

*M.Tech. Admission 2016*

# *Information Brochure*



*Indian Institute of Technology Madras*

# **VISION & MISSION**

## **VISION**

To be an academic institution in dynamic equilibrium with its social, ecological and economic environment, striving continuously for excellence in education, research and technological service to the nation.

## **MISSION**

- To create and sustain a community of learning in which students acquire knowledge and learn to apply it professionally with due consideration for ethical, ecological and economic issues
- To pursue research and disseminate research findings
- To provide knowledge-based technological services to satisfy the needs of society and the industry
- To help in building national capabilities in science, technology, humanities, management, education and research

## **QUALITY POLICY**

To pursue global standards of excellence in all our endeavors namely, teaching, research, consultancy and continuing education and to remain accountable in our core and support functions through processes of self-evaluation and continuous improvement.

## **CORE VALUES**

In pursuit of its mission, IIT Madras will

- develop human resources to serve the nation
- recognize teaching as a unifying activity
- nurture integrity, creativity and academic freedom
- retain a willingness to experiment with new paradigms

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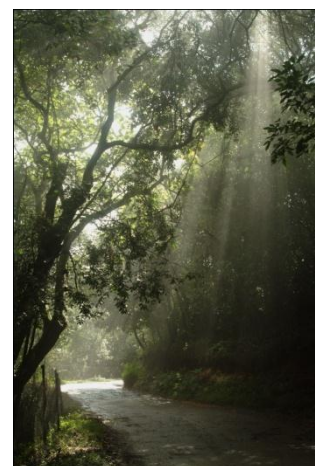
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# 1. THE INSTITUTE

The Indian Institute of Technology Madras (IIT Madras) was established as an autonomous institute of national importance in 1959 by the Government of India with initial technical and financial support from the Government of Germany. IIT Madras, with a number of well-equipped laboratories, advanced research facilities, sophisticated services and computing and networking capabilities, is recognized to have done exceedingly well in the fields of higher technical education, research and industrial consultancy.



IIT Madras conducts academic Programmes of B.Tech., Dual Degree (B.Tech. and M.Tech.), Dual Degree (B.S. & M.S.), M.B.A., M.Tech., M.Sc., Integrated M.A., M.S., and Ph.D. in various disciplines. Located in about 250 hectares of natural flora and fauna, with 19 students' hostels and about 1076 faculty/ staff/ married research scholars' quarters, IIT Madras is one of the greenest residential campuses in the country. Faculty of international repute, a brilliant student community, excellent technical and supporting staff and an effective administration have all contributed to the pre-eminent status of IIT Madras.



## 2. M.TECH. ADMISSIONS

### 2.1 About M.Tech. Programmes

The four-semester M.Tech. Programmes offered in various Disciplines and Programmes by different departments of the institute are based on the credit system and provide a student with a wide choice of courses. Each Programme comprises several core and elective courses and project work. These Programmes, along with the number of seats available, are indicated in Table 1.



Further details of the Disciplines/ Programmes offered in the respective departments are given in Section 3 - Programme Highlights. Apart from these, User Oriented M.Tech. Programmes (UOP) are also offered by certain departments to meet specific requirement of industries. Details of these Programmes are available in Section 4 of this brochure.

Each Discipline/ Programme in a department has a faculty advisor to help the students in the choice of academic options for elective courses. Students may be permitted to do their project work in industries and other approved organizations. Students are also encouraged to participate in the research and development projects undertaken by the faculty through the Industrial Consultancy and Sponsored Research (IC & SR; see also Section 6).

Opportunities exist for a limited number of students to carry out M.Tech. Projects in Germany.

Almost all students desirous of placement are placed in reputed organizations and industries after completing their courses of study.

**M.Tech. students will be eligible for upgradation to Ph.D. if they satisfy the following criteria:**

- a) The candidate should have successfully completed a minimum of 2 semesters in the M.Tech. Programme.**
- b) The candidate should have a minimum CGPA of 8.0 in the prescribed courses.**

A Committee duly constituted by the Head of the Department will consider applications for upgradation to Ph.D. and make its recommendation. After upgradation, they may opt for two degrees (M.Tech. & Ph.D.) subject to the fulfilling the course requirements.

## **2.2 Financial Assistance – For Indian Nationals only**

(i) Financial assistance in the form of Half-Time Teaching Assistantship (HTTA) at the rate of **Rs.12,400/- p.m.** (tenable for a maximum period of 24 months) will be awarded to Indian Nationals doing the M.Tech. Programmes, subject to Institute rules. HTTA students are required to assist the department for 8 hours of work per week related to academic activities of the department such as laboratory demonstration, tutorials, evaluation of assignments, test papers, seminars, research projects, etc. The number of seats available under HTTA is indicated in Table 1.

(ii) A few assistantships may also be offered by some government organizations such as Atomic Energy Regulatory Board, Aeronautical Research and Development Board, and so on.

(iii) A few seats are available without HTTA (N-HTTA, i.e., without any financial assistance) in some M.Tech. Programmes as indicated in Table 1. Candidates can opt for either HTTA (Code ending with Y), or N-HTTA (Code ending with N), or both, in a particular M.Tech. Programme. The eligibility criteria for HTTA and N-HTTA categories are the same.

(iv) Provision exists for the candidates who have joined M.Tech. Programmes under N-HTTA category to convert to HTTA at the end of one semester depending on the vacancies in HTTA category and on the basis of their performance in the first semester examinations.

## **2.3 Fellowship Schemes**

### **(i) DAE-GF Scheme**

DAE-Graduate Fellowship (DAE-GF) Scheme in various engineering disciplines is offered by Department of Atomic Energy. GATE qualified candidates selected under this scheme will get a fellowship of Rs.20,000/- per month. After successful completion of M.Tech. Programme, the DAE-GF scheme fellows will be placed in one of the DAE units.

### **(ii) AERB-GF Scheme**

Under Atomic Energy Regulatory Board Graduate Fellowship (AERB-GF) Scheme, up to three candidates will be selected either from Mechanical Engineering (only in Design/ Nuclear/ Thermal Engineering) or Chemical Engineering discipline or from both and they will be offered a monthly stipend. More details about AERB-GF scheme may be seen in the website [www.aerb.gov.in](http://www.aerb.gov.in).

## 2.4 Reservation of Seats

Seats are reserved for Indian Nationals under the categories, SC/ ST/ OBC (Non-creamy layer) and PwD (Persons with Disability) according to the Government of India rules.

## 2.5 Who can Apply?

- A) GATE qualified candidates
- B) IIT Graduates with B.Tech. Degree
- C) Candidates sponsored by various organizations recognized by DST as Research and Development units, candidates sponsored by NIOT or from educational institutions approved by AICTE/ UGC/ Government or from Government/ Public Sector Undertakings
- D) QIP candidates
- E) UOP candidates of various organizations/industries as per the MoU (Memorandum of Understanding) with the Institute
- F) Defence sponsored candidates
- G1) Foreign Nationals who graduated in India/ abroad and have qualified in GATE.
- G2) All other Foreign Nationals who do not come under G1.

The minimum requirement and admission procedure are different for different categories (A to G) and are given in Section 2.7. Candidates should contact the appropriate office for details as per the addresses listed in Section 2.6. Candidates belonging to categories C to F cannot apply through MTEch Application Portal (MAP).

## 2.6 Whom to Contact?

The candidates may write to the following offices for details about specific Programmes.

<p><u>For Categories A, B &amp; G1:</u>            The Chairman            M.Tech. Admission Committee            GATE Office            IIT Madras            Chennai 600036  <b>Online Application:</b>  <a href="http://mtechadm.iitm.ac.in">http://mtechadm.iitm.ac.in</a>            email: mtechadm@iitm.ac.in            Phone: 044-22578200; Fax: 044-22578204</p>	<p><u>For Category D:</u>            The Chairman            Centre for Continuing            Education            IIT Madras            Chennai 600036</p>
<p><u>For Categories C, E &amp; G2</u>            Deputy Registrar (Academic Courses)            IIT Madras            Chennai 600036  <b>Also see,</b> Webpage <a href="https://mtechspons.iitm.ac.in">https://mtechspons.iitm.ac.in</a>  <a href="http://www.iitm.ac.in/admissionprocedureforforeignstudents">http://www.iitm.ac.in/admissionprocedureforforeignstudents</a></p>	<p><u>For Category F:</u>            Director General of Military            Training            General Staff Branch            Army Headquarters            DHQ PO, New Delhi 110011</p>

## 2.7 Minimum Eligibility

### A. FOR GATE QUALIFIED CANDIDATES

(Also, see Section 2.8.1)

Candidates qualified in GATE 2015 or GATE 2016 and satisfying any one of the following:

- i. Bachelor's degree in Engineering/ Technology/ Architecture from educational Institutions approved by AICTE/ Government\*
- ii. Master's degree in Chemistry/ Life Sciences/ Mathematics/ Physics related subjects from educational Institutions approved by UGC/ Government\*
- iii. Degrees obtained through Distance Education/ Correspondence Mode for the qualifying degree specified in [(i) or (ii)]. The Departments will follow suitability test/ interview procedure for screening in such cases.
- iv. Candidates yet to appear or have appeared in the final examination for the qualifying degree specified in [(i) or (ii)] and whose results are likely to be declared by **July 15, 2016**.
- v. Associate Membership holders of professional bodies for admission into their **parent disciplines from the following:**
  - The Institution of Engineers (India) (AMIE)
  - The Aeronautical Society of India (AMAEI) (eligible only for aerodynamics, structures and propulsion streams)
  - The Indian Institute of Metals (AMIIM)
  - The Indian Institute of Chemical Engineers, including Polymer and Environmental Group (AMICHEM)
  - The Institution of Electronics and Telecommunication Engineers (AMIEETE)

\* If the degree is issued by a university in countries other than India, the degree must be recognized by Association of Indian Universities (AIU)/ Commonwealth Universities/ International Association of Universities (IAU) as equivalent to the corresponding Indian Degrees/ Certificates. Additional requirements of GRE/ TOEFL may be required.

### B. FOR IIT GRADUATES

(Also, see Section 2.8.1)

Candidates graduating/ graduated from IITs with B.Tech. degree can apply without GATE Score. They should have CGPA of 7.5 (on the scale of 10) and above if they belong to SC/ST Category, and CGPA of 8.0 (on scale of 10) and above if they are OBC or General or PwD (Person with Disability) Candidates. Their applications will be reviewed by the respective Department(s).

### C. FOR SPONSORED CANDIDATES

(Also, see Section 2.8.2)

Candidates employed and sponsored (with full pay and allowances for 24 months) by industry/ government organizations/ private and public enterprises, engaged in R&D work recognized by DST/ engineering colleges recognized by AICTE, possessing at least two years of professional experience as on the last date of receipt of applications at IIT Madras can apply, provided they hold:

- (i) B.E./ B.Tech. degree from AICTE recognized Engineering Colleges/ University with first class or 60% aggregate marks in all the four years (no need for having GATE Score); or

- (ii) AMIE or any other Associate memberships listed above (no need for having GATE Score)  
Also visit: <https://mtechspons.iitm.ac.in>.

#### **D. FOR QUALITY IMPROVEMENT PROGRAMME (QIP) CANDIDATES**

M.Tech. under Quality Improvement Programme (sponsored by AICTE) is advertised separately and the selection of QIP candidates is made through a test/ interview.

#### **E. FOR USER ORIENTED PROGRAMMES (UOP)**

Please refer to Section 4 for details of these Programmes.

#### **F. FOR DEFENCE SPONSORED CANDIDATES**

M.Tech. Programme sponsored by Defence Authority (Research & Training and Post Graduate Training) is through a separate selection procedure. See page 3.

#### **G. FOR FOREIGN NATIONALS**

G1. Foreign Nationals who have obtained Bachelor's degree in Engineering/ Technology/ Architecture or equivalent or a Master's degree in Mathematics/ Chemistry/ Physics/ Life Sciences/ Related Subjects from a university in India/ abroad and approved by UGC/ AICTE/ Government should possess a valid GATE 2015 or GATE 2016 Score. Also, see Sections 2.8.1 & 2.8.3.

G2. Foreign Nationals who do not fall under G1 have to apply separately as explained in the webpage <http://www.iitm.ac.in/admissionprocedureforforeignstudents>.

## **2.8 How to Apply?**

Please note that to apply with a valid GATE Score (either GATE 2015 or GATE 2016) or as IIT B.Tech. graduate, you have to register in the website mentioned below. If you plan to apply with more than one of the above, register separately using same email and mobile number but with different credentials among (a) valid GATE 2015 Score, (b) valid GATE 2016 Score and (c) IIT B.Tech. Graduation with valid CGPA.

