. Nandan Nilekani, former Chairman, UIDAI and co-founder of Infosys for gracing this convocation. To have been part of the visionary team that helped make a name for India globally in the IT space is achievement enough. To follow it up with the creation of the world's largest online identification system Aadhaar is stupendous. It is indeed a matter of pride for us as Indians and IITians that one amongst us had the guts to dream that such a state-of-the-art system could be successfully set up and function seamlessly in a large country of 1.25 billion with known infrastructural deficiencies. He has most recently been recognized with the Nikkei Asia Prize for his pioneering efforts in this regard. I am sure all our students are eager to hear him and draw inspiration from his lifetime of service to the nation.

Before I end, I would like to congratulate the prize winners and wish all our graduands happiness, professional success and fulfillment from a life of service to family and country. God bless you all.

Jai Hind.

ADMINISTRATION

The Indian Institute of Technology (IIT) Madras is an autonomous statutory organization functioning within the Institutes of Technologies Act 1961, as amended by the Institute of Technology Amendment Act, 1963. The IITs (at Mumbai, Kanpur, Kharagpur, Delhi, Guwahati, Roorkee, Rupnagar, Bhubaneswar, Gandhinagar, Hyderabad, Patna, Jodhpur, Mandi, Indore and Varanasi (BHU), as well as Chennai) are administrated centrally by the Councils of IITs, an apex body established by the Government of India (GoI) to co-ordinate the activities of these institutes. The Minister for Human Resource Development, GoI is the Chairperson of the Council. Each IIT has a Board of Governors responsible for overall administration and control.

The Senate decides the academic policies of IIT Madras. It approves and controls the curricula, courses, examinations and declaration of results. It appoints various committees to look into specific academic matters arising from time to time. The teaching, training and research activities of various departments at the institute are constantly under review to improve both facilities and standards. The Director of the institute is the Chairman of the Senate. The members of the Senate are listed in the Appendix.

The Finance Committee provides financial advice. The Buildings and Works Committee advises the institute on matters related to buildings and works. The compositions of these committees and boards, together with a list of other officers, are also provided in the Appendix.

Staff Position

As on 31 March 2017, 573 faculty members and 79 Group 'A' officers were in service.

Number of faculty/employees in service

Faculty Members	Visiting Faculty	Group A Staff	Scientific Officer	Technical Staff	Administrative Staff
573	11	79	1	271	340

Number of faculty and employees appointed during 2016-2017

Professors	Associate Professors	Assistant Professors	Visiting Faculty	Administrative and Technical Staff (including Group A)
2	34	29	11	76

Staff Welfare

Human Resource Development

As part of human resource development (HRD) activities, the institute plans and implements programmes for providing opportunities to technical and administrative staff members to update and upgrade their knowledge and skills so that they may perform their duties effectively. The programmes are also aimed at enhancing the sense of pride and satisfaction in them for what they do. These activities are also a part of the training requirements under the ISO dispensation.

HRD programmes

HRD activities were initiated at the institute in 1997 under the charge of a professor. In the period of reporting, three internal training programmes and one external training programme organized by other institutions/organizations were attended by our employees. The impact of these programmes, based on the feedback received at the end of each programme, appears to be advantageous to the institute, as the employees were able to upgrade their knowledge from the programmes designed as per their needs.

Faculty members and officers in the academic and general administration

I. Academic Administration	
Director	Prof. Bhaskar Ramamurthi
Deans	
Academic Courses	Dr. V. Jagadeesh Kumar
Academic Research	Dr. A. K. Mishra
Administration	Dr. Koshy Varghese
Industrial Consultancy & Sponsored Research (IC&SR)	Dr. Krishnan Balasubramaniam
Associate Dean (IC&SR)	Dr. Ravindra Gettu
Students	Dr. M. S. Sivakumar
Planning	Dr. Ravinder David Koilpillai
International and Alumni Relations	Dr. R. Nagarajan
II. Heads of Departments	
Aerospace	Dr. K. Bhaskar
Applied Mechanics	Dr. S. Vengadesan
Biotechnology	Dr. D. Karunagaran
Chemical Engineering	Dr. A. Kannan
Chemistry	Dr. Indrapal Singh Aidhen
Civil Engineering	Dr. A. Meher Prasad
Computer Science and Engineering	Dr. Krisnamoorthy Sivalingam
Electrical Engineering	Dr. Devendra Jalihal

Engineering Design	Dr. Srikanth Vedantam
Humanities and Social Sciences	Dr. Umakant Dash
Management Studies	Dr. L. Prakash Sai
Mathematics	Dr. M. Thamban Nair
Mechanical Engineering	Dr. B. V. S. S. S. Prasad
Metallurgical and Materials Engineering	Dr. B. S. Murthy
Ocean Engineering	Dr. S. A. Sannasiraj
Physics	Dr. M. S. Ramachandra Rao

III. Head of Research Centre

Sophisticated Analytical and Instrumentation Facility	Dr. S. S. Bhattacharyya

IV. Heads of special facilities for interaction with other institutions

Centre for Industrial Consultancy and Sponsored Research	Dr. Krishnan Balasubramanian
Chairman, Centre for Continuing Education	Dr. A. Ramesh
Centre Electronics Centre	Dr. V. Jagadeesh Kumar
Chairman, Computer Centre	Dr. C. Balaji
Chairman	
GATE	Dr. Sanjay Kumar
JEE	Dr. P. B. Bisht

V. Central Administration

Registrar	Ms. V. G. Bhooma
Joint Registrar (Academic)	Mr. R. Esakkimuthu
Joint Registrar (Students)	Lt. Col. Jayakumar
Deputy Registrars	
Academic Section	Mr. D. Ravee
Administration	Mr. V. Swaminathan
Finance & Accounts Section	Mr. A. V. Sudarsanam
Stores & Purchase Section	Ms. G. Chitrapavai
IC&SR	Mr. S. Sundaravinayagam
Assistant Registrars	
Academic Section	Mr. V. Rajendran
Administration	Mr. R. Chandrakasu
	Mr. B. Vijay Shankar
Finance & Accounts Section	Mr. S. Ravi
	Mr. R. Muralidharan
Recruitment Section	Ms. K. Vijayalakshmi
Internal Audit Section	Mr. K. Kumarappan
Office of the Dean (Students) / T&P	Mr. V. Perumal
Engineering Unit	Mr. Y. E. L. Sudhakar Rao Pujari
IC & SR	Mr. P. Sarvaharana

Chief Security Officer	Mr. N. Elumalai
Central Library	
Librarian	Mr. Mahendra N. Jadhav
Assistant Librarian	Mr. K. Saravanan

VI. Heads of central services, facilities and section

Chief Medical Officer-in-charge	Dr. Mahalakshmi M. Ravi
Chairman, Council of Wardens	Dr. K. Sethupathi
Central Glass Blowing Section	Dr. U. V. Varadaraju
Professor-in-charge, Central Workshop	Dr. N. Ramesh Babu
Chairman, Library Advisory Committee	Dr. K. Ramamurthy
Co-ordinator, NSS	Dr. K. C. Sivakumar
Advisor, Sports	Dr. P. N. Santhosh
Advisor, Cultural	Dr. Umakant Dash
Advisor, Co-Curricular	Dr. B. Arockiarajan
Advisor, Foreign Students	Dr. Sudarshan Padmanabhan
Chief Vigilance Officer (part time)	Dr. S. Sankararaman
Advisor, Placement and Training	Dr. Manu Santhanam
Advisor, Mentoring for Individual Transformation (MITr)	Dr. G. Ranga Rao
Advisor (Weaker Section)	Dr. G. L. Samuel
Chairperson, Women's Forum	Dr. Preeti Aghalayam
Professor-in-charge, Workflow	Dr. Rahul R. Marathe
Head, Centre for Innovation (CFI)	Dr. B. Ravindran
Professor-in-charge, IITM website	Dr. N. S. Narayanaswamy
Professor in-charge, RUTAG	Dr. Abhijit P. Deshpande

VII. Engineering Unit

Chairman	Dr. Ligy Philip
Co-Chairman	Dr. K. Murali
Superintending Engineer	Mr. H. Anantharaman
Executive Engineers	Mr. K. Viswanath
	Mr. K. Dharmaraj
	Dr. M. Ramachandran
Senior Horticulture Officer	Mr. V. Seenivasan
Assistant Executive Engineers	Mr. M. Murali Prakash
	Mr. H. Anandaram
	Mr. K. Rizwan Ali
	Ms. N. R. Vineetha
	Mr. K. Ravichandran

VIII. IC&SR

Chief Techno-economic Officer	Mr. R. Sundaram
Senior Techno-economic Officer	Mr. V. Suresh

ACADEMIC PROGRAMMES AND AWARD OF DEGREES

The Indian Institute of Technology Madras offered Ph.D. programme in all the 16 departments, M.S. programme in 12 departments, M.Tech programme in 28 streams/specialisations, M.Sc. programme in three branches, B.Tech programme in 10 branches, Dual degree (B.Tech and M.Tech) programme in 21 streams/specialisations, Dual Degree (B.S. and M.S.) in Biological Sciences and Physics, M.B.A. programme, M.A. Integrated programme in two streams and besides a preparatory course for SC/ST students during the year under report.

Admissions 2016-17

The total number of students and scholars admitted to various programmes both in July 2016 and in January 2017 are given in the following table:

Fresh admissions

Sl. No.	Department	B.Tech.	Dual Degree	M.Tech.	PG Diploma	M.Sc.	M.B.A	M.A.	M.S.	Ph.D.	Total
1.	Aerospace Engineering	45	14	20	-	-	-	-	15	24	118
2.	Applied Mechanics	-	-	20	-	-	-	-	21	29	70
3.	Biotechnology	-	61	4	-	-	-	-	4	34	103
4.	Chemical Engineering	72	18	35	-	-	-	-	4	15	144
5.	Chemistry	-	-	-	-	54	-	-	-	46	100
6.	Civil Engineering	62	36	88	-	-	-	-	9	38	233
7.	Computer Science and Engineering	41	13	48	-	-	-	-	32	14	148
8.	Electrical Engineering	66	55	56	-	-	-	-	50	43	270
9.	Engineering Design	-	57	-	-	-	-	-	10	13	80
10.	Humanities and Social Science	-	-	-	-	-	-	46	-	26	72
11.	Management Studies	-	-	-	40	-	51	-	11	26	128
12.	Mathematics	-	-	11	-	48	-	-	-	25	84
13.	Mechanical Engineering	75	72	96	-	-	-	-	38	60	341
14.	Metallurgical and Materials Engineering	35	11	21	-	-	-	-	6	26	99
15.	Ocean Engineering	39	19	43	-	-	-	-	10	15	126
16.	Physics	30	11	9	-	42	-	-	-	24	116
17.	Interdisciplinary	-	-	-	-	-	-	-	7	36	43
	Total	465	367	451	40	144	51	46	217	494	2275

Enrolment of Students/Scholars

Sl. No.	Department	B.Tech.	Dual Degree	M.Tech.	PG Diploma	M.Sc.	M.B.A	M.A.	M.S.	Ph.D.	Total
1.	Aerospace Engineering	161	96	41	-	-	-	-	59	123	**480**
2.	Applied Mechanics	-	-	44	-	-	-	-	63	149	**256**
3.	Biotechnology	18	249	14	-	-	-	-	17	207	**505**
4.	Chemical Engineering	286	94	65	-	-	-	-	35	129	**609**
5.	Chemistry	-	-	-	-	109	-	-	-	265	**374**
6.	Civil Engineering	258	198	171	-	-	-	-	47	302	**976**
7.	Computer Science and Engineering	178	127	114	-	-	-	-	106	97	**622**
8.	Electrical Engineering	310	324	117	-	-	-	-	165	253	**1169**
9.	Engineering Design	-	300	-	-	-	-	-	38	82	**420**
10.	Humanities and Social Science	-	-	-	-	-	-	226	-	91	**317**
11.	Management Studies	-	-	21	40	-	113	-	41	118	**333**
12.	Mathematics	-	-	-	-	112	-	-	-	94	**206**
13.	Mechanical Engineering	336	400	173	-	-	-	-	178	382	**1469**
14.	Metallurgical and Materials Engineering	140	70	47	-	-	-	-	24	139	**420**
15.	Ocean Engineering	162	82	92	-	-	-	-	60	148	**544**
16.	Physics	133	48	21	-	90	-	-	-	188	**480**
	Total	**1982**	**1988**	**920**	**40**	**311**	**113**	**226**	**833**	**2767**	**9180**

B.Tech. students on roll

Sl. No.	Branch	2016	2015	2014	2013	2012 and Earlier Batches	Total
1.	Aerospace Engineering	43	40	33	33	12	**161**
2.	Biotechnology					18	**18**
3.	Chemical Engineering	69	66	63	66	22	**286**
4.	Civil Engineering	63	57	58	48	32	**258**
5.	Computer Science and Engineering	46	45	31	32	24	**178**
6.	Electrical Engineering	70	73	73	67	27	**310**
7.	Engineering Physics	28	30	31	25	19	**133**
8.	Mechanical Engineering	77	83	82	71	23	**336**
9.	Metallurgical and Materials Engineering	31	31	31	30	17	**140**
10.	Naval Architecture	35	28	32	32	35	**162**
	Total	**462**	**453**	**434**	**404**	**229**	**1982**

