INDIAN INSTITUTE OF TECHNOLOGY MADRAS

YEAR BOOK 2018–19

NIRF #1

ARIIA #1

INSTITUTE OF EMINENCE

Awarded by HRD Ministry

CONTENTS

DEPARTMENTS

CENTRES OF SPECIAL FACILITIES

YEAR AT A GLANCE

Total Admissions	2491

UG Students	PG Students	Research Scholars
496	1520	475

Total on Roll	9947

UG Students	PG Students	Research Scholars
2086	4936	2925

New Faculty Members Joined the Institute this Year — 93

Visiting Faculty — 54

Total Faculty Members — 594

New Partnerships with International Institutions in 2018-19 — 25

Total Partnership with International Institutions — 246

Non-Teaching Employees — 677

Research articles published in journals# by the faculty members — 2411

Books Published by Faculty — 95

Papers Presented in Conference — 876

Total Scholars who Received Ph.D. Degree — 244

Continuing Education Programmes — 70

Companies Visited for Placement   **246**

Total Job Offers   **970**

UG Placements
257

PG Placements
592

Total Placements
871

PPOs
99

PhD Placements
22

Sponsored Research Projects
284

₹ 327 CR

Project Value

Consultancy Assignments
651

₹ 168 CR

Project Value

Indian **142**

Total Patents Filed
195

53 International

Indian **22**

Total Patents Obtained
45

23 International
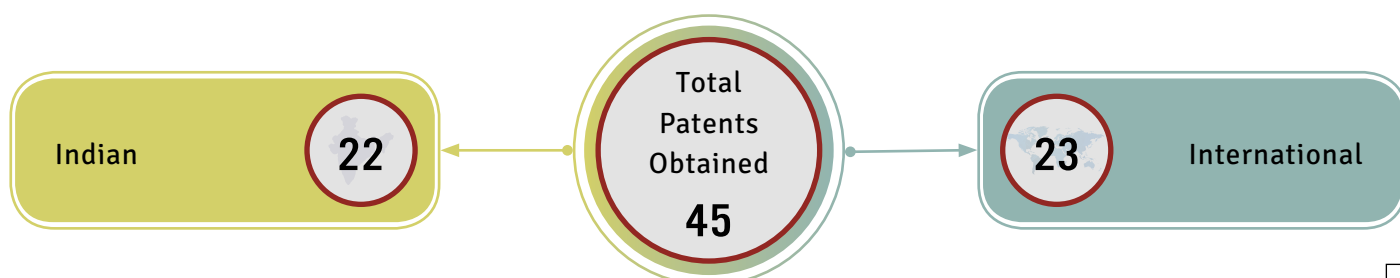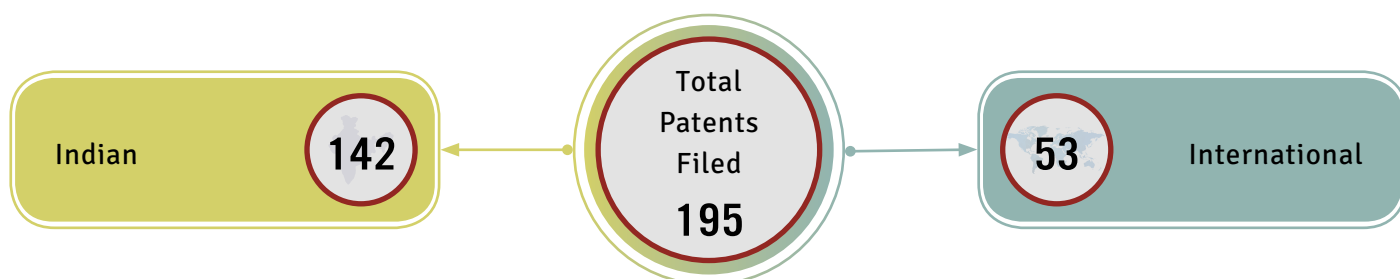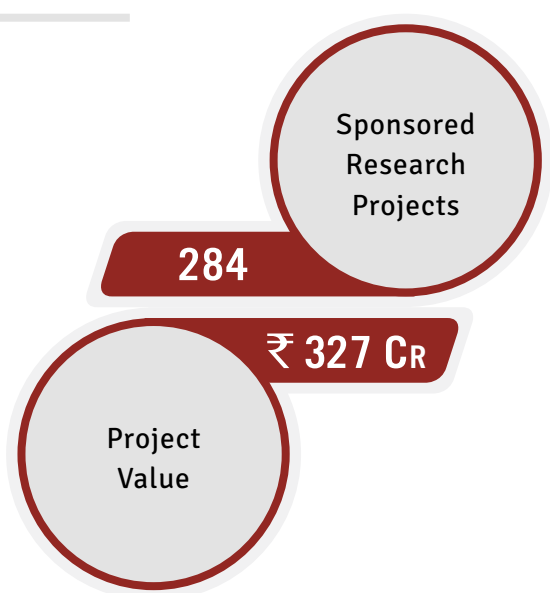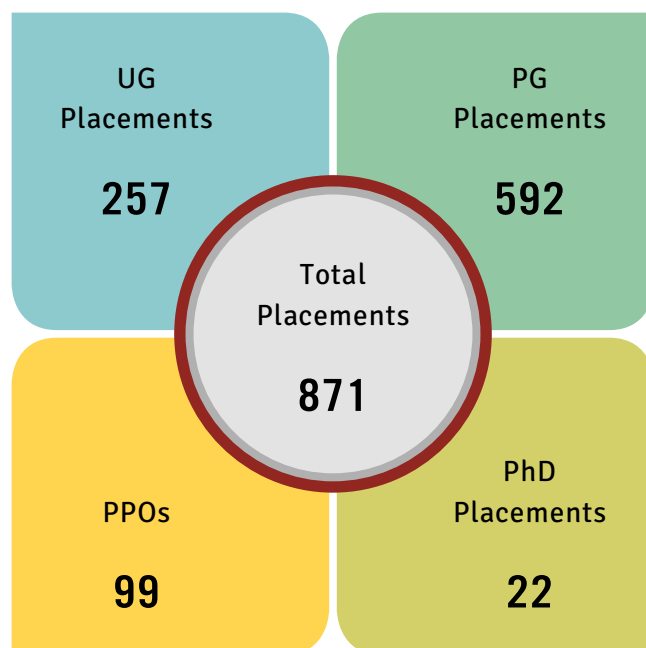
DIRECTOR'S REPORT

Presented at the 56th Convocation of IIT Madras

Prime Minister of India Shri Narendra Modiji,

Governor of Tamil Nadu Shri Banwarilal Purohitji,

Chief Minister of Tamil Nadu Thiru. Edappadi Palanisami Avargal,

Union Minister for HRD, Dr. Ramesh Pokhriyalji Nishank,

Deputy Chief Minister of Tamil Nadu Thiru. O Panneerselvam Avargal,

Chairman, Board of Governors IIT Madras, Dr. Pawan Goenka

Members of the Board of Governors,

Members of the Academic Senate,

Distinguished Members of the Diplomatic Corps,

Chief Guests of the Degree Distribution Programmes,

Distinguished Guests,

Colleagues,

Alumni,

Graduands, award winners, and their family members,

My greetings to everyone assembled here on this joyous occasion, and a special welcome to our dear graduating students!

2019 is a momentous year for IIT Madras, as we complete 60 years since inception. We are indeed honoured and privileged that the Prime Minister of India, Shri Narendra Modiji, has found the time, and thought it fit, to grace our Convocation this year. We are extremely grateful to you, Sir, for this gesture, which we shall cherish for all time.

That Chennai was the chosen location for the third IIT in India was in great measure due to the alacrity shown by the Tamil Nadu government in making available this wonderful location for its campus. We owe a special gratitude to the State government for its unstinting support to the Institute ever since, including the provision of land for the IIT Madras Research Park, and for further expansion of the campus at Thaiyur.

The Ministry of Human Resources Development of the Government of India has nurtured IIT Madras with utmost care. If we have grown today to become one of the premier institutions of the country and have earned global recognition, it is in substantial measure due to the generosity of MHRD. It is no exaggeration, therefore, to state that we exist in order to serve the country and her people.

We express our deepest gratitude for the generous assistance of the German government in our formative years. More than 75 German faculty and technical staff served at IIT Madras, and our laboratories were fully equipped with the best machinery then available. In keeping with their famed quality, the German equipment kept working until, finally, we were forced to retire them to overcome obsolescence, though we still cling to a few! We continue to have thriving collaborations not just with German universities, but with many other leading universities from across the world. Today, we are awarding four PhD degrees jointly with University of Technology Sydney, Swinburne University and National Tsing Hua University.

The first batch of 107 students graduated in 1964, and the first PhD degree was awarded in 1965. Today, 2,584 degrees, including 371 PhD degrees, will be awarded. Over the past 60 years, more than 40,000 alumni have stepped out of our portals and made a mark for themselves and the Institute. Among them are captains of industry, leading scientists of India's space, defence and nuclear establishments, academicians of global renown, entrepreneurs who have created entirely new industries, civil servants of distinction, and even a famous musician or two. Many of our alumni partner and engage with the Institute in various ways, including outreach to engineering college students in order to help them with internships, startups, and industry exposure.

We recall with gratitude the efforts of about 1,800 faculty members and 2,400 staff members, who have toiled under the stellar leadership of eleven Directors during these 60 years. It was not easy to remain wedded to excellence, when resources were limited and global contacts sparse.

While the Institute has grown steadily since inception, it has done so by leaps and bounds in the last decade since our Golden Jubilee. In this period, our student strength has doubled. We have built a large number of new hostels, academic buildings, and residences, even as we have ensured that our campus retains its greenery and its fauna. Between 2009-2019, our faculty strength has grown by 50 per cent and research scholar population has nearly trebled, while research funding has outpaced this to go up six times. Our research output too has gone up dramatically in this period.

IIT Madras prides itself on its research collaboration with industry, its Industrial Consultancy Centre harking back to 1973, mentored by the Germans before they departed. The start-up ecosystem at IIT Madras is known for its deeptechnology startups and counts amongst the best in the country. Given this remarkable growth, our alumni and other donors have affirmed their faith in their alma mater by increasing their contributions forty-fold in this period, to touch ` 73 crore annually last year.

These key performance indicators have led to the Institute being ranked first among engineering institutes in the NIRF rankings, first in the Atal Innovation rankings, and most recently being declared as an Institution of Eminence.

Perhaps less well-known are the several technological contributions of our faculty, students and startups that have had a deep and lasting impact on our people and the country, as these do not show up in any ranking framework.

Among the first high-impact projects undertaken was the saving of India's fast-depleting forests by replacing wooden railway sleepers. IIT Madras and Indian Railways designed and tested the country's first pre-stressed concrete sleeper in the only laboratory equipped to do so at the time. IIT Madras also helped a dozen entrepreneurs set up manufacturing lines for the sleepers.

In the 80s, IIT Madras about 30 self-standing concrete towers for designed for Doordarshan the first time in India. The towers were to be erected across the country, from Kasauli in the north to Rameshwaram in the south, from Bhuj in the west to Itanagar in the east. At 330m, some of these remain today the tallest free-standing structures in the country. The tower at Bhuj was among the few buildings to survive the devastating earthquake of 2002.

When India was looking for an alternative to the investmentheavy landline telephone in the nineties, IIT Madras developed and commercialised technology for fixed wireless telephones costing only a third as much as landlines. More than a million lines were deployed and were also exported to a dozen countries. Today, we have teamed up with seven other institutes to build a complete end-to-end 5G wireless system.

Since 1985, IIT Madras has been taking up important tasks for ISRO, including some for the Chandrayaan Mission. Two years from now, Indian astronauts will travel to space and return in the crew module whose splashdown was successfully tested in the Bay of Bengal in 2014. In 2012, IIT Madras had designed and tested for ISRO a 4:1 scale model in its wave basin, one of only two in the country that can simulate ocean conditions.

The National Cancer Tissue Biobank at IIT Madras has till date collected tissue samples from more than 3,250 patients and completed genome sequencing of 320 breast cancer samples for establishing an India-specific cancer genome database.

When floods devastated Kedarnath in 2013, our National Centre for Safety of Heritage Structures carried out for ASI subsoil and vibration tests, safety assessment for hydrostatic and earthquake loads, and recommended steps for structural conservation, seismic retrofit and health monitoring.

In order to attain 100 percent electrification of homes under the Prime Minister's Saubhagya Scheme, IIT Madras provided its off-grid solar-dc technology in partnership with startup Cygni, for around 45,000 homes in totally inaccessible regions of Rajasthan, Ladakh, Manipur, Assam and Meghalaya.

Based on 20 years of nanotechnology research, AMRIT filters developed by our Centre for Clean Water are delivering arsenic- and iron-free water at 2 paise per litre to over a million people in Punjab and Bengal every day.

The country's only approved mobile eye surgery facility, jointly developed by IIT Madras and Sankar Netralaya, has performed more than 20,000 cataract surgeries in villages across Tamil Nadu and Jharkhand. Partnering with J Mitra, which has developed the country's first benchtop blood testing instrument iQuant, the Institute is revolutionising clinical testing in small towns across the country.

IIT Madras has brought to bear its knowledge of the science of tyre dynamics to help JK Tyres create India's most fuelefficient truck tyres that compete with the global best in class.

After helping revive the Eden Channel in Haldia Port resulting in avoidance of dredging spoils as well as annual savings of ` 250 crore, our National Port Centre is now optimising the dredging for the Ghogha-Dahej RoRo service.

As advanced manufacturing technology is key for the Make in India programme, IIT Madras has collaborated with many machine tool builders to develop state-of-the-art machines, some of which are embargoed. We provide, in partnership with a startup Dhvani, advanced inspection machines for critical precision manufacturing. The problem of high wear of the cold drawing dies in the manufacture of seamless tubes at TI has been addressed by IIT Madras using Chemical Vapour Deposition diamond coating technology, that has increased die-life four times and provided better product finish.

The indigenous Shakti family of microprocessors with architectural support for machine learning, fault tolerance and security, are being used both in critical applications as well as by industry.

Our work for the Tamil Nadu government spans many dimensions. The Tamilnadu Accident and Emergency-Care Initiative, designed by IIT Madras, has had an immediate impact in reducing trauma-related mortality, and is now being adopted by MORTH as a pan-India model. The State Health Resources Centre on our campus has

carried out a study of the Chief Minister's Comprehensive Health Insurance Scheme and published the Tamil Nadu Health accounts. We carry out cybersecurity studies at the Cyber Arangam, and assist in infrastructure projects and pollution control through the Centre for Urbanization, Buildings and Environment.

The affordable, environment-friendly and rapid-construction Glass-fiber Reinforced Gypsum housing technology developed at IIT Madras was used to construct hostels at IITTirupati, and is now ready for nation-wide adoption to tackle the housing challenge.