### **2.8.1 FOR GATE QUALIFIED CANDIDATES AND IIT GRADUATES WITH B.TECH. DEGREE (Refer Sections 2.7 A & B):**

**Apply ONLINE at <http://mtechadm.iitm.ac.in>**

(Instructions and further links available on the Website)

**Website Opens on 07 March, 2016 (00:01 hrs)**

**and**

**Closes on 15 April, 2016 (23:59 hrs)**

**Application fee (per application): Rs.100 /- for SC/ ST/ PwD Candidates  
and Rs.200/- for others**

In case of difficulty in applying ONLINE, please contact

The Chairman  
M.Tech. Admission Committee  
GATE Office  
Indian Institute of Technology Madras  
Chennai 600036

Phone: 044 - 22578200  
Fax: 044 - 22578204  
E-mail: [mtechadm@iitm.ac.in](mailto:mtechadm@iitm.ac.in)

The application fee should be paid online at the online Application website.



Before you start filling the ONLINE application form, pay attention to the following:

- (a) Carefully read all the instructions given herein.
- (b) Study Tables 1, 2, 3 and 4 carefully, along with details of Programmes in Section 3.
- (c) If you satisfy the minimum requirement (Section 2.7 A/B), choose your options from Table 1 (also refer Tables 2, 3 & 4) and decide your choices of Programmes. Note that Programme codes ending with Y indicate HTTA and N indicate N-HTTA.
- (d) Note the following additional Suitability Test/ Interview (refer Table 3) requirements for:
  - (i) Candidates with XE Gate Paper, applying to AM1, AM2, CE2 and CE4 Programmes.
  - (ii) ZE/ZS candidates may be considered for admission to the Programmes relevant to the discipline of their qualifying degree as decided by the concerned Departments. If they are considered, they may have to take Suitability Test/ Interview.
  - (iii) Candidates having degrees obtained through Distance Education/ Correspondence Mode, who apply to AM1, AM2, CS1, MM1, OE1, OE2, and PE1.
  - (iv) All the candidates who apply to OE1, OE2 and PE1.

If you are called for the Suitability Test/ Interview, you **need to be present** to be considered for that particular Programme. You may have to report to the respective departments on **30<sup>th</sup> April, 2016 (Saturday)**. Even if you do not attend the Suitability Test/ Interview for a particular Programme, you will still be considered for the other Programmes that you have chosen in your application and that do not require Suitability Test/ Interview.

- (e) Keep ready the soft copy of the following documents (if applicable) for uploading at the website:

- Image file of your recent passport size photograph (*file in jpeg format, size, Min: 10 KB, Max.: 80KB, - Photo Size, Width: 30 mm, Height: 45 mm*)
- Image file of your signature (*file in jpeg format, size, Min: 10 KB, Max.: 80 KB, - Box Size, Width: 80 mm, Height: 35 mm*)
- Nationality Certificate\* (Any of the following: Birth Certificate or First page of your passport or Voter id or SSLC Certificate showing Nationality or Certificate issued by approved Govt. agency for Nationality)
- Persons with Disability (PwD) are required to upload a certificate\* of disability from the **AUTHORIZED MEDICAL BOARD** attached to one of the following - Vocational Rehabilitation Centre (VRC) for Physically Handicapped persons/ Special Employment Exchange for Physically Handicapped/ Government Hospital (District and State level).
- SC/ST Certificate\*
- OBC (Non-Creamy Layer) Certificate\*: To consider under OBC category, candidates should upload the OBC (Non-Creamy Layer) certificate in the format prescribed by Government of India issued by competent authorities available in the website [http://mtechadm.iitm.ac.in/pdfs/OBC\\_NCL.pdf](http://mtechadm.iitm.ac.in/pdfs/OBC_NCL.pdf) Submission of only BC or MBC certificate will not be treated as OBC category. If no valid OBC (Non-Creamy Layer) certificate copy is enclosed, the candidate will be treated under General category.
- Complete list of courses with syllabi\* for ZE/ZS candidates
- Complete Grade Card(s)\* till date for IIT B.Tech. candidates

\* Scanned pdf file with maximum size of 2 MB. Multiple scanned pages should be combined into a single pdf file.

- (f) Exercise utmost care in choosing the order of choices as the process of selection is computerized. An error in the list of choices may even lead to rejection of your application. Once the choices are made and application is submitted they can **NOT** be changed.
- (g) Complete the application in all respects. No changes in the application are permitted after you submitted the application.
- (h) Application Fee (per application) should be paid online at the online application website. Please note the following:  
 If a candidate wishes to apply using valid GATE 2015, GATE 2016 Scores and also through IIT Graduate, three separate applications for each GATE Score and IIT Graduate (application fee is per application) must be submitted.  
 If a candidate wishes to apply using valid GATE 2015 and GATE 2016 Scores, two separate applications for each GATE Scores (application fee is per application) must be submitted.
- (i) After completing the online application form, download the complete application form for safe keeping and record purposes. There is **NO** need to send the hard copy.

### 2.8.2 FOR SPONSORED CANDIDATES [Refer to Sections 2.5 (C) and 2.7 (C)]

**How to Apply:** Application can be submitted only ONLINE. The application fee is Rs.250/- for SC/ST/PwD candidates and Rs.500/- for others (to be paid online). Instructions on how to apply are available on the IIT Madras Website: <https://mtechspons.iitm.ac.in>. In case of difficulty in applying, please contact:

The Deputy Registrar  
 Courses Unit  
 Academic Section  
 IIT Madras  
 Chennai 600036  
 Phone No.044-22578035/8038, Fax:044-22578042)  
 email: [cacad@iitm.ac.in](mailto:cacad@iitm.ac.in), [drcourses@itm.ac.in](mailto:drcourses@itm.ac.in).

#### IMPORTANT DATES

Portal opens on	07-03-2016
Portal closes on the given last date at 23.59 hrs.	15-04-2016

- a) Before filling the application form, ensure that you satisfy the minimum requirements stipulated in Section 2.7 C.
- b) While filling the choices, follow column (3) (Discipline Code) of Table 1. The programme codes should not end with Y or N as HTTA is not applicable to the sponsored candidates.

### 2.8.3 FOR FOREIGN NATIONALS WHO OBTAINED QUALIFYING DEGREE IN INDIA/ ABROAD (Refer to Section 2.7 G1):

Application procedure is similar to the one described in Section 2.8.1, but with constraints on the available programmes. Foreign Nationals are not eligible for HTTA and therefore, can choose **programme codes ending with F only** (Refer to Table 1 and Table 3). The following soft copy of the documents may be kept ready.

- Complete list of courses with syllabi in case of ZE/ZS candidates
- First page\* of the valid Passport and valid Indian visa/ Overseas Citizen of India (OCI) card/ Person of Indian Origin (PIO) card

Application fee remains as Rs. 200/- per application.

**Table 1 – M.Tech. Programmes in Various Departments/Programmes**

No.	Department/ Degree/ Programme	Discipline Code	Code (for Choices)	No. of Seats#
1.	Department of Aerospace Engineering – M.Tech. in Aerospace Engineering			
	Aerospace Engineering	AE1	AE1Y	12
			AE1N	3
			AE1F	2
2.	Department of Applied Mechanics – M.Tech. in Engineering Mechanics and M.Tech. in Biomedical Engg.			
	Engineering Mechanics (Fluid Mechanics/Solid Mechanics)	AM1	AM1Y	10
			AM1N	2
	Biomedical Engineering	AM2	AM2Y	6
			AM2N	1
	3.	Department of Chemical Engineering – M.Tech. in Chemical Engineering		
Chemical Engineering		CH1	CH1Y	27
			CH1N	5
			CH1F	2
4.	Department of Civil Engineering – M.Tech. in Civil Engineering			
	Building Technology and Construction Management	CE1	CE1Y	7
			CE1N	2
			CE1F	1
	Environmental Engineering	CE2	CE2Y	6
			CE2N	3
			CE2F	1
	Geotechnical Engineering	CE3	CE3Y	7
			CE3N	1
			CE3F	1
	Hydraulic and Water Resources Engineering	CE4	CE4Y	6
			CE4N	3
			CE4F	1
	Structural Engineering	CE5	CE5Y	13
			CE5N	3
			CE5F	1
	Transportation Engineering	CE6	CE6Y	8
			CE6N	1
CE6F			1	
5.	Department of Computer Science and Engineering – M.Tech. in Computer Science and Engg.			
	Computer Science and Engineering	CS1	CS 1Y	54
6.	Department of Electrical Engineering - M.Tech. in Electrical Engineering			
	Communication and Signal Processing	EE1	EE1Y	17
			EE1F	1
	Power Systems and Power Electronics	EE2	EE2Y	11
			EE2F	1
	Microelectronics and VLSI Design	EE3	EE3Y	14
			EE3F	1
	Control and Instrumentation	EE4	EE4Y	11
			EE4F	1
	Microelectronics and Photonics	EE5	EE5Y	10
EE5N			5	
			EE5F	2

**Table 1 – M.Tech. Programmes in Various Departments/ Programmes**

7.	Department of Mathematics - M.Tech. in Industrial Mathematics and Scientific Computing			
	Industrial Mathematics and Scientific Computing	MA1	MA1Y	10
			MA1N	3
MA1F			2	
8.	Department of Mechanical Engineering - M.Tech. in Mechanical Engineering			
	Thermal Engineering	ME1	ME1Y	36
			ME1N	4
			ME1F	1
	Design	ME2	ME2Y	20
			ME2N	4
			ME2F	1
	Manufacturing Engineering	ME3	ME3Y	18
			ME3N	3
ME3F			1	
9.	Department of Metallurgical and Materials Engineering - M.Tech. in Metallurgical and Materials Engg.			
	Metallurgical and Materials Engineering	MM1	MM1Y	20
MM1N			4	
10.	Department of Ocean Engineering - M.Tech. in Ocean Engineering			
	Ocean Engineering	OE1	OE1Y	14
			OE1N	1
Ocean Technology*	OE2*	OE2Y	10	
11.	Department of Physics - M.Tech. in Solid State Technology			
	Functional Materials and Nanotechnology	PH1	PH1Y	11
			PH1N	1
			PH1F	2
Interdisciplinary M.Tech. Programmes				
12.	M.Tech. in Catalysis Technology (Co-ordinating Dept. – Chemical Engg.)	CA1	CA1Y	6
			CA1F	2
13.	M.Tech. in Clinical Engineering (Co-ordinating Dept. - Biotechnology)	CL1	CL1Y	16
14.	M.Tech. in Petroleum Engineering (Co-ordinating Dept. – Ocean Engg.)	PE1	PE1Y	12
TOTAL			Y	392
			N	49
			F	25
<b>GRAND TOTAL</b>				<b>466</b>

Y – With Half-Time Teaching Assistantship (HTTA) N – Without Half-Time Teaching Assistantship (N-HTTA)

F – For Foreign Nationals only

# The number of seats is subject to change.

\* Assistantship sponsored by NIOT

**Table2: M.Tech. Programmes: Eligibility for Admission**

Discipline of Qualifying Degree	Qualifying Discipline Code	Eligible <b>M.Tech.2016 Programme Codes</b> (to which applications can be submitted) For details on additional requirements for each Programme, Refer <a href="#">Table3</a>
<b>Qualifying Disciplines in Engineering/Technology</b>		
Aeronautical/Aerospace Engg.	AE	AE1, AM1, AM2, CL1, CS1, MA1, ME1, ME2, ME3, OE1, OE2
Agricultural Engineering	AG	CE2, CE4, CL1, CS1
Architecture (B.Arch.)	AR	CE1, CE6, CL1, CS1
Automobile Engineering	AU	AE1, AM1, CL1, CS1, ME1, ME2, ME3
Biochemical Engineering	BI	CH1, CL1, CS1
Biomedical Engineering	BM	AM2, CL1, CS1, EE4
Biotechnology	BT	CE2, CL1, CS1, MM1
Civil Engineering	CE	AE1, AM1, AM2, CE1, CE2, CE3, CE4, CE5, CE6, CL1, CS1, MA1, OE1, OE2
Chemical Engineering	CH	AE1, AM1, AM2, CA1, CE2, CH1, CL1, CS1, MA1, ME1, MM1, PE1
Ceramics	CR	CL1, CS1, MM1
Computer Science	CS	AE1, AM2, CL1, CS1, MA1, ME3
Electronics and Communications Engg.	EC	AE1, AM2, CL1, CS1, EE1, EE2, EE3, EE4, EE5, MA1, ME3
Electrical and Electronics Engg.	EE	AE1, AM2, CL1, CS1, EE1, EE2, EE3, EE4, EE5, MA1, ME3, PH1
Energy Engineering	EN	AE1, CL1, CS1, EE2, ME1
Engineering Physics	EP	CL1, CS1, EE1, EE2, EE3, EE4, EE5, PH1
Environmental / Environmental and Civil Engg.	EV	CE2, CE4, CH1, CL1, CS1
Industrial Engineering	IE	CL1, CS1, ME3
Instrumentation	IN	AE1, AM2, CL1, CS1, EE1, EE2, EE3, EE4, EE5, ME3
Information Technology	IT	CL1, CS1
Mechanical Engineering	ME	AE1, AM1, AM2, CE2, CE4, CL1, CS1, MA1, ME1, ME2, ME3, MM1, OE1, OE2, PE1
Manufacturing Engineering	MF	AE1, CL1, CS1, ME3, MM1
Machine Tool Engineering	ML	CL1, CS1, ME3
Metallurgical and Materials Engg.	MM	AE1, AM1, AM2, CL1, CS1, MA1, MM1, PH1
Marine Engineering	MR	CL1, CS1, ME1, OE1, OE2
Naval Architecture	NA	AE1, AM1, CL1, CS1, MA1, ME3, OE1, OE2
Petroleum Engineering	PE	CL1, CS1, ME1, PE1
Production and Industrial Engg.	PI	CL1, CS1, ME3
Production Engineering	PR	AE1, CL1, CS1, ME3, MM1
Other Disciplines in Engineering/Technology	ZE	AE1, AM1, AM2, CA1, CE1, CE2, CE3, CE4, CE5, CE6, CH1, CL1, CS1, EE1, EE2, EE3, EE4, EE5, ME1, ME2, ME3, MM1, OE1, OE2, PH1
<b>Qualifying Disciplines in Science</b>		
Chemistry	CY	CA1, CS1, MM1, PH1
Geology and Geophysics	GG	CS1, PE1
Maths/Applied Maths	MA	CS1, MA1
M.Sc. Computer Science	MC	CS1
Master of Computer Applications	MP	CS1
Materials Science	MS	CS1, MM1, PH1
Nanotechnology	NT	CS1, MM1, PH1
Operations Research	OR	CS1
Physics/Applied Physics	PH	CS1, EE5, MA1, MM1, PH1
Statistics	ST	CS1
Master's Degree in Life Sciences	ZL	CS1
Other Disciplines in Science	ZS	AE1, CA1, CH1, CS1, ME1, ME2, MM1