Dual Degree (B.Tech. and M.Tech.) students on roll

Sl. No.	Branch	2016	2015	2014	2013	2012	2011 and Earlier Batches	Total
1.	Aerospace Engineering	14	9	7	5	7	3	**45**
	AE (B.Tech.) and AM (M.Tech.)			11	19	15	6	**51**
2.	Biotechnology							
	Biological Engineering	30	24	29	30	26	12	**151**
	Biological Sciences (B.S. and M.S.)	23	23	13	18	21		**98**
3.	Chemical Engineering	17	18	20	16	19	4	**94**
4.	Civil Engineering and	35	34	30	39	29	14	**181**
	Infrastructural Civil			8	4	5		**17**
	CE (B.Tech.) and AM (M.Tech.)							
5.	Computer Science and Engineering	15	15	28	28	29	12	**127**
6.	Electrical Engineering	58	58	47	55	52	29	**299**
	EE (B.Tech.) and AM (M.Tech.)			8	7	7	3	**25**
7.	Engineering Design	56	54	54	55	55	26	**300**
8.	Mechanical Engineering	77	80	69	78	84	12	**400**
9.	Metallurgical and Materials Engineering	11	9	13	13	19	5	**70**
10.	Naval Architecture and Ocean	18	13	9	8	7	5	**60**
	Engineering			5	9	8		**22**
	NA (B.Tech.) and AM (M.Tech.)							
11.	Physics (B.S. and M.S.)	11	6	10	8	8	5	**48**
	Total	**365**	**343**	**361**	**392**	**391**	**136**	**1988**

M.Sc. students on roll

Sl. No.	Branch	2016	2015	Total
1.	Chemistry	54	55	109
2.	Mathematics	48	64	112
3.	Physics	43	47	90
	Total	**145**	**166**	**311**

M.Tech. students on roll

Sl. No.	Department\Discipline\Batch	2016	2015	Extended students	Total
1.	Aerospace Engineering	18	21	2	41
2.	Applied Mechanics	18	22	4	44
3.	Biotechnology–Clinical Engineering	4	7	3	14
4.	Chemical Engineering	30	17	2	49
	Catalysis Technology	2	6	2	10
	Nuclear Engineering	-	5	1	6
5.	Civil Engineering				
	CE 1 – Building Technology and Construction Management	8	11	3	22
	CE 2 – Environmental Engineering	6	8	-	14
	CE 3 – Geotechnical Engineering	7	8	1	16
	CE 4 – Hydraulic and Water Resource Engineering	5	6	1	12
	CE 5 – Structural Engineering	14	13	2	29
	CE 6 – Transportation Engineering	4	7	-	11
	CE 7 – Construction Technology and Management	33	34	-	67
6.	Computer Science and Engineering	48	60	6	114
7.	Electrical Engineering				
	EE 1 – Communication Systems	15	16	1	32
	EE 2 – Power Systems and Power Electronics	6	10	4	20
	EE 3 – Micro Electronics and VLSI Design	15	16	1	32
	EE-4 – Control and Instrumentation System	9	12	-	21
	EE-5 – Photonics	4	5	3	12
8.	Industrial Maths and Scientific Computing	10	10	1	21
9.	Mechanical Engineering:				
	ME 1 – Thermal Engineering	25	36	3	64
	ME 2 – Mechanical Design	28	31	-	59
	ME 3 – Manufacturing and Precision Engineering	19	19	1	39
	ME 4 – Automotive Engine Technology	-	10	1	11
10.	Metallurgical and Materials Engineering	21	25	1	47
11.	Ocean Engineering	15	16	1	32
	Ocean Technology	10	10	-	20
	Petroleum Engineering	7	13	-	20
	Offshore Technology	10	10	-	20
12.	Physics				
	PH – Solid State Technology	9	12	-	21
	Total	**400**	**476**	**44**	**920**

M.B.A. students on roll

Sl. No.	Branch	2016	2015	Total
1.	Management Studies	52	16	**113**

M.A. students on roll

Sl. No.	Branch	2016	2015	2014	2013	2012	Total
1.	Humanities and Social Sciences	46	42	42	42	54	**226**

M.S. scholars on roll

Sl. No.	Branch	Year I	Year II	Year III	Year IV	Year V and Others	Total
1.	Aerospace Engineering	17	17	14	9	1	**58**
2.	Applied Mechanics	23	20	14	7	1	**65**
3.	Biotechnology	4	4	6	3	0	**17**
4.	Chemical Engineering	4	11	13	3	0	**31**
5.	Civil Engineering	9	10	13	8	4	**44**
6.	Computer Science and Engineering	32	35	25	8	6	**106**
7.	Electrical Engineering	52	52	31	22	11	**168**
8.	Engineering Design	10	7	9	9	3	**38**
9.	Management Studies	11	11	8	10	1	**41**
10.	Mechanical Engineering	39	56	62	21	3	**181**
11.	Metallurgical and Materials Engineering	6	4	9	4	1	**24**
12.	Ocean Engineering	10	24	16	6	4	**60**
	Total	**217**	**251**	**220**	**110**	**35**	**833**

Ph.D. scholars on roll

Sl. No.	Branch	Year I	Year II	Year III	Year IV	Year V and Others	Total
1.	Aerospace Engineering	29	20	33	20	28	**130**
2.	Applied Mechanics	31	30	22	21	36	**140**
3.	Biotechnology	36	37	27	39	62	**201**
4.	Chemical Engineering	18	33	34	18	27	**130**
5.	Chemistry	48	50	58	37	70	**263**
6.	Civil Engineering	40	65	60	49	82	**296**
7.	Computer Science and Engineering	15	18	16	20	29	**98**
8.	Electrical Engineering	45	53	48	47	62	**255**
9.	Engineering Design	15	9	25	9	25	**83**
10.	Humanities and Social Sciences	28	28	20	10	8	**94**
11.	Management Studies	28	28	13	21	28	**118**
12.	Mathematics	28	25	16	16	13	**98**
13.	Mechanical Engineering	62	77	100	59	88	**386**
14.	Metallurgical and Materials Engineering	28	35	14	21	39	**137**
15.	Ocean Engineering	17	38	32	29	34	**150**
16.	Physics	26	33	31	44	54	**188**
	Total	**494**	**579**	**549**	**460**	**685**	**2767**

Courses Offered

In the academic year 2016-17, 1767 courses were offered of which 883 courses were offered in July–November 2016 and 824 courses in January–May 2017, were offered. The following table has the department-wise details of the courses offered:

Number of courses offered

Sl. No.	Department	July–November 2016			January–May 2017		
		Core	Elective	Total	Core	Elective	Total
1.	Aerospace Engineering	24	21	**45**	19	24	**43**
2.	Applied Mechanics	23	21	**44**	17	20	**37**
3.	Biotechnology	36	17	**53**	37	21	**58**
4.	Chemical Engineering	24	26	**50**	30	26	**56**
5.	Chemistry	16	6	**22**	12	14	**26**
6.	Civil Engineering	62	28	**90**	43	40	**83**
7.	Computer Science and Engineering	21	26	**47**	17	22	**39**
8.	Engineering Design	27	15	**42**	22	13	**35**
9.	Electrical Engineering	31	36	**67**	25	48	**73**
10.	Humanities and Social Sciences	43	50	**93**	37	43	**80**
11.	Management Studies	14	38	**52**	12	17	**29**
12.	Mathematics	21	15	**36**	16	30	**46**
13.	Mechanical Engineering	49	29	**78**	48	24	**72**
14.	Metallurgical and Materials Engineering	24	26	**50**	16	24	**40**
15.	Ocean Engineering	40	14	**54**	32	15	**47**
16.	Physics	42	18	**60**	37	23	**60**
	Total	**497**	**386**	**883**	**420**	**404**	**824**

Convocation Degrees awarded

Sl. No.	Department	Dual Degree		Ph.D.	M.S.	M.Tech.	M.Sc.	M.B.A	PGD VLM	M.A	Dual Degree		Dual Degree		B.Tech. (Honours)	B.Tech.	Total
		M.S.	Ph.D.								B.Tech./ B.S. (Honours)	M.Tech./ M.S.	B.Tech./ B.S.	M.Tech./ M.S.			
1.	Aerospace Engineering	2	2	10	4	21	0	0	0	0	4	4	12	12	6	22	**99**
2.	Applied Mechnics	2	2	17	13	20	0	0	0	0	1	1	25	25	0	0	**106**
3.	Biotechnology	1	1	20	4	7	0	0	0	0	3	3	10	10	0	9	**68**
4.	Chemical Engineering	0	0	7	5	27	0	0	0	0	2	2	18	18	5	61	**145**
5.	Chemistry	0	0	29	0	0	49	0	0	0	0	0	0	0	0	0	**78**
6.	Civil Engineering	1	1	15	16	77	0	0	0	0	3	3	33	33	1	60	**243**

Sl. No.	Department	Dual Degree		Ph.D.	M.S.	M.Tech.	M.Sc.	M.B.A	PGD VLM	M.A	Dual Degree		Dual Degree		B.Tech. (Honours)	B.Tech.	Total
		M.S.	Ph.D.								B.Tech./ B.S. (Honours)	M.Tech./ M.S.	B.Tech./ B.S.	M.Tech./ M.S.			
7.	Computer Science and Engineering	0	0	9	19	50	0	0	0	0	1	1	28	28	2	33	**171**
8.	Electrical Engineering	0	0	14	47	43	0	0	0	0	3	3	61	61	4	66	**302**
9.	Engineering Design	0	0	7	4	0	0	0	0	0	0	0	53	53	0	0	**117**
10.	Humanities and Social Sciences	0	0	0	0	0	0	0	0	41	0	0	0	0	0	0	**41**
11.	Management Studies	0	0	13	11	0	0	61	39	0	0	0	0	0	0	0	**124**
12.	Mathematics	0	0	5	0	15	36	0	0	0	0	0	0	0	0	0	**56**
13.	Mechanical Engineering	1	1	24	19	83	0	0	0	0	3	3	65	65	11	71	**346**
14.	Metallurgical and Materials Engineering	1	1	9	8	18	0	0	0	0	2	2	11	11	0	21	**84**
15.	Ocean Engineering	0	0	13	15	41	0	0	0	0	0	0	11	11	1	28	**120**
16.	Physics	0	0	18	0	5	37	0	0	0	2	2	3	3	1	20	**91**
	Total	**8**	**8**	**210**	**165**	**407**	**122**	**61**	**39**	**41**	**24**	**24**	**330**	**330**	**31**	**391**	**2191**

Award of Prizes to Students

Convocation Prizes	4
Bachelor of Technology—B.Tech	12
Dual Degree (B.Tech. and M.Tech)	12
Master of Technology—M.Tech	29
Master of Science—M.Sc	4
Master of Business Administration—M.B.A.	2
PG Diploma	3
Master of Arts—M.A.	2
M.S. and Ph.D	10
Institute Day Merit Prizes	159

DEPARTMENTS

DEPARTMENT OF AEROSPACE ENGINEERING

The Department of Aerospace Engineering was established in 1969. Its areas of teaching and research are aerodynamics and flight mechanics, propulsion and combustion, and aerospace structures.

FACULTY MEMBER ACTIVITIES

Short-term Course	2
Workshops	4
Seminar	1
Symposia	3
Conferences	2
Meetings	4
Special Lectures	4

VISITS ABROAD (FACULTY)

20

ACADEMIC PROGRAMMES

NEW COURSES 5

NO. OF FACULTY

Professors	11
Associate Professors	7
Assistant Professors	8
Visiting Faculty	1
Professors of Practice	1

VISITS (Students & Scholars)

India	Abroad
27	32

NEW LABS

2

AWARDS & PRIZES

Outside IITM	Awards
2	2
Within IITM	**Honours**
5	2

PATENTS FILED

5

PATENTS OBTAINED

1

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	43	40	32	33	12	160
Dual Degree	14	9	22	24	31	100
M.Tech.	18	21	1	-	1	40
M.S.	16	19	11	8	1	55
Ph.D.	22	20	32	20	27	121
Total	113	109	98	85	72	476

RESEARCH AND CONSULTANCY

Sponsored research projects	14
Industrial Consultancy Projects	1
RBIC projects	5

FELLOWSHIPS OF ACADEMIES AND PROFESSIONAL SOCIETIES

IAS	1

RESEARCH PUBLICATIONS

National Journals	1
International Journals	45
National Conferences	40
International Conferences	40

COUNTRIES VISITED

India ✦ Switzerland ✦ Portugal ✦ France

PURPOSE OF VISIT

Research Activities ✦ Collaborative Scientific ✦ Exchange Program ✦ Course Work

DISTINGUISHED VISITORS

- North Carolina State University
- Lt. Gen. Shankar and his Team
- NAL, Bengaluru
- DRDL, Hyderabad
- SRM University, Chennai
- Navstik Labs, Pune
- California Institute of Technology, Pasadena
- University of california, Sandiego
- CNRS, France
- Power and Gas Division, Siemens
- Technische Universitat Darmstadt, Germany
- Georgia Institute of Technology
- Texas A&M
- Rolls-Royce Engines (UK)
- ISRO
- IISC, Bengaluru
- University of Science and Technology, Kingdom of Saudi Arabia
- NAL, Bengaluru
- GmbH and Co, Hasselroth, Germany
- India

DEPARTMENT OF APPLIED MECHANICS

The Department of Applied Mechanics has been in existence since 1962 and is a full-fledged interdisciplinary graduate research department over the years. The department focuses on academic activities in three broad areas: (1) Biomedical Engineering, (2) Fluid Mechanics and (3) Solid Mechanics. The department also offers minor streams for undergraduate students.