With nearly 200 startups incubated at the IIT Madras Research Park till date, some early ones are now approaching unicorn status. What started as a student prototype in 2014 is now India's leading e-scooter.the Ather450; the conversational AI company Uniphore is making waves globally with its voice-driven technologies; and small dairy farms are being automated and assisted through IoT and cloud-based intelligence by Stellapps. We are confident that several more startups will join their ranks each year as we go forward.

India will grow rapidly over the next 15 years and IIT Madras will do more than its share to make this happen. As the world changes rapidly around us, accelerated by the revolutions in automation, AI and new materials, it is not enough to aspire to rise to the level of the best-in-class institution of today. Tomorrow's model university must not only produce the best graduates and most advanced research discoveries, but should simultaneously also be of utmost relevance to the community and country through the impact of its work and startups. IIT Madras aspires to reach the highest peaks of both excellence and relevance, and thus serve the country and her people in an exemplary manner.

Before I conclude, I congratulate the graduating classes of 2019 and the award winners for their hard work and stupendous performance. IIT Madras is proud of you and is confident that you will keep the flag of our Institute flying high.

Jai Hind!

ADMINISTRATION

The Indian Institute of Technology Madras (IIT Madras) is an autonomous statutory organisation 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, Varanasi (BHU) and Chennai) are administrated centrally by the Councils of IITs, an apex body established by the Government of India (GoI) to coordinate 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 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 advise the institute on matters relating to buildings and works activities. 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 2019, 594 faculty members and 82 Group A officers were in position.

Number of Faculty/Employees in Position

Faculty Members	Visiting Faculty	Group A Staff	Scientific Officer	Technical Staff	Administrative Staff
594	54	82	-	267	328

Number of faculty and Employees Appointed during 2018-2019

Professors	Associate Professors	Assistant Professors	Visiting Faculty and Others	Administrative and Technical Staff (including Group A)
47	26	20	21	19

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 employees to update and upgrade their knowledge and skills so that they may perform their duties effectively. The programmes are also aimed at enhancing the pride and satisfaction they feel in their work. The overall feeling of happiness engendered by these programmes overflows to their home lives and contributes to a sense of well-being to the entire family. These activities also form a part of the training requirements under the ISO dispensation.

HRD programmes conducted

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 programmes organised by other institutions/ organisations were attended by our employees. The impact of the various programmes, as seen from the feedback at the end of each programme, appears to be advantageous to the institute. The employees were able to upgrade their knowledge through these programmes, as these were designed based on needs.

List of Faculty Members and Officers in the Academic and General Administration

Academic Admin	
Director	Prof. Bhaskar Ramamurthi
Deans	
Academic Courses	Dr. V. Jagadeesh Kumar
Academic Research	Dr. A. K. Mishra
Admin	Dr. Koshy Varghese
Industrial Consultancy and Sponsored Research (IC&SR)	Dr. Ravindra Gettu
IC&SR (Associate Dean)	Dr. Kamakoti V
Students	Dr. M. S. Sivakumar
Planning	Dr. Ligy Philip
International and Alumni Relations	Dr. Mahesh Panchagnula
Heads of Departments	
Aerospace	Prof. K. Bhaskar, Dr. P. Sriram
Applied Mechanics	Prof. S. Vengadesan, Prof. S. Ramakrishnan
Biotechnology	Prof. D. Karunagaran
Chemical Engineering	Prof. A. Kannan, Prof. R. Nagarajan
Chemistry	Prof. Indrapal Singh Aidhen, Prof. K. Mangala Sunder
Civil Engineering	Prof. K. Ramamurthy
Computer Science and Engineering	Prof. Krishnamoorthy Sivalingam, Prof. C. Chandra Sekhar
Electrical Engineering	Prof. Devendra Jalihal
Engineering Design	Prof. Srikanth Vedantam
Humanities and Social Sciences	Prof. Umakant Dash
Management Studies	Prof. L. Prakash Sai
Mathematics	Prof. S. Sundar
Mechanical Engineering	Prof. N. Ramesh Babu
Metallurgical and Materials Engineering	Prof. S. Ganesh Sundara Raman, Prof. Udayachandran Chakkingal
Ocean Engineering	Prof. S. A. Sannasiraj
Physics	Prof. Ramachandra Rao, Prof. K. Sethupathi
Head of Research Centre	
Sophisticated Analytical and Instrumentation Facility	Dr. S.S. Bhattacharyya

Head of Special Facilities for Interaction with other Institutions

Centre for Industrial Consultancy & Sponsored Research	Dr. Ravindra Gettu
Chairman, Centre for Continuing Education	Dr. A. Ramesh
Centre Electronics Centre	Dr. V. Jagadeesh Kumar
Chairman, CC	Dr. Harishankar Ramachandran

Chairman

GATE	Dr. Shaligram Tiwari, Dr. Nilesh J Vasa
JEE	Dr. Madhu Mutyam, Dr. Joytirmaya Tripathy

Central Admin

Registrar	Smt. Bhooma V.G., Dr. Jane Prasad
Joint Registrar (Academic)	Shri. R. Esakkimuthu, Shri. D Ravee
Joint Registrar (Students)	Lt. Col. Jayakumar
Audit Section	Shri. A. V. Sudarsanam
EU	Shri. A. V. Sudarsanam

Deputy Registrars

Admin	Shri. V. Swaminathan, Shri. P V Karunakaran, Smt. G. Chitrapavai
F&A Section	Shri. P. V. Karunakaran
S&P Section	Smt. G. Chitrapavai
IC&SR	Shri. S. Sundaravinayagam
Office of the Dean (Students)/T&P	Shri. Y. E. L. Sudhakar Rao Pujari

Assistant Registrars

Academic Section	Shri. V. Rajendran, Smt. Sheba Sabari P K
Administration	Shri. R. Chandrakasu, Shri. D Ravi
	Shri. B. Vijay Shankar
	Smt. Rashmi Uday Kumar
Communication and PR	Smt. Rashmi Uday Kumar
F&A Section	Shri. V. Perumal
	Shri. R. Muralidharan
Recruitment Section	Smt. K. Vijayalakshmi
Office of the Dean (Students)/T&P	Shri. Y. E. L. Sudhakar Rao Pujari
IC&SR	Shri. P. Sarvaharana
Engineering Unit	Smt. Mary Sabthiha Rani N
Chief Security Officer	Shri. N. Elumalai

Central Library

Librarian	Dr. Mahendra N. Jadhav
Deputy Librarian	Dr. M. Anandamurugan
Assistant Librarian	Dr. K. Saravanan

Head of Central Services, Facilities and Section	
Chief Medical Officer in-charge	Dr. Mahalakshmi M. Ravi
Chief Medical Officer	Dr. Rebecca Punithavalli (w.e.f. 19 September 2018)
Chairman, Council of Wardens	Dr. Sathyanarayana N. Gummadi
Central Gas Blowing Section	Dr. Varadarajan U. V.
Professor in-charge, CWS	Dr. Seshadri Sekhar A
Chairman, Library Advisory Committee	Dr. K. Ramamurthy
Coordinator, NSS	Dr. K. C. Sivakumar
Advisor, Sports	Dr. P. N. Santhosh
Advisor, Cultural	Dr. Nandita Das Gupta
Advisor (Co-Curricular)	Dr. B. Arockiarajan, Dr. Shaikh Faruque Ali
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. Body George
Professor in-charge, IIT Madras website	Dr. N.Narayanaswamy
Professor in-charge, RuTAG	Dr. Abhijit P. Deshpande
EU	
Chairman, EU	Dr. K Murali
Superintending Engineer	Shri. H Anantharaman, Shri. Viswanath
Executive Engineers	Shri. K. Viswanath
	Shri. K. Dharmaraj
	Dr. M. Ramachandran
Senior Horticulture Officer	Shri. V. Seenivasan
Assistant Executive Engineers	Shri. M. Murali Prakash
	Shri. H. Anandaram
	Shri. K. Rizwan Ali
	Smt. N. R. Vineetha
	Shri. K Ravichandran
	Shri. Ajay Krishnan
	Shri. V Manickavasagam
	Shri. Rajavel D
	Shri. K Narayanaperumal
IC&SR	
Senior Techno Economic Officer	Shri. 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 (regular and web based) in 30 streams/specialisations, M.Sc. programme in three branches, B.Tech programme in nine branches, Dual Degree (B.Tech and M.Tech) programme in 38 streams/specialisation, Dual Degree (BS and MS) in Biological Sciences and Physics, M.B.A., EMBA, M.A. Integrated programme in two streams and a preparatory course for SC/ST/PwD students during the year under report.

Admissions 2018-19

The total number of students and scholars admitted to various programmes, both in July 2018 and in January 2019, are given in the following table:

Fresh Admission

Sl. No.	Department	B.Tech	Dual Degree	M.Tech	PG Diploma VLM	PG Diploma Metro Rail	M.Sc	M.B.A	EMBA	M.A	M.S	Ph.D	Total
1.	Aerospace Engineering	43	14	29	–	–	–	–	–	–	20	16	122
2.	Applied Mechanics	–	–	21	–	–	–	–	–	–	16	25	62
3.	Biotechnology	–	59	30	–	–	–	–	–	–	5	15	109
4.	Chemical Engineering	68	16	37	–	–	–	–	–	–	10	20	151
5.	Chemistry	–	–	–	–	–	51	–	–	–	–	55	106
6.	Civil Engineering	57	32	102	–	17	–	–	–	–	13	29	250
7.	Computer Science and Engineering	71	2	47	–	–	–	–	–	–	23	18	161
8.	Electrical Engineering	73	58	155	–	–	–	–	–	–	56	43	385
9.	Engineering Design	–	57	–	–	–	–	–	–	–	8	16	81
10.	Humanities and Social Sciences	–	–	–	–	–	–	–	–	–	44	27	71
11.	Management Studies	–	–	–	38	–	–	49	45	–	10	14	156
12.	Mathematics	–	–	24	–	–	39	–	–	–	–	14	77
13.	Mechanical Engineering	88	81	90	–	–	–	–	–	–	49	51	359
14.	Metallurgical and Materials Engineering	32	12	21	–	–	–	–	–	–	15	31	111
15.	Ocean Engineering	34	15	37	–	–	–	–	–	–	12	33	131
16.	Physics	30	10	10	–	–	41	–	–	–	–	37	128
17.	Inter disciplinary	–	–	–	–	–	–	–	–	–	–	31	31
	Total	496	356	603	38	17	131	49	45	44	237	475	2491

Enrolment of Students/Scholars

Sl. No. Department	B.Tech	Dual Degree	M.Tech	PG Diploma VLM	PG Diploma Metro Rail	M.Sc	M.B.A	EMBA	M.A	M.S	Ph.D	Total
1. Aerospace Engineering	174	97	62	-	-	-	-	-	-	52	134	519
2. Applied Mechanics	-	-	58	-	-	-	-	-	-	73	169	300
3. Biotechnology	15	292	39	-	-	-	-	-	-	19	206	571
4. Chemical Engineering	300	99	77	-	-	-	-	-	-	25	136	637
5. Chemistry	-	-	-	-	-	106	-	-	-	-	256	362
6. Civil Engineering	274	196	225	-	17	-	-	-	-	38	291	1040
7. Computer Science and Engineering	234	97	120	-	-	-	-	-	-	97	96	644
8. Electrical Engineering	310	332	316	-	-	-	-	-	-	162	295	1415
9. Engineering Design	-	310	-	-	-	-	-	-	-	34	90	434
10. Humanities and Social Sciences	-	-	-	-	-	-	241	-	-	-	119	360
11. Management Studies	-	-	-	38	-	-	-	117	84	34	115	388
12. Mathematics	-	-	38	-	-	108	-	-	-	-	104	250
13. Mechanical Engineering	353	410	235	-	-	-	-	-	-	167	386	1551
14. Metallurgical and Materials Engineering	137	65	49	-	-	-	-	-	-	34	160	445
15. Ocean Engineering	160	85	93	-	-	-	-	-	-	38	179	555
16. Physics	129	51	16	-	-	90	-	-	-	-	189	475
Total	2086	2034	1328	38	17	304	241	117	84	773	2925	9947

B.Tech students on roll

Sl. No.	Branch	2018	2017	2016	2015	2014 and earlier batch	Total
1.	Aerospace Engineering	43	39	43	30	19	174
2.	Biotechnology	-	-	-	-	15	15
3.	Chemical Engineering	68	73	70	63	26	300
4.	Civil Engineering	57	56	63	58	40	274
5.	Computer Science and Engineering	71	47	46	43	27	234
6.	Electrical Engineering	73	73	70	65	29	310
7.	Engineering Physics	30	27	28	27	17	129
8.	Mechanical Engineering	88	83	76	78	28	353
9.	Metallurgical and Materials Engineering	32	33	30	28	14	137
10.	Naval Architecture	34	32	35	26	33	160
	Total	496	463	461	418	248	2086

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

Sl. No.	Branch	2018	2017	2016	2015	2014	2013 and Earlier	Total
1.	Aerospace Engineering	14	12	15	19	18	9	87
	AE (B.Tech) and AM (M.Tech)	-	-	-	-	4	6	10
2.	Biotechnology							
	Biological Engineering	33	31	30	25	29	8	156
	Biological Sciences (B.S. and M.S.)	26	31	24	24	13	18	136
3.	Chemical Engineering	16	16	17	20	24	6	99
4.	Civil Engineering and Infrastructural Civil	32	32	35	37	39	14	189
	CE (B.Tech) and AM (M.Tech)	-	-	-	-	4	3	7
5.	Computer Science and Engineering	2	16	15	14	28	22	97
6.	Electrical Engineering	58	58	56	65	57	29	323
	EE (B.Tech) and AM (M.Tech)	-	-	-	-	5	4	9
7.	Engineering Design	57	56	56	54	55	32	310
8.	Mechanical Engineering	81	78	77	83	71	20	410
9.	Metallurgical and Materials Engineering	12	11	10	12	15	5	65
10.	Naval Architecture and	15	15	17	15	6	9	77
	Ocean Engineering	-	-	-	-	6	2	8
11.	Physics (B.S. and M.S.)	10	9	10	8	10	4	51
	Total	368	362	343	384	392	189	2034

M.Sc students on roll

Sl. No.	Branch	2014	2013 and Earlier	Total
1.	Chemistry	51	55	106
2.	Mathematics	39	69	108
3.	Physics	41	49	90
	Total	145	172	304

M.Tech students on roll

Sl. No.	Department\Discipline\Batch	2018	2017	Extended students	Total
1.	Aerospace Engineering	29	31	2	62
2.	Applied Mechanics	21	27	10	58
3.	Biotechnology – Clinical Engineering	14	8	1	39
	– Bio Process Engineering	16	39	14	189
4.	Chemical Engineering	30	28	5	63
	CA – Catalysis Technology	7	5	2	14
	NE – Nuclear Engineering	-	-	1	1