**Table 3: M.Tech. Programmes: Eligible Disciplines, Seats available# and Additional Requirements**

No.	Programme Code	Eligible Discipline Codes	HTTA	Non-HTTA	Foreign Nationals	Additional Requirements
1.	AE1	AE	3	0	2	GATE Paper must be AE, CE, ME or XE
		ME	6*	2*		
		AU, CE, CH, EN, MF, MM, NA, PR	2*	1*		
		CS, EC, EE, IN, ZE, ZS	1*	0		
2.	AM1	AE, AU, CE, CH, ME, MM, NA, ZE	10	2	0	GATE Paper must be AE, CE, CH, ME, MT or XE (Test/Interview for XE GATE Paper)
	AM2	BM	2	1	0	GATE Paper must be AE, CE, CH, CS, EC, EE, IN, ME, MT or XE (Test/Interview for XE GATE Paper)
		IN	2*	0		
		AE, CE, CH, CS, EC, EE, ME, MM, ZE	2*	0		
3.	CA1	CH, ZE	3	0	2	GATE Paper must be CH or CY
		CY, ZS	3*	0		
4.	CE1	CE	4	2	1	GATE Paper must be AR or CE
		AR	2	0		
		ZE	1	0		
	CE2	CE	4	3	1	GATE Paper must be AG, BT, CE, CH, ME or XE (Test/Interview for XE GATE Paper)
		AG, BT, CH, EV, ME, ZE	2*	0		
	CE3	CE	6	1	1	GATE Paper must be CE
		ZE	1*	0		
	CE4	CE	3	3	1	GATE Paper must be AG, CE, ME or XE (Test/Interview for XE GATE Paper)
		AG	2	0		
		EV, ME, ZE	1*	0		
	CE5	CE	12	3	1	GATE Paper must be CE
		ZE	1*	0		
	CE6	CE	6	1	1	GATE Paper must be AR or CE
		AR, ZE	2*	0		
5.	CH1	BI, CH, EV, ZE, ZS	27	5	2	GATE Paper must be CH
6.	CL1	AE, AG, AR, AU, BI, BM, BT, CE, CH, CR, CS, EC, EE, EN, EP, EV, IE, IN, IT, ME, MF, ML, MM, MR, NA, PE, PI, PR, ZE	16	0	0	GATE Paper must be AE, BT, CE, CH, CS, EC, EE, IN, ME, MN, MT, PI, TF or XE
7.	CS1	All Disciplines of Qualifying Degree	54	0	0	GATE Paper must be CS
8.	EE1	EC, EE, EP, IN, ZE	17	0	1	GATE Paper must be EC
	EE2	EC, EE, EN, EP, IN, ZE	11	0	1	GATE Paper must be EE
	EE3	EC, EE, EP, IN, ZE	14	0	1	GATE Paper must be EC
	EE4	IN	7	0	1	GATE Paper must be IN
		BM, EC, EE, EP, ZE	4	0		GATE Paper must be EC or EE
	EE5	PH, EP	3	5	2	GATE Paper must be PH
EC, EE, IN, ZE		7	GATE Paper must be EC, EE or IN			
9.	MA1	MA	6	3	2	NIL
		PH	2*	0		
		AE, CE, CH, CS, EC, EE, ME, MM, NA	2*	0		

**Table 3: M.Tech. Programmes: Eligible Disciplines, Seats available# and Additional Requirements**

No.	Programme Code	Eligible Discipline Codes	HTTA	Non-HTTA	Foreign National	Additional Requirements
10.	ME1	ME	34	3	1	Nil
		AE, AU, CH, EN, MR, PE, ZE, ZS	2*	1*		
	ME2	ME	18	3	1	Nil
		AE, AU, ZE, ZS	2*	1*		
	ME3	ME	16	2	1	Nil
		AE, AU, CS, EC, EE, IE, IN, MF, ML, NA, PI, PR, ZE	2*	1*		
11.	MM1	MM	15	3	0	Nil
		BT, CH, CR, CY, ME, MF, MS, NT, PH, PR, ZE, ZS	5*	1		
12.	OE1	AE, CE, ME, MR, NA, ZE	14	1	0	GATE Paper must be other than XL (Test/ Interview for all candidates)
	OE2	AE, CE, ME, MR, NA, ZE	10**	0	0	GATE Paper must be other than XL (Test/ Interview for all candidates)
13.	PE1	ME	3	0	0	GATE Paper must be CH, GG (with Part B Geophysics), ME, PE or XE (Test/ Interview for all candidates)
		GG	3	0		
		CH	3	0		
		PE	3	0		
14.	PH1	PH	6	1	1	Nil
		EP, NT	3*	0	0	
		CY, EE, MM, MS, ZE	2*	0	1*	

# The number of seats is subject to change.

\* The indicated number will be considered as the maximum number of available seats for that group of eligible disciplines and the seats will be allotted from the combined merit list (along with discipline mentioned in the first row)

\*\* Assistantship sponsored by NIOT

- ZE/ZS candidates must upload a complete list of courses studied during their degree Programme with syllabi. They may be considered for admission to the Programmes relevant to the discipline of their qualifying degree as decided by the concerned Departments. If they are considered, they may have to take suitability test/interview.
- Candidates with degrees obtained through Distance Education/Correspondence Mode must take test/interview for the following Programmes: AM1, AM2, CS1, MM1, OE1, OE2, and PE1.
- Applications of candidates with B.Tech. from IITs, applying for admission without GATE Score will be reviewed by the respective Department(s). They must upload the all Grade Card(s) pertaining to the B.Tech. Programme at the website.

**Table 4: Eligible Programmes for various combinations of Qualifying Disciplines and GATE Papers**

	GATE Paper AE	GATE Paper AG	GATE Paper AR	GATE Paper BT	GATE Paper CE	GATE Paper CH	GATE Paper CS	GATE Paper CY	GATE Paper EC	GATE Paper EE	GATE Paper EY	GATE Paper GG (Geophysics for PE1)
<b>Qual Disp AE</b>	AE1 AM1 AM2 CL1 MA1 ME1 ME2 ME3 OE1 OE2	MA1 ME1 ME2 ME3 OE1 OE2	MA1 ME1 ME2 ME3 OE1 OE2	CL1 MA1 ME1 ME2 ME3 OE1 OE2	AE1 AM1 AM2 CL1 MA1 ME1 ME2 ME3 OE1 OE2	AM1 AM2 CL1 MA1 ME1 ME2 ME3 OE1 OE2	AM2 CL1 CS1 MA1 ME1 ME2 ME3 OE1 OE2	MA1 ME1 ME2 ME3 OE1 OE2	AM2 CL1 MA1 ME1 ME2 ME3 OE1 OE2	AM2 CL1 MA1 ME1 ME2 ME3 OE1 OE2	MA1 ME1 ME2 ME3 OE1 OE2	MA1 ME1 ME2 ME3 OE1 OE2
<b>Qual Disp AG</b>	CL1	CE2 CE4		CE2 CL1	CE2 CE4 CL1	CE2 CL1	CL1 CS1		CL1	CL1		
<b>Qual Disp AR</b>	CL1		CE1 CE6	CL1	CE1 CE6 CL1	CL1	CL1 CS1		CL1	CL1		
<b>Qual Disp AU</b>	AE1 AM1 CL1 ME1 ME2 ME3	ME1 ME2 ME3	ME1 ME2 ME3	CL1 ME1 ME2 ME3	AE1 AM1 CL1 ME1 ME2 ME3	AM1 CL1 ME1 ME2 ME3	CL1 CS1 ME1 ME2 ME3	ME1 ME2 ME3	CL1 ME1 ME2 ME3	CL1 ME1 ME2 ME3	ME1 ME2 ME3	ME1 ME2 ME3
<b>Qual Disp BI</b>	CL1			CL1	CL1	CH1 CL1	CL1 CS1		CL1	CL1		
<b>Qual Disp BM</b>	AM2 CL1			CL1	AM2 CL1	AM2 CL1	AM2 CL1 CS1		AM2 CL1 EE4	AM2 CL1 EE4		
<b>Qual Disp BT</b>	CL1 MM1	CE2 MM1	MM1	CE2 CL1 MM1	CE2 CL1 MM1	CE2 CL1 MM1	CL1 CS1 MM1	MM1	CL1 MM1	CL1 MM1	MM1	MM1
<b>Qual Disp CE</b>	AE1 AM1 AM2 CL1 MA1 OE1 OE2	CE2 CE4 MA1 OE1 OE2	CE1 CE6 MA1 OE1 OE2	CE2 CL1 MA1 OE1 OE2	AE1 AM1 AM2 CE1 CE2 CE3 CE4 CE5 CE6 CL1 MA1 OE1 OE2	AM1 AM2 CE2 CL1 MA1 OE1 OE2	AM2 CL1 CS1 MA1 OE1 OE2	MA1 OE1 OE2	AM2 CL1 MA1 OE1 OE2	AM2 CL1 MA1 OE1 OE2	MA1 OE1 OE2	MA1 OE1 OE2
<b>Qual Disp CH</b>	AE1 AM1 AM2 CL1 MA1 ME1 MM1	CE2 MA1 ME1 MM1	MA1 ME1 MM1	CE2 CL1 MA1 ME1 MM1	AE1 AM1 AM2 CE2 CL1 MA1 ME1 MM1	AM1 AM2 CA1 CE2 CH1 CL1 MA1 ME1 MM1 PE1	AM2 CL1 CS1 MA1 ME1 MM1	CA1 MA1 ME1 MM1	AM2 CL1 MA1 ME1 MM1	AM2 CL1 MA1 ME1 MM1	MA1 ME1 MM1	MA1 ME1 MM1 PE1
<b>Qual Disp CR</b>	CL1 MM1	MM1	MM1	CL1 MM1	CL1 MM1	CL1 MM1	CL1 CS1 MM1	MM1	CL1 MM1	CL1 MM1	MM1	MM1