FACULTY MEMBER ACTIVITIES

Short-term Course	9
Workshops	10
Seminar	0
Symposia	3
Conferences	44
Others	0
Special Lectures	16

VISITS ABROAD (FACULTY)

41

ACADEMIC PROGRAMMES

NEW COURSES 20

NO. OF FACULTY

Professors	9
Associate Professors	11
Assistant Professors	8

VISITS (Students & Scholars)

India	Abroad
46	23

NEW LABS

4

AWARDS & PRIZES

Outside IITM	Awards
9	4
Within IITM	**Honours**
1	4

PATENTS FILED

3

PATENTS OBTAINED

0

NEW FACILITIES

- HP DL580 Generation Server
- Three HP DL580 Generation CTO Server
- Single Dot Print Servo Hydraulic Testing Machine
- Computerised Loading System for Optical Measurement System
- Experimental facility to measure the pressure and temperature measurement
- Hand kinematics measurement system
- Visual feedback occlusion spectacles
- A 16-channel Electromyography
- Phase Doppler Particle Analyzer
- Nanoindenter
- Optical Microscopy
- FTIR

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
Dual Degree	-	-	-	-	30	-
M.Tech.	22	25	-	-	-	-
M.S.	21	18	9	-	4	52
Ph.D.	28	26	15	12	21	102
Upgradation	2	4	1	5	10	22
DPHD	5	5	7	-	-	17

RESEARCH AND CONSULTANCY

Sponsored research projects	12
Industrial Consultancy Projects	2
RBIC projects	1
Retainer Consultancy	7

RESEARCH PUBLICATIONS

National Journals	2
International Journals	69
National Conferences	33
International Conferences	33
Books Authored	1

COUNTRIES VISITED

Germany ✦ Canada ✦ India

PURPOSE OF VISIT

Meetings ✦ Discussion ✦ Reviews ✦ Workshops ✦ Talks ✦ Participations ✦ Research ✦ Examination

MAJOR INFRASTRUCTURE DEVELOPMENT MADE

R&D Testing facility developed

DISTINGUISHED VISITORS

- IOWA State University
- Agarwal Hospital
- IISc Bengaluru
- Drexel University, USA
- RWTH Aachen University, Germany
- Dalla Lana School of Public Health
- University of Mississippi
- Texas A&M
- Swa
- nsea University
- AIIMS, New Delhi
- University of Texas, Austin
- SUNY Buffalo, NY
- University of IOWA
- Philadelphia, USA
- VIT Vellore

DEPARTMENT OF BIOTECHNOLOGY

Set up in 2004, the Department of Biotechnology aims to acquire international repute by having a strong interdisciplinary research and teaching base in biological sciences &engineering, and an active collaboration with industries and healthcare institutions. The department is housed in the Bhupat and Jyoti Mehta School of Biosciences. The first batch of the B.Tech. and Dual Degree students graduated in July 2006 and 2007, respectively. The focus of research is bioprocess engineering, computational biology, chemical biology and medical biotechnology in cancer and cardiovascular areas. Faculty members hold several patents and are involved in active industrial consultancy. A Center of Excellence in bioprocess engineering to develop domain knowledge and expertise, a DST-funded national facility to identify potential drug targets through cellular dynamics, and a FIST facility for infrastructure have been set up. The DBT is now supporting a National Cancer Tissue Biobank and has funded the set-up of a Bioinformatics Center. The IITM Bio-incubator, funded by BIRAC, offers lab and office space, equipment, technical support and centralized utilities for process and product development.

FACULTY MEMBER ACTIVITIES

Short-term Course	4
Workshops	6
Seminar	1
Symposium	4
Conferences	3
Others	0
Special Lectures	30

VISITS ABROAD (FACULTY)

21

ACADEMIC PROGRAMMES

NEW COURSES 2

NO. OF FACULTY

Professors	15
Associate Professors	8
Assistant Professors	7
Emeritus Professors	2
Adjunct Faculty	3
INSA Senior Scientists	1

VISITS (Students & Scholars)

India	Abroad
21	39

AWARDS & PRIZES

Outside IITM	Awards
13	5
Within IITM	**Honours**
2	5

PATENTS FILED

2

PATENTS OBTAINED

0

NEW FACILITIES

- Dell PowerEdge R730xd Server
- Fujitsu CelisiusR940 Work Station

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
Dual Degree	54	48	42	43	40+5	232
M.Tech.	3	7	-	-	-	10
M.S.	2	4	4	3	-	13
Ph.D.	19	9	15	32	22+9	106
Total	78	68	61	78	76	361

RESEARCH AND CONSULTANCY

Sponsored research projects	35
Retainer Consultancy	1

FACULTY MEMBERS' PARTICIPATION UNDER MOU

3

EXCHANGE PROGRAMME UNDER MOU

8

FELLOWSHIPS OF ACADEMIES AND PROFESSIONAL SOCIETIES

3

RESEARCH PUBLICATIONS

National Journals	2
International Journals	137
National Conferences	10
International Conferences	6
Books Authored	6

EDITORIAL BOARDS OF JOURNALS

9

COUNTRIES VISITED

India ✦ Taiwan ✦ UK ✦ France ✦ Japan

PURPOSE OF VISIT

Purpose of Visit ✦ Research ✦ Discussion ✦ Exchange Fellowships ✦ Internships ✦ Exchange semester

DISTINGUISHED VISITORS

- Sanger Institute and EMBL-European Bioinformatics Institute, UK
- Université de Strasbourg, France
- UGC-Emeritus Fellow
- University of Georgia, USA
- MUSC College of Dental Medicine, USA
- Indian Institute of Technology Guwahati
- Department of Virosciencein Erasmus Medical Center, Netherlands
- IFOM-The FIRC Institute of Molecular Oncology, Milan, Italy
- University of Westminster, UK
- National Institutes of Environmental Health Sciences
- Rush University,Chicago
- Macquarie University, Sydney, Australia
- FBC – Bergische Universität Wuppertal Germany.
- Medical College, Vellore
- Polytechnic University Russia
- The Science and Ethics Foundation, Kulappully, Shoranur, Kerala

DEPARTMENT OF CHEMISTRY

The Department of Chemistry was a part of the Department of Chemical Engineering during 1959-1961 but became an independent department in 1961 with Prof. V. Srinivasan as the Head-in-Charge. Prof. M.V.C. Sastri assumed charge as the first Head of the Department in November 1961. He was instrumental in building the department and the Applied Chemistry Building (completed in 1973); for the establishment of the Special Instruments Laboratory (1970; later known as RSIC and presently known as SAIF); and the MSRC (established in 1974. The department offers M.Sc. and Ph.D. programmes in chemistry. Various aspects of chemistry are also taught at the preparatory level and in the B.Tech. programme (core as well as minor stream courses). The department is well equipped with modern instrumentation facilities and actively engaged in performing quality teaching and research in frontier areas.

FACULTY MEMBER ACTIVITIES

Meetings	27
Workshops	1
Seminar	0
Symposium	1
Conferences	4
Others	0
Special Lectures	33

VISITS ABROAD (FACULTY)

22

ACADEMIC PROGRAMMES

NEW COURSES 1

NO. OF FACULTY

Professors	19
Associate Professors	11
Assistant Professors	5

VISITS (Students & Scholars)

India	Abroad
4	20

AWARDS & PRIZES

Outside IITM	Awards
17	7
Within IITM	**Honours**
7	7

PATENTS FILED

1

PATENTS OBTAINED

5

NEW FACILITIES

- Chiral HPLC
- Gas Chromotography and Mass Spectrometer

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
M.S.	54	54	-	-	-	108
Ph.D.	45	56	56	37	83	277
Total	99	110	56	37	83	385

RESEARCH AND CONSULTANCY

Sponsored research projects	10
Industrial Consultancy Projects	6
RBIC projects	14
Retainer Consultancy	7

FACULTY MEMBERS' PARTICIPATION UNDER MOU

2

EXCHANGE PROGRAMME UNDER MOU

8

FELLOWSHIPS OF ACADEMIES AND PROFESSIONAL SOCIETIES

HUMBOLDT	1

RESEARCH PUBLICATIONS

National Journals	12
International Journals	213
Books Authored	1

EDITORIAL BOARDS OF JOURNALS

1

DISTINGUISHED VISITORS

- IISc, Bengaluru
- Umea University, Sweden
- Eli Lilly and Company, Indianapolis
- Indian Institute of Chemical Technology, Hyderabad
- Indian Institute of Science Education and Research Bhopal, Bhauri
- Indian Association for the Cultivation of Science
- Bangalore University
- Michigan State University
- University of Texas, Austin, USA
- National Cancer Institute, NIH, Bethesda, USA
- IIT Kharagpur
- University of Delhi
- Indian Science News Association, Kolkata
- Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bengaluru
- Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bengaluru
- Indian Association for the Cultivation of Science, Jadavpur, Kolkata
- Linnaeus University, Sweden and Deputy Vice Chancellor, Linnaeus University
- Dai Nippon Printing Co. Limited, Japan
- University of Stuttgart, Germany
- National Centre for Biological Sciences
- Purdue University, West Lafayette, US
- IIT Kanpur
- Halifax, Canada
- INPT, 205 route de Narbonne, France
- IIT Guwahati
- Universität Wuppertal, Germany
- Dow AgroSciences LLC., Indianapolis, USA
- University of North Carolina, Wilmington
- Tata Institute of Fundamental Research
- Stanford University, Stanford, California
- IIT Bombay
- Indian Institute of Technology Hyderabad

DEPARTMENT OF CHEMICAL ENGINEERING

The Department of Chemical Engineering was established in 1959. The department has permanent faculty members who carry out research in state-of-the art areas. The focus of the research is on reaction and transport, energy, materials and environment. The faculty work towards analysing these systems by understanding their behaviour at the molecular level as well as using a system approach.

FACULTY MEMBER ACTIVITIES

Short-term Course	5
Workshops	11
Seminar	1
Symposium	1
Conferences	11
Others	18
Special Lectures	18

VISITS ABROAD (FACULTY)

36

ACADEMIC PROGRAMMES

NEW COURSES 2

NO. OF FACULTY

Professors	16
Associate Professors	7
Assistant Professors	5
Visiting Faculty	1
Professors Emeriti	1
Hosted Fellow	1
Inspire Fellow	2

VISITS (Students & Scholars)

India	Abroad
57	19

AWARDS & PRIZES

Outside IITM	Awards
7	7
Within IITM	**Honours**
17	7

PATENTS FILED

5

PATENTS OBTAINED

1

NEW FACILITIES

- Advanced Microflow Reactor Supplied by Corning for UAY project
- Atomic Absorption Spectroscopy
- Motorized Microscope Arrangement
- Evoqua water purifying system

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	69	66	63	9	-	207
Dual Degree	17	18	20	17	-	72
M.Tech.	32	26	1	-	-	59
M.S.	6	8	13	6	-	33
Ph.D.	17	27	32	21	45	97
Total	141	145	129	53	45	468

RESEARCH AND CONSULTANCY

Sponsored research projects	41
Industrial Consultancy Projects	6
RBIC projects	14
Retainer Consultancy	7

FELLOWSHIPS OF ACADEMIES AND PROFESSIONAL SOCIETIES

INAE	2
TNASC	1
INSTITUTE OF ENGINEERS	1
CSIR	2

RESULTS FROM RESEARCH WORK

Ph.D	7
M.S	5

INTERNATIONAL COLLABORATION

2

RESEARCH PUBLICATIONS

National Journals	6
International Journals	119
National Conferences	25
International Conferences	24
Books Authored	2

EDITORIAL BOARDS OF JOURNALS

9

COUNTRIES VISITED

Germany ✦ Switzerland ✦ USA

PURPOSE OF VISIT

Sandwich Programme ✦ Internship ✦ Research ✦ Student Observer ✦ Visiting Scholar

OTHER ACTIVITIES

Faculty and staff members	17
Inter-disciplinary group achievements	5
Socially relevant activities	4

DISTINGUISHED VISITORS

- IIT Gandhinagar
- Polymer and Advanced Materials Laboratory, National Chemical Laboratory
- University of Georgia
- Yokohama National University, Japan
- Resources Engineering and Sciences
- Mechanical and Aeronautical Engineering
- University of Florida, USA
- University of Bordeaux, France
- University of Illinois,USA
- University of Waterloo, Canada
- Monash University, Australia
- Columbia University, New York
- University of Maryland
- Cambridge, Massachusetts, USA
- Research and Engineering Company, Annandle, NJ
- Ghent University, Belgium
- IIT Kanpur
- IIT Madras
- Rutgers University, USA
- Patil University, Maharashtra
- University of Akron,USA
- Durham University

DEPARTMENT OF CIVIL ENGINEERING

The Department of Civil Engineering was established in 1959 and has contributed significantly to India's infrastructure and human resource development. It offers B. Tech, Dual Degree, M. Tech., M.S. and Ph.D. programmes that rank as some of the best in the country, and perhaps, in the world. Its faculty members hold advanced degrees and training from reputed institutions in India and abroad and along with research scholars in the department, carry out innovative and challenging high-end research and industrial projects. The Department of Civil Engineering is known for its teaching, research, consultancy and training. Its alumni hold prestigious positions in leading academic institutes, industries and government organizations worldwide. The activities of the Department are carried out under different disciplines, administratively organised into five divisions, namely Building Technology and Construction Management (BTCM), Environmental and Water Resources Engineering (EWRE), Geotechnical Engineering (GT), Structural Engineering (ST) and Transportation Engineering (TR). There are 14 well-equipped laboratories attached to these divisions. Environmental and Water Resources Engineering and Structural Engineering Laboratories have received substantial initial funding from the Federal Republic of Germany.