Sl. No.	Department\Discipline\Batch	2018	2017	Extended students	Total
5.	Civil Engineering	83	71	20	410
	CE 1 – Building Technology and Construction Management	8	9	7	24
	CE 2 – Environmental Engineering	12	9	6	27
	CE 3 – Geotechnical Engineering	15	6	2	23
	CE 4 – Hydraulic and Water Resource Engineering	7	13	2	22
	CE 5 – Structural Engineering	19	19	1	39
	CE 6 – Transportation Engineering	10	11	3	24
	CE 7 – Construction Technology and Management	31	33	2	66
6.	Computer Science and Engineering	47	57	16	120
7.	Electrical Engineering	15	6	9	77
	EE 1 – Communication and Signal Processing	100	67	2	169
	EE 2 – Power Systems and Power Electronics	13	9	5	27
	EE 3 – Micro Electronics and VLSI Design	12	47	7	66
	EE 4 – Control and Instrumentation System	11	7	1	19
	EE 5 – Micro Electronics and Photonics	8	4	3	15
	EE 6 – Integrated Circuits and Systems	11	9	-	20
8.	Industrial Maths and Scientific Computing	24	13	1	38
9.	Mechanical Engineering	15	6	9	77
	ME 1 – Thermal Engineering	30	51	10	91
	ME 2 – Mechanical Design	23	28	4	55
	ME 3 – Manufacturing Engineering	16	20	3	39
	ME 4 – Automotive Technology	21	29	-	50
10.	Metallurgical and Materials Engineering	21	26	2	49
11.	Ocean Engineering	21	14	5	40
	– Ocean Technology	8	9	1	18
	– Petroleum Engineering	8	9	4	21
	– Offshore Technology	-	10	3	13
12.	Physics	15	6	9	77
	– Solid State Technology	10	5	1	16
	– Functional Materials and Nanotechnology	-	-	-	15
	Total	603	613	112	1328

M.B.A. students on roll

Sl. No.	Branch	2018	2017	Total
1.	Management Studies	49	68	117

M.A. students on roll

Sl. No.	Branch	2018	2017	2016	2015	2014	Total
1.	Humanities and Social Sciences	44	45	45	42	65	241

M.S. scholars on roll

Sl. No.	Branch	Year I	Year II	Year III	Year IV	Year V and others	Total
1.	Aerospace Engineering	20	8	10	10	4	52
2.	Applied Mechanics	16	26	16	14	1	73
3.	Biotechnology	5	5	4	3	2	19
4.	Chemical Engineering	10	7	5	2	1	25
5.	Civil Engineering	13	13	7	4	1	38
6.	Computer Science and Engineering	23	22	27	20	5	97
7.	Electrical Engineering	56	28	38	30	10	162
8.	Engineering Design	8	9	11	4	2	34
9.	Management Studies	10	11	7	6	-	34
10.	Mechanical Engineering	49	48	28	30	12	167
11.	Metallurgical and Materials Engineering	15	13	3	2	1	34
12.	Ocean Engineering	12	10	4	9	3	38
	Total	237	200	160	134	42	773

Ph.D scholars on roll

Sl. No.	Branch	Year I	Year II	Year III	Year IV	Year V and others	Total
1.	Aerospace Engineering	17	21	25	21	50	134
2.	Applied Mechanics	28	35	37	31	38	169
3.	Biotechnology	19	31	33	41	82	206
4.	Chemical Engineering	20	25	17	33	41	136
5.	Chemistry	56	35	37	49	79	256
6.	Civil Engineering	30	41	44	65	111	291
7.	Computer Science and Engineering	19	9	11	18	39	96
8.	Electrical Engineering	47	54	47	56	91	295
9.	Engineering Design	19	12	13	10	36	90
10.	Humanities and Social Sciences	28	21	24	23	23	119
11.	Management Studies	15	15	30	28	27	115
12.	Mathematics	14	20	27	26	17	104
13.	Mechanical Engineering	54	45	52	81	154	386
14.	Metallurgical and Materials Engineering	37	22	31	31	39	160
15.	Ocean Engineering	34	26	21	40	58	179
16.	Physics	38	30	26	28	67	189
	Total	475	442	475	581	952	2925

EMBA students on roll

Sl. No.	Branch	2018	2017	Total
1.	Management Studies	45	39	84

PG Diploma in VLM students on roll

Sl. No.	Branch	2017	Total
1.	Management Studies	38	38

PG Diploma in MRTM students on roll

Sl. No.	Branch	2017	Total
1.	Civil Engineering	17	17

Courses offered

In the academic year 2018-19, 1,748 courses were offered of which 878 courses were offered in July-November 2018 and 870 courses were offered in January-May 2019. The department-wise details of the courses offered are given below:

Number of courses offered

Sl. No.	Department	Number of courses July-November 2018			Number of courses January-May 2019		
		Core	Elect.	Total	Core	Elect.	Total
1.	Aerospace Engineering	41	-	41	43	-	43
2.	Applied Mechanics	44	-	44	44	-	44
3.	Biotechnology	41	-	41	46	-	46
4.	Civil Engineering	92	-	92	86	-	86
5.	Chemical Engineering	59	-	59	57	-	57
6.	Computer Science and Engineering	44	-	44	48	-	48
7.	Chemistry	22	-	22	34	-	34
8.	Engineering Design	32	-	32	30	-	30
9.	Electrical Engineering	70	-	70	71	-	71
10.	Humanities and Social Sciences	82	-	82	83	-	83
11.	Mathematics	41	-	41	41	-	41
12.	Mechanical Engineering	74	-	74	72	-	72
13.	Metallurgical and Materials Engineering	45	-	45	42	-	42
14.	Management Studies	86	-	86	64	-	64
15.	Ocean Engineering	46	-	46	48	-	48
16.	Physics	59	-	59	61	-	61
	Total	506	382	878	397	467	870

Convocation Degrees Awarded

Sl. No.	Department	Joint Degree	Dual Degree M.S/M.Tech	Dual Degree Ph.D	Ph.D.	M.S.	M.Tech	PGDM-RTM	M.Sc.	M.B.A.	M.A.	Dual Degree B.Tech/BS (Honours)	Dual Degree M.Tech/MS	Dual Degree B.Tech/BS (Honours)	Dual Degree M.Tech/MS	B.Tech Honours	B.Tech	Total
1.	Aerospace Engineering	-	2	2	7	10	16	-	-	-	-	-	-	18	18	1	26	100
2.	Applied Mechanics	-	6	6	19	10	16	-	-	-	-	1	1	20	20	-	-	99
3.	Biotechnology	-	-	-	19	7	8	-	-	-	-	-	-	47	47	-	6	134
4.	Civil Engineering	-	4	4	9	12	24	-	-	-	-	-	-	15	15	2	57	142
5.	Chemical Engineering	1	-	-	33	-	-	-	53	-	-	-	-	-	-	-	-	87
6.	Computer Science and Engineering	1	3	3	21	11	70	15	-	-	-	2	2	32	32	2	52	246
7.	Chemistry	-	1	1	5	20	45	-	-	-	-	2	2	19	19	3	34	151
8.	Engineering Design	-	12	12	14	27	41	-	-	-	-	9	9	43	43	7	65	282
9.	Electrical Engineering	-	1	1	13	9	1	-	-	-	-	-	-	58	58	-	-	141
10.	Humanities and Social Sciences	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	7
11.	Mathematics	2*	2	2	13	11	-	-	-	51	-	-	-	-	-	-	-	81
12.	Mechanical Engineering	-	-	-	15	-	6	-	48	-	35	-	-	-	-	-	-	104
13.	Metallurgical and Materials Engineering	-	6	6	23	50	64	-	-	-	-	4	4	74	74	10	68	383
14.	Management Studies	-	-	-	9	4	19	-	-	-	-	-	-	15	15	-	35	97
15.	Ocean Engineering	-	-	-	14	11	26	-	-	-	-	-	-	6	6	-	35	98
16.	Physics	-	-	-	23	-	6	-	39	-	-	1	1	8	8	4	25	115
	Total	4	37	37	244	182	342	15	140	51	35	19	19	355	355	29	403	2267

* (M.S+Phd.)

Awards and Prizes to students
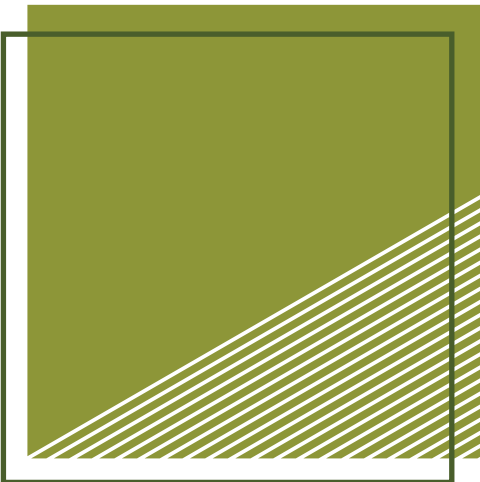
Convocation Prizes	4
Bachelor of Technology (B.Tech)	10
Dual Degree (B.Tech. & M.Tech)	13
Master of Technology (M.Tech)	20
Master of Science (M.Sc)	3
Master of Business Administration (M.B.A.)	2
Master of Arts (M.A.)	2
PG Diploma	1
M.S. and Ph.D	12
Institute Day Merit Prizes	123
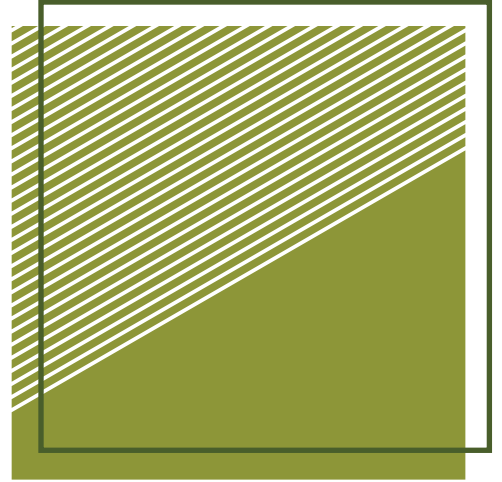
DEPARTMENTS

DEPARTMENT OF AEROSPACE ENGINEERING

Established in 1969, the Department of Aerospace Engineering has been offering B.Tech, M.Tech, M.S. and Ph.D. programmes. The areas of teaching and research of the department are aerodynamics and flight mechanics, propulsion and combustion, and aerospace structures.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	43	41	39	34	19	176
Dual Degree	14	12	19	26	26	97
M.Tech.	30	31	-	-	-	61
M.S.	20	7	8	11	-	46
Ph.D.	17	21	26	20	50	134
Total	124	112	92	91	95	514

New Courses

7

ACADEMIC PROGRAMMES

2

NO. OF POST–DOCTORAL FELLOWS

India
9

Abroad
11

MEETINGS
(Students & Scholars)

Outside IITM
1

Within IITM
8

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	15
Associate Professors	3
Assistant Professors	11

FACULTY MEMBER ACTIVITIES

Meetings	2
Special Lectures	1

DISTINGUISHED VISITORS

Aero India 2019 Panellists ✦ Ameya World School, Visakhapatnam ✦ Masdar Institute, Abu Dhabi ✦ Moscow Aviation Institute ✦ Trinity Aviation ✦ University of California ✦ Dr. Vikram Hrishikeshavan

17

VISITS ABROAD
(Faculties)

2

DISTINGUISHED
VISITORS
(Students)

RESEARCH & CONSULTANCY

Sponsored Research Projects	34
Industrial Consultancy Projects	26

OTHER ACTIVITIES

▸ Department students/staff visited SDSC SHAR ISRO, Sriharikota
▸ Student Visits – 8

DEPARTMENT OF APPLIED MECHANICS

The Department of Applied Mechanics has been in existence since 1962.   A   full-fledged   interdisciplinary graduate research department, it focuses on academic activities in three broad areas of biomedical engineering, fluid mechanics and solid mechanics. The department also offers minor streams for undergraduate students.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
Dual Degree	20	20	-	-	-	20
M.Tech.	21	27	-	-	-	48
M.S.	16	26	13	06	01	62
Ph.D.	28	35	37	27	35	162
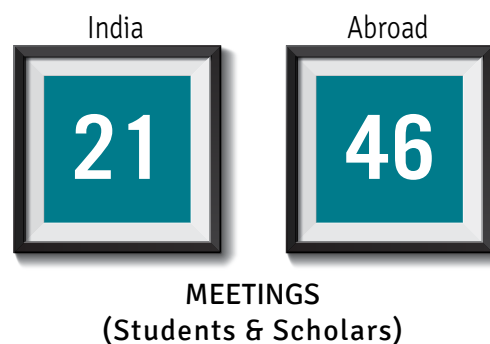
India **21** Abroad **46**

MEETINGS
(Students & Scholars)

Outside IITM **7** Within IITM **2**

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	15
Associate Professors	8
Assistant Professors	5

FACULTY MEMBER ACTIVITIES

Short-term Courses	3
Workshops	1
Symposia	1
Conferences	2
Trainings	1
Special Lectures	19

DISTINGUISHED VISITORS

Clemson University ✦ Continental Corporation ✦ Gates Foundation ✦ Institute for Energy Technology ✦ Medtronics ✦ Neurabay Technologies Private Limited ✦ Philips Innovation Campus ✦ Sanjay Yenugal ✦ Schlumberger Limited ✦ Tanzil Ur Rahman ✦ Tufts University ✦ University of Cincinnati ✦ University of Illinois ✦ University of Southampton ✦ Virginia Tech

15	**1**	Patents Filed **7**	Patents Awarded **1**	Copyright Registered **2**
VISITS ABROAD (Faculties)	HONOURS & AWARDS (Faculties)		DESIGN & DEVELOPMENT	

RESEARCH & CONSULTANCY

Sponsored Research Projects	19
Industrial Consultancy Projects	4
RBIC Projects	5
Testing Projects	4
CSR Project	1
Exchange programme with other Universities, including Institutions/ Universities under MoU	1

OTHER ACTIVITIES

- Faculty Visits – 33
- Student Visits – 1
- A new startup, Ariano Technologies (a spin-off of Touch Lab), has been registered as a private company
- Department faculty members IITM Research Park
- The process to perform safety audit for all the laboratories was carried out

DEPARTMENT OF BIOTECHNOLOGY

The Department of Biotechnology at IIT Madras was founded in 2004 with a vision to be recognised as a department of international repute with a strong interdisciplinary research and teaching base in biological sciences and engineering involving an active collaboration with industries and healthcare institutions. The department is housed in Bhupat and Jyoti Mehta School of Biosciences. The thrust areas of research are bioprocess engineering, computational biology, chemical biology and medical biotechnology related to cancer and cardiovascular diseases.