**Important Note: \*\*\*N & \*\*\*F seats are NOT available for some departments/qualifying disciplines.**

**Please refer to Table 3 of the Brochure for details**



	GATE Paper IN	GATE Paper MA	GATE Paper ME	GATE Paper MN	GATE Paper MT	GATE Paper PE	GATE Paper PH	GATE Paper PI	GATE Paper TF	GATE Paper XE	GATE Paper XL
<b>Qual Disp AE</b>	AM2 CL1 MA1 ME1 ME2 ME3 OE1 OE2	MA1 ME1 ME2 ME3 OE1 OE2	AE1 AM1 AM2 CL1 MA1 ME1 ME2 ME3 OE1 OE2	CL1 MA1 ME1 ME2 ME3 OE1 OE2	AM1 AM2 CL1 MA1 ME1 ME2 ME3 OE1 OE2	MA1 ME1 ME2 ME3 OE1 OE2	MA1 ME1 ME2 ME3 OE1 OE2	CL1 MA1 ME1 ME2 ME3 OE1 OE2	CL1 MA1 ME1 ME2 ME3 OE1 OE2	AE1 AM1 AM2 CL1 MA1 ME1 ME2 ME3 OE1 OE2	MA1 ME1 ME2 ME3
<b>Qual Disp AG</b>	CL1		CE2 CE4 CL1	CL1	CL1			CL1	CL1	CE2 CE4 CL1	
<b>Qual Disp AR</b>	CL1		CL1	CL1	CL1			CL1	CL1	CL1	
<b>Qual Disp AU</b>	CL1 ME1 ME2 ME3	ME1 ME2 ME3	AE1 AM1 CL1 ME1 ME2 ME3	CL1 ME1 ME2 ME3	AM1 CL1 ME1 ME2 ME3	ME1 ME2 ME3	ME1 ME2 ME3	CL1 ME1 ME2 ME3	CL1 ME1 ME2 ME3	AE1 AM1 CL1 ME1 ME2 ME3	ME1 ME2 ME3
<b>Qual Disp BI</b>	CL1		CL1	CL1	CL1			CL1	CL1	CL1	
<b>Qual Disp BM</b>	AM2 CL1		AM2 CL1	CL1	AM2 CL1			CL1	CL1	AM2 CL1	
<b>Qual Disp BT</b>	CL1 MM1	MM1	CE2 CL1 MM1	CL1 MM1	CL1 MM1	MM1	MM1	CL1 MM1	CL1 MM1	CE2 CL1 MM1	MM1
<b>Qual Disp CE</b>	AM2 CL1 MA1 OE1 OE2	MA1 OE1 OE2	AE1 AM1 AM2 CE2 CE4 CL1 MA1 OE1 OE2	CL1 MA1 OE1 OE2	AM1 AM2 CL1 MA1 OE1 OE2	MA1 OE1 OE2	MA1 OE1 OE2	CL1 MA1 OE1 OE2	CL1 MA1 OE1 OE2	AE1 AM1 AM2 CE2 CE4 CL1 MA1 OE1 OE2	MA1
<b>Qual Disp CH</b>	AM2 CL1 MA1 ME1 MM1	MA1 ME1 MM1	AE1 AM1 AM2 CE2 CL1 MA1 ME1 MM1 PE1	CL1 MA1 ME1 MM1	AM1 AM2 CL1 MA1 ME1 MM1	MA1 ME1 MM1 PE1	MA1 ME1 MM1	CL1 MA1 ME1 MM1	CL1 MA1 ME1 MM1	AE1 AM1 AM2 CE2 CL1 MA1 ME1 MM1 PE1	MA1 ME1 MM1
<b>Qual Disp CR</b>	CL1 MM1	MM1	CL1 MM1	CL1 MM1	CL1 MM1	MM1	MM1	CL1 MM1	CL1 MM1	CL1 MM1	MM1

**Important Note: \*\*\*N & \*\*\*F seats are NOT available for some departments/qualifying disciplines.**

**Please refer to Table 3 of the Brochure for details**

	GATE Paper AE	GATE Paper AG	GATE Paper AR	GATE Paper BT	GATE Paper CE	GATE Paper CH	GATE Paper CS	GATE Paper CY	GATE Paper EC	GATE Paper EE	GATE Paper EY	GATE Paper GG (Geophysics for PE1)
<b>Qual Disp CS</b>	AE1 AM2 CL1 MA1 ME3	MA1 ME3	MA1 ME3	CL1 MA1 ME3	AE1 AM2 CL1 MA1 ME3	AM2 CL1 MA1 ME3	AM2 CL1 CS1 MA1 ME3	MA1 ME3	AM2 CL1 MA1 ME3	AM2 CL1 MA1 ME3	MA1 ME3	MA1 ME3
<b>Qual Disp EC</b>	AE1 AM2 CL1 MA1 ME3	MA1 ME3	MA1 ME3	CL1 MA1 ME3	AE1 AM2 CL1 MA1 ME3	AM2 CL1 MA1 ME3	AM2 CL1 CS1 MA1 ME3	MA1 ME3	AM2 CL1 EE1 EE3 EE4 EE5 MA1 ME3	AM2 CL1 EE2 EE4 EE5 MA1 ME3	MA1 ME3	MA1 ME3
<b>Qual Disp EE</b>	AE1 AM2 CL1 MA1 ME3 PH1	MA1 ME3 PH1	MA1 ME3 PH1	CL1 MA1 ME3 PH1	AE1 AM2 CL1 MA1 ME3 PH1	AM2 CL1 MA1 ME3 PH1	AM2 CL1 CS1 MA1 ME3 PH1	MA1 ME3 PH1	AM2 CL1 EE1 EE3 EE4 EE5 MA1 ME3 PH1	AM2 CL1 EE2 EE4 EE5 MA1 ME3 PH1	MA1 ME3 PH1	MA1 ME3 PH1
<b>Qual Disp EN</b>	AE1 CL1 ME1	ME1	ME1	CL1 ME1	AE1 CL1 ME1	CL1 ME1	CL1 CS1 ME1	ME1	CL1 ME1	CL1 EE2 ME1	ME1	ME1
<b>Qual Disp EP</b>	CL1 PH1	PH1	PH1	CL1 PH1	CL1 PH1	CL1 PH1	CL1 CS1 PH1	PH1	CL1 EE1 EE3 EE4 PH1	CL1 EE2 EE4 PH1	PH1	PH1
<b>Qual Disp EV</b>	CL1	CE2 CE4		CE2 CL1	CE2 CE4 CL1	CE2 CH1 CL1	CL1 CS1		CL1	CL1		
<b>Qual Disp IE</b>	CL1 ME3	ME3	ME3	CL1 ME3	CL1 ME3	CL1 ME3	CL1 CS1 ME3	ME3	CL1 ME3	CL1 ME3	ME3	ME3
<b>Qual Disp IN</b>	AE1 AM2 CL1 ME3	ME3	ME3	CL1 ME3	AE1 AM2 CL1 ME3	AM2 CL1 ME3	AM2 CL1 CS1 ME3	ME3	AM2 CL1 EE1 EE3 EE5 ME3	AM2 CL1 EE2 EE5 ME3	ME3	ME3
<b>Qual Disp IT</b>	CL1			CL1	CL1	CL1	CL1 CS1		CL1	CL1		
<b>Qual Disp ME</b>	AE1 AM1 AM2 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	CE2 CE4 MA1 ME1 ME2 ME3 MM1 OE1 OE2	MA1 ME1 ME2 ME3 MM1 OE1 OE2	CE2 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	AE1 AM1 AM2 CE2 CE4 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	AM1 AM2 CE2 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2 PE1	AM2 CL1 CS1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	MA1 ME1 ME2 ME3 MM1 OE1 OE2	AM2 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	AM2 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	MA1 ME1 ME2 ME3 MM1 OE1 OE2	MA1 ME1 ME2 ME3 MM1 OE1 OE2 PE1
<b>Qual Disp MF</b>	AE1 CL1 ME3 MM1	ME3 MM1	ME3 MM1	CL1 ME3 MM1	AE1 CL1 ME3 MM1	CL1 ME3 MM1	CL1 CS1 ME3 MM1	ME3 MM1	CL1 ME3 MM1	CL1 ME3 MM1	ME3 MM1	ME3 MM1

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	GATE Paper IN	GATE Paper MA	GATE Paper ME	GATE Paper MN	GATE Paper MT	GATE Paper PE	GATE Paper PH	GATE Paper PI	GATE Paper TF	GATE Paper XE	GATE Paper XL
Qual Disp CS	AM2 CL1 MA1 ME3	MA1 ME3	AE1 AM2 CL1 MA1 ME3	CL1 MA1 ME3	AM2 CL1 MA1 ME3	MA1 ME3	MA1 ME3	CL1 MA1 ME3	CL1 MA1 ME3	AE1 AM2 CL1 MA1 ME3	MA1 ME3
Qual Disp EC	AM2 CL1 EE5 MA1 ME3	MA1 ME3	AE1 AM2 CL1 MA1 ME3	CL1 MA1 ME3	AM2 CL1 MA1 ME3	MA1 ME3	MA1 ME3	CL1 MA1 ME3	CL1 MA1 ME3	AE1 AM2 CL1 MA1 ME3	MA1 ME3
Qual Disp EE	AM2 CL1 EE5 MA1 ME3 PH1	MA1 ME3 PH1	AE1 AM2 CL1 MA1 ME3 PH1	CL1 MA1 ME3 PH1	AM2 CL1 MA1 ME3 PH1	MA1 ME3 PH1	MA1 ME3 PH1	CL1 MA1 ME3 PH1	CL1 MA1 ME3 PH1	AE1 AM2 CL1 MA1 ME3 PH1	MA1 ME3 PH1
Qual Disp EN	CL1 ME1	ME1	AE1 CL1 ME1	CL1 ME1	CL1 ME1	ME1	ME1	CL1 ME1	CL1 ME1	AE1 CL1 ME1	ME1
Qual Disp EP	CL1 PH1	PH1	CL1 PH1	CL1 PH1	CL1 PH1	PH1	EE5 PH1	CL1 PH1	CL1 PH1	CL1 PH1	PH1
Qual Disp EV	CL1		CE2 CE4 CL1	CL1	CL1			CL1	CL1	CE2 CE4 CL1	
Qual Disp IE	CL1 ME3	ME3	CL1 ME3	CL1 ME3	CL1 ME3	ME3	ME3	CL1 ME3	CL1 ME3	CL1 ME3	ME3
Qual Disp IN	AM2 CL1 EE4 EE5 ME3	ME3	AE1 AM2 CL1 ME3	CL1 ME3	AM2 CL1 ME3	ME3	ME3	CL1 ME3	CL1 ME3	AE1 AM2 CL1 ME3	ME3
Qual Disp IT	CL1		CL1	CL1	CL1			CL1	CL1	CL1	
Qual Disp ME	AM2 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	MA1 ME1 ME2 ME3 MM1 OE1 OE2	AE1 AM1 AM2 CE2 CE4 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2 MM1 OE1 OE2 PE1	CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	AM1 AM2 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	MA1 ME1 ME2 ME3 MM1 OE1 OE2 PE1	MA1 ME1 ME2 ME3 MM1 OE1 OE2	CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2	AE1 AM1 AM2 CE2 CE4 CL1 MA1 ME1 ME2 ME3 MM1 OE1 OE2 MM1 OE1 OE2 PE1	MA1 ME1 ME2 ME3 MM1
Qual Disp MF	CL1 ME3 MM1	ME3 MM1	AE1 CL1 ME3 MM1	CL1 ME3 MM1	CL1 ME3 MM1	ME3 MM1	ME3 MM1	CL1 ME3 MM1	CL1 ME3 MM1	AE1 CL1 ME3 MM1	ME3 MM1

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**Please refer to Table 3 of the Brochure for details**

	GATE Paper AE	GATE Paper AG	GATE Paper AR	GATE Paper BT	GATE Paper CE	GATE Paper CH	GATE Paper CS	GATE Paper CY	GATE Paper EC	GATE Paper EE	GATE Paper EY	GATE Paper GG (Geophysics for PE1)
<b>Qual Disp ML</b>	CL1 ME3	ME3	ME3	CL1 ME3	CL1 ME3	CL1 ME3	CL1 CS1 ME3	ME3	CL1 ME3	CL1 ME3	ME3	ME3
<b>Qual Disp MM</b>	AE1 AM1 AM2 CL1 MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	CL1 MA1 MM1 PH1	AE1 AM1 AM2 CL1 MA1 MM1 PH1	AM1 AM2 CL1 MA1 MM1 PH1	AM2 CL1 CS1 MA1 MM1 PH1	MA1 MM1 PH1	AM2 CL1 MA1 MM1 PH1	AM2 CL1 MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1
<b>Qual Disp MR</b>	CL1 ME1 OE1 OE2	ME1 OE1 OE2	ME1 OE1 OE2	CL1 ME1 OE1 OE2	CL1 ME1 OE1 OE2	CL1 ME1 OE1 OE2	CL1 CS1 ME1 OE1 OE2	ME1 OE1 OE2	CL1 ME1 OE1 OE2	CL1 ME1 OE1 OE2	ME1 OE1 OE2	ME1 OE1 OE2
<b>Qual Disp NA</b>	AE1 AM1 CL1 MA1 ME3 OE1 OE2	MA1 ME3 OE1 OE2	MA1 ME3 OE1 OE2	CL1 MA1 ME3 OE1 OE2	AE1 AM1 CL1 MA1 ME3 OE1 OE2	AM1 CL1 MA1 ME3 OE1 OE2	CL1 CS1 MA1 ME3 OE1 OE2	MA1 ME3 OE1 OE2	CL1 MA1 ME3 OE1 OE2	CL1 MA1 ME3 OE1 OE2	MA1 ME3 OE1 OE2	MA1 ME3 OE1 OE2
<b>Qual Disp PE</b>	CL1 ME1	ME1	ME1	CL1 ME1	CL1 ME1	CL1 ME1 PE1	CL1 CS1 ME1	ME1	CL1 ME1	CL1 ME1	ME1	ME1 PE1
<b>Qual Disp PI</b>	CL1 ME3	ME3	ME3	CL1 ME3	CL1 ME3	CL1 ME3	CL1 CS1 ME3	ME3	CL1 ME3	CL1 ME3	ME3	ME3
<b>Qual Disp PR</b>	AE1 CL1 ME3 MM1	ME3 MM1	ME3 MM1	CL1 ME3 MM1	AE1 CL1 ME3 MM1	CL1 ME3 MM1	CL1 CS1 ME3 MM1	ME3 MM1	CL1 ME3 MM1	CL1 ME3 MM1	ME3 MM1	ME3 MM1
<b>Qual Disp ZE</b>	AE1 AM1 AM2 CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	CE2 CE4 ME1 ME2 ME3 MM1 OE1 OE2 PH1	CE1 CE6 ME1 ME2 ME3 MM1 OE1 OE2 PH1	CE2 CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	AE1 AM1 AM2 CE1 CE2 CE3 CE4 CE5 CE6 CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	AM1 AM2 CA1 CE2 CH1 CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	AM2 CL1 CS1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	CA1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	AM2 CL1 EE1 EE3 EE4 EE5 ME1 ME2 ME3 MM1 OE1 OE2 PH1	AM2 CL1 EE2 EE4 EE5 ME1 ME2 ME3 MM1 OE1 OE2 PH1	ME1 ME2 ME3 MM1 OE1 OE2 PH1	ME1 ME2 ME3 MM1 OE1 OE2 PH1
<b>Qual Disp CY</b>	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	CA1 MM1 PH1	CS1 MM1 PH1	CA1 MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1
<b>Qual Disp GG</b>						PE1	CS1					PE1