FACULTY MEMBER ACTIVITIES

Short-term Course	2
Workshops	15
Seminar	3
Training Program	2
Conferences	9
Special Lectures	50
Others	2

VISITS ABROAD (FACULTY)

49

ACADEMIC PROGRAMMES

NEW COURSES 18

NO. OF FACULTY

Professors	28
Associate Professors	15
Assistant Professors	9
Visiting Faculty	1
Adjunct Faculty	2

VISITS (Students & Scholars)

India	Abroad
0	49

AWARDS & PRIZES

Outside IITM	Awards
10	10
Within IITM	**Honours**
16	3

PATENTS FILED

5

PATENTS OBTAINED

1

NEW FACILITIES

- Compliant Data Acquisition
- Fogging/Misting System
- Accelerometer, ABC Lathe
- Milling Machine
- Vibration Monitoring and Sesmic Characterization System
- Dynamic simple shear apparatus with accessories
- HPU Components
- Trible H1 Kenma with Accessories
- SKC Personal Sampling Pump
- SMPS with Long DMA
- Microplate Detection System
- Mobile Moisture Measurement Meter
- Thermo Dioner Integrion Ion Chromotographer
- Online Multi-Parameter Analyser & Controller

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and Others	Total
B.Tech.	63	58	54	48	33	256
Dual Degree	35	34	42	43	49	203
M.Tech.	77	87	7*	-	-	171
M.S.	10	12	13*	12	-	47
Ph.D.	40	72	60	49	82**	303
Total	225	263				980

* more than 2 years ** more than 4 years

RESEARCH AND CONSULTANCY

Sponsored research projects	18
Industrial Consultancy Projects	196
RBIC projects	31
Retainer Consultancy	2

EXCHANGE PROGRAMME UNDER MOU

MoU signed between Charles University in Prague, Czech Republic and Indian Institute of Technology Madras.

FACULTY MEMBERS' PARTICIPATION UNDER MOU

6

INTERNATIONAL COLLABORATION

Prof. Ligy Philip and Prof. B.S. Murthy have been coordinating the activities of the Indo-German Centre for Sustainability (IGCS) in the areas of water and waste management.

RESEARCH PUBLICATIONS

National Journals	0
International Journals	113
National Conferences	16
International Conferences	51
Books Authored	4

EDITORIAL BOARDS OF JOURNALS

5

OTHER ACTIVITIES

Inter-disciplinary group achievements	3
Socially relevant activities	1

DISTINGUISHED VISITORS

- Technical University of Madrid
- University of Illinios Hospital and Health Sciences System,Chicago
- Karunya University
- Bouygues Group, France
- University of Missouri, Kansas City
- University of Ottawa, Canada

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Started as the Computer Centre in 1973, the Department of Computer Science and Engineering was established as a full-fledged department at the Indian Institute of Technology Madras in 1983. It currently offers B.Tech., Dual Degree, M.Tech., M.S. and Ph.D. programmes.

FACULTY MEMBER ACTIVITIES

Workshops	3
Symposium	1
Conferences	4
Special Lectures	50

VISITS ABROAD (FACULTY)

26

ACADEMIC PROGRAMMES

NEW COURSES 23

NO. OF FACULTY

Professors	14
Associate Professors	6
Assistant Professors	10

VISITS (Students & Scholars)

India	Abroad
30	13

AWARDS & PRIZES

Outside IITM	Awards
6	8
Within IITM	**Honours**
7	8

PATENTS FILED

5

PATENTS OBTAINED

1

NEW FACILITIES

- HP Xeon Gen 9 Servers (six)

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	46	43	29	31	8 + 2	159
Dual Degree	15	15	28	28	26 + 2	114
M.Tech.	50	57	4	1	-	112
M.S.	19	16	5	5	3	48
Ph.D.	7	10	12	17	12 + 1	59
Total	137	141	78	82	54	492

RESEARCH AND CONSULTANCY

Sponsored research projects	13
Industrial Consultancy Projects	2
RBIC projects	5
Retainer Consultancy	6

FELLOWSHIPS OF ACADEMIES AND PROFESSIONAL SOCIETIES

INAE	3
INSA	1
IEEE FELLOW	2
ACM DISTINGUISHED SCIENTIST	1

RESEARCH PUBLICATIONS

National Journals	1
International Journals	38
National Conferences	8
International Conferences	47
Books Authored	3

INTERNATIONAL COLLABORATION

2

EDITORIAL BOARDS OF JOURNALS

6

COUNTRIES VISITED

India ✦ USA ✦ Spain

PURPOSE OF VISIT

Networking ✦ Meetings ✦ Conference ✦ Project Proposals ✦ Research ✦ Interspeech ✦ Internship

DISTINGUISHED VISITORS

- Curtin University, Perth, Australia
- Institute of Technology (BTH), Sweden
- University of Sydney, Australia
- Singapore University of Technology and Design, Singapore
- University of Oklahoma, USA
- Freiburg University, Germany
- University of Houston, USA
- Simon Center for Brain Research MIT
- IIT Bombay
- Stanford University
- Umea University, Sweden
- CMU, USA
- INRIA, France
- Washington State University, USA
- IIS, Bengaluru
- TU Dortmund, Germany
- Xerox Research Centre India, Bengaluru
- University of Regensburg, Germany
- University of New South Wales, Australia
- University of Cambridge, UK
- Purdue University, USA
- Rice University
- University of Maryland
- IBM IRL
- IIT Delhi
- University of Washington
- University of South Florida
- University of Maryland
- MPI Saarbrucken
- Pennsylvania, State University, USA
- SUNY Stony Brook, USA

DEPARTMENT OF ELECTRICAL ENGINEERING

The Department of Electrical Engineering comprises several laboratories categorized into five major areas:

EE1 – Communications, Signal Processing and Communication Networks
EE2 – Power Systems, Power Electronics and High Voltage
EE3 – Microelectronics, MEMS and Analog and Digital VLSI
EE4 – Control Systems, Measurements and Instrumentation
EE5 – Photonics, Optical Communications and RF
EE6 – Integrated Circuits and Systems

All the faculty members in the department hold Ph.D. degrees from reputed universities

FACULTY MEMBER ACTIVITIES

Short-term Course	4
Meetings	40
Talks	8
Others	5
Presentation and talks	6

VISITS
(Students & Scholars)

India	Abroad
57	19

AWARDS & PRIZES

Outside IITM: 4

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V	Year V and others	Total
B.Tech.	70	73	73	67	-	-	283
Dual Degree	58	58	55	62	60	-	293
M.Tech.	49	58	-	-	-	-	107
M.S.	56	43	31	18	9	-	157
Ph.D.	65	55	45	43	28	12	248
Total	298	287	204	190	97	12	1088

RESEARCH AND CONSULTANCY

Sponsored research projects (SPR)	17
SPR (New)	6
SPR (Ongoing External)	51
SPR (Ongoing Internal)	19
Industrial Consultancy projects	7
RBIC projects	12
Retainer Consultancy	7

VISITS ABROAD (FACULTY)

47

VISITS ABROAD (STUDENT)

2

ACADEMIC PROGRAMMES

EDITORIAL BOARDS OF JOURNALS

1

RESEARCH PUBLICATIONS

National/International Journals	99
National/International Conferences	181

DEPARTMENT OF ENGINEERING DESIGN

Set up in the year 2006, the Department of Engineering Design was the 16th department to come up at IITM. Engineering design is a series of steps that engineers follow to come up with a solution to a problem. Many times the solution involves designing a product that meets certain criteria and/or accomplishes a certain task. It is a decision-making process, often iterative, in which the basic sciences and the engineering sciences are applied to the optimal conversion of resources to meet a stated objective. Students are first introduced to the design process along with fundamental mathematics, science and engineering, graphic art, design and aesthetics. They are trained not only in the mechanical aspects of design, but also in electronics, control and embedded systems for all-round skill development. Courses in geometric modelling, finite elements, materials engineering, automotive engineering, mechatronics, robotics, biomedical imaging and diagnostic techniques are also offered.

FACULTY MEMBER ACTIVITIES

Short-term Course	9
Workshops	6
Symposium	1
Conferences	6
Special Lectures	20

VISITS ABROAD (FACULTY)

16

ACADEMIC PROGRAMMES

NEW COURSES 14

NO. OF FACULTY

Professors	5
Associate Professors	5
Assistant Professors	5
Visiting Faculty	2

VISITS (Students & Scholars)

India	Abroad
12	9

AWARDS & PRIZES

Outside IITM	Awards
5	3
Within IITM	**Honours**
3	3

PATENTS FILED

4

NEW FACILITIES

- 1 Near Infrared Spectrometer (Bentham Instruments, UK)

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	56	54	54	55	55 + 26	300
Dual Degree	10	6	6	9	-	31
M.Tech.	9	6	11	13	14 + 15	68
M.S.	4	2	-	-	-	6
Ph.D.	1	1	5	1	-	8
Total	80	69	76	78	69 + 41	413

RESEARCH AND CONSULTANCY

Sponsored research projects	13
RBIC projects	12

STUDENT'S VISIT

1

INTERNATIONAL COLLABORATION

1

EDITORIAL BOARDS OF JOURNALS

4

RESEARCH PUBLICATIONS

National Journals	1
International Journals	53
National Conferences	10
International Conferences	39
Books Authored	2

DISTINGUISHED VISITORS

- Srishti School of Design
- Deputy Director (Industries and Commerce)
- AGM, SME Centre, SBI
- Ather Energy, Bengaluru
- Daimler India Commercial Vehicle
- Madha Dental College and Hospital
- Ramachandra University
- IIT Hyderabad
- GE Global Research Centre, Bengaluru
- NITIC
- University of Leeds
- IIT Kanpur
- University of Technology

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

Founded in 1959, the Department of Humanities and Social Sciences (HSS) is one of the oldest departments of IITM. Its distinguishing factor is its inter-disciplinary nature, which allows students to develop an appreciation for a diverse set of fields, including development studies, economics, English studies, environmental studies, history, international relations, philosophy, political science and sociology. The department offers both Master's and Doctoral programmes, as well as electives for B.Tech. and M.Tech. students. Coupled with its multi-disciplinary background, the Department of HSS boasts a diverse and experienced faculty. It has an excellent student-teacher ratio and state-of-the-art facilities, offering an altogether enriching academic environment.

FACULTY MEMBER ACTIVITIES

Workshops	12
Seminar	7
Symposium	1
Conferences	2
Special Lectures	5

VISITS ABROAD (FACULTY)

16

ACADEMIC PROGRAMMES

NEW COURSES 8

NO. OF FACULTY

Professors	11
Associate Professors	13
Assistant Professors	9
Visiting Faculty	1
DAAD Faculty	1

VISITS (Students & Scholars)

India	Abroad
11	10

AWARDS & PRIZES

Outside IITM	Awards
8	2
Within IITM	**Honours**
7	2

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
M.S.	45	42	42	42	36	207
Ph.D.	25	28	14	11	11	89
Total	70	70	36	53	47	296

RESEARCH AND CONSULTANCY

Sponsored research projects	8
Industrial Consultancy Projects	12
RBIC projects	14
Retainer Consultancy	7

FACULTY MEMBERS' PARTICIPATION UNDER MOU

1

EXCHANGE PROGRAMME UNDER MOU

8

EDITORIAL BOARDS OF JOURNALS

3

RESEARCH PUBLICATIONS

National Journals	9
International Journals	14
National Conferences	7
International Conferences	2
Books Authored	5

DISTINGUISHED VISITORS

- Thorat (Chairman, ICSSR)
- Drexel University

OTHER ACTIVITIES

- DoHSS: Academic Conference 2017 on Traversing the Margins organised by MA students and research scholars.
- Inaugural lecture by Prof. Sukhadeo Thorat, Chairman, ICSSR

DEPARTMENT OF MANAGEMENT STUDIES

Founded in 2004, the Department of Management Studies (DoMS) offers a 2-year fulltime M.B.A. programme and research programmes leading to M.S. and Ph.D. degrees. DoMS also offers an M.S. (Entrepreneurship) programme; the Visionary Leadership in Manufacturing (VLM) programme and the Postgraduate Diploma for Executives (PGPEX-VLM), jointly with IIM Calcutta and IIT Kanpur. The summer job offers and the 555 placement offers from nationally and globally reputed companies, attest to the acclaim received by the department and the growing stature of its MBA programme. Presently, the department has the largest number of management research scholars in India. Research scholars' work is regularly published in reputed international and national journals and presented at prestigious international and national conferences. In the recent past, research scholars have received international awards for their doctoral theses and papers which are cited frequently.

Some major areas of research at the department are listed here:

• Applied statistics • Models in supply chain management • Combinatorial optimization • Production and operations management • Finance • Project management • Human resource management • Quality management • Information systems • Quantitative strategy • Knowledge management • Services management • Marketing • Technology managementt

FACULTY MEMBER ACTIVITIES

Short-term Course	3
Management Development Program	30
Seminar	4
Workshops	1
Conferences	2
Training	1
Special Lectures	8

VISITS ABROAD (FACULTY)

18

ACADEMIC PROGRAMMES

NEW COURSES 2

NO. OF FACULTY

Professors	10
Associate Professors	6
Assistant Professors	10

VISITS (Students & Scholars)

India	Abroad
25	18

AWARDS & PRIZES

Outside IITM	Awards
5	8
Within IITM	**Honours**
5	8

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
M.B.A	52	59	-	-	-	111
M.S.	12	11	10	7	1	41
Ph.D.	28	29	13	19	12+13	114
Total	92	99	23	26	26	266

RESEARCH AND CONSULTANCY

Sponsored research projects	6
New Faculty Grant	5
RBIC projects	14
Retainer Consultancy	7

FACULTY MEMBERS' PARTICIPATION UNDER MOU

1

EXCHANGE PROGRAMME UNDER MOU

2

EDITORIAL BOARDS OF JOURNALS

2

RESEARCH PUBLICATIONS

National Journals	2
International Journals	37
National Conferences	6
International Conferences	23
Books Authored	4

FELLOWSHIPS OF ACADEMIES AND PROFESSIONAL SOCIETIES

Hof University of Applied Sciences, Germany, Staff mobility for Teaching under Erasmus+Mobility project, 9-13 November 2016

OTHER ACTIVITIES

- Dr. Thenmozhi and Dr. T.J. Kamalanabhan, Executive Programme for Business Administration
- Dr. M. Thenmozhi, EPBA – Executive Programme in Business Administration
- Dr. A. Thillai Rajan, Professor, Serves as an Associate of the Mossavar Rahmani Centre for Business & Government, Harvard Kennedy University School, Harvard University, January 2017
- Dr. T.J. Kamalanabhan and Dr. M. Thenmozhi, Professor, EPBA
- Dr. Saji K Mathew, Selected as Treasurer, AIS India Chapter By Association of Information Systems (AIS), Atlanta

DISTINGUISHED VISITORS

- Life Sciences, Defence Research & Development Organisation (GERAD), HEC Montréal, Canada
- Additional Director General of Police, Government of Tamil Nadu
- Software Process Improvement Network
- IIM Bangalore
- Sabre Airline Solutions
- Ohio State University
- Sabre Airline Solutions in Bangalore, India
- University of Illionois
- IIT Bombay
- Wayne State University
- Washington University in St. Louis
- Nottingham Trent University
- University of North Carolina, Greensboro
- University of Connecticut
- New York University
- Deakin Business School, Melbourne
- Pennsylvania State University, USA
- University of Victoria
- IIM Calcutta and President of Madras Consultancy Group
- Wilfridlaurier University, Canada

DEPARTMENT OF MATHEMATICS

Established in 1959, the Department of Mathematics is one of oldest departments of Indian Institute of Technology Madras. Today, the department offers M.Sc. programme in Mathematics, M.Tech. programme in Industrial Mathematics and Scientific Computing (IMSC) and a Ph.D. programme. In addition, the department has taken on the responsibility of teaching mathematics to B.Tech., M.Tech. (other than IMSC), M.Sc. and Ph.D. students of the Institute.