There is a Centre of Excellence in Bioprocess Engineering to develop knowledge and expertise in the domain and a Department of Science & Technology (DST), Ministry of Science and Technology, funded National Facility to identify potential drug targets through cellular dynamics and FIST facility for infrastructure facilities.

Earlier, the Department of Biotechnology (DBT), Ministry of Science and Technology, funded a programme support on cancer biology. Now, DST is supporting National Cancer Tissue Biobank. A Bioinformatics Centre has also been set up with the funding from DBT. The IIT Madras Bioincubator, initiated by the department and funded by BIRAC, offers lab and office space, including equipment, technical support and centralised utilities for process and product development.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	-	-	-	-	15	15
Dual Degree	59	63	53	49	50	274
M.Tech.	30	6	-	-	-	36
M.S.	5	5	3	1	-	14
Ph.D.	19	34	32	31	46	162
Total	113	93	88	81	111	501

New Courses

7

ACADEMIC
PROGRAMMES

India

70

Abroad

29

MEETINGS
(Students & Scholars)

Outside IITM

17

Within IITM

11

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	19
Associate Professors	5
Assistant Professors	5
Emeritus Professors	2
Adjunct Faculty	7
INSA Senior Scientists	1

FACULTY MEMBER ACTIVITIES

Short-term Courses	7
Workshops	1
Seminars	3
Conferences	24
Selection Committee	13
Special Lectures	10

DISTINGUISHED VISITORS

ANU College of Science ✦ ANU Research School of Earth Sciences ✦ ANU Research School of Physics and Engineering ✦ Baylor College of Medicine ✦ Beatson Institute for Cancer Research ✦ Case Western Reserve University School of Medicine ✦ Genotypic Technology (P) Limited ✦ Harvard Medical School ✦ IISc Bangalore ✦ IISER Kolkata ✦ IISER Trivandrum ✦ Indian Society of Evolutionary Biologists ✦ Indiana University School of Medicine ✦ InStem ✦ Johannes Gutenberg University ✦ Johns Hopkins School of Public Health ✦ Macquarie University ✦ National Renewable Energy Laboratory ✦ Nature Communications ✦ Nature Genetics ✦ NCBS Campus ✦ Newcastle University ✦ Oklahoma State University ✦ Perkin Elmer India ✦ PrEl's Technologies ✦ Stanford University ✦ Stockholm University ✦ TIFR ✦ UCSD/Salk Center for Academic Research and Training in Anthropogeny ✦ University of California ✦ University of Cambridge ✦ University of Pittsburgh ✦ University of Southampton ✦ University of Strasbourg ✦ University of Washington ✦ Uppsala University ✦ Weizmann Institute of Science

	Honours	Awards		Patents Filed
8	**2**	**7**	**2**	**5**
VISITS ABROAD (Faculties)	HONOURS & AWARDS (Faculties)		JOURNAL EDITORIAL BOARDS	DESIGN & DEVELOPMENT

RESEARCH & CONSULTANCY

Sponsored Research Projects	127
Industrial Consultancy Projects	22
RBIC Projects	1
Faculty members' participation with other Institutions under MoU	2

OTHER ACTIVITIES

▸ Students Visits – 8

DEPARTMENT OF CHEMICAL ENGINEERING

The Department of Chemical Engineering was established in 1950. It has a rich pool of permanent faculty members, who are not only dedicated teachers, but also researchers carrying out cutting-edge research in frontier areas of chemical engineering and inter/multi-disciplinary subjects. The focus of the research is on reaction and transport processes, energy, materials and environment. The faculty work towards analysing these systems at multiple scales by understanding their behaviour from the molecular to macroscopic levels as well as using a system-based approach.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	68	74	70	63	00	275
Dual Degree	16	16	17	20	24	93
M.Tech.	37	33	00	00	00	70
M.S.	10	07	05	01	00	23
Ph.D.	20	25	17	25	49	136
Total	151	155	109	109	73	597

New Courses

1

ACADEMIC PROGRAMMES

31

VISITS ABROAD (Faculty)

2

JOURNAL EDITORIAL BOARDS

India **55** Abroad **47**

MEETINGS (Students & Scholars)

Outside IITM **11** Within IITM **8**

AWARDS & PRIZES (Students & Scholars)

NUMBER OF FACULTIES

Professors	21
Associate Professors	5
Assistant Professors	4
Professor Emeritus	1
INSPIRE Fellow	1

FACULTY MEMBER ACTIVITIES

Short-term Courses	6
Workshops	4
Symposia	2
Conferences	7
Trainings	1
Special Lectures	19
Meetings	41

DISTINGUISHED VISITORS

ABB Corporate Research ✦ Argonne National Laboratory ✦ Baker Hughes ✦ Georgia Institute of Technology ✦ IAL ✦ IIT Bombay ✦ IIT Hyderabad ✦ John Hopkins School of Medicine ✦ Max Planck Institute for Polymer Research ✦ Mitsubishi Electric Research Laboratories ✦ Monash University ✦ Narayan Subramanian ✦ NTNU ✦ Portugal Team ✦ Sea6 Energy Private Limited ✦ Suez Water Technology Solutions ✦ The University of British Columbia ✦ University of Cambridge ✦ University of Florida ✦ University of Surrey ✦ University of Tulsa

Honours	Awards		Patents Filed	Patents Awarded	New Facilities / Major Equipment
2	10		6	3	2
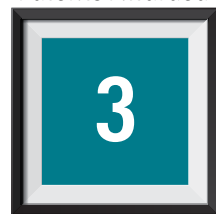
HONOURS & AWARDS
(Faculties)

DESIGN & DEVELOPMENT

RESEARCH & CONSULTANCY

Sponsored Research Projects	10
Industrial Consultancy Projects	5
RBIC Projects	11
Retainer Consultancy	1
Testing Projects	2
Faculty members' participation with other Institutions under MoU	1

OTHER ACTIVITIES

▶ Dual degree (MS and Ph.D) – 2
▶ Dual degree (M.Tech and Ph.D) – 2
▶ Ph.D – 9 & M.S – 12
▶ Faculty achievements/matters – 12
▶ Students matters – 4
▶ International collaborations – 5
▶ Advisory board formed – 6
▶ Faculty awards – 3 & Student awards – 3
▶ Courses conducted – 2
▶ MoU signed between NFU & IITM – 1

DEPARTMENT OF CHEMISTRY

The Department of Chemistry was a part of the Department of Chemical Engineering from 1959-1961. It was set up as 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 as well as the Applied Chemistry Building (completed in 1973). Prof. Sastri was also responsible for the Special Instruments Laboratory (established in 1970; later known as RSIC and presently known as SAIF), and the MSRC (established in 1974 with Prof. Sastri as the Head and Prof. V. Srinivasan as the Associate Head).

The department offers M.Sc. and Ph.D. programmes in Chemistry. Various aspects of Chemistry are also taught at the preparatory level (for weaker section students) and in the B.Tech. programme (core as well as minor stream courses in chemistry).

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
M.Sc.	50	53	-	-	-	103
Ph.D.	57	34	36	49	77	253
Total	107	87	36	49	77	356

New Courses

3
ACADEMIC PROGRAMMES

18
VISITS ABROAD (Faculties)

4
FELLOWSHIPS (Academies & Professional Societies)

9
JOURNAL EDITORIAL BOARDS

India **22** | Abroad **42**
MEETINGS (Students & Scholars)

Outside IITM **24** | Within IITM **10**
AWARDS & PRIZES (Students & Scholars)

NUMBER OF FACULTIES

Professors	23
Associate Professors	8
Assistant Professors	3

FACULTY MEMBER ACTIVITIES

Short-term Courses	4
Workshops	3
Seminars	2
Symposia	6
Conferences	18
Meetings	20
Trainings	1
Special Lectures	53
Visits (Other Institutions)	3

DISTINGUISHED VISITORS

ANU College of Science ✦ ANU Research School of Chemistry ✦ Asian Wiley Journal ✦ Cardiff University ✦ Centre for Interdisciplinary Studies ✦ Cochin University of Science and Technology ✦ Colorado State University ✦ Harvard Medical School ✦ IISc Bangalore ✦ IISER Bhopal ✦ IIT Bombay ✦ IIT Guwahati ✦ IIT Jodhpur ✦ IIT Roorkee ✦ Japan Advanced Institute of Science and Technology ✦ M/S Hikal Limited ✦ National Academy of Inventors ✦ Novartis Institute for Biomedical Research ✦ Osaka University ✦ Purdue University ✦ Rice University ✦ Technische Universität Dortmund ✦ The University of British Columbia ✦ The University of Manchester ✦ University of Calcutta ✦ University of Delhi ✦ University of Hyderabad ✦ University of Jyvaskyla ✦ University of Leeds ✦ University of Southampton

13	**19**	**10**	**11**	**3**
HONOURS & AWARDS (Faculties)	Indian Patents Filed	Indian Patents Awarded	International Patents Filed	International Patents Awarded

DESIGN & DEVELOPMENT

RESEARCH & CONSULTANCY

Sponsored Research Projects	26
Industrial Consultancy Projects	26
RBIC Projects	8
Retainer Consultancy	3
Faculty members' participation with other Institutions under MoU	3

OTHER ACTIVITIES

▸ Faculty Visits – 1
▸ Student Visits – 4

DEPARTMENT OF CIVIL ENGINEERING

The Department of Civil Engineering has been in existence since the inception of IIT Madras in 1959. Since then, it is contributing to the nation's infrastructure development and human resource development. Its academic programmes in B. Tech, Dual Degree, M. Tech, M.S. and Ph.D are some of the best in the country, and perhaps, in the world. The faculty members have received advanced degrees and/or training from reputed Institutions in India, Germany, the UK, the USA, Japan, Singapore, Canada, Netherlands, the former USSR and other countries.

The prime activities of the department are teaching, research, consultancy and training. These activities 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. The EWRE and ST laboratories have received substantial initial funding from the Federal Republic of Germany.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	57	56	64	57	14	248
Dual Degree	32	32	34	37	49	184
M.Tech.	103	100	>20	-	-	223
M.S.	16	14	3	3	4	40
Ph.D.	40	42	45	67	107	301
Total	248	244	166	164	174	996

New Courses
5

New Labs
6

ACADEMIC PROGRAMMES

India
15

Abroad
28

MEETINGS
(Students & Scholars)

Outside IITM
7

Within IITM
14

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	35
Associate Professors	12
Assistant Professors	11
Professor of Practice	2
Adjunct Faculty	1
Visiting Faculty	1

FACULTY MEMBER ACTIVITIES

Short-term Courses	10
Workshops	8
Symposia	5
Conferences	15
Meetings	34
Trainings	4
Special Lectures	26

DISTINGUISHED VISITORS

Colorado State University ✦ Florida Atlantic University ✦ Future Cities Laboratory ✦ Helmholtz Centre for Environmental Research – UFZ ✦ IOWA State University ✦ Kirthivasan V ✦ Michigan State University ✦ Purdue University ✦ University of California Davis ✦ University of Hong Kong ✦ University of Technology Sydney

48
VISITS ABROAD (Faculties)

6
NEW ASSIGNMENTS (Faculties)

1
FELLOWSHIPS (Academies & Professional Societies)

1
JOURNAL EDITORIAL BOARDS

2
BOOKS/MONOGRAPHS (Authored/Co-Authored)

Honours
1

Awards
3

HONOURS & AWARDS (Faculties)

Honours
10

HONOURS & AWARDS (Students)

Patents Filed
4

New Facilities / Major Equipment
61

DESIGN & DEVELOPMENT

RESEARCH & CONSULTANCY

International Collaboration Achievements

▸ Consultancy Projects – 266

▸ Sponsored Projects – 23

OTHER ACTIVITIES

Faculty members' participation with other Institutions under MoU   2

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Started as the Computer Centre in 1973, the Department of Computer Science and Engineering (CSE) was established as a full-fledged department in 1983. The department has 700 students and more than 30 faculty members. About 60 per cent of the students are postgraduates, mostly supported by Government of India scholarships and research projects. The department also offers several attractive industry-sponsored fellowships to outstanding Ph.D. scholars. The vision of the department is "global excellence and local relevance" in research, teaching and technology development in the field of computer science and engineering.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech. and Dual Degree	73	63	61	58	54	309
M.Tech.	47	57	3	7	0	114
M.S.	5	17	22	24	11	79
Ph.D.	8	10	9	11	56	94
Total	133	147	95	100	121	596

New Courses

9

New Labs

1

ACADEMIC PROGRAMMES

India

32

Abroad

39

MEETINGS
(Students & Scholars)

Outside IITM

18

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	15
Associate Professors	6
Assistant Professors	11

FACULTY MEMBER ACTIVITIES

Workshops	7
Conferences	2
Special Lectures	55

DISTINGUISHED VISITORS

AIST ✦ AMD ✦ Carnegie Mellon University ✦ Conduent Research Labs ✦ Dr. Alice Pellet-Mary ✦ Massachusetts Institute of Technology ✦ National Institutes of Health ✦ Office of Naval Research ✦ Ohio State University ✦ Synopsys ✦ Temple University ✦ University of California ✦ University of Edinburgh ✦ University of Houston ✦ University of Maryland Baltimore County ✦ University of Southern California ✦ Weizmann Institute of Science

22

VISITS ABROAD
(Faculties)

Honours

3

Awards

1

HONOURS & AWARDS
(Faculties)

7

JOURNAL
EDITORIAL BOARDS

RESEARCH & CONSULTANCY

Sponsored Research Projects	20
Industrial Consultancy Projects	21

OTHER ACTIVITIES

▸ Faculty Visits – 52

DEPARTMENT OF ELECTRICAL ENGINEERING

The Department of Electrical Engineering comprises several laboratories. These laboratories are grouped into six major areas: EE1 - Communications (including wireless), Digital, Speech and Image Processing; EE2 - Power Systems, Power Electronics and High Voltage; EE3 - Microelectronics; EE4 - Control, Instrumentation, Biomedical; EE5 - Photonics; and EE6 - Integrated Circuits and Systems. All faculty members in the department have earned Ph.D. degrees from reputed universities.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	73	73	66	65	29	306
Dual Degree	58	58	60	65	95	336
M.Tech.	155	143	-	-	18	316
M.S.	15	41	7	22	52	137
Ph.D.	48	84	51	60	113	318

New Courses

6

ACADEMIC PROGRAMMES

Abroad

17

MEETINGS
(Students & Scholars)

Outside IITM

6

Within IITM

3

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Head	1
Professors	32
Associate Professors	19
Assistant Professors	19
Inspire Faculty	2
Ramalingaswamy Fellow	1
Scientific Officers/Engineers	1