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	GATE Paper IN	GATE Paper MA	GATE Paper ME	GATE Paper MN	GATE Paper MT	GATE Paper PE	GATE Paper PH	GATE Paper PI	GATE Paper TF	GATE Paper XE	GATE Paper XL
<b>Qual Disp ML</b>	CL1 ME3	ME3	CL1 ME3	CL1 ME3	CL1 ME3	ME3	ME3	CL1 ME3	CL1 ME3	CL1 ME3	ME3
<b>Qual Disp MM</b>	AM2 CL1 MA1 MM1 PH1	MA1 MM1 PH1	AE1 AM1 AM2 CL1 MA1 MM1 PH1	CL1 MA1 MM1 PH1	AM1 AM2 CL1 MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	CL1 MA1 MM1 PH1	CL1 MA1 MM1 PH1	AE1 AM1 AM2 CL1 MA1 MM1 PH1	MA1 MM1 PH1
<b>Qual Disp MR</b>	CL1 ME1 OE1 OE2	ME1 OE1 OE2	CL1 ME1 OE1 OE2	CL1 ME1 OE1 OE2	CL1 ME1 OE1 OE2	ME1 OE1 OE2	ME1 OE1 OE2	CL1 ME1 OE1 OE2	CL1 ME1 OE1 OE2	CL1 ME1 OE1 OE2	ME1
<b>Qual Disp NA</b>	CL1 MA1 ME3 OE1 OE2	MA1 ME3 OE1 OE2	AE1 AM1 CL1 MA1 ME3 OE1 OE2	CL1 MA1 ME3 OE1 OE2	AM1 CL1 MA1 ME3 OE1 OE2	MA1 ME3 OE1 OE2	MA1 ME3 OE1 OE2	CL1 MA1 ME3 OE1 OE2	CL1 MA1 ME3 OE1 OE2	AE1 AM1 CL1 MA1 ME3 OE1 OE2	MA1 ME3
<b>Qual Disp PE</b>	CL1 ME1	ME1	CL1 ME1 PE1	CL1 ME1	CL1 ME1	ME1 PE1	ME1	CL1 ME1	CL1 ME1	CL1 ME1 PE1	ME1
<b>Qual Disp PI</b>	CL1 ME3	ME3	CL1 ME3	CL1 ME3	CL1 ME3	ME3	ME3	CL1 ME3	CL1 ME3	CL1 ME3	ME3
<b>Qual Disp PR</b>	CL1 ME3 MM1	ME3 MM1	AE1 CL1 ME3 MM1	CL1 ME3 MM1	CL1 ME3 MM1	ME3 MM1	ME3 MM1	CL1 ME3 MM1	CL1 ME3 MM1	AE1 CL1 ME3 MM1	ME3 MM1
<b>Qual Disp ZE</b>	AM2 CL1 EE5 ME1 ME2 ME3 MM1 OE1 OE2 PH1	ME1 ME2 ME3 MM1 OE1 OE2 PH1	AE1 AM1 AM2 CE2 CE4 CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	AM1 AM2 CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	ME1 ME2 ME3 MM1 OE1 OE2 PH1	ME1 ME2 ME3 MM1 OE1 OE2 PH1	CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	AE1 AM1 AM2 CE2 CE4 CL1 ME1 ME2 ME3 MM1 OE1 OE2 PH1	ME1 ME2 ME3 MM1 PH1
<b>Qual Disp CY</b>	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1
<b>Qual Disp GG</b>			PE1			PE1				PE1	

**Important Note: \*\*\*N & \*\*\*F seats are NOT available for some departments/qualifying disciplines.**

**Please refer to Table 3 of the Brochure for details**

	GATE Paper AE	GATE Paper AG	GATE Paper AR	GATE Paper BT	GATE Paper CE	GATE Paper CH	GATE Paper CS	GATE Paper CY	GATE Paper EC	GATE Paper EE	GATE Paper EY	GATE Paper GG (Geophysics for PE1)
Qual Disp MA	MA1	MA1	MA1	MA1	MA1	MA1	CS1 MA1	MA1	MA1	MA1	MA1	MA1
Qual Disp MC							CS1					
Qual Disp MP							CS1					
Qual Disp MS	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	CS1 MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1
Qual Disp NT	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	CS1 MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1
Qual Disp OR							CS1					
Qual Disp PH	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	CS1 MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1
Qual Disp ST							CS1					
Qual Disp ZL							CS1					
Qual Disp ZS	AE1 ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1	AE1 ME1 ME2 MM1	CA1 CH1 ME1 ME2 MM1	CS1 ME1 ME2 MM1	CA1 ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1

**Important Note: \*\*\*N & \*\*\*F seats are NOT available for some departments/qualifying disciplines.**

**Please refer to Table 3 of the Brochure for details**

	GATE Paper IN	GATE Paper MA	GATE Paper ME	GATE Paper MN	GATE Paper MT	GATE Paper PE	GATE Paper PH	GATE Paper PI	GATE Paper TF	GATE Paper XE	GATE Paper XL
Qual Disp MA	MA1	MA1	MA1	MA1	MA1	MA1	MA1	MA1	MA1	MA1	MA1
Qual Disp MC											
Qual Disp MP											
Qual Disp MS	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1
Qual Disp NT	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1	MM1 PH1
Qual Disp OR											
Qual Disp PH	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	EE5 MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1	MA1 MM1 PH1
Qual Disp ST											
Qual Disp ZL											
Qual Disp ZS	ME1 ME2 MM1	ME1 ME2 MM1	AE1 ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1	ME1 ME2 MM1	AE1 ME1 ME2 MM1	ME1 ME2 MM1

**Important Note: \*\*\*N & \*\*\*F seats are NOT available for some departments/qualifying disciplines.**

**Please refer to Table 3 of the Brochure for details**

## 2.9 Admission procedure

### 2.9.1 GATE qualified Indian Nationals

Admission to candidates (who are not required to take Suitability Test/ Interview) will be finalized strictly in the order of merit as per the GATE Score (CGPA & Department Review for IIT Graduates) and on the basis of choices given by them in the application.

Candidates requiring Suitability Test/ Interview shall report at the office of the Head of the respective Department as per the following schedule:

**Date of Suitability Test/ Interview**      **30<sup>th</sup> April, 2016 (Saturday)** Time: 8:30 a.m.

**Persons with Disability (PwD):** For PwD candidates with any category of disability (viz., blindness or low vision, hearing impairment, locomotor disability or cerebral palsy), benefit will be given to only those who have at least 40% permanent physical impairment in relation to a body part/ system/ extremity/ whole body, etc. Such candidates must upload, along with the Application Form, the **Certificate of Disability** from the authorized medical board attached to one of the following: Vocational Rehabilitation Centre (VRC) for Physically Handicapped persons /Special Employment Exchange for Physically Handicapped/ Government Hospital (District and State level).

First set of offers for HTTA and N-HTTA seats are likely to be sent by **10<sup>th</sup> May 2016 (Tuesday)**. The candidates who accept the offer, have to make online payment of Institute Fees within the stipulated date. Second and subsequent rounds of offers may be made depending on the availability of the seats. Online Procedural Details are available at the M. Tech. Admission Portal. In the final round, seats unfilled, if any, within a Department offering multiple Programmes will be re-distributed to other Programmes within the Department.

- Upgrading

There is a possibility of upgrading the choice(s) of the candidates who have already accepted the offer of admission, depending upon the subsequent availability of vacancies. Please note that during the upgradation, depending on the indicated order of preference, it is possible for a candidate to switch from a HTTA seat to an N-HTTA seat if N-HTTA is higher in order of preference given by the candidate.

- Additional Round of Offer after the Admission Day (25<sup>th</sup> July, 2016, Monday)

When the candidates who are given admission during first, second and subsequent rounds of offers withdraw from the programmes, the seats get vacant. Though subsequent round(s) of offers try to fill these vacancies, there is a possibility that some seats may get vacant after the Admission Day (25<sup>th</sup> July 2016: Monday). If the seats fall vacant, Additional Round of Offers will be conducted on **26<sup>th</sup> July 2016 (Tuesday)** to fill these remaining vacancies. Candidates who could not secure admission in the first, second and subsequent rounds of offers before the Admission Day, will be considered for this Round. Unlike the "Spot Round" conducted last year, candidates are **NOT** required to report **In Person** for the Additional Round. The Additional Round



will be similar to the round of offers conducted before the Admission Day. Please note that Additional Round of offers after the Admission Day will be operated only when there are any unfilled seats, and its operational details will be available on the M. Tech Admission site: <http://mtechadm.iitm.ac.in>

## Reporting for Admission

GATE qualified candidates and IIT B.Tech. graduates who accept the offer of admission must produce completion certificate of their qualifying degree examination and join the Institute on **25<sup>th</sup> July, 2016 (Monday) forenoon**. Failure to do so will result in cancellation of the offer of admission. Sponsored candidates also should report for admission on **25<sup>th</sup> July, 2016 (Monday) afternoon**. Selected candidates will have to pay various fees and deposit amounts as applicable. The candidate must produce a medical fitness certificate from a Registered Medical Practitioner in the format which can be downloaded along with the letter of offer of admission.

In all matters relating to admission, the decision of the M.Tech. Admission Committee will be final.

### 2.9.2 GATE qualified Foreign Nationals

Admission to Foreign Nationals follows similar procedure as mentioned in Section 2.9.1 on par with General Category candidates.

## 2.10 Payment of Admission Fee and Refund Policy

### 2.10.1 For Indian Nationals:

When admission is offered and accepted by candidates, the candidates have to pay an Institute Fee of **Rs. 17963/-** in the case of General/ OBC candidates and **Rs. 12963/-** in the case of SC/ST candidates, using the online payment facility available on the website. In case a candidate withdraws his/her offer of Admission, a Processing Fee of **Rs.1000/-** will be retained by the Institute and the remaining amount would be refunded. However, if a candidate accepts the offer of admission made in the Additional Round (after the Admission Day of 25th July, 2016), and pays the Institute Fee, then no refund of Institute Fee will be made on withdrawal of admission.

### 2.10.2 For Foreign Nationals:

If a Foreign National is offered admission, it would be provisional. If this offer is accepted, the candidate has to pay an Institute Fee of **USD 2261/-** (for SAARC Nationals) or **USD 4261/-** (for other than SAARC Nationals) per annum. The amount can be paid in equivalent Indian currency (**INR**) as specified by Institute (will be informed at the time of paying) using online payment facility available on the website. In case a candidate withdraws his/her offer of Admission, a Processing Fee of **Rs.1000/-** will be retained by the Institute and the remaining amount would be refunded. However, if a candidate accepts the offer of admission made in the Additional Round (after the Admission Day of 25th July, 2016), and pays the Institute Fee, then no refund of Institute Fee will be made on withdrawal of admission.

**Table 5: Institute Fee to be paid using online payment facility**

Category/ Group	Day Scholar	Hosteller
General & OBC <b>per semester</b>	Rs. 17213	Rs. 17963
SC & ST <b>per semester</b>	Rs. 12213	Rs. 12963
Foreign Nationals (SAARC Nationals) <b>per annum</b>	USD 2261	USD 2261
Foreign Nationals (Non-SAARC Nationals) <b>per annum</b>	USD 4261	USD 4261

Hostellers have to pay additionally Rs. 20150 to the Chairman, Council of Wardens during the time of admission (Refer Table 6D) through the website [www.onlinesbi.com](http://www.onlinesbi.com) using any bank Debit / Credit Card / Net Banking.

## 2.11 Details of Fees and Deposits

The break-up of various fees and deposits for all the four semesters are given in Table 6. Fees are subjected to revision from time to time as decided by the Institute.