FACULTY MEMBER ACTIVITIES

Short-term Course	1
Workshops	4
Video Course	1
Symposium	1
Conferences	5
Others	18
Special Lectures	12

VISITS ABROAD (FACULTY)

8

ACADEMIC PROGRAMMES

NEW COURSES 4

NO. OF FACULTY

Professors	13
Associate Professors	8
Assistant Professors	17
Visiting Faculty	1
Adjunct Professor	1
Institute PDFs	4
Inspire Fellow	1

VISITS (Students & Scholars)

India	Abroad
33	2

VISITS (Other Institutes)

16

AWARDS & PRIZES

Outside IITM	Awards
0	2
Within IITM	**Honours**
6	1

Students on Roll

Programme	No. of. Students
M.Tech.	99
M.S.	20
Ph.D.	100
Total	219

RESEARCH AND CONSULTANCY

Sponsored research projects	10
Industrial Consultancy Projects	0
RBIC projects	0
Retainer Consultancy	0

EDITORIAL BOARDS OF JOURNALS

4

RESEARCH PUBLICATIONS

National Journals	3
International Journals	60
National Conferences	0
International Conferences	6
Books Authored	1

OTHER ACTIVITIES

- Seminar Talks — 42

DISTINGUISHED VISITORS

- IIT Hyderabad
- Karnataka University
- IIT Delhi
- Technical University Munich, Germany
- Bindura University, Zimbabwe
- University of Oklahoma, USA
- Kerala University
- ISI Bengaluru
- IISER, Pune
- IIT Kanpur
- IISC, Bengaluru
- California State University Los Angeles, USA
- University of Sait-Etienn, France
- Rider University, USA
- Vrije Universiteit Amsterdam, The Netherlands
- Daejeon, Republic of Korea

DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Mechanical Engineering was established in 1959, the foundation year of the institute. Today, it offers Ph.D., M.S., M.Tech., B.Tech. and Dual Degree programmes and has excellent facilities to carry out state-of-the-art research in three major disciplines of mechanical engineering, namely thermal engineering, mechanical design and manufacturing engineering. The thermal engineering stream comprises of six laboratories: Heat Transfer and Thermal Power, Hydro-Turbo Machines, I.C. Engines, Refrigeration and Air Conditioning, Thermal-Turbo Machines and Thermodynamics and Combustion. The design stream consists of the machine design section, machine dynamics laboratory. The manufacturing engineering stream consists of the manufacturing engineering section and precision engineering and instrumentation laboratories.

FACULTY MEMBER ACTIVITIES

Short-term Course	6
Workshops	10
Seminar	4
Symposium	2
Conferences	16
Others	0
Special Lectures	62

VISITS ABROAD (FACULTY)

27

ACADEMIC PROGRAMMES

NEW COURSES 6

NO. OF FACULTY

Professors	24
Associate Professors	13
Assistant Professors	24
Emeritus Professor	2

VISITS (Students & Scholars)

India	Abroad
32	32

AWARDS & PRIZES

Outside IITM	Awards
1	3
Within IITM	**Honours**
2	3

PATENTS FILED

17

PATENTS OBTAINED

1

NEW FACILITIES

- Transient Dynamometer for engine experimentation under actual road conditions
- Inauguration of
- Next-generation Precision Grinder
- Cortex Metamax 3B VO2 Analyzer System

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	75	82	81	71	15	324
Dual Degree	79	80	71	72	78	380
M.Tech.	71	94				165
M.S.	19	23	33	16		91
Ph.D.	23	28	64	43	40	198
Total	267	307	249	202	133	1158

RESEARCH AND CONSULTANCY

Sponsored research projects	65
Industrial Consultancy Projects	63
RBIC projects	9
Retainer Consultancy	1

RESULTS FROM RESEARCH WORK

Ph.D 10

M.S 9

INTERNATIONAL COLLABORATION

40

FACULTY MEMBERS' PARTICIPATION UNDER MOU

6

EDITORIAL BOARDS OF JOURNALS

1

EXCHANGE PROGRAMME UNDER MOU

1

RESEARCH PUBLICATIONS

National Journals	5
International Journals	157
National Conferences	0
International Conferences	70
Books Authored	4

DISTINGUISHED VISITORS

- Grenoble, France
- University of Nebraska Lincoln, Lincoln, NE, USA
- IIT, Kharagpur
- Rehabilitation Institute of Chicago
- University of Toronto
- Universitat Rovira I Virgili
- University of Leeds
- Institute for Technical Thermodynamics
- IIT Kharagpur
- Virginia Tech University
- University of Southampton

DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING

One of the oldest departments of IIT Madras, the Department of Metallurgical and Materials Engineering (MME) was originally established in 1959 but assumed present name in 2003.Actively engaged in research, education and industrial consultancy, the department offers B.Tech., M.Tech., M.S. and Ph.D. degree courses. Its teaching, research and consultancy activities cover a broad area ranging from conventional metallurgy to frontiers of materials science and engineering. The department has strong linkages with industry and is well known for the expertise of its faculty in industrial metallurgy. Over the years, it has hosted excellent research infrastructure in the broad areas of material science and engineering, ranging from materials processing (forming, joining, casting, particulate processing, nanostructured materials) tocharacterization (X-ray diffraction, electron microscopy, thermal analysis), mechanical testing, environmental degradation/corrosion, surface engineering, computational materials science and electronic materials.

FACULTY MEMBER ACTIVITIES

Short-term Course	2
Workshops	13
Seminar	5
Symposium	0
Conferences	15
Others	0
Special Lectures	21

VISITS ABROAD (FACULTY)

19

ACADEMIC PROGRAMMES

NEW COURSES 27

NO. OF FACULTY

Professors	12
Associate Professors	8
Assistant Professors	10
Visiting Faculty	2
Steel Chair Professor	1
Distinguished Professor	1
Adjunct Faculty	2

VISITS (Students & Scholars)

India	Abroad
16	12

AWARDS & PRIZES

Outside IITM	Awards
18	2
Within IITM	**Honours**
5	10

PATENTS FILED

2

PATENTS OBTAINED

1

NEW FACILITIES

- Advanced Microflow Reactor Supplied by Corning for UAY project
- Atomic Absorption Spectroscopy
- Motorized Microscope Arrangement
- Evoqua water purifying system

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	31	31	31	30	17	140
Dual Degree	11	9	13	13	24	70
M.Tech.	21	25	-	-	1	47
M.S.	7	4	4	3	-	18
Ph.D.	31	27	18	22	29	127
Total	101	96	66	68	71	402

RESEARCH AND CONSULTANCY

Sponsored research projects	14
Industrial Consultancy Projects	22
RBIC projects	0
Retainer Consultancy	0

FELLOWSHIPS OF ACADEMIES AND PROFESSIONAL SOCIETIES

B.S. Murty, Fellow of Andhra Pradesh Academy of Sciences

INTERNATIONAL COLLABORATION

11

EDITORIAL BOARDS OF JOURNALS

4

RESEARCH PUBLICATIONS

National Journals	0
International Journals	130
National Conferences	7
International Conferences	2
Books Authored	7

OTHER ACTIVITIES

- An M.Tech. programme in Industrial Metallurgy was started through e-learning mode.
- M.Tech. projects were also initiated with various industries.

DISTINGUISHED VISITORS

- BARC
- University of Wollongong, Australia
- ARCI, Hyderabad
- Minneapolis, MN, USA
- Swansea University, UK
- Tsukuba, Japan
- IISc Bengaluru
- Los Alamos National Laboratory, USA
- University of Tennessee, Knoxville
- Massachusetts Institute of Technology, USA
- Techno Confluence Intelligent Engineering Solutions Pvt. Ltd., Bengaluru
- IGCAR, Kalpakkam
- Institute of Iron and Steel Technology, TU Bergakademie Freiburg, Germany
- Materials Chemistry-RWTH Aachen University, Germany
- GE, Bengaluru
- University of Pennsylvania
- Rensselaer Polytechnic Institute, USA
- The University of Queensland, Australia
- Technical University of Berlin, Germany
- Fronius International, GmbH, Austria
- Karlsruhe Institute of Technology , Germany
- Clemson University, Clemson, USA
- University of Calfornia Santa Barbara, USA
- IIT Kanpur
- University of Bristol, UK
- Michigan Technological University, USA
- Nanyang Technological University, Singapore
- AF Research Laboratory, Materials and Manufacturing Directorate, OH, USA
- Swinburne University, Melbourne, Australia

DEPARTMENT OF OCEAN ENGINEERING

The Ministry of Education and Social Welfare, as per the decision of the Council of Indian Institute of Technology, established the Ocean Engineering Centre of IIT Madras in 1977. The department is a Centre of Excellence for advancing the frontiers of science; for providing breakthrough technology; and for developing education and training programmes in the field of Ocean Engineering.

FACULTY MEMBER ACTIVITIES

Short-term Course	0
Workshops	3
Seminar	0
Symposium	2
Conferences	4
Others	0
Special Lectures	4

VISITS ABROAD (FACULTY)

7

ACADEMIC PROGRAMMES

NEW COURSES 2

NO. OF FACULTY

Professors	15
Associate Professors	5
Assistant Professors	4

VISITS (Students & Scholars)

India	Abroad
0	8

AWARDS & PRIZES

Outside IITM	Awards
1	1
Within IITM	**Honours**
17	1

NEW FACILITIES

- An integrated sensor mounting cage for underwater deployment of instruments on cruise
- VSF (Volume Scattering Function) Meter to measure angular scattering pattern of underwater light field

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	35	28	31	32	35	161
Dual Degree	18	13	14	17	21	83
M.Tech.	56	40	-	-	-	96
M.S.	12	20	12	3	5	52
Ph.D.	26	22	22	44	37	151
Total	153	123	79	96	98	578

RESEARCH AND CONSULTANCY

Sponsored research projects	1
Industrial Consultancy Projects	43
RBIC projects	0
Retainer Consultancy	0

FACULTY MEMBERS' PARTICIPATION UNDER MOU

2

EXCHANGE PROGRAMME UNDER MOU

0

RESEARCH PUBLICATIONS

National Journals	2
International Journals	62
National Conferences	23
International Conferences	23
Books Authored	0

OTHER ACTIVITIES

- Faculty and staff members 17
- Inter-disciplinary group achievements 5
- Socially relevant activities 4

DISTINGUISHED VISITORS

- Newcastle University
- SEATECH
- Submarine Design Group, Indian Navy
- Kuwait Institute of Scientific Research
- IDT, ONGC
- Indian Naval Ship, Adyar
- OMV Exploration and Production GmbH
- Embassy Science Fellow, US Consulate, Chennai
- Platform Design and Survivability Office of Naval Research Global, London, UK

DEPARTMENT OF PHYSICS

The Department of Physics of the Indian institute of Technology Madras was established in 1959. A comprehensive centre for higher education and research encompassing traditional areas and rapidly evolving frontiers, the department has been recognised internationally. Its faculty are experts in the areas of experimental solid state physics, optical and laser physics, soft condensed matter physics and various aspects of theoretical and computational physics, ranging from condensed matter to string theory and cosmology. The Department of Physics offers a vibrant undergraduate programme, B.Tech. (Engineering Physics) programme, in conjunction with the Department of Electrical Engineering. The department offers three master's programmes - the Dual Degree (B.S. and M.S.), M.Sc. and M.Tech. programmes in Physics. The department also conducts a regular doctoral research (Ph.D.) programme.