FACULTY MEMBER ACTIVITIES

Short-term Courses	1
Workshops	1
Symposia	2
Conferences	11
Special Lectures	22

DISTINGUISHED VISITORS

Boston University ✦ IISc Bangalore ✦ IIT Bombay ✦ Lund University ✦ Michigan State University ✦ Synopsys ✦ TIFR ✦ University of California ✦ University of New Mexico ✦ University of Texas

14	Honours 3	Awards 4	7	Patents Filed 1
VISITS ABROAD (Faculties)	HONOURS & AWARDS (Faculties)		JOURNAL EDITORIAL BOARDS	DESIGN & DEVELOPMENT

RESEARCH & CONSULTANCY

Sponsored Research Projects	5
Industrial Consultancy Projects	1
RBIC Projects	2
Retainer Consultancy	1
Faculty members' participation with other Institutions under MoU	1

DEPARTMENT OF ENGINEERING DESIGN

Set up in 2006, the Department of Engineering Design was the 16th department of Indian Institute of Technology Madras. 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.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
Dual Degree	57	56	56	52	61	282
M.S.	9	10	11	5	2	37
Ph.D.	17	10	9	6	32	74
Direct Ph.D.	1	1	4	2	-	8
M.Tech. + Ph.D.	-	1	1	2	5	9
Total	84	78	81	67	100	410

New Courses

1

Modification of Courses

1

Prerequisite of Courses

1

ACADEMIC PROGRAMMES

India

14

Abroad

12

MEETINGS (Students & Scholars)

Outside IITM

11

Within IITM

5

AWARDS & PRIZES (Students & Scholars)
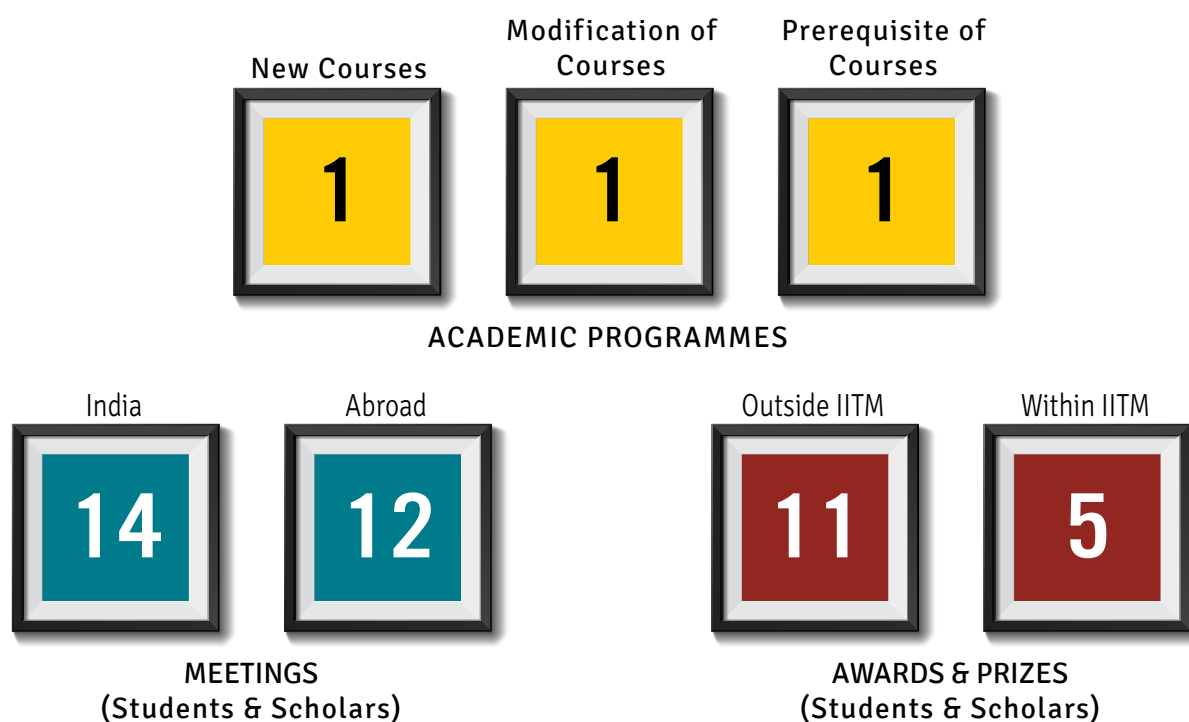
NUMBER OF FACULTIES

Professors	9
Associate Professors	6
Assistant Professors	1

FACULTY MEMBER ACTIVITIES

Short-term Courses	6
Workshops	1
Conferences	6
Special Lectures	13

DISTINGUISHED VISITORS

Network N+I ✦ Pole Universitaire Leonard de Vinci ✦ ESILV

11

VISITS ABROAD
(Faculties)

Honours

2

Awards

3

HONOURS & AWARDS
(Faculties)

1

JOURNAL
EDITORIAL BOARDS

Patents Filed

4

Patents Awarded

1

New Facilities /
Major Equipment

14

DESIGN & DEVELOPMENT

RESEARCH & CONSULTANCY

Sponsored Research Projects	13
Industrial Consultancy Projects	3
RBIC Projects	15
Retainer Consultancy	2

OTHER ACTIVITIES

▶ Staff retreat at VGP Resort
▶ Two students were placed 25th at the 12th edition of the University Rover Challenge (Hanksville, Utah, USA)
▶ MoUs – 2
▶ Student Visit – 1

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Founded in 1959, the Department of Humanities and Social Sciences is one of the oldest departments in Indian Institute of Technology Madras. The department's essentially interdisciplinary nature is its distinguishing factor, which allows students to develop an appreciation for a diverse set of fields such as 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 boasts of a highly diverse and experienced faculty. It has an excellent student.teacher ratio, providing opportunities for academically intense learning. Equipped with state-of-the-art facilities in a serene campus, the department offers an enriching academic environment.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
M.A.	44	41	45	42	65	237
Ph.D.	28	21	24	21	22	116
Total	72	62	69	63	87	353

New Courses

10

ACADEMIC
PROGRAMMES

India | Abroad

81 | **24**

MEETINGS
(Students & Scholars)

Outside IITM | Within IITM

2 | **13**

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	14
Associate Professors	9
Assistant Professors	13
Visiting Faculty	1
DAAD Faculty	1

FACULTY MEMBER ACTIVITIES

Short-term Courses	31
Workshops	27
Seminars	5
Symposia	8
Conferences	33
Special Lectures	56

DISTINGUISHED VISITORS

Centre for Civil Society ✦ Chandni Chanan ✦ City University of New York ✦ Deva Sundaram N ✦ Dr. Mark Lacy ✦ Dr. Nayanika Mukherjee ✦ Dr. Rinzin Dorjee ✦ Dr. Tulsi Bainath ✦ Geethanjali Rajan ✦ IIT Delhi ✦ IIT Kanpur ✦ Jawaharlal Nehru University ✦ Keith Butler ✦ La Trobe University ✦ Leeds University Business School ✦ Massey University ✦ RWTH Aachen ✦ Srijan ✦ TCS ✦ Tenzin Dalha ✦ The Hindu ✦ University of St Andrews ✦ Volgograd State University ✦ Yale-NUS College

Awards

60

VISITS ABROAD
(Faculties)

1

HONOURS & AWARDS
(Faculties)

3

JOURNAL
EDITORIAL BOARDS

10

FELLOWSHIPS
(Academies &
Professional Societies)

RESEARCH & CONSULTANCY

Sponsored Research Projects	8
Exchange Programme with other Institutions under MoU	9
Faculty members' participation with other Institutions under MoU	4

OTHER ACTIVITIES

▸ New India Internship and Creative Engineering Project
▸ A module on Health Economics for the MPH students of National Institute of Epidemiology, Chennai
▸ Fifteen New India Internship (Technology and Rural Development) initiated with Member of Parliaments
▸ Faculty Visit – 3
▸ Student Visit – 4

DEPARTMENT OF MANAGEMENT STUDIES

Set up in April 2004, the Department of Management Studies (DoMS) offers a two-year, full-time M.B.A. programme (started in July 2001), research programmes leading to M.S. and Ph.D. degrees, an M.S. (Entrepreneurship) programme, Visionary Leadership in Manufacturing (VLM) programme, and a Post-graduate Diploma for Executives (PGPEX-VLM) jointly with IIM Calcutta and IIT Kanpur. There is also an Executive MBA degree programme (two-year) for working professionals.

Over the years of its existence, the department thoroughly revised its MBA programme curriculum, expanded its research activities, re-launched the M.S. (Entrepreneurship) programme with a new structure and worked towards establishing long-term relationships with globally reputed institutions and organisations.

Some major areas of research at the department are:
▸ Applied statistics
▸ Models in supply chain management
▸ Combinatorial optimisation
▸ Production and operations management
▸ Finance
▸ Project management
▸ Human resource management
▸ Quality management
▸ Information systems
▸ Strategy and business policy
▸ Knowledge management
▸ Services management
▸ Marketing
▸ Technology management

India
17

Abroad
9

MEETINGS
(Students & Scholars)

Outside IITM
10

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	13
Associate Professors	4
Assistant Professors	6
MHRD IPR Chair Professor	1
Ajit Singhvi Chair Professor	1
Professor of Practice	1

FACULTY MEMBER ACTIVITIES

Workshops	19
Seminars	1
Symposia	1
Conferences	3
Special Lectures	4

DISTINGUISHED VISITORS

Anti-Spam Research Lab ✦ Chennai Mathematical Institute ✦ Cognizant ✦ Columbia University ✦ Crisil ✦ Curtin University ✦ Dev Gadhvi ✦ Goldman Sachs ✦ IIT Delhi ✦ Indian Statistical Institute ✦ La Trobe University ✦ Lucas TVS ✦ Matrimony.com Ltd. ✦ Myntra ✦ National Sample Survey Organization ✦ Naturals Salon & Spa ✦ North Western University ✦ Oracle ✦ PwC India ✦ Rolls Royce ✦ Ross & Mount ✦ School of Information Systems ✦ Standard Chartered Global Business Services ✦ Tata Motors ✦ University of Western Sydney ✦ Vetri Motors Private Limited ✦ Walmart eCommerce

9

VISITS ABROAD
(Faculties)

Honours

3

Awards

1

HONOURS & AWARDS
(Faculties)

3

FELLOWSHIPS
(Academies &
Professional Societies)

RESEARCH & CONSULTANCY

Sponsored Research Projects	5
Exchange Programme with other Institutions under MoU	3
Faculty members' participation with other Institutions under MoU	2

OTHER ACTIVITIES

▶ Marathon: Life goes on – Organ Donation
▶ Teaching Innovator Award

DEPARTMENT OF MATHEMATICS

The Department of Mathematics was established in 1959 along with the institute. The department offers M.Sc. in Mathematics, M.Tech in Industrial Mathematics and Scientific Computing (IMSC) and Ph.D. programmes. In addition, the department has taken the responsibility of teaching mathematics courses to B.Tech, M.Tech (other than IMSC), M.Sc. and Ph.D. students of the institute.

The major research areas of the department are:

- Algebraic combinatorics
- Algebraic geometry
- Algebraic topology
- Applied probability
- Approximation theory
- Category theory
- Combinatorial optimisation
- Combinatorics
- Combinatorics of words
- Commutative algebra
- Complex analysis
- Conformal geometry
- Contact and symplectic topology
- Convective heat and mass transfer
- Computational fluid dynamics
- Computational number theory
- Cryptology
- Differential and integral equations
- Differential topology
- Fixed point theory
- Fluid mechanics
- Functional analysis
- Fractals
- Game theory
- Graph algorithms
- Graph theory
- Harmonic analysis
- Inverse and ill-posed problems
- Linear algebra
- Low-dimensional topology
- Mathematical modeling
- Mathematical study of ferromagnetic networks
- Nonlinear analysis of functional differential equations
- Nonlinear analysis
- Nonlinear differential equations
- Number theory
- Operator algebras
- Operator equations
- Operator theory
- Optimisation
- Partial differential equations
- PDE numerics
- Solid mechanics
- Special functions
- Systems and control theory
- Theory of codes
- Theory of computation
- Theory of wavelets
- Time frequency analysis
- Wave structure interactions

STUDENTS ON ROLL

Programme	Number of Students
M.Sc.	91
M.Tech.	38
Ph.D.	102
Total	231

India

45

MEETINGS
(Students & Scholars)

Within IITM

1

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	16
Associate Professors	8
Assistant Professors	16
INSPIRE Faculty	1
Visiting Professor	1
Adjunct Professor	1
Institute Post-Doctoral Fellow	6

FACULTY MEMBER ACTIVITIES

Short-term Courses	1
Workshops	8
Invited Talks/Paper Presentation	8
Visits (Other Institutions)	83

9

VISITS ABROAD
(Faculties)

Awards

9

HONOURS & AWARDS
(Faculties)

RESEARCH & CONSULTANCY

RBIC Projects	7
Exchange Programme with other Institutions under MoU	4

OTHER ACTIVITIES

▶ Seminar Talks – 39

DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Mechanical Engineering was established in the year 1959. It offers Ph.D., M.S., M.Tech., B.Tech. and Dual Degree programmes. The department 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 five laboratories, namely, Heat Transfer and Thermal Power, Turbo Machines, IC Engines, Refrigeration and Air Conditioning and Thermodynamics and Combustion.