**Table 6: Fees and Deposits**

**For Indian Nationals:**

### A. One Time Payment

No.	Details of Fees	July-Dec 2016 (Rs.)
1.	Admission fee	150
2.	Grade Card	150
3.	Provisional Certificate	100
4.	Medical Examination Fee	100
5.	Student Welfare Fund	500
6.	Modernisation Fee	500
7.	Alumni Life Membership(NS)	500
8.	Publication(NS)	250
<b>Total – A</b>		<b>2250</b>

## B. Semester Fees

No.	Details of Fees	July- Dec 2016 (Rs.)	Jan-May 2017 (Rs.)	July-Dec 2017 (Rs.)	Jan- May 2018 (Rs.)
1.	Tuition Fee+	5000#	5000#	5000#	5000#
2.	Examination Fee	300	300	300	300
3.	Registration & Enrolment	300	300	300	300
4.	Gymkhana	1000	1000	1000	1000
5.	Medical Fee and Student Wellness Fee	400	400	400	400
6.	Hostel Seat Rent*	5000	5000	5000**	5000**
7.	Fan, Electricity & Water*	750	750	750	750
8.	Medical Insurance	963**	-	963**	-
<b>Total - B</b>		<b>13713</b>	<b>12750</b>	<b>13713</b>	<b>12750</b>

## C. Deposits (Refundable)

1.	Institute Deposit (Rs.)	1000
2.	Library Deposit (Rs.)	1000
<b>Total – C</b>		<b>2000</b>

## D. Hostel Fees & Mess Charges per Semester (Payable to the Chairman, Council of Wardens)

No.	Details of Fees	July- Dec 2016 (Rs.)	Jan-May 2017 (Rs.)	July-Dec 2017 (Rs.)	Jan- May 2018 (Rs.)
1.	Hostel Admission Fee	100	100	100	100
2.	Hostel Deposit (NS) (Refundable)*	2000	-	-	-
3.	Advance Dining Charges	12000	12000	12000	12000
4.	Establishment 'A' Charges***	5000	5000	5000	5000
5.	Establishment 'B' Charges	1000	1000	1000	1000
6.	Solid Waste Disposal Charges	50	50	50	50
<b>Total - D</b>		<b>20150</b>	<b>18150</b>	<b>18150</b>	<b>18150</b>

## Notes/ Exceptions

(NS) Non-Statutory Fees

+ SC/ST Students are exempted from payment of Tuition Fee.

# M.Tech. Sponsored candidates have to pay tuition Fee of Rs. 20,000/- additionally per semester.

\* Only for Hostellers

\*\* Subject to revision

\*\*\* Day Scholars also have to pay this amount.

**For Foreign Nationals under Section 2.7(G1):**

Country	Annual Fees In USD	One Time Fees In USD	Hostel Fees in INR	
			Deposit	Per Semester
SAARC Nationals	2000	261	2000	18150 (approx.)
Non-SAARC Nationals	4000			

### 3. M.TECH. PROGRAMME HIGHLIGHTS

#### I. DEPARTMENT OF AEROSPACE ENGINEERING

##### M.Tech. in Aerospace Engineering (AE1)

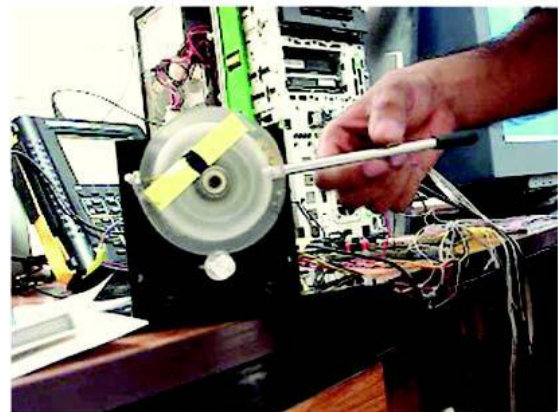
This Programme is based on a common core in the areas of aerodynamics, space technology, design, propulsion and structures. A number of elective courses are available for specialisation in areas related to aerospace engineering. Candidates with specialisations other than aeronautical/ aerospace engineering have to undergo certain basic core courses during the first semester. There is provision for aeronautical/ aerospace graduates to opt for other courses in lieu of basic core courses. Students also can choose elective courses offered by other departments which are of interest and have a direct bearing on the Programme of studies. Computational facilities with appropriate software support as well as experimental facilities in aerodynamics, propulsion, guidance/control and structures are available for project work.



#### II. DEPARTMENT OF APPLIED MECHANICS

##### M.Tech. in Engineering Mechanics (AM1) and M.Tech. in Biomedical Engineering (AM2)

Applied Mechanics is the only department in IIT Madras dedicated to Post Graduate programs in Engineering completely. In view of its unique interdisciplinary academic activities candidates from wide range of Engineering disciplines (see Tables 2 and 3) are eligible to apply.



##### Engineering Mechanics (Fluid Mechanics and Solid Mechanics) (AM1):

First Semester is common for all the students of this specialization. Based on the performance in the first semester and their preference, students will be allotted to either of these two groups.

Fluid Mechanics covers turbulence, hydrodynamic instability, convection, fluid-structure interaction, bio-fluid mechanics, waves, micro scale flows, CFD, etc. Solid Mechanics covers continuum theory, plates and shells, plasticity, fracture mechanics, modeling of materials, dynamics of structures, finite and boundary element methods, experimental stress analysis, digital photo mechanics. The students can choose analytical, computational and experimental approaches for their project work.

### **Biomedical Engineering (AM2):**

Closing the gap between the engineering and medicine, this specialization covers science and technology to understand the complexity of human physiology and pathology and to design and develop new diagnostic and rehabilitation techniques. A number of courses have been designed towards this objective and the students can undertake projects in medical instrumentations, imaging, signal processing, biomechanics, rehabilitation, haptics, etc.

### **III. DEPARTMENT OF BIOTECHNOLOGY**

#### **M.Tech. in Clinical Engineering (CL1)**

The use of advanced technology is an essential requirement of the modern medical practice. Thus, presence of well-trained Clinical Engineers within the healthcare system is also needed to ensure effective and safe use of this technology. Clinical Engineers are an integral part of the clinical and management team, and work closely with the medical practitioners to achieve optimal use of technology in healthcare. Clinical Engineers, being directly exposed to clinical set-up, can identify the un-met clinical need and apply their design and development skills to provide innovative solutions, which can fundamentally change the medical practice in the future.



The Joint M. Tech. Clinical Engineering Programme is the FIRST Programme in the country to formally train Graduate Engineers as Clinical Engineers. It was launched in 2008 with the support of Department of Science and Technology, Government of India.

Indian Institute of Technology Madras (One of the country's premier Institutes in technology education and research), Sree Chitra Tirunal Institute of Medical Sciences and Technology (SCTIMST), Trivandrum (A leading National Institute involved in technology development for medical devices and a tertiary care hospital) and Christian Medical College (CMC), Vellore (One of the finest medical colleges and research institutes, and a 2500 bedded multi-speciality hospital) jointly run the M.Tech. (Clinical Engineering) Programme. It brings together three of the best Institutions in the country that combine engineering, medicine and management. It has been designed to enable students to develop comprehensive knowledge in the field and acquire multiple skills to become highly proficient Clinical Engineers.

The selection will be done on an All-India basis, through a screening test and a personal interview of eligible candidates. The M.Tech. Programme will be of two years duration. The students will study and work at all the three participating Institutes. Fellowship is awarded to all the selected students for the complete duration (2 years) of the Programme. An aptitude for engineering and an interest in working in a hospital environment is desirable for the Programme.

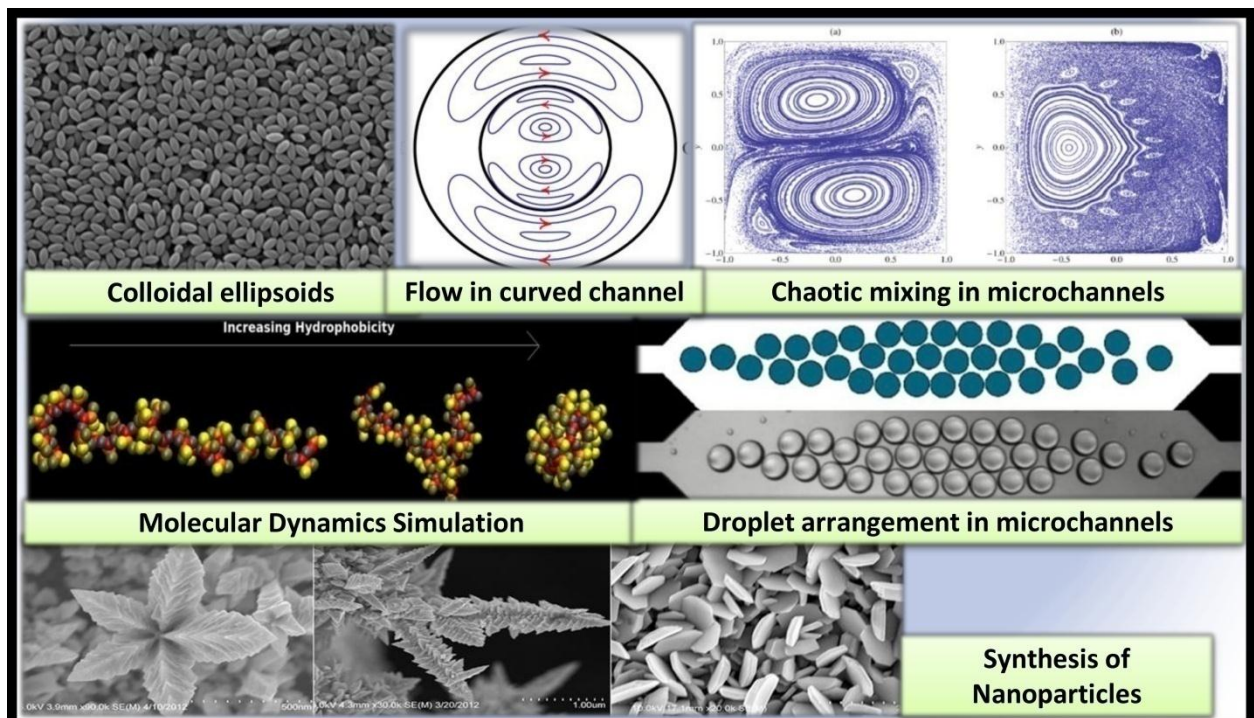
### Highlights of the Programme:

- A minimum of one semester in each institution, where engineering, medical and management courses are taught formally.
- Clinical Attachment (1 year in CMC, Vellore and SCTIMST, Trivandrum) gives a direct exposure to different departments of these hospitals to give an insight into the realities of a typical healthcare system.
- Internship (6 Months in SCTIMST, Trivandrum) - To work as a Clinical Engineer in the tertiary care hospital of the Institute.
- One week training in peripheral/ rural hospitals around the country.
- Short training in a medical device / medical instrumentation industry.
- Guest lectures and short courses by eminent professionals from leading hospitals and institutions of the country.
- Thorough exposure to medical device design and development processes.

For further details about the Clinical Engineering Programme, please visit <http://www.biotech.iitm.ac.in/mcephd/>. You can also contact Professor Mukesh Doble, Institute Co-ordinator, Joint Programmes with SCTIMST and CMC, Department of Biotechnology, IIT Madras, Chennai – 600036.

## IV. DEPARTMENT OF CHEMICAL ENGINEERING

### M.Tech. in Chemical Engineering (CH1)



The department of Chemical Engineering offers its M.Tech. programs specifically designed to provide specialized knowledge and equip students to meet the ever-changing demands of industry and academia. The students go through an enriching curriculum that offers them a well-balanced mix of coursework and research. The

program is spread over four semesters.

The main emphasis in the first two semesters is on coursework. The courses are classified as core/compulsory and electives. The *core courses* that present the basic and advanced concepts of Chemical Engineering in a holistic framework include *Chemical Reactor Theory, Transport Phenomena, Thermodynamics and Mathematical Methods in Chemical Engineering*. The *elective courses* are decided by the student in consultation with his/her thesis supervisor. These are intended to provide expertise in the student's research area of interest and equip him/her with the necessary tools and concepts for carrying out research project in the second half of the program. The student is free to choose these electives from a wide list of advanced elective courses offered by any department at IIT Madras.

The research project constitutes a major part of the work in the second year. The student under the supervision of a faculty member carries out state-of-the-art research in the frontier areas of chemical engineering such as computational fluid dynamics, materials science, biochemical engineering, environmental engineering, process control, reaction engineering, transport phenomena, particle technology, semiconductor processing, complex fluids and rheology, microfluidics, etc. The research involves solving problems of fundamental significance as well as of industrial relevance. The department offers the students an opportunity to work on research projects of fundamental nature sponsored by DST, DAE, ISRO, IGCAR, AICTE, MHRD, SERC, EIL among others. The department also attracts projects of industrial relevance sponsored by IOCL, HPCL, BPCL, HUL, JSW, ABB, BOC, BHEL, Carborundum, Saint-Gobain, Madras Refineries Limited, Tata Honeywell Limited, NMRL, Aditya Birla Group, CUMI-Murugappa Group, Renault-Nissan Technology Centre, General Motors among others.