FACULTY MEMBER ACTIVITIES

Short-term Course	3
Workshops	14
Seminar	11
Symposium	1
Conferences	11
Others	0
Special Lectures	42

VISITS ABROAD (FACULTY)

22

ACADEMIC PROGRAMMES

NEW COURSES 3

NO. OF FACULTY

Professors	22
Associate Professors	16
Assistant Professors	15
Visiting Faculty	1

VISITS (Students & Scholars)

India	Abroad
4	8

AWARDS & PRIZES

Outside IITM	Awards
2	5
Within IITM	**Honours**
17	3

PATENTS FILED

4

PATENTS OBTAINED

1

NEW FACILITIES

- Electrochemical workstation
- LCG computing facility by NKN
- RPC detector development facility

Students on Roll

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	30	30	30	30	28	148
Dual Degree	11	06	09	18	08	52
M.Tech.	42	43	-	-	-	85
M.S.	9	13	-	-	-	22
Ph.D.	26	34	30	41	37+14	182
Total	118	126	58	89	87	489

RESEARCH AND CONSULTANCY

Sponsored research projects	40
Industrial Consultancy Projects	7
RBIC projects	0
Retainer Consultancy	0

FACULTY MEMBERS' PARTICIPATION UNDER MOU

3

EXCHANGE PROGRAMME UNDER MOU

0

FELLOWSHIPS OF ACADEMIES AND PROFESSIONAL SOCIETIES

Max Planck Partner Groups 1

INTERNATIONAL COLLABORATION

2

STUDENT'S VISIT

35

EDITORIAL BOARDS OF JOURNALS

1

RESEARCH PUBLICATIONS

National Journals	0
International Journals	172
National Conferences	25
International Conferences	25
Books Authored	0

COUNTRIES VISITED

France ✦ London ✦ Munich ✦ Germany ✦ Singapore ✦ Taiwan ✦ USA ✦ Switzerland ✦ India ✦ Denmark

PURPOSE OF VISIT

Research ✦ Meetings ✦ Talks ✦ Presentation ✦ Conferences ✦ Workshops

DISTINGUISHED VISITORS

- Debye Institute for Nanomaterials Science (DINS), Netherlands
- IIT Kanpur
- IIM Udaipur
- CERN, Geneva, Switzerland
- IMSc
- IISER Mohali
- S. N. Bose National Centre for Basic Sciences, Kolkata
- Georgia State University, Atlanta U.S.A.
- Dublin City University, Ireland
- Georgia State University, Atlanta USA
- University of Southern California, Los Angeles, USA
- Université de Lorraine, Nancy, France
- DCMP and MS, TIFR India
- Bucknell University, USA
- Leiden University and National Institute for Subatomic Physics
- University of Chicago
- Laboratory of Physical Chemistry, ETH Zurich
- IISc, Bengaluru
- University of Oxford
- Centre for Nano and Soft Matter Sciences, Bengaluru
- University of Arizona, USA
- University of Colorado, Boulder
- Columbia University
- University of Queensland (UQ), Australia
- IISER Thiruvananthapuram
- Max Planck Institute for Terrestrial Microbiology, Marburg, Germany
- IUCAA Pune
- IIT Indore
- TU Dresden
- IISc, Bengaluru
- IMSc, Chennai
- Institute of Science and Technology (UNIST), Republic of Korea
- Imperial College, London
- University of Technology, Gothenburg, Sweden
- Walther-Meißner-Institut, Bayerische Akademie der Wissenschaften
- Physical Research Laboratory, Ahmedabad
- TIFR, Hyderabad

CENTRES OF SPECIAL FACILITIES

CENTRAL FACILITIES

CENTRE FOR INDUSTRIAL CONSULTANCY & SPONSORED RESEARCH

The Centre for Industrial Consultancy and Sponsored Research (IC&SR) was set up in 1973 to foster and promote sponsored research activities and relationships with industries. The centre facilitates active participation of faculty in various interactive programmes organized for the benefit of industries and the institute, plays a pro-active role in managing the intellectual property generated by the institute and its commercialization, and provides administrative support for carrying out consultancy and sponsored research projects, particularly for recruitment of project staff, maintenance of accounts and purchase of equipment and materials. Some of its other activities are sponsored research programmes, consultancy projects (research based/retainer/institutional), collaborative projects with organizations and industries in foreign countries, industrial associateship scheme, ISRO-IITM Space Technology Cell joint projects, IGCAR-IITM Cell joint projects, NIOT-IITM Ocean Technology Cell, patenting and technology transfers, faculty and student entrepreneurship and incubation, and positive messaging and outreach programme.

Faculty: Prof. Krishnan Balasubramanian, Dean ✦ Prof. Ravindra Gettu, Associate Dean (from May 2016)

Staff: Sh. R. Sundaram, Chief Techno Economic Officer ✦ Dr. V. Suresh, Senior Techno Economic Officer ✦ Sh. B. Nagarajan, Joint Registrar (up to February 2017) ✦ Sh. Sundaravinayagam, Deputy Registrar (from August 2016) ✦ Sh. P. Sarvaharana, Assistant Registrar

SPONSORED RESEARCH

2016-17

Projects	212
Value (in lakhs)	₹ 32,650
Co-ordinators (faculty members)	290

On-going Projects

Value (in lakhs)	₹ 93,761
Co-ordinators (faculty members)	340

CONSULTANCY PROGRAMMES

2016-17

Assignments	565
Value (in lakhs)	₹ 11,357
Co-ordinators (faculty members)	210

On-going Projects

Value (in lakhs)	₹ 19,412

SPONSORED RESEARCH

2016-17

Approved proposals	17
Value (in lakhs)	₹ 495

INDUSTRIAL ASSOCIATESHIP SCHEME

2016-17

Total industries	101
Large-scale	20
Medium-scale	58
Small-scale	23

OTHER PROGRAMMES

- ISRO-IITM Space Technology Cell joint projects:
  - On-going projects: 26 (₹ 775 lakhs)
  - New projects: 5 (₹ 170 lakhs)
- IGCAR-IITM Cell
  - On-going projects: 4 (₹ 106 lakhs)
- NIOT-IITM Cell
  - On-going projects: 5 (₹ 136 lakhs)
  - New projects: 1 (₹ 19 lakhs)
- HAL-IITM Centre for Aerospace Transmission Systems (CATS) has been set up in IIT Madras. Hindustan Aeronautics Limited (HAL) is interested in supporting research and development projects at IITM in the area of aerospace transmission system through the centre
- IIT Madras initiated activities for transfer of technologies that are of immediate relevance to society. For this purpose, the following three projects have been taken up:
  - Socially Relevant Projects,
  - Rural Technology Action Group, and
  - Centre for Social Innovation and Entrepreneurship (CSIE)

DISTINGUISHED VISITORS

- NTPC
- LG Soft India Bangalore
- Festo India
- Rolls Royce
- Tata Communications
- Mahindra & Mahindra
- Siemens
- BHEL Ranipet
- Jindal Stainless Limited

RESEARCH FUND (₹ in lakhs)

R&D Award	180
Innovation Eco-systems	50
Exploratory Research Projects	336
New Faculty Initiation Grant	175
One Team Project	200
Patenting and Commercialization	50
Maintenance and Operation	157

PUBLICATIONS

- IIT Madras Calendar
- IIT Madras New Year Greeting Card
- IIT Madras Diary for 2017

MOUs / AGREEMENTS

98

TECHNOLOGY TRANSFER

₹ 1,85,01,071

POSITIVE MESSAGING & OUTREACH PROGRAM

IIT Madras is one of the few high-ranking institutions in India that are prompt, active and well connected on the social media. Our Facebook page has over 1,02,000 likes and is extremely well updated with a response time of just one day, actively engaging over 30,000 people every week. IIT Madras' tweets have 36K impressions every month on an average. We have a noteworthy LinkedIn connect. We are also ahead of the curve in our presence across other platforms like Instagram, Google+ and Pinterest. A monthly e-newsletter is sent to all stakeholders of IITM.

CENTRE FOR CONTINUING EDUCATION

The Centre for Continuing Education (CCE) was established in June 1986. It supports faculty members in meeting the following objectives of Indian Institute of Technology Madras:

- Providing knowledge-based technological services to satisfy the needs of society and industry
- Helping build national capabilities in science, technology, humanities, management, education and research
- Effectively participating and contributing to the institute's commitment of providing a broad base of learning opportunities

The Centre for Teaching and Learning was established in 2011 under the auspices of the CCE. This has now grown into a fully functional centre with its own administrative structure. This centre strives to be a centre of excellence and innovation in the Teaching Learning Processes (TLP) and a new and sustainable paradigm in higher technical education, producing human resources of the highest professional and personal quality for the service of the nation.

Quality Improvement Programme (QIP)

	Ph.D.			M.Tech.		
Period	Admitted	On Roll	Awarded	Admitted	On Roll	Awarded
2016–2017	14	56	13	3	7	1
Since inception	655	—	531	640	—	606

SHORT-TERM TRAINING PROGRAMMES UNDER QIP (AICTE-STC)

19

ACTIVITIES OF THE CD CELL

3

BOOK WRITING SCHEME (BWS)

1

CONTINUING EDUCATION PROGRAMMES (CEPS)

Internal	External
53	27

USER ORIENTED PROGRAMS (UOPS)

5

OTHER FACILITIES

Educational Technology Cell

Central Photographic Section

Conference Registration

P.G. SENAPATHY CENTRE FOR COMPUTING RESOURCES

The Computer Centre at Indian Institute of Technology Madras was established in 1973 to provide centralized computing resources and support the academic initiatives of the institute. It has had professionally maintained facilities that have served the IIT Madras community, from the IBM System 370 in the 1970s and the Siemens system in the 1980s to the SGI, IBM power and Sun systems in the earlier part of this millennium and the super-computers and communication and network services of today. Over the years, the computing and information technology requirements of the community have been increasing. The Computer Centre's organization has also evolved with the increase in requirements. In 2007, the infrastructure of the Centre was significantly upgraded through an endowment given by Mr. S. Gopalakrishnan in the name of his father Mr. P.G. Senapathy.

The activities of the Centre are organized under five verticals: high-performance computing environment (HPCE), networks, e-services, data centre and workflow. Each vertical is focused on continually improving its services to meet the needs of the IIT Madras community.

HPCE

This group was established to cater to the ever-increasing demand for super-computing facilities from researchers at IIT Madras. The Virgo super-cluster, with 292 nodes and two iDataPlex dx360 M4 master nodes, with FDR 10 InfiniBand connectivity, is already in use. These nodes have 2× Intel E5-2670 eight-core, 2.6 GHz processors, with 4 GB of memory per core. This machine, which caters to the needs of the research community, mostly uses parallel programming.

E-SERVICES

The E-Services vertical focuses on services such as web system configurations, e-mail, web access, web security, storage solutions, virtualization and web services.

DATA CENTRE

The function of the Data Centre is to ensure appropriate management of facilities so that all verticals of the Computer Centre function efficiently and without interruption. These facilities include the uninterrupted power supply, backup power supply (DG set), CCTV, climate control, access control, water leakage system, fire protection under BMS and office space maintenance. The Data Centre has upgraded the Building Management Systems with the latest technology.

NETWORKS

The campus computer network was established in 1994, connecting about 18 buildings in the Academic Zone with telephone cables. The initial bandwidth was 64 Kbps. Today, with a fiber-backbone high-speed network (10 Gbps), there is connectivity for all the buildings in the Academic Zone. In addition, a backbone inter-connecting the three zones (Academic Zone, Hostel Zone and Residential Zone) is also operational. The total number of nodes in the campus is approximately 20,000. The network equipment in the Academic Zone was upgraded to provide 100/1000 Mbps connectivity to the nodes. All the buildings in the Academic Zone are provided with dual fiber connectivity. Facilitation for video conferencing is also provided under the network service. The network vertical also oversees the procurement of external network services as well as the design, installation and maintenance of the network structure, switches and cabling across the IIT Madras campus.

WORKFLOW

The enterprise resource planning (ERP) software implemented is internally referred to as Workflow. The Workflow group at the Computer Centre works with various sections in the institute to support system usage and capture changes in requirements involved in process development activities, maintaining reporting websites that collect data from Workflow, and generating reports using new software tools.

CENTRAL ELECTRONICS CENTRE

The Central Electronics Centre (CEC) was established in 1971 with the main objective of servicing and maintaining the wide variety of sophisticated electronic equipment at the institute. A key attribute of this centre is a blend of an academic environment and an industry-like working atmosphere.

The centre is housed in a dust-free environment. It has a team of qualified, experienced and talented staff members trained in India and Germany in various aspects of electronic instrumentation, testing and calibration. The infrastructural facilities and equipment have been continually enhanced over the years using Government of India funds and successive Indo-German collaborative projects.

So far, the CEC has provided expertise and services in the above areas to more than 230 industries/organizations inside and outside the country.

ACTIVITIES

Short-term courses for IIT staff	2
Short-term courses for industries	1
Training programmes	3

DESIGN & DEVELOPMENT ACTIVITIES

New facilities added or major equipment procured	8

RESEARCH & CONSULTANCY

Industrial consultancy projects	32
Value	₹ 13,71,320

SOPHISTICATED ANALYTICAL INSTRUMENT FACILITY

The Sophisticated Analytical Instrument Facility (SAIF) at Indian Institute of Technology Madras was established with the financial support from the Department of Science and Technology, Government of India. The facility provides sophisticated instruments and equipment to students, scientists, researchers and faculty members, apart from academia, educational institutions, national laboratories, R&D establishments and industries from all over India in general and South India in particular. The primary purpose of the facility is to enable the scientific community to collect data and carry out analysis using extremely sophisticated analytical equipment for advanced research at very nominal rates.

SAIF also undertakes, on request, servicing of sophisticated analytical instruments at other institutions and provides training in the operation and maintenance of such equipment. Periodically, the facility conducts workshops, seminars and conferences to disseminate information on new trends in sophisticated instrumentation and methods in addition to providing training and hands-on experience. Students from educational institutions, colleges and schools visit SAIF regularly to gain exposure to the use of sophisticated instruments for analysis.