The Design stream consists of Machine Design Section, Machine Dynamics Laboratory, NDE Laboratory, Rehabilitation Research and Device Development Laboratory. The Manufacturing Engineering stream consists of the Machine Tools Laboratory, Metrology Laboratory, Automation Laboratory, Sheet Metal Research Centre and Precision Engineering Laboratory.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and Others	Total
B.Tech.	88	83	76	78	28	353
Dual Degree	81	78	77	83	91	410
M.Tech.	90	128	17	-	-	235
M.S.	49	48	26	19	2	144
Ph.D.	54	45	52	81	153	385
Total	362	382	248	261	274	1527

New Courses

9

ACADEMIC PROGRAMMES

Abroad

71

MEETINGS
(Students & Scholars)

Outside IITM

5

Within IITM

9

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	29
Associate Professors	15
Assistant Professors	21
Emeritus Professor/ Visiting Faculty	1

FACULTY MEMBER ACTIVITIES

Short-term Courses	9
Workshops	29
Seminars	3
Symposia	4
Conferences	42
Special Lectures	36

DISTINGUISHED VISITORS

Alfa TKG Co. Limited ✦ Dr. Pierre Duret ✦ Iowa State University College of Engineering Research ✦ MAG India IAS Private Limited ✦ Mahindra & Mahindra ✦ Michigan State University ✦ Purdue University ✦ San Diego State University ✦ TCS Limited ✦ Texas A&M University ✦ U.S. Department of Engineering

23
VISITS ABROAD
(Faculties)

16
HONOURS & AWARDS
(Faculties)

1
JOURNAL
EDITORIAL BOARDS

2
FELLOWSHIPS
(Academies &
Professional Societies)

Patents Filed
16

Patents Awarded
4

New Facilities /
Major Equipment
6

Process/Instruments/
Equipment/Software
4

DESIGN & DEVELOPMENT

RESEARCH & CONSULTANCY

Sponsored Research Projects & Industrial Consultancy Projects	65
Faculty members' participation with other Institutions under MoU	6

OTHER ACTIVITIES

▸ Faculty Visits – 62

DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING

One of the oldest departments of IIT Madras, the Department of Metallurgical and Materials Engineering (MME) was established in 1959 as Department of Metallurgy. It was renamed as Department of Metallurgical and Materials Engineering 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 spectrum, from conventional metallurgy to frontiers of materials' science and engineering. The department is respected for its strong linkages with industry and expertise in industrial metallurgy. Over the years, it has hosted excellent research infrastructure in the broad areas of material science and engineering, such as materials processing (forming, joining, casting, particulate processing, nanostructured materials), characterisation (X-ray diffraction, electron microscopy, thermal analysis), mechanical testing, environmental degradation/corrosion, surface engineering, computational materials science and electronic materials. The department continues to strive for excellence and realising its vision of becoming a pioneering department in the areas of material science and engineering, while consolidating its strength in traditional areas of metallurgical engineering.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	36	30	30	30	17	143
Dual Degree	13	10	9	14	22	68
M.Tech.	31	21	2	-	-	54
M.S.	15	13	4	4	1	37
Ph.D.	58	31	16	23	35	163
Total	153	105	61	71	75	465

New Courses

6

ACADEMIC PROGRAMMES

India

14

Abroad

16

MEETINGS
(Students & Scholars)

Outside IITM

15

Within IITM

6

AWARDS & PRIZES
(Students & Scholars)

NUMBER OF FACULTIES

Professors	17
Associate Professors	5
Assistant Professors	9
Adjunct Faculty	4

FACULTY MEMBER ACTIVITIES

Short-term Courses	1
Workshops	12
Seminars	1
Symposia	1
Conferences	2
Special Lectures	36

DISTINGUISHED VISITORS

CNRS-European Center for Ceramics ✦ Dr. K. A. Padmanabhan ✦ Georgia Institute of Technology ✦ IISc Bangalore ✦ IIT Bombay ✦ Institute of Nanotechnology KIT ✦ Intel Corporation ✦ ISRO ✦ Josai University Educational Corporation ✦ National Institute of Standards and Technology ✦ Oak Ridge National Laboratory ✦ Peter the Great St. Petersburg Polytechnic University ✦ The University of Utah ✦ TU Bergakademie Freiberg ✦ University of Florida ✦ University of Münster ✦ University of Salerno ✦ University of Singapore ✦ Zeiss Research Microscopy Solutions

Honours

31

VISITS ABROAD
(Faculties)

10

HONOURS & AWARDS
(Faculties)

10

JOURNAL
EDITORIAL BOARDS

13

FELLOWSHIPS
(Academies &
Professional Societies)

Patents Filed

New Facilities /
Major Equipment

7

5

DESIGN & DEVELOPMENT

RESEARCH & CONSULTANCY

Sponsored Research Projects	53
Industrial Consultancy Projects	36
RBIC Projects	14
Retainer Consultancy	2

OTHER ACTIVITIES

▸ Faculty Visits – 4

DEPARTMENT OF OCEAN ENGINEERING

The Ministry of Education and Social Welfare, as per the decision of Council of Indian Institute of Technology, established the Ocean Engineering Center of IIT Madras in 1977 based on the recommendation of the committee headed by Dr. Y. Nayudamma. The department had to act as a Centre of Excellence for advancing the frontiers of science, provide breakthrough technology and develop education and training programmes in the field of ocean engineering. A national advisory committee consisting of representatives of the then Ministry of Education and institutions such as Council of Scientific and Industrial Research (CSIR), University Grants Commission (UGC), Department of Science & Technology (DST), Oil and Natural Gas Corporation (ONGC) and Engineers India Limited (EIL), other IITs and user industries with the Director, IIT Madras as the chairman monitored the progress of the department over the years. A review committee headed by Prof. M. G. K. Menon also reviewed the progress of the department in 1982 and its recommendation has since been implemented.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	34	32	35	26	33	160
Dual Degree	15	15	17	15	23	85
M.Tech.	42	50	-	-	-	92
M.S.	12	10	9	-	-	31
Ph.D.	34	26	21	40	58	179
Total	137	133	82	81	114	547

Outside IITM

10

AWARDS & PRIZES
(Students & Scholars)

India

1

Abroad

1

MEETINGS
(Students & Scholars)

NUMBER OF FACULTIES

Professors	14
Associate Professors	5
Assistant Professors	5

FACULTY MEMBER ACTIVITIES

Short-term Courses	5
Workshops	4
Conferences	7
Trainings	2
Special Lectures	10

DISTINGUISHED VISITORS

Baker Hughes ✦ Dhanish Ahmed Engineering College ✦ Dr. Anil Kumar ✦ Florida Atlantic University ✦ IISc Bangalore ✦ ITEC ✦ ONGC ✦ Spectrum Academy School ✦ Texas A&M University ✦ Universidad Politecnica de Madrid ✦ University of Utah

30
VISITS ABROAD
(Faculties)

3
VISITS INDIA
(Faculties)

Honours
1

Awards
3

HONOURS & AWARDS
(Faculties)

8
JOURNAL
EDITORIAL BOARDS

Patents Filed
1

Patents Awarded
1

New Facilities /
Major Equipment
3

DESIGN & DEVELOPMENT

RESEARCH & CONSULTANCY

Sponsored Research Projects	21
Industrial Consultancy Projects	129
RBIC Projects	3

OTHER ACTIVITIES

▶ Faculty Visits – 1
▶ Student Visits – 3
▶ A unidirectional flow test rig is designed to test the wave energy harvesting turbine and installed in Wave Energy & Fluids Engineering Lab

DEPARTMENT OF PHYSICS

The Department of Physics was established in 1959. The department conducts research in many frontier areas in the sylvan campus of IIT Madras. These areas include experimental solid state physics, quantum electronics, 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) 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.

STUDENTS ON ROLL

Programme	Year I	Year II	Year III	Year IV	Year V and others	Total
B.Tech.	30	27	28	27	8 + 9	129
Dual Degree	10	9	10	8	11 + 3	51
M.Sc.	41	41	4	2	-	88
M.Tech.	10	5	-	1	-	16
Ph.D.	38	31	29	17	27 + 54	196
Total	129	113	71	55	46 + 66	480

New Courses

1

ACADEMIC PROGRAMMES

India **117**   Abroad **55**

MEETINGS
(Students & Scholars)

Outside IITM **9**   Within IITM **6**

AWARDS & PRIZES
(Students & Scholars)

75

VISITS ABROAD
(Faculties)

Honours **5**   Awards **3**

HONOURS & AWARDS
(Faculties)

Patents Filed **6**   New Facilities / Major Equipment **2**

DESIGN & DEVELOPMENT

NUMBER OF FACULTIES

Professors	24
Associate Professors	15
Assistant Professors	16
Visiting Faculty	1
Adjunct Faculty	2
DST INSPIRE Faculty	1
DST Ramanujan Fellow	1

FACULTY MEMBER ACTIVITIES

Short-term Courses	1
Workshops	14
Seminars	7
Symposia	2
Conferences	6
Special Lectures	34

DISTINGUISHED VISITORS

Allen Institute ✦ ANU Research School of Physics and Engineering ✦ Boston College ✦ Chennai Mathematical Institute ✦ Dr. Devanarayanan ✦ Dr. Madhuparna Karmakar ✦ Dr. Navin Manaswi ✦ Dr. Sayantan Sharma, IMSc, Chennai ✦ Durham University ✦ Free University of Berlin ✦ Harish-Chandra Research Institute ✦ ICTS ✦ IGCAR ✦ IISc Bangalore ✦ IIT Kanpur ✦ IIT New Delhi ✦ IIT Palakkad ✦ Indian Association for the Cultivation of Science ✦ Institut de Physique Nucleaire ✦ Institute for Basic Science ✦ Institute for Theoretical Physics ✦ Institute of Biophysical Chemistry ✦ Institute of Mathematical Sciences ✦ Inter-University Centre for Astronomy and Astrophysics ✦ International Centre for Theoretical Sciences ✦ Jawaharlal Nehru University ✦ John Hopkins University ✦ Kansas State University ✦ Macquarie University ✦ Max Planck Institute for Nuclear Physics ✦ Max Planck Institute for the Physics of Complex Systems ✦ Max Planck Institute Gottingen ✦ Max Planck Institute of Quantum Optics ✦ Nanyang Technological University ✦ NISER ✦ Oak Ridge National Lab ✦ Physical Research Laboratory ✦ Potsdam Institute for Climate Impact Research ✦ RWTH Aachen University ✦ Saha Institute of Nuclear Physics ✦ Sharif University ✦ Springer Nature ✦ SRI International ✦ Stanford University ✦ Sydney University ✦ Technische Universitaet Dortmund ✦ Technische Universität ✦ Technische Universität München ✦ Tel Aviv University ✦ The University of Manchester ✦ TIFR ✦ Tohoku University ✦ TU Wien ✦ UIUC ✦ Universidad Autonoma de Madrid ✦ Universite Paris-Sud ✦ University at Buffalo ✦ University of Alabama ✦ University of Alberta ✦ University of Arkansas ✦ University of Bern ✦ University of Bonn ✦ University of California ✦ University of Chicago ✦ University of Colorado Boulder ✦ University of Copenhagen ✦ University of Electronics and Technology of China ✦ University of Michigan ✦ University of Mumbai ✦ University of Notre Dame ✦ University of Oxford ✦ University of Virginia ✦ University of Würzburg ✦ Uppsala University ✦ Vellore Institute of Technology ✦ Vivekananda College ✦ Wayne State University ✦ XENOCS ✦ Yale University
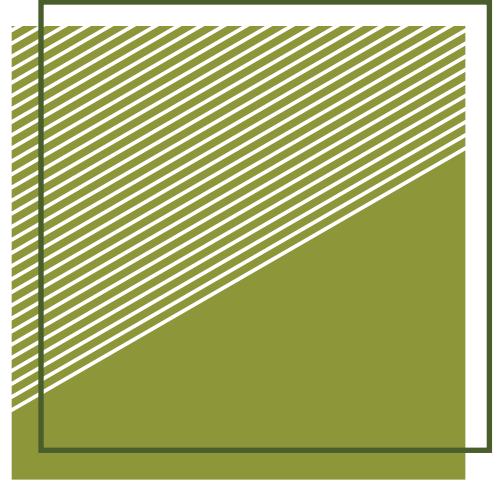
RESEARCH & CONSULTANCY

|	
Sponsored Research Projects	58
Industrial Consultancy Projects	13
Faculty members' participation with other Institutions under MoU	2

OTHER ACTIVITIES

▸ Aneesh's significant contribution on "Whispering Gallery Modes" of microcavities through Ph.D. thesis

▸ A journal paper has been published with collaborative research with the scientists at ORC, Southampton

▸ Faculty Visits – 2

CENTRES OF SPECIAL FACILITIES

CENTRAL FACILITIES
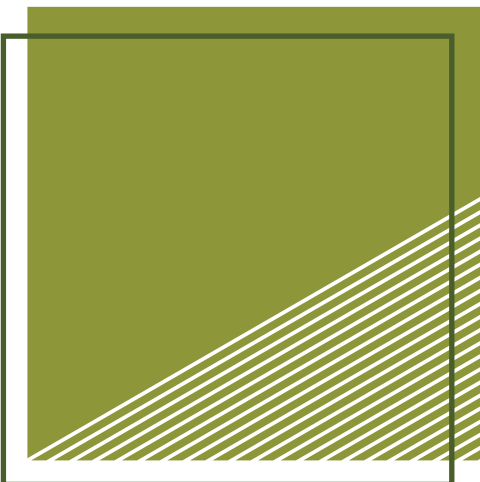
CENTRE FOR INDUSTRIAL CONSULTANCY & SPONSORED RESEARCH

The Centre for Industrial Consultancy & Sponsored Research (ICSR) was set up in 1973 to foster and promote sponsored research activities as well as relationships with industries. It facilitates active participation of the faculty in various interactive programmes organised for the benefit of industries and the institute. The Centre also plays a proactive role in managing the intellectual property and its commercialisation that are generated by the institute. In addition, the Centre provides administrative support to carry out consultancy and sponsored research projects, particularly for the recruitment of project staff, maintenance of accounts and purchase of equipment and materials.

Faculty: Prof. Ravindra Gettu, Dean ✦ Prof. Kamakoti Veezhinathan, Associate Dean (since 24 January 2019)

Staff: Dr. V. Suresh, Senior Techno Economic Officer ✦ Ms. Vijayalakshmi K, Deputy Registrar (I/C) ✦ Ms. Vijayakumari, Superintendent (Purchase) ✦ Shri K. C. Chandrajit, Junior Superintendent (IP) ✦ Smt. Hemalatha Hariharan, Senior Assistant (Recruitment)

SPONSORED RESEARCH

2018-19

Projects	284
Value (₹ in lakhs)	32,649
Co-ordinators (faculty members)	247

On-going Projects

Value (₹ in lakhs)	141,411
Co-ordinators (faculty members)	414

CONSULTANCY PROGRAMMES

2018-19

Assignments	651
Value (₹ in lakhs)	16,768

On-going Projects

Value (₹ in lakhs)	30,985
Co-ordinators (faculty members)	218

CORPORATE SOCIAL RESPONSIBILITY

2018-19

Assignments	17
Value (₹ in lakhs)	2,607
Enhancements in previously approved projects (₹ in lakhs)	355

INDUSTRIAL ASSOCIATESHIP SCHEME

2018-19

Total Industries	104
Large Scale	21
Medium Scale	58
Small Scale	25

NEW FACULTY SCHEME

2018-19

Approved Proposals	14
Value (₹ in lakhs)	359

RESEARCH FUND

(₹ in lakhs)

R&D Award	230
Innovation Ecosystems	110
Exploratory Research Projects	205
New Faculty Initiation Grant	105
Patenting and commercialisation	50
Maintenance and Operation	131

OTHER PROGRAMMES

▸ ISRO-IITM Space Technology Cell joint projects
- On-going Projects: 21 (₹708 lakhs)
- New Projects: 8 (₹280 lakhs)

▸ IGCAR-IITM Cell
- On-going Projects: 7 (₹170 lakhs)

▸ NIOT-IITM Cell
- On-going Projects: 7 (₹170 lakhs)
- National Institute of Ocean Technology – IIT Madras (NIOT-IITM) Cell has been set up in IIT Madras to initiate further NIOT-sponsored research activities at IIT Madras and has been functional since 2010-2011.