The program is designed so that the students are evaluated on a continual basis. Emphasis is also placed on developing the written and oral communication skills of students. The M.Tech. program provides students with an experience that enhances their suitability in both industry and academia and empowers them to contribute to the development of chemical industry in India. The scope of each research area in the Chemical Engineering Department of IIT Madras is broadly classified as:

### **1. Fundamental studies**

Mathematical modeling of physico-chemical phenomena, applied statistical mechanics, thermodynamic property estimation, phase equilibria, flow visualization, microwave assisted thawing, drying, multi-component boiling and condensation, simultaneous heat and mass transfer processes, single and multiphase flow at micro-scales and its stability.

### **2. Modeling of processes and equipment**

Hydrodynamic and kinetic studies of turbulent bed contactors, trickle beds, slurry reactors, fast and inverse bed fluidized bed, CFD analysis of process equipment, advanced separation processes such as reactive and a zeotropic distillation, membrane processes, modeling of rotary kilns, bio-process engineering and optimization, analysis of bio-reactors, microelectronic fabrication techniques, microreactor technology



### 3. Development, characterization and processing of materials

Development of polymer blends and composites, polymer based nano-composites, rheology of polymers and colloids, damping and vibration isolation using polymers. Applying physical concepts to problems in biology, metals, molecules and light.

### 4. Process design and control, systems engineering

Advanced control design such as adaptive control, intelligent control, non-linear control, fault diagnosis and fault tolerant control, synthesis and optimization of process systems, statistical data processing, simulation and optimization of crushing and grinding circuits.

### 5. Environmental engineering and waste reduction

Liquid and solid waste treatment, air pollution monitoring and control, toxic and hazardous waste management, environmental risk assessment, color removal from waste water, recycling of mixed plastic waste.

## V. DEPARTMENT OF CIVIL ENGINEERING

### M.Tech. in Civil Engineering

The following six Programmes are offered in M.Tech. Civil Engineering Discipline:

#### **Building Technology and Construction Management (CE1)**

This unique specialization offers courses covering a range of subjects in Building Sciences, Construction Materials, and Construction Engineering and Management areas, which include:

Building Science: Functional design of buildings, Buildings acoustics & noise control, Building services, and Energy management in buildings.

Construction Materials: Modern construction materials, Characterisation of Construction Materials, Advanced concrete technology, Maintenance & rehabilitation of constructed facilities, and Structural systems & design.

Construction Engineering and Management: Construction methods and equipment, Sustainable Construction, Construction planning and control, Construction project management, Construction economics and finance, Quality and safety management, Lean construction, Construction contracts & specifications, and Computer applications in construction.



## **Environmental Engineering (CE2)**

This interdisciplinary Programme is designed to meet the needs of government departments/ public sector and industry, with emphasis on various aspects like protected water supply and sanitation for public health, pollution control, sustainable development, and fundamental science of various climate interaction and processes. The topics to be covered include protected water supply, waste water management, air pollution control, solid waste management, ground water pollution-fate, transport and remediation, environmental planning and impact assessment, modelling of air and water quality environmental chemistry, environmental microbiology biotechnology and environmental systems analysis, fundamentals of atmospheric and climate sciences.

The laboratory is equipped with sophisticated instrumentation facility with Gas chromatographs, High pressure Liquid Chromatograph, Ion chromatograph, Elemental analyzer, Total organic compound analyzer, FTIR and UV Spectrophotometers is one of the best facilities in the Country for environmental sample analyses. State-of-the-art and high end instruments for air pollution and climate research including aerosol research.

## **Geotechnical Engineering (CE3)**

This Programme provides specialized knowledge in various geotechnical engineering topics such as foundation engineering, ground improvement techniques, design of retaining walls, underground excavations, etc. A wide range of subjects such as advanced soil mechanics, rock mechanics, soil exploration and testing, applied soil mechanics, advanced foundation engineering, soil dynamics and machine foundations, earthquake geotechnical engineering, geoenvironmental engineering, geosynthetics and reinforced soil structures, ground improvement, finite element analysis and constitutive modelling of soils, geotechnics for infrastructures, and seismic site characterization are included in the curriculum.

## **Hydraulic and Water Resources Engineering (CE4)**

The major emphasis in Hydraulic and Water Resources Engineering is to provide specialized and practical knowledge in: soft computing in water resources, hydrologic modelling, stochastic and spatial hydrology, computational hydraulics, river flow, flood, dam-break flow, tsunami and storm surge propagation, coastal and estuarine flow, conjunctive use of surface and ground water, aquifer modelling and management, pollutant and sediment transport in rivers, water resources planning and management, irrigation water management, climate change, urban water supply and GIS/remote sensing applications.

The laboratory has several flumes for conducting various open-channel flow experiments. In addition, the laboratory is equipped with several table top models (hydraulic benches) to demonstrate basic hydraulic and hydrologic phenomenon such as laminar and turbulent flow, impact of jet, flow over weirs and notches, pumps, water distribution networks and basic rainfall-runoff processes. In addition, a number of high end PC's are available to meet the requirements of the graduate students. Advanced technical, computational and mathematical software tools required for design and simulation of water and environmental systems are available for class projects and research use.

## **Structural Engineering (CE5)**

This Programme deals with the following major areas: advanced structural mechanics, finite element analysis, structural dynamics, structural stability, structural reliability, structural optimization, reinforced and pre-stressed concrete, steel structures, design for wind and earthquake, plates and shells, bridges, tall buildings, towers, computer applications in structural engineering, fracture mechanics, masonry structures, power plant structures, composite structures.

## **Transportation Engineering (CE6)**

The programme covers wide range of topics under Transportation Engineering which includes characterization of pavement materials, design, construction, maintenance and management; traffic engineering including Intelligent Transportation System, transportation planning, modeling and management. The programme shapes up the students with the needed expertise and proficiency for a professional career in the field of transportation engineering. The students are imparted hands on training on pavement material characterization using state-of-art equipment; pavement evaluation studies; traffic engineering studies and analysis; development of models through latest software in design studio and by associating the students in several industry sponsored research projects. The students specialized in the area of Transportation engineering are very well placed in leading consultancy and research organizations/institutions in India and abroad. More details about the programme can be seen at: <http://www.civil.iitm.ac.in/new/?q=te> ; <http://coeut.iitm.ac.in/> and <http://www.civil.iitm.ac.in/faculty#tr>

## **VI. DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

### **M.Tech. in Computer Science and Engineering (CS1)**

The objective of this discipline is to train the manpower required (a) to meet the industry needs of the country, (b) to pursue research in specialized areas, and (c) to meet the growing needs of engineering colleges for trained faculty in Computer Science and Engineering. The Programme includes courses covering the core of Computer Science and Engineering discipline and several electives in areas of Intelligent Systems and Knowledge Engineering, Human Computer Interaction, Theoretical Computer Science, Networks and Distributed Systems Programming Languages, Compilers, Software Engineering, and Hardware Systems.



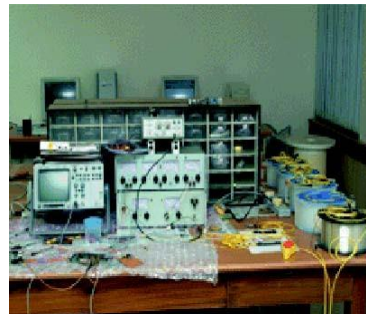
## VII. DEPARTMENT OF ELECTRICAL ENGINEERING

The following five Programmes are offered in M.Tech. Electrical Engineering Discipline:

### **Communications and Signal Processing (EE1)**

This Programme leads to specialization in modern communication system (with emphasis on broad band wireless communication), signal processing, optical and computer networks. Foundational graduate-level courses include probability and random processes, communication systems and digital signal processing.

A number of advanced electives are available in the areas of digital communication, information theory, coding theory, wireless communications, speech & image signal processing, optical and data networks. Comprehensive laboratory training covers implementation on DSP processors & advanced wireline and wireless communications. The students opting for this Programme are expected to have good basic knowledge in the areas of analog & digital communications, signal processing. The mathematical backgrounds needed are (i) signals and systems (LTI systems and basic transform theory) and (ii) basic probability & random-processes.



### **Power Systems and Power Electronics (EE2)**

This Programme leads to specialization in one or more of the following areas: electrical machines and drives, power electronics, power systems and high voltage engineering. Application of digital control methods in these areas could also be studied through an appropriate selection of the project work. In the first semester students have to undergo courses in the areas of power electronics, power systems, control engineering and instrumentation systems.

In the second semester, students get an opportunity to learn high voltage engineering and can further choose electives to further their knowledge in their specialization areas. Opportunity exists to take further advanced electives in the third semester besides starting on their project work. The fourth semester of the Programme is fully dedicated to a project work in the chosen area of specialization.

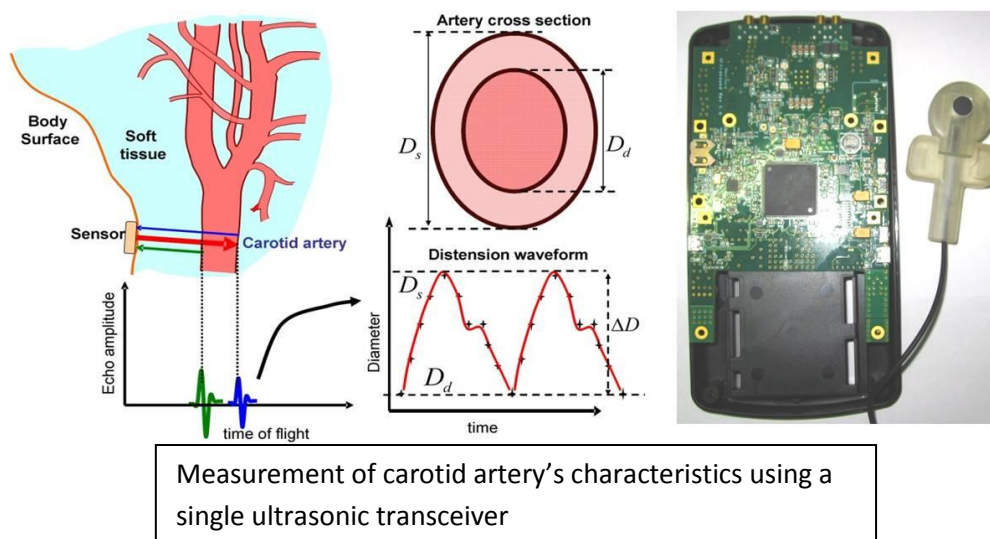
### **Microelectronics and VLSI Design (EE3)**

This Programme leads to specialization in the areas of semiconductor devices, VLSI technology, Micro Electro Mechanical Systems (MEMS), analog and digital IC design and architectures. A number of electives in the areas of VLSI design, mixed signal ICs, semiconductor device modeling, technology and characterization, photonic devices as well as MEMS are offered. The students have access to state of the art laboratory facilities and design tools.

It is desirable that students opting for this Programme have adequate background in semiconductor devices and analog and digital integrated circuits.

## Control and Instrumentation (EE4)

This Programme leads to specialization in the areas of control theory and systems, robotics, electronics and instrumentation for biomedical, power and measurement applications. In addition to core subjects and laboratory courses that focus on control systems, electronics and instrumentation, a number of electives are offered in the areas of transducers, analysis and synthesis of control systems, biomedical instrumentation. The program has strong linkage with the Healthcare Technology Innovation Centre ([www.htic.iitm.ac.in](http://www.htic.iitm.ac.in)) operating out of IIT Madras Research Park. Students will have opportunities to work along with medical professionals and industry in developing technology solutions for unmet healthcare needs of India.



It is desirable that students opting for this Programme have strong fundamentals in control theory, instrumentation, analog and digital electronics.

## Microelectronics and Photonics (EE5)

Photonics deals with all aspects of light such as its generation, transmission, modulation, processing, switching, amplification, detection and sensing. Expertise in the area of Photonics in the EE department fall under the categories of

1. Devices and Components - Integrated optoelectronics, Fibre Bragg Gratings (FBGs), Plasmonics, Optical MEMS, All optical logic.

2. Subsystems - a combination of optoelectronic devices and mixed signal electronics for metrology and instrumentation.

3. Networks - Optical communication networks, both at a physical layer and the implementation of algorithms and protocols at the service layer, and advanced encryption schemes using quantum key distribution. The program is supported by faculty from Departments of Physics, Applied Mechanics, and Engineering Design.



The curriculum for the Photonics Programme can be found in <http://www.ee.iitm.ac.in/optics/node/13>

The curriculum of all the five Programmes of M.Tech. includes a comprehensive twelve-month individual project. Students are exposed to cutting edge technology in these projects, and work on research problems that often serve as spring-boards to Research and Development careers.

### **VIII. DEPARTMENT OF MATHEMATICS**

#### **M.Tech. in Industrial Mathematics and Scientific Computing (MA1)**

The primary objective of this Programme is to train the manpower required to deal with the problems faced by industry through knowledge of mathematical modeling and scientific computational techniques so as to achieve reduced costs, flexibility and high quality.