NUMBER OF FACULTIES

Professor	1
Adjunct Professor	1
Scientific Officer/Engineer	1
Technical Staff	8

FACULTY ACTIVITIES

Seminars	3
Conferences	1
Special Lectures	5
Fellowships	1
New facilities added or major equipment procured	3

RESEARCH PUBLICATIONS

International Journals	4
National Conferences (as abstract)	3
International Conferences (as abstract)	1

CENTRAL FACILITIES

Set up in 1959, the Central Workshop initially consisted of shops associated with three major manufacturing processes, namely metal cutting, metal joining and metal forming. Later, sections on other modern manufacturing processes and control systems were introduced in workshop training. The Central Workshop also operates and maintains the buses of the institute.

CENTRAL WORKSHOP FACILITIES

SHOP

Carpentry ✦ Fitting and Tool Room ✦ Machine Shop ✦ Gear Shop ✦ Electrical Shop ✦ Instrument Shop ✦ Welding Shop ✦ Foundry Shop ✦ Smithy Shop

SECTIONS

Pneumatics and Hydraulics ✦ FRP ✦ Plastics ✦ Instrumentation and Communication Lab

TRAINING

Department	Students
Electrical Engineering	121
Engineering Physics	30
Mechanical Engineering	147
Metallurgical and Materials Engineering	46
Aerospace Engineering	59
Chemical Engineering	90
Naval Architecture and Ocean Engineering	59
Civil Engineering	99
Biological Engineering	35
Computer Science and Engineering	54
Engineering Design	57

TRAINING MODULES

Power Tools ✦ Machining process – Turning ✦ Machining process – Milling ✦ Foundry and Smithy ✦ Plastics and FRP ✦ Welding ✦ Electrical ✦ Electronics ✦ Pneumatics and Hydraulics ✦ Instrumentation and Communication

CENTRAL GLASS BLOWING SECTION

Established in 1972, the Central Glass Blowing Section is one of the important infrastructural facilities of Indian Institute of Technology Madras. The facility undertakes design and fabrication of sophisticated glass apparatus for research and development in various departments. It has a range of modern glass working equipment that was largely procured from Germany under a collaborative programme. The apparatus includes a horizontal-cum-vertical lathe, a universal forming lathe and a high-vacuum system. The section is also well equipped with a good number of sophisticated burners, drilling and cutting machines, grinding and polishing equipment and such other tools necessary for fashioning varied glass apparatus. It has an adequate facility for quartz working and has developed a high level of expertise in this area.

The sophisticated apparatus fabricated includes cryostats, spherical and cylindrical Dewar flasks, lugging probes, laser housing tubes with water jackets, reactor tubes, vacuum tube collectors (for solar energy) and quartz ware. From April 2016 to March 2017, the Central Glass Blowing Section undertook 260 work orders from various departments.

CENTRAL LIBRARY

The Central Library of Indian Institute of Technology Madras is equipped with all modern facilities. It has a rich collection of information resources in the form of CD-ROMs, online databases, e-journals, e-books, e-standards, e-patents and printed material on applied science, engineering, technology, humanities, management, social science and emerging subjects. The collection has 3,80,685 items, including 655 current journals, apart from various value-added services through modern information-handling tools and techniques to cater to the information needs of 12,849 members.

COLLECTIONS

Books	2,35,637
Theses	7,173
Book Bank	14,058
Current periodicals	655
Back volumes of periodicals	1,14,533
CD-ROMs, Audio/Video cassettes	1,948
e-Books	6,681

MEMBERSHIP

Staff	695
Faculty members (including retired)	830
Students	10,650
Alumni members	386
Corporate members	42
IAS members	190
Project coordinators	56

SERVICES

Circulation	
Project loans to departments/centres	
Inter-library loan transactions	
Reprint service	
Smart Cards	
Expenditure (lakhs of ₹)	
Purchase of books	78.79
Subscriptions to journals & databases	969.00

ACTIVITIES

Short-term courses/workshops/ seminars/symposia/conferences/ meetings/training programmes	17
Special lectures	4
Distinguished visitors	6

MAJOR INITIATIVES

The Central Library has taken various initiatives to improve the existing infrastructure, facilities, services and collections to provide strong and dynamic support to the academic, research, development, continuing education and industrial interaction programmes and policies of the institute. Some of these initiatives are—Online resources (e-journals, e-databases, and e-books), e-Shodh Sindhu Consortium, Extended working hours on Saturday and Sundays, Systematic re-shelving of books, Smart Card facilities, and Major reorganisation of library book in stacks.

STUDENTS AMENITIES & ACTIVITIES

HOSTELS

Men's hostel	16
Women's hostel	4
Dining halls	10

INSTITUTE GYMKHANA

Takes care of the general welfare, sports and co-curricular and cultural activities of students.

ADVISOR, WEAKER SECTION

Takes care of the welfare of the foreign national and weaker section students.

NATIONAL CADET COPS (NCC)

A total of 199 Senior Division Air Wing and 1 Senior Wing NCC cadets were enrolled.

NATIONAL SERVICE SCHEME (NSS)

NSS was launched in 1969 on the birth centenary of Mahatma Gandhi. It is aimed at involving students in community service.

MEDICAL FACILITIES

- Well-equipped casualty
- Operation theatre
- Recovery room
- Post-operative ward
- NABL-accredited clinical laboratory
- Pharmacy
- Echocardiogram
- Ultra-sonogram
- X-Ray unit
- Physiotherapy unit
- Well-equipped Labour Room
- New Born Care
- Outpatient department

SPORTS SECTION

SPORTFEST 2016–2017: Seventeen men's colleges and 11 women's colleges participated

32nd Inter IIT Aquatic Meet - 2016: Participation from 12 IITs in swimming and 7 in water polo events

Jimmy George Volleyball Tournament - 2017: 8 men teams and 4 women teams competed

Inter-Hostel Tournaments 2016– 2017: Schroeter Trophy & Deans Trophy

MITR AND SAATHI

A lot of workshops were organised by the joint team of both MiTR and SAATHI, which were directed towards the well-being of the student community in general and help and support for the deserving students and the faculty in particular in terms of attending to their needs for counseling, medication and discussion forum.


LIFE GUARD STAND
MADRAS

INTERNATIONAL & ALUMNI RELATIONS

The Dean's Office for International & Alumni Relations (I&AR) was established in October 2012. This office strives to support the institute's drive towards global excellence in education, research, relations with industry, innovation and entrepreneurship, sustainability and social impacts, internationalization and physical infrastructure.

VISION

The vision of the Office of I&AR is to enhance the global stature and impact of IIT Madras by leveraging alumni and international relations.

MISSION

The mission of the Office of I&AR is to leverage the institute's excellent relationship with alumni to increase engagement with academia/research labs, industry/business, entrepreneurs and foundations to promote institute–external relations by building on alumni relations and to raise funds for the benefit of the institute and its stakeholders such as students, faculty and staff, and society.

ALUMNI RELATIONS

Distinguished Alumnus Awards	12
Leadership Lecture Series	27
Travel Grants	
Students	253
Amount given (₹ in lakhs)	87.43
Faculty	25
Amount given (₹ in lakhs)	13.00

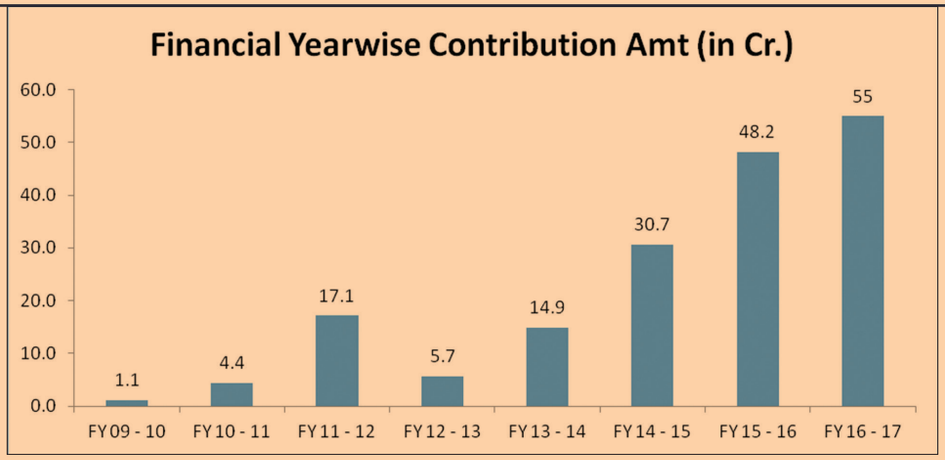
HIGHLIGHTS FOR FY 2016-17

- Total number of new donors who have come on board since 2009 is nearly 5,000—about 10% of our total alumni base.
- 70% of the receipts are from India-based donors and corporates; 30% are from the U.S. (a reversal of the historic trend).
- Contribution for CSR projects is 30% of the total received.
- 50% of the contributions are from batch reunions and individuals (alumni and non-alumni).
- 20% of contributions are from industry for non-CSR initiatives (research, naming rights, etc.).
- With the shift of critical mass to India-based contributors, March has now become the month with the largest inflow (displacing the previous champion, December).
- Crowdfunding, where short-term projects with limited funding requirements are placed on a social media platform, has become a significant source for contributions (nearly ₹ 75 lakh) and for attracting new donors (over 200 in FY 2016-17). The mean contribution is ₹ 35,000.

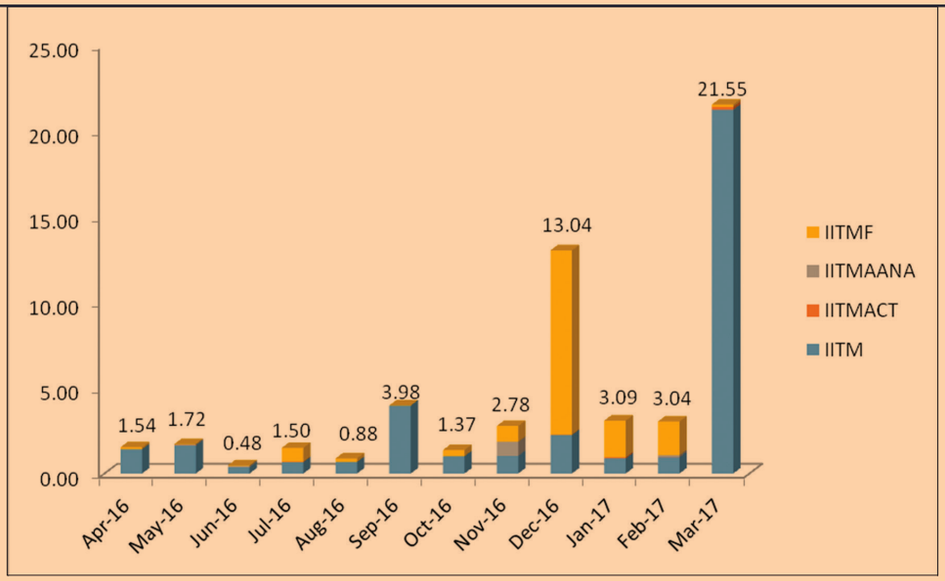
SSAN ANANYA EDUCATIONAL TRUST

SSAN Ananya is a trust set up with the noble intention of helping deserving students who require financial help during their education at IIT Madras and inspiring them to be a part of a unique brand of citizens who believe in the importance of 'paying forward' the interest-free loan. So far nine students have received ₹ 12.75 lakh from this scheme.

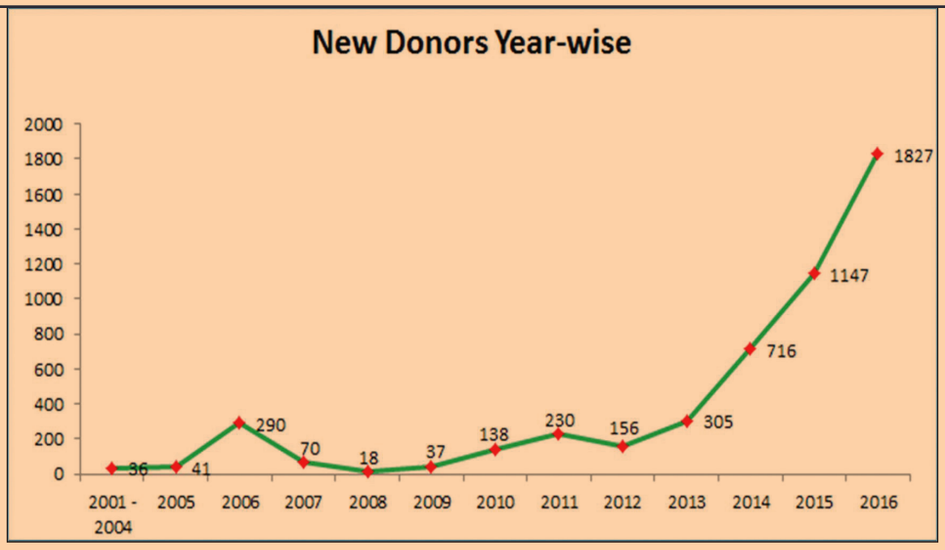
Statistics of Funds Received



Month-wise and Source-wise Funds Received



New donors (year-wise)



CENTRES OF EXCELLENCE

IIT Madras has established several advanced interdisciplinary Research Centres of Excellence. Some of them are listed below:

1. Raghupathi Singhania Centre of Excellence for Tyre & Vehicle Mechanics
2. Centre of Excellence in Urban Transport
3. Centre for Decentralised Power System
4. Centre for Non-Destructive evaluation
5. National Centre for Combustion R & D
6. National Centre for Catalysis Research
7. Centre for NEMS & Nanophotonics
8. Healthcare Technology Innovation Centre
9. Centre for Technology and Policy
10. National Centre for Safety of Heritage Structures
11. Indo-German Centre for Sustainability
12. China Studies Centre
13. Reliance-IITM Telecom Centre of Excellence
14. Centre for Functional Nano materials
15. Thematic Unit of Excellence on Water
16. Centre for Excellence in Wireless Technology
17. Centre of Excellence on Machine Tools and Production Technology
18. Centre of Excellence in Iron & Steel Technology
19. Centre for Computational Brain Research
20. Initiative in Biological Systems Engineering
21. Interdisciplinary Laboratory in Data Sciences
22. Centre for Social Innovation & Entrepreneurship
23. Centre for Railway Research

STUDENTS PLACEMENT

INTERNSHIPS

The IIT Madras students are given internships to gain first-hand experience of professional world by going on summer or winter internships. These internships are given to students to make them industry ready. The success of the exercise can be estimated by the 56 pre-placement offers received by the institute this year.