▸ IIT Madras has ongoing activities for transfer of technologies of immediate relevance to society. For this purpose, the following schemes have been taken up:
- Rural Technology Action Group (funded by Planning Commission)
- Centre for Social Innovation & Entrepreneurship (CSIE)

106

MOUS/
AGREEMENTS

(₹ in lakhs)

90

TECHNOLOGY
TRANSFER/ROYALTY

POSITIVE MESSAGING AND OUTREACH PROGRAMME

IIT Madras is one of the few high-ranking academic institutions in India that are prompt, active and well connected on social media. Our Facebook page has over 1,57,817 likes and is extremely well updated with a response time of just nine hours, and actively engages over 34,000 people every week. IIT Madras' tweets have 150K impressions every month on an average. We have noteworthy LinkedIn impressions of 100K. A monthly e-newsletter is sent to all stakeholders of the institute.

CENTRE FOR CONTINUING EDUCATION

The Centre for Continuing Education (CCE) was established in June 1986. The centre supports faculty members in meeting the following objectives of IIT 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)

Period	Ph.D.			M.Tech		
	Admitted	No. on Roll	Awarded	Admitted	No. on Roll	Awarded
2018-2019	11	57	10	-	6	-
Since inception	674	-	550	643	-	610

19

SHORT-TERM COURSES UNDER QIP (AICTE-STC)

Internal

47

External

23

CONTINUING EDUCATION PROGRAMMES (CEPS)

7
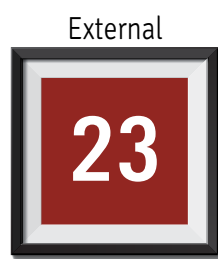
USER-ORIENTED PROGRAMS (UOPS)

OTHER FACILITIES

Web-Enabled M.Tech Programmes for Industries Global Initiative of Academic Networks (GIAN) Conferences.

P.G. SENAPATHY CENTRE FOR COMPUTING RESOURCES

The Computer Centre at IIT Madras was established in 1973 to provide centralised computing resources and support to 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 to the supercomputers and communication and network services of today. Over the years, the computing and information technology requirements of IIT Madras community have been increasing. The Computer Centre's organisation has also evolved with the increase in requirements. In 2007, the infrastructure of the Centre was upgraded significantly through an endowment by S. Gopalakrishnan in the name of his father P. G. Senapathy.

The activities of the centre are organised under five verticals: high-performance computing environment (HPCE), networks, e-services, data centre and workflow.

HIGH-PERFORMANCE COMPUTING ENVIRONMENT

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 eightcore, 2.6 GHz processors with 4 GB of memory per core. The machine, which caters to the needs of the research community, mostly uses parallel programming.

WORKFLOW

Enterprise resource planning (ERP) software, or what is internally referred to as a Workflow, has been implemented at the Computer Centre. The Workflow group 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.

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. Several new services were enhanced and added by the vertical.

DATA CENTRE

The function of the 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.

NETWORKS

The campus computer network was established in 1994, connecting about 18 buildings in the Academic Zone using telephone cables. The initial bandwidth was 64 kbps. Today, we have a fiber-backbone high-speed network connectivity of 10 Gbps 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 25,000. 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, virtual class rooms, web casting important events, EDUROAM and VPN 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.

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. The CEC 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-mentioned areas to more than 230 industries/ organisations inside and outside the country.

ACTIVITIES

Short-term Courses for Industries	6
Training	13

DESIGN AND DEVELOPMENT ACTIVITIES

New facilities added or major equipment procured	5

RESEARCH AND CONSULTANCY

Industrial consultancy projects	57
Value	₹37,46,362

SOPHISTICATED ANALYTICAL INSTRUMENT FACILITY

The Sophisticated Analytical Instrument Facility (SAIF), established with financial support from the Department of Science and Technology, Government of India, provides sophisticated instruments and equipment to students, scientists, researchers and faculty members from IIT Madras, apart from academia, educational institutions, national laboratories, R&D establishments and industries from all over India in general and south India in particular. Periodically, SAIF 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
Senior Techincal Officer	1
Technical Officers	3
Junior Technical Superintendent	1
Junior Technicians	3

FACULTY ACTIVITIES

Workshop	2
Special Lectures	13
Design and Development	
▸ New facilities added	1

OTHER ACTIVITIES OF THE DEPARTMENT

A 500 MHz Solid State FT-NMR Facility has been set up. This is now being used, by students and research scholars from IIT Madras as well as academic institution, Govt R&D institutions and industries from across the Country.

CENTRAL WORKSHOP & CGBS

Set up in 1959, Central Workshop (CWS) initially consisted of shops associated with three major manufacturing processes, i.e. 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 bus transport services and maintains institute buses.

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	119
Engineering Physics	30
Mechanical Engineering	163
Metallurgical & Materials Engineering	51
Aerospace Engineering	57
Chemical Engineering	88
Naval Architecture & Ocean Engineering	52
Civil Engineering	95
Biological Engineering	33
Computer Science & Engineering	63
Engineering Design	55
Total	**806**

TRAINING MODULES

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

CENTRAL GLASS BLOWING SECTION

Established in 1972, the Central Glass Blowing Section (CGBS) 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 has been 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 2018 to March 2019, the CGBS undertook 582 work orders from various departments.

CENTRAL LIBRARY

The Central Library is equipped with all modern facilities, and 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 related to applied science, engineering, technology, humanities, management, social science and emerging subjects. The library has 3,90,148 items, including 962 current journals, catering to the information needs of 15,192 members.

COLLECTIONS

Books (general)	2,48,523
Theses	8,312
Book Bank	14,972
Current periodicals	962
Back volumes of periodicals	1,15,049
CD-ROMs, Audio/Video Cassettes	1,510
e-Books	8,684

MEMBERSHIP

Staff	718
Faculty members (including retired)	859
Students	12,900
Alumni members	421
Corporate members	42
IAS members	196
Project coordinators	56

SERVICES

▸ Circulation
▸ Project loans to Faculty/Departments/Centre's
▸ Inter-library loan transactions
▸ DDS/Reprint service
▸ Smart Cards
▸ Expenditure (₹ in lakhs)
  ▪ Purchase of books/eBooks   110
  ▪ Subscriptions to journals
    and databases   1,622.15

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 book recommendation system, 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.

STUDENT AMENITIES & ACTIVITIES

HOSTELS

Men's hostels	16
Ladies' hostels	4
Dining halls	10

INSTITUTE GYMKHANA

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

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.

NATIONAL CADET CORPS (NCC)

A total of 200 cadets enrolled.

ADVISOR, WEAKER SECTION

Take care of the welfare of the foreign nationals, differently abled students and weaker section students.

SPORTS SECTION

SPORTFEST 2018-2019—a inter-collegiate invitation tournament for both men and women from city colleges, was conducted from 25-28 September 2018. This tournament helps finalise the probable Inter-IIT team.

34th Inter-IIT Aquatics Meet 2018—organised by IIT Guwahati from 3-7 October 2018.

4th Inter-IIT Chess Meet 2018—hosted by IIT Madras from 6-12 December 2018 at Guwahati. Overall, 17 IITs participated in the event.

53rd Inter-IIT Sports Meet 2018—organised in Guwahati from 13-24 December 2018. Twenty-three IITs participated in 13 sports for men and 6 sports for women.

Inter-Hostel Tournaments 2018-2019

National Sports Organisation—functions as per the Government of India's decision to improve sports with special reference in maintaining the fitness of students.

MITR

Events

▸ A holistic cum value-added meeting was held between the MITr Faculty Heads and YourDOST Team on 8 April 2018.

▸ MITr team (for aspiring volunteers) meeting was chaired by Chief Advisor MiTR on 16 April 2018 at the Chemistry Department.

▸ MITr Panel (selection committee) selected key Mitr Core members on 24 and 25 April 2018.

▸ Combined MITr-SAATHI Day was celebrated on 28 April 2018. Dr Saras Bhaskar, a renowned mental health consultant, was the chief guest. Certificates were given to all.

▸ PG Orientation programme for more than 675 students was conducted on 10 July 2018 at the SAC Building under the Chair . Dean of Students

▸ Orientation for both students and parents of B.Tech DD and MA programmes was held on 24 July 2018 at the SAC Building.

▸ An exclusive orientation for the parents was held on 27 July 2018 at the SAC Building. The topic was Your Child@IIT.

▸ A combined MITr-SAATHI meeting was held in the Chemistry Block on 19 September 2018.

▸ Barefoot Counselling Training programme was conducted by Medall at the SAC Building on 9 October 2018.

▸ New MITr Aspirants–an interactive meeting–was held on 12 October 2018 at the Conference Hall in DoST Office Building.

▸ Being a Helper–a MITr–SAATHI training session was conducted by Medall at the PPT Hall on 31 October 2018.

▸ Medall conducted Barefoot Counselling, a training workshop for both MITr–SAATHI combined team, on 10 November 2018.

▸ SAFE Workshop (Part One)—a training capsule was conducted by Medall at the PPT Hall on 9 February 2019.

▸ SAFE Workshop (Part Two)—conducted by Medall at the PPT Hall on 16 March 2019.

Counseling

▸ One-to-one counselling was provided by the counselors from Medall and YourDOST to students who reached them via the support contact number pasted on doors of all hostel rooms.

▸ The coordinators of MITr helped students by talking to them and counselling whenever needed. The students reached them using the contact details provided or were referred via Medall or YourDOST.

SAATHI

▸ **Saathi Mentor Programme:** Nearly 150 potential mentors from senior undergraduates were interviewed and 120 of them were selected; eight freshers were allocated to each mentor so that they could guide freshers in the right direction.

▸ **Saathi Acad Buddy:** 20 Acad buddies were selected from the senior undergraduate student pool to help freshers, who need guidance in studies; around 50 freshies received supplementary teaching over and above class room teaching; more than 250 hours of teaching clocked in the year.

▸ **Saathi Quizzero:** Mock quizzes of MA1101 and PH1101 relating academics were conducted for freshies to get themselves revised for exams; more than 300 freshies attended.

▸ **Saathi first talk-Beyond coding-What you don't know can hurt you!** An interesting talk by S. Ramesh, an employee for over 25 years with leading MNCs in the US, discussed about workplace behaviour and issues faced by Indians while working in a multicultural organisation.

▸ **Breaking boundaries!** The talk given by Suresh Balasubramani, an IITM alumnus, was on navigating through various career paths such as engineering, MBA and data science.

- **Storytelling and the Art of the Narrative:** Stories can be an extremely powerful way to influence people. It is extremely impactful and engaging for your audience if you communicate your ideas in the form of a story. In that regard, Saathi delivered its third talk by Sukumar Rajagopal (former Chief Innovation Officer, Cognizant), who runs a behaviour change start-up called Tiny Magiq.

- **Freshie treasure hunt:** The event was conducted in collaboration with the Informals team of Saarang to improve bonding among the freshies and make them acquainted with all the major landmarks in the institute.

- **Mindfulness:** In these times of distraction, how does one stay mindful? A session on Mindfulness by Ms. G. L. Sampoorna, a certified Heal Your LifeR workshop teacher-trainer for India.

- **Matters that matter:** Dr. Prof. B. M. Hegde, a Padma Bhushan awardee, came down to the institute to address the topic of Health and Happiness, Power of the Mind in Healing the Body. More than 250 students, faculty, staff, residents and outsiders attended this event.

- **Life Lessons from the Armed Forces:** Three decorated defense personnel, Lt Col Jayakumar from the Army, Student Amenities and Activities Commodore Sd Murthy from the Navy, and Gp Capt R Vijayakumar VSM from the Air Force shared their life experiences on life in the armed forces. Attributes like passion, courage and determination can play a role in dayto- day life.

- **Who's the boss?—Productivity workshop:** The workshop was on staying away from distractions and addictions in the digital age. Sunitha Ramadurai from Neoway presented the neuro-linguistic approach of awareness and tackling distractions. This was in a workshop series mode and conducted on two different days.

- **Compassionate Connection through Non-Violent Communication:** A three-day workshop was by international facilitators Ms. Ramanusha, Mr. Chiristian and Ms. Shyleswari. It was a unique and different pedagogy of silence, reflection, adult learning and group dynamics to raise awareness on connecting power of one another, to embody compassion and embrace one's inner self.

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, internationalisation 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.
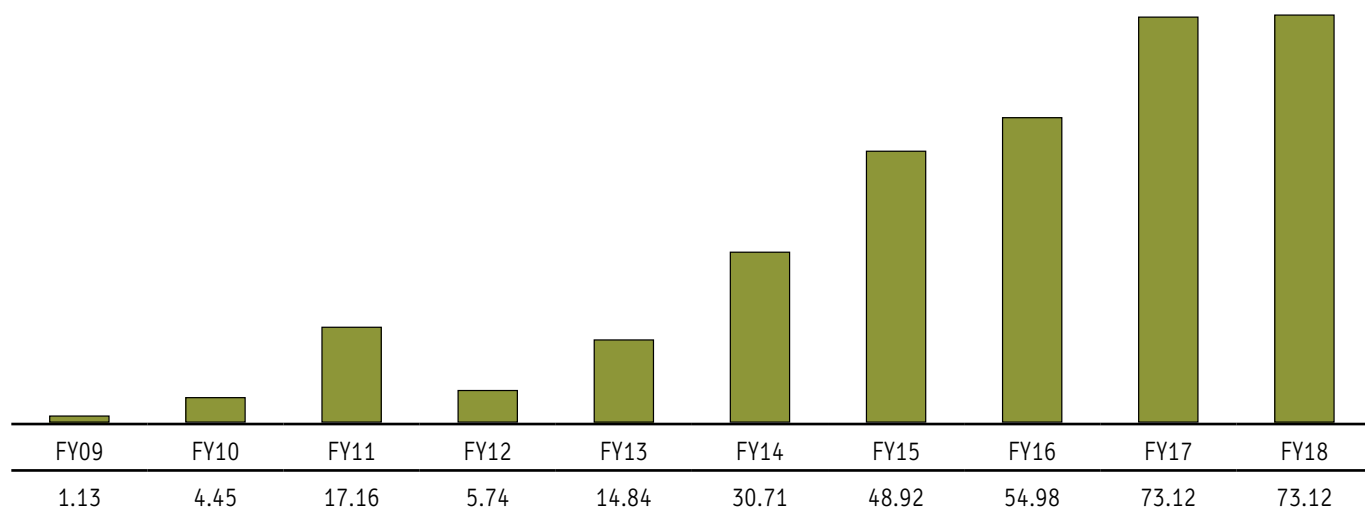
MISSION