Students / Scholars Placed

Branch	B.Tech.	Dual	M.Tech.	M.A.	M.Sc.	M.S.	Ph.D.	Total
Aerospace	16	11	3	-	-	3	0	33
Applied Mechanics	-	-	7	-	-	4	2	13
Biotechnology	-	18	1	-	-	-	-	19
Civil	32	23	21	-	-	2	1	79
Chemical	44	13	6	-	-	-	1	63
Chemistry	-	-	-	-	3	-	-	3
Computer Science	18	21	47	-	-	12	-	98
Electrical	39	36	34	-	-	11	2	122
Engineering Design	-	31	-	-	-	2	1	34
Engineering Physics	-	-	-	-	-	-	-	-
Humanities and Social Sciences	-	-	-	9	-	-	-	8
Mathematics/IMSC	-	-	2	-	5	-	-	7
Mechanical	47	49	43	-	-	40	1	180
Metallurgical	16	7	11	-	-	3	2	39
Ocean	19	8	12	-	-	1	0	40
Physics	14	4	1	-	-	-	2	21
	245	221	188	9	8	78	12	759
Pre-placement offers		56						
Total		817						

FINANCIAL ASSISTANCE TO STUDENTS

Indian Institute of Technology Madras supports meritorious students with financial assistance through scholarships and fellowships to pursue engineering, technology and science education at the institute. Details of the scholarships and fellowships sanctioned to students of different programmes during 2016-17 are provided here.

ASSISTANCE TO B.TECH / DUAL DEGREE STUDENTS

Merit-cum-means scholarship: Twenty-five per cent of the students admitted to B.Tech./Dual Degree programmes and whose parental income is less than ₹ 4.5 lakh per annum were sanctioned Merit-cum-means (MCM) scholarship. These students are exempted from payment of tuition fee of ₹ 45,000 per semester and provided a pocket allowance of ₹ 1,000 per month. During the period under report, 679 students benefited from the scholarship. SC/ST students admitted to B.Tech./Dual Degree programmes and whose parental income is less than ₹ 4.5 lakh per annum were sanctioned the concession of free messing and a pocket allowance of ₹ 250 per month. They were also exempted from tuition fees and hostel seat rent as per Government of India post-matric scholarship rules. As on 31 March 2017, 246 students benefited from the scholarship. Institute free studentship scholarship for B.Tech/Dual Degree programmes were sanctioned to students, exempting them from payment of tuition fees. 79 students were benefited from the Ministry of Tribal Affairs SC/ST Scholarship, Government of India.

Top 7% of the general category students admitted to B.Tech./DD programme are eligible for National Prize of ₹ 1,000 (one time) and a certificate of merit on the basis of the rank in JEE (Advanced) and parents' income not exceeding ₹ 4.5 lakh. A total of 400 general category students were admitted to B.Tech./DD in July 2016 and 28 students were eligible for National Prize.

MCM and SC/ST scholarships

Batch	MCM Scholarship	SC/ST Scholarship
2016	148	57
2015	156	55
2014	178	68
2013	197	66
Total	679	246

State Government Scholarship (B.Tech./DD)

	Batch / Number of students				
Scholarship	2016	2015	2014	2013	Total
NCERT	3	6	-	1	10
Kerala State	1	-	-	-	1
Total	4	6	-	1	11

M.Tech.

Students who joined M.Tech programme through GATE were awarded half-time teaching assistantship (HTTA) at ₹ 12,400 per month. During the period under report, 307 fresh assistantships and two renewed assistantships were given.

M.Tech. Dual Degree

Students of 2012 batch who joined M.Tech. programme under Dual Degree were awarded HTTAs at ₹ 12,400 per month from 1 June 2015 onwards on the basis of their obtaining a valid GATE score or on securing CGPA of 8.0 or above (CGPA of 7.5 and above for SC/ST). During the period under review, 304 students were awarded fresh assistantships from June-December 2016, and 304 renewed assistantships in January 2017 out of which 288 students were renewed HTTA at the rate of ₹ 12,400 per month and 16 students at the rate of ₹ 6,950 per month since they obtained CGPA of less than 6.5 in July-November 2016 semester.

M.Sc.

Students admitted to the M.Sc. programme were sanctioned Rs 1,000 per month merit scholarship as per rule. Exemption from payment of tuition fee was also given to certain students. During the period under report, 118 students benefited from the scholarship.

M.A.

Institute Merit Scholarship: Twenty-five per cent of students admitted to the M.A. programme and whose parental income is less than ₹ 4.5 lakh were sanctioned merit scholarships. They were exempted from the payment of tuition fee of ₹ 3,000 semester and provided a pocket allowance of ₹ 1,000 per month.

SC/ST students admitted to the M.A. programme and whose parental income is less than ₹ 4.5 lakh were given the concession of free messing and a pocket allowance of ₹ 250 per month and exempted from tuition fees and hostel seat rent as per Government of India post-matric scholarship rules.

Institute free studentship scholarships for M.A. programme were sanctioned to students, exempting from payment of tuition fees.

M.S.

The scholars admitted to the M.S. programme through GATE are given Half-Time Teaching Research Assistantship (HTRA) of Rs 12,400 per month for two years and later extended to third year on the recommendation of GTC. During the period under report, 453 scholars received these assistantships of which 238 were fresh scholars.

Ph.D.

The scholars admitted to the Ph.D. full-time programme in engineering are sanctioned HTRAs of ₹ 25,000 per month for first two years and ₹ 28,000 per month for next three years. During the period under report, 1,450 scholars obtained assistantships, 538 of them being fresh scholars.

Ph.D. scholars of science departments who are able to submit thesis within 4.5 years and Ph.D. scholars of engineering departments who are able to submit their thesis within four years from the date of admission are sanctioned Pre-Doctoral Fellowship of ₹ 45,000 for six months. During the year under report, 45 Ph.D. scholars have been sanctioned Pre-Doctoral Fellowship.

FINANCIAL ASSISTANCE TO RESEARCH SCHOLARS/STUDENTS

The institute encourages research scholars to present papers in international conferences for which they are given financial assistance. The financial assistance provided to M.S. and Ph.D. scholars is up to the limit of ₹ 1,50,000, including registration fee.

NATIONAL/INTERNATIONAL CONFERENCES IN INDIA

Research scholars and students of course programmes are given the following financial assistance for presentation of papers in national/international conferences in India:

Registration fee

National and international conference: ₹ 5,000

Travel: Third Class AC train fare

Daily allowance: ₹ 500 per diem subject to a maximum of 10 days

FINANCE & ACCOUNTS

The financial year of the institute corresponds with that of the Government of India (1 April to 31 March of the following year). The accounts of the institute are annually audited by the Principal Accountant General (Tamil Nadu and Pondicherry), Chennai on behalf of the Comptroller and Auditor General of India.

The 84th Finance Committee of the institute in its meeting held on 28 November 2016 recommended non-plan revised estimates of ₹ 375.70 crore (gross) for the year 2016–2017 and budget estimates of ₹ 406 crore (gross) for the year 2017–2018. The committee also recommended a revised estimate of ₹ 253 crore for the year 2016–2017 and budget estimates of ₹ 334 crore under the plan head. The same were approved by the Board of Governors of the institute in their 231th meeting held on 28 November 2016. The following is a summary of the revised estimates for 2016–2017 and budget estimates for 2017–2018 under the non-plan and plan heads.

(Figures in crore of ₹)

Item	Budget Estimate 2016–2017	Revised Estimate 2016–2017	Budget Estimate 2017–2018
Non-plan account			
Non-plan grant expected	283.00	334.43	328.00
Institute income projected	49.99	67.57	78.00
Grant projected for salary	163.75	183.95	204.50
Grant for pension and retirement benefits	73.60	93.50	87.30
Grant for non-salary component	45.65	30.68	36.20
Total	332.99	375.70	406.00
Plan grant account			
Grant expected from MHRD	245.00	253.00	334.00
Grant for scholarships OH-31	75.00	75.00	75.00
Grant for asset creation OH-35	170.00	178.00	259.00
Total	245.00	253.00	334.00

Audit

The annual accounts of the institute for the year 2015–2016 were audited by the Principal Accountant General (Tamil Nadu and Pondicherry) during June–July 2016, and a certified copy of the annual accounts with the audit report was sent to MHRD after the annual accounts were duly adopted by the Board of Governors to arrange for placing the same before both the Houses of Parliament during the winter session.

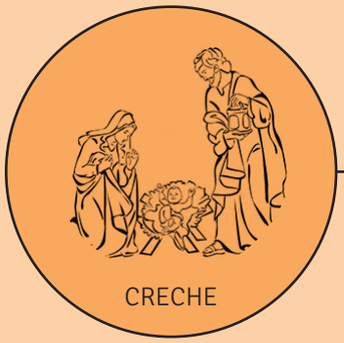
(Figures in crore of ₹)

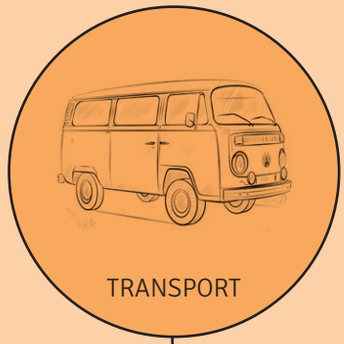
Summary of provisional plan and non-plan grant utilization for 2016–017

Item	Amount
Plan grant account	
Opening balance	-27.74
Plan grant received	159.92
Total funds	132.18
Plan expenditure	
Building and construction	66.84
Academic equipment	10.31
Equipment for specialized centre	-
Infrastructure (furniture/computers, etc.)	7.02
Periodicals/journals/books for library	9.48
Scholarship payments (HTTA/HTRA/PDF) and Revenue expenditure	74.93
Total plan expenditure	168.58
Non-plan account	
Opening balance	-26.42
Grant received during 2016–2017	295.00
Institute Income	96.06
Total funds available	364.64
Non-plan expenditure	
Salary and related items	170.57
Pension and other terminal benefits	92.27
Non-salary, non-pension items (other components)	107.81
Total non-plan expenditure	370.65

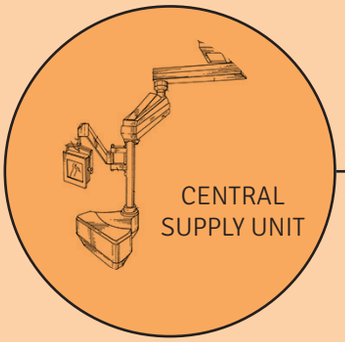
The balance of the corpus fund as on 31 March 2017 is ₹ 201.44 crore and the balance of the institute Endowment account as on 31 March 2017 is ₹ 80.60 crore.

CAMPUS AMENITIES


CRECHE


TRANSPORT


GUEST HOUSE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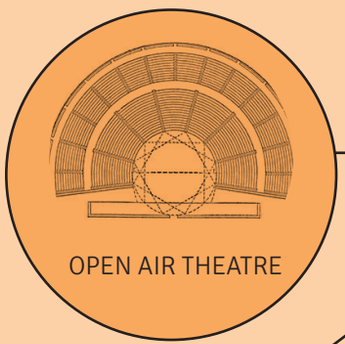
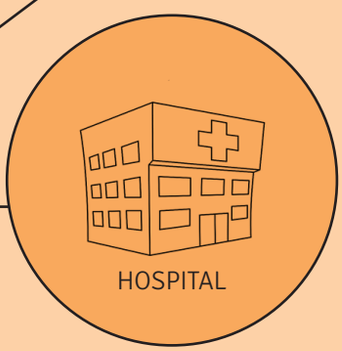

OPEN AIR THEATRE

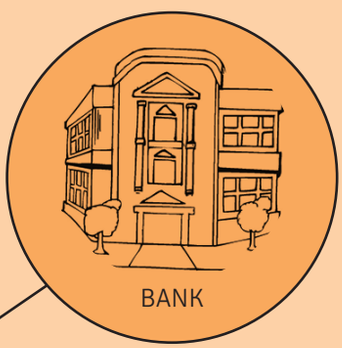

HORTICULTURE


STUDENT ACTIVITY CENTRE

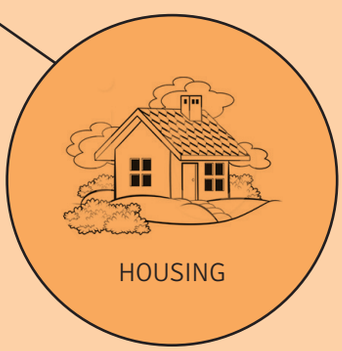
SCHOOLS


CAFETERIA

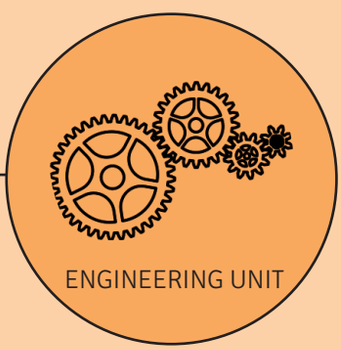

HOSPITAL


BANK


TELEPHONE


HOUSING

POST OFFICE


ENGINEERING UNIT

Indian Institute of Technology Madras
Chennai-600036, Tamil Nadu, India

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