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–students, faculty and staff, and society.
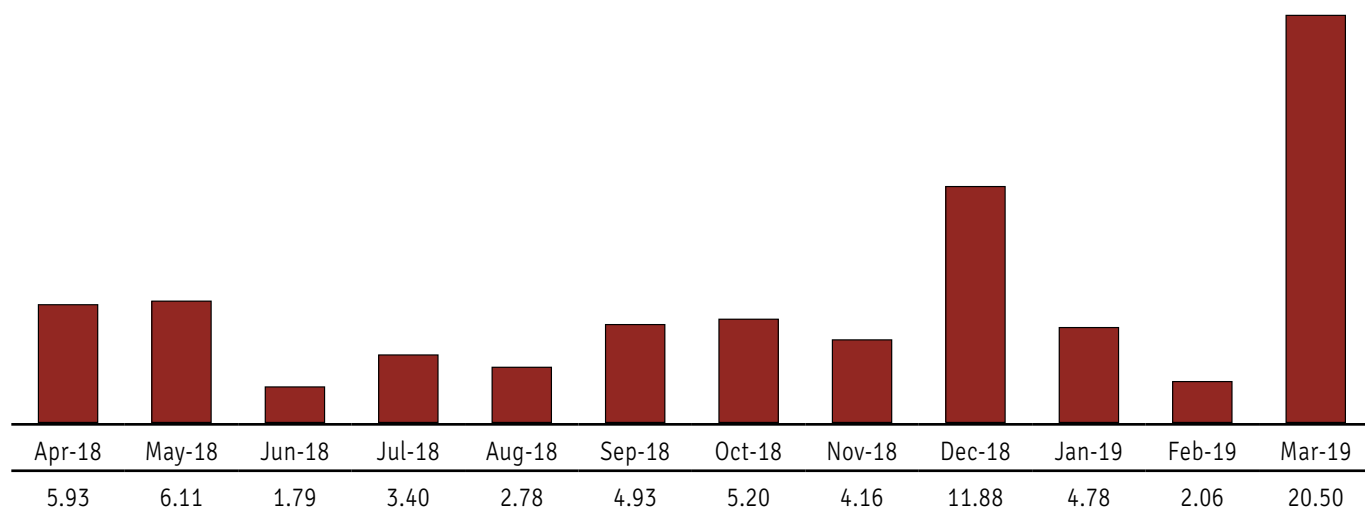
ALUMNI RELATIONS

Distinguished Alumnus Awards	12
Leadership Lecture Series	16
Travel grants	
Students	208
Amount given (₹ in lakhs)	89.11
Faculties	25
Amount given (₹ in lakhs)	13.90
Boeing-funded travel grant	
Students	7
Amount given (₹ in lakhs)	2.10

FINANCIAL YEAR-WISE CONTRIBUTION (Amount in ₹ crore)

FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18
1.13	4.45	17.16	5.74	14.84	30.71	48.92	54.98	73.12	73.12

MONTH-WISE FUNDS RECEIVED (Amount in ₹ crore)

Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
5.93	6.11	1.79	3.40	2.78	4.93	5.20	4.16	11.88	4.78	2.06	20.50

DONORS (FINANCIAL YEAR-WISE)

FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18
188	214	371	283	501	883	1490	2120	2152	1436
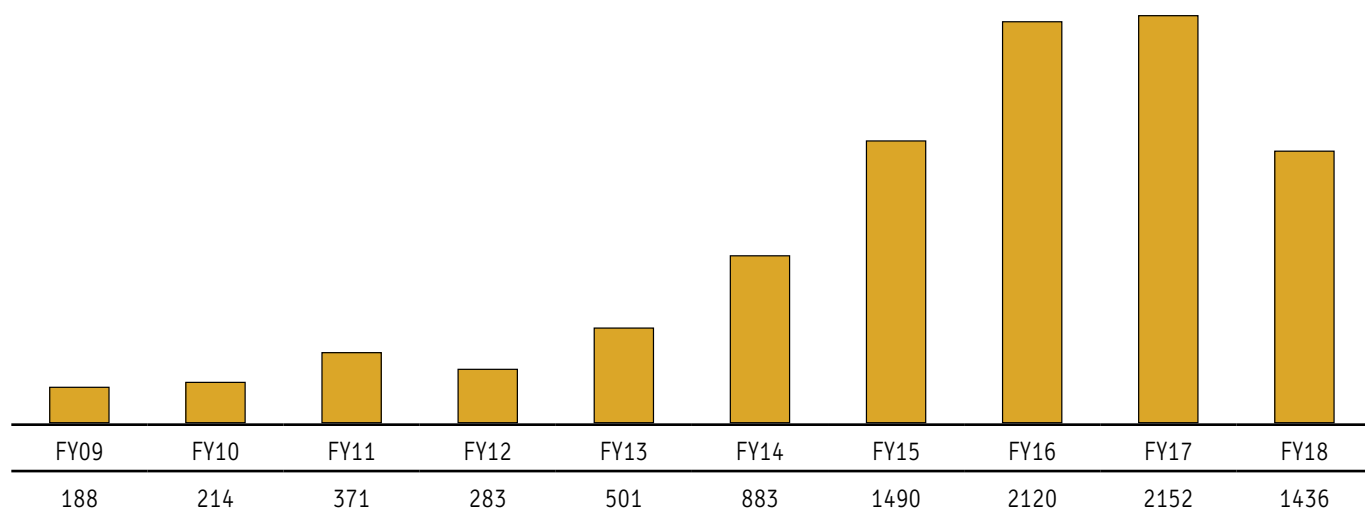
CENTRES OF EXCELLENCE

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

A total of 970 students/scholars (excluding MBA) were placed in various organizations.

Branch	B.Tech	Dual	M.Tech	MA	M.Sc	MS	Ph.D	Total
Aerospace	22	15	13	0	0	6	0	56
Applied Mechanics	0	0	11	0	0	10	1	22
Biotechnology	0	23	3	0	0	0	0	26
Civil	39	24	27	0	0	3	0	93
Chemical	39	19	16	0	0	3	6	83
Chemistry	0	0	0	0	13	0	1	14
Computer Science	17	21	43	0	0	19	0	100
Electrical	39	35	35	0	0	14	5	128
Engineering Design	0	39	0	0	0	5	1	45
Humanities & Social Sciences	0	0	0	9	0	0	0	9
Mathematics/IMSC	0	0	10	0	2	0	1	13
Mechanical	53	50	46	0	0	26	3	178
Metallurgical	15	10	8	0	0	0	1	34
Ocean	18	9	20	0	0	3	3	53
Physics	15	2	0	0	0	0	0	17
	257	247	232	9	15	89	22	871
Pre-placement offers								99
Total								970

FINANCIAL ASSISTANCE TO STUDENTS

Indian Institute of Technology Madras supports meritorious students with financial assistance through scholarships and fellowships to pursue engineering and technology and science education at the institute. The details of the scholarships and fellowships sanctioned to students of different programmes during 2018-19 are listed in this section.

ASSISTANCE TO B.TECH/DUAL DEGREE STUDENTS

Merit-cum-means (MCM) Scholarship: Students of B.Tech/ Dual Degree programmes whose parental income is less than ₹4.5 lakh were sanctioned MCM Scholarship. They were exempted from tuition fee of ₹1,00,000 semester and give a pocket allowance of ₹1,000 per month. Students, whose parental income is between ₹1 and ₹5 lakh, are given 2/3rd tution fee waiver of ₹66,666 per semester by the Alumni office through various donors apart from a pocket allowance of ₹1,000 per month. During the period under report, 488 students benefited from these scholarships. All SC/ST/PwD students are exempted from the tution fee of ₹1,00,000 per semester. SC/ST students admitted to B.Tech/ Dual Degree programmes and with parental income less than ₹4.5 lakh were given the concession of free messing, pocket allowance of ₹250 per month and exemption from tuition fees and hostel seat rent. As on 31 March 2019, 168 students were benefited from the initiative. Alumni-funded scholarship for B.Tech/Dual Degree programmes were sanctioned to General/OBC students with parental income between ₹1 and ₹5 lakh. One-third tuition fees of these students was waived off. 33 students were benefited from the Ministry of Tribal Affairs SC/ST Scholarship, Government of India.

Top 7 per cent of the General category students admitted to B.Tech/DD programme are eligible to be given notional prize of ₹1,000 (one time) and a certificate of merit on the basis of the rank in JEE (Advanced) and parents' income exceeding ₹4.5 lakh. In July 2018, 430 General category students were admitted to B.Tech/DD, and 30 students were eligible for Notional Prize. Alumni-funded scholarship are available to the topper students based on their academic performances as proposed by the sponsoring alumni.

MCM & SC/ST SCHOLARSHIPS

Batch	MCM Scholarship	SC/ST Scholarship
2018	117	32
2017	78	36
2016	138	42
2015	155	58
Total	488	168

M.Tech—Students, who joined the M.Tech programme through GATE, were awarded Half-Time Teaching Assistantship (HTTA) at ₹12,400 per month. During the period under report, 481 fresh assistantships and 424 renewed assistantships were given.

M.Tech Dual Degree—The students of 2014 batch who joined M.Tech programme under Dual Degree were awarded Half-time Teaching Assistantship (HTTA) at ₹12,400 per month from 1 June 2018 onwards based on their obtaining valid GATE score or on securing CGPA of 8.0 or above. During the period under review, 294 students were awarded fresh assistantship from June 2018 to December 2018, and 300 renewed assistantships in January 2019 out of which 292 students were renewed HTTA at the rate of ₹12,400 per month and eight students at the rate of ₹6,950 per month since they obtained CGPA of less than 6.5 in July-November 2018 semester.

M.Sc.—Students admitted to M.Sc programme were sanctioned Rs. 1,000 per month merit scholarship as per rule. Exemption from tuition fee was also given to certain students. During the period under report, 117 students benefited from the scholarship.

M.A.—Institute Merit Scholarship: Twenty-five per cent of the students admitted to M.A. programme and whose parental income is less than ₹4.5 lakh were sanctioned Merit Scholarship, i.e. exempted from the tuition fee of ₹3,000 per semester and given a pocket allowance of ₹1,000 per month. The SC/ST students admitted to M.A. programme and whose parental income is less than ₹4.5 lakh were sanctioned the concession of free messing plus pocket allowance of ₹250 per month and exempted from tuition fees and hostel seat rent as per the Government of India post-matric scholarship rules. Institute-free studentship scholarships for M.A. programme were sanctioned to students. These scholarships give exemption from payment of tuition fees.

M.S.—The scholars admitted to M.S. programme through GATE are given Half-time Teaching Research Assistantship (HTRA) of ₹12,400 per month for two years and later three years on the recommendation of GTC. During the period under report, 479 scholars received these assistantships of which 191 were fresh scholars.

Ph.D—The scholars admitted to Ph.D. full-time programme in engineering are sanctioned Half-time Teaching/Research Assistantship (HTRA) of ₹31,000 per month for first two years and ₹35,000 per month for next three years. During the period under report, 1,775 scholars obtained assistantships of which 689 were fresh scholars. The Ph.D. scholars of science departments who are able to submit thesis within four-and-a-half years and Ph.D. scholars of engineering departments who are able to submit 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, 34 Ph.D. scholars were sanctioned this fellowship.

FINANCIAL ASSISTANCE TO RESEARCH SCHOLARS/STUDENTS

To encourage research scholars to present papers in international conferences, the Insitute gives them 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 presenting papers in national/international conferences in India:

Registration fee

National and international conferences: ₹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 Puducherry), Chennai on behalf of the Comptroller and Auditor General of India.

The 87th Finance Committee of the institute, in its meeting held on 30 November 2018, recommended revised estimates of ₹717.92 crore (gross) for the year 2018-19 and budget estimates of ₹747.00 crore (gross) for the year 2019-20 under Revenue expenditure head. The committee also recommended a revised estimate of ₹82.50 crore for 2018- 19 and budget estimate of ₹114.00 crore for 2019-20 under the capital expenditure. The same were approved by the Board of Governors of the institute in their 239th meeting held on 30 November 2018.

The following is a summary of the revised estimates for 2018- 19 and budget estimates for 2019.20 under the revenue expenditure and capital expenditure as approved by the Board.

(figures in ₹ crore)

Item	Budget Estimate 2018-19	Revised Estimate 2018-19	Budget Estimate 2019-20
Grant under OH-36 and OH31			
Institute income projected	89.14	89.14	91.20
Grant projected for salary (OH-36)	305.90	290.07	307.35
Grant projected for Pension and Pensionary Benefits (OH-31)	105.20	105.20	110.00
Grant for scholarships (OH-31)	101.00	101.00	110.00
Grant for non-salary component (OH-31)	194.82	221.65	219.65
Grant expected under OH-36 and OH-31 Grant under OH-35	706.92	717.92	747.00
Grant projected for Asset creation	66.02	82.50	114.00
Grant expected under OH-35	66.02	82.50	114.00

Audit

The annual accounts of the institute for 2017-18 were audited by the Principal Accountant General (Tamil Nadu and Puducherry) in June-July 2018. A certified copy of the annual accounts, with the audit report, was sent to the Ministry of Human Resource Development (MHRD) after the annual accounts were duly adopted by the Board of Governors on 12 December 2018 to enable the MHRD to arrange placing the same before both the Houses of Parliament during winter session.

Summary of provisional plan and non-plan grant utilisation for 2018-19

(figures in ₹ crore)

Item	Amount
Grant under OH-35	
Opening balance	0.84
Grant received under OH-35	76.71
Total funds available under OH-35	77.55
Expenditure under OH-35	
Building and electrical installation	24.93
Academic equipment	10.15
Equipment for specialised centre	
▸ Infrastructure (furniture/computers, etc)	4.54
▸ Periodicals/journals/books for library	18.05
Total Expenditure under OH-35	57.67
Grant under OH-31 and OH-36	
Opening balance	-23.77
Grant received under OH-31 and OH-36	508.89
Institute Income	82.00
Total funds available under OH-31 and OH-36	567.12
Expenditure under OH-31 and OH-36	
Salary and related items (OH-36)	212.10
Pension and other terminal benefits (OH-31)	117.84
Scholarship payments (OH-31)	96.93
Non-salary, non-pension items (OH-31)	148.44
(Other components) Total Expenditure under OH-31 and OH-36	575.31

The balance of the Corpus Fund as on 31 March 2019 was ₹264.94 crore, and the balance of the Institute Endowment account as on 31 March 2019 was ₹114.66 crore.

CAMPUS AMENITIES

HORTICULTURE

TELEPHONE

BANK

HOUSING

CENTRAL SUPPLY UNIT

LADIES CLUB

COMMUNITY HALL

ENGINEERING UNIT

HOSPITAL

POST OFFICE

CRECHE

TRANSPORT

GUEST HOUSE

CAFETERIA

SHOPPING COMPLEX

SCHOOLS

OPEN AIR THEATRE

STUDENT ACTIVITY CENTRE

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Chennai-600036, Tamil Nadu, India

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