The curriculum is interdisciplinary in nature and the course contents provide a broad understanding of the different aspects of applied mathematics and computer applications. The lecture-based courses cover a wide spectrum of topics including mathematical modeling, applied statistics and probability, operations research, numerical methods, discrete mathematics, data structures and simulation. The laboratory courses provide necessary training in advanced techniques of software and simulation. Students are also required to take suitable courses from engineering and science departments. Modeling workshops, spread over two semesters, are an integral part of the Programme, during which the students gain proficiency in the modeling of real world problems, experience in team work and effective technical communication.

An important component of the Programme is the project work that will be done by the student in collaboration with industry and engineering / science departments. The aim of the projects is to impart in-depth training in the analysis of problems relevant to industry.

### **IX. DEPARTMENT OF MECHANICAL ENGINEERING**

The following three Programmes are offered in M.Tech. Mechanical Engineering Discipline:

#### **Thermal Engineering (ME1)**

The Programme 'Thermal Engineering' offers courses related to theory and applications of thermal engineering. Core and Elective courses are offered by the Thermal Engineering faculty from the six laboratories comprising of (a) Thermodynamics and Combustion Engineering laboratory, (b) Heat



Transfer and Thermal Power laboratory, (c) Hydroturbomachines laboratory, (d) Internal Combustion Engines and Gas Turbines laboratory, (e) Refrigeration and Airconditioning laboratory, and (f) Thermal Turbomachines laboratory. All students have to take 9 stream courses in the first two semesters.

The courses are as follows:

Semester I - Advanced Heat and Mass Transfer, I.C. Engines Combustion and Pollution, Refrigeration and Cryogenics, Incompressible Fluid Flow, Principles of Turbomachinery and Applied Thermodynamics.

Semester II - Numerical Methods in Thermal Engineering, Measurements in Thermal Engineering, Advanced Energy Conversion, Thermal Engineering Laboratory.

The students also have an opportunity to study 4 elective courses from the department (out of a total of 66 possible electives) and 1 free elective from any department. The students will undertake a two semester project in their second year.

Core courses are designed to provide the students the required base for undertaking specialized electives and the project. The student will pursue a project of his/her choice in any area in which the thermal engineering faculty are engaged.

### **Mechanical Design (ME2)**

Mechanical Design Programme offers courses related to the mechanical aspects of design and their application. All the students take five core (theory) courses and one laboratory in the first semester - computational methods in engineering, theory of vibrations, principles of product design, design with advanced materials and advanced mechanics of solids.

Additional core subjects such as failure analysis, finite element analysis and a laboratory course on CAE are offered in the second semester. The students are offered a basket of electives such as design synthesis, design of transmission elements, gear design, CAD/CAM for product design, mechatronics, product reliability, design of transmission systems, fracture mechanics, tribo-design, tribo-instrumentation, nonlinear solid mechanics, optimization methods, rotor dynamics, random vibration, acoustics and noise control, vehicular vibration, chaotic vibration, advanced theory of vibration, modal analysis of mechanical systems, advanced nondestructive evaluation, elastic waves and ultrasonics, structural health and integrity monitoring, design for manufacture and assembly, theory of mixtures, mechanics of human movement.

The concepts learned through course work are useful for the project work done in the third and final semesters. The project work can be taken up in the following broad areas of expertise: Finite Element Analysis; CAE; Vibration; Acoustics and Noise Control; Fluid-structure interactions; Constitutive Material Modeling; Fatigue and Fracture; Machine Elements; Mechanisms; Kinematics; Non-Destructive Evaluation; Structural Health and Condition Monitoring; Tribology; Robotic and Automated Inspection, Fretting; Rotor Dynamics; Product Design; Bio-Mechanics, Human Body Kinematics, Prosthetics; Design Optimization and Reliability Engineering as well as in new and Emerging areas of mechanical engineering relating to design.

## **Manufacturing and Precision Engineering (ME3)**

The courses offered in the first and second semesters are computational methods in engineering, microprocessors in automation, metrology and computer aided inspection, computer-aided design in manufacturing, computer numerical control, advanced materials and processing, sensors for intelligent manufacturing & condition monitoring and mechatronics and oil hydraulics & pneumatic systems, Manufacturing and Precision Engineering Laboratories.

A good number of electives permit one to choose his/her area of interest within the broad spectrum of courses related to advanced manufacturing engineering, computer integrated manufacturing and precision engineering.

The list of electives include the courses such as production system design and control, robotics and robot applications, handling system design, tooling for automated manufacturing & assembly, and management of finance, marketing & personnel, with a special emphasis on impact of computers in advanced manufacturing. Further, a wide variety of electives for in-depth study in specific areas of CIM such as artificial intelligence in manufacturing, flexible manufacturing systems, machine vision & its applications are included. This also includes courses to give a clear understanding of the organizational aspects and total quality management of CIM environment. A number of electives are offered to cover precision engineering elements and instruments, manufacturing methods in precision engineering, precision drives & controls, applied optics, instrumentation and controls, and other important aspects of precision engineering which have assumed a great significance in the recent past for realizing a host of products ranging from IT to Aerospace.

The project work can be taken up in the areas such as computer applications in design and manufacturing, materials, heat treatment and manufacturing processes, process equipment and tools, process control and optimization, inspection, testing and quality assurance, manufacturing automation; sensors and handling devices. their selection, integration and control, simulation and management aspects. Project work can also be undertaken in the broad areas of instrumentation, robotics, precision manufacture, metrology, microprocessor system based development. CAD, adaptive and digital control system, active noise control, active suspension, embedded controllers for automotive application, sensor technology, micro actuators, dynamic balancing, magnetic suspension, gyroscopic systems, hydraulic and pneumatic systems, simulation and dynamic analysis, sintered bearings, mechatronic devices, computer aided surgery and Micro Electro Mechanical Systems (MEMS).

## **X. DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING**

### **M.Tech. in Metallurgical and Materials Engineering (MM1)**

This Programme is designed to strengthen understanding of the students in the core areas of metallurgical and materials engineering, and to meet the needs of Indian industry as well as R&D organizations. A blend of theoretical knowledge



**Thermo-Mechanical  
Simulator (Gleeble 3800)**



and modern laboratory and industrial practices is imparted to students through a few core courses and a set of elective courses. These courses span the areas of materials technology and manufacturing processes such as metal forming and materials joining. In addition, courses pertaining to areas such as characterization techniques improve the ability of the student to adapt to emerging areas of research. There are certain core courses such as mechanical behaviour of materials, materials characterization, thermodynamics & kinetics, Advanced phase transformations and numerical methods for metallurgists to be taken up by all M.Tech. students. A set of elective courses apart from the core courses will give a firm foundation to the students in an area of their choice.

The department offers materials technology related electives in the areas of advanced ceramics, bio-materials, Nano materials, smart materials, electronic materials, corrosion engineering, failure analysis, process modeling, solidification phenomena, iron and steel technology, etc.

Courses in the areas of manufacturing processes expose the students to various metal forming, metal joining techniques, surface engineering, metal casting processes, advanced powder processing, etc. The courses in the group of metal forming include metal forming processes, metal forming tools, plasticity and plastic deformation, press tools for metal forming, and special topics in metal forming, etc. The courses in the group of metal joining include advanced topics in metal joining, stress analysis in weld design, welding application technology, welding metallurgy, welding processes, etc.

In addition, courses in the areas of X-ray diffraction techniques, electron diffraction and microscopy, non-destructive evaluation, residual stress analysis, etc., will prepare the students to understand and use various characterization tools.

Apart from the departmental core and elective courses, some of the courses offered by other departments/specializations may also to be taken. Seminars and summer industrial training are integral parts of the Programme. Projects work constitutes a significant part of the M.Tech. Programme.

For further information visit web site: <http://www.mme.iitm.ac.in>

## ***XI. DEPARTMENT OF OCEAN ENGINEERING***

### **M.Tech. in Ocean Engineering (OE1)**

The M.Tech. Programme in Ocean Engineering relates to all forms of engineering activity in the oceans and includes deep-ocean, offshore and coastal waters. It is an interdisciplinary field which provides background to the students in a wide variety of areas such as offshore hydrodynamics, structural and foundation engineering, design and analysis of marine vehicles and floating systems, coastal engineering, design and analysis of offshore structures, ocean energy, instrumentation, experimental methods, and ocean



engineering materials. A large

number of electives provide opportunity to specialize in one or more areas of ocean engineering and equip students with skills in design, experiments and numerical modeling. This program prepares students to take up careers in offshore engineering pertaining to oil and gas, marine transportation, ports, coastal engineering etc.

### **M.Tech. in Ocean Technology (OE2)**

M.Tech. in Ocean Technology is a full-time four semester program sponsored by the National Institute of Ocean Technology (NIOT), Ministry of Earth Sciences, to meet the needs of trained manpower in various ocean technology related projects in India.

Students opting for this program should have background either in engineering or in science and they should be interested in a career in technology, engineering systems which include marine transport, environment, ocean mining, underwater systems, ports and harbours, maritime security and marine scientific research. Ocean Engineering activities require a multi-disciplinary approach involving technical aspects of complex marine systems in coastal as well as deep ocean waters. The curriculum is specially tailored to encompass these aspects. Another important component of this program is shipboard training designed to give the students a feel for the sea and an opportunity to conduct scientific research in sea.

Eligibility: Candidates should have first class or 60% (55% in case of SC/ST) in Bachelor's degree in any branch of Engineering or Technology or Master's degree in Oceanography, Marine Sciences, Ocean Science and Technology, Applied Mathematics, Applied Geology, Geophysics, and Physics or any other equivalent degree approved by the Advisory Committee with minimum 2 years experience in NIOT or in an organization approved by NIOT. Fresh candidates with GATE score may also apply for a few seats approved by NIOT.

## **XII. DEPARTMENT OF PHYSICS**

### **M.Tech. Functional Materials and Nanotechnology (PH1)**

Today's nanotechnology makes use of functional materials for various cutting edge technologies. Solid state materials with functional properties play a key role in applications spanning from space, defence, automotive, electronic, spintronics, MEMS, sensors, and medical technology. The fundamental understanding of functional materials is imperative in order to envisage applicability of these materials.

The department of Physics offers an M.Tech. program in "Functional Materials and Nanotechnology". This full-time four-semester program exposes the students to the science and technological aspects of the most advanced material systems. The students will gain thorough knowledge on the basic aspects of materials, design of materials with properties suitable for device



applications. In addition, the program provides a complete perspective of the physics of nanomaterials and material technology aspects at the nanoscale leading to new avenues in nanoscience and nanotechnology.

The lecture based courses cover a wide spectrum of topics. The main focus is to provide abroad understanding of the various aspects of functional materials and nanotechnology. The topics include synthesis and characterization of advanced functional and nanomaterials, semiconductors and devices, magnetic and spintronic materials, optical and optoelectronic materials, superconductors, sensors and actuators. In addition, courses on vacuum science and thin films and advanced condensed matter physics, will provide a strong platform for those who might be interested in research programs.

The laboratory courses provide necessary training on material preparation, and advanced characterization techniques for nanotechnology. The students will be exposed to the state-of-the-art facilities such as High Resolution Electron Microscopy, Scanning Probe Microscopy (SPM), SQUID Magnetometer, Spectroscopy Techniques, Thin Film Deposition Techniques, etc.

An important component of the program is the project work that spreads over the last two semesters. The project work enables the students to equip themselves for a research career and also imparts necessary training and experimental expertise relevant to industry. Internship at industry/research laboratories during the first year summer will add to this rich experience.

### **XIII. M.Tech. PROGRAMMES (INTERDISCIPLINARY)**

#### **M.Tech. in Catalysis Technology (CA1)**

This Programme will be coordinated by the Department of Chemical Engineering in association with the National Centre for Catalysis Research (NCCR). NCCR is a national centre established by the Department of Science and Technology, Government of India to promote human resource development in this vital area and also to be useful to the Indian industry.

Considering the needs of Indian Chemical industry, this Programme has been developed strictly adhering to the academic standards stipulated by our institute. Elective courses cover topics such as catalysis in green chemistry and environment, photo-catalysis, catalysis in petroleum technology, catalysis in the production of chemicals, nano-materials in catalysis, bio-catalysis and computational methods in catalysis. All these electives have been designed to reflect the frontiers of research and development that are going on in these areas. In addition the candidates have been given the option to choose the electives offered by the Chemical Engineering Department and also by the Department of Chemistry on surface chemistry and chemical and electro chemical energy systems. The blend of science and technology in this course has come out naturally and hence the course can be interesting to students of both streams.

#### **M.Tech. in Clinical Engineering (CL1)**

See page 27

## **M.Tech. in Petroleum Engineering (PE1)**

The M.Tech. Programme in Petroleum Engineering is an interdisciplinary Programme designed to meet the need of highly qualified manpower in the petroleum industry.

The curriculum covers the entire gamut of engineering activities in the petroleum industry, from petroleum prospecting, exploration and production to petroleum refining. Both onshore and offshore petroleum reserves and their exploitation are emphasized. The Programme will provide the students with a broad knowledge of the principles and practical aspects of petroleum engineering through key courses on petroleum geology, reservoir engineering, petroleum prospecting technologies, drilling technology, oil and gas production systems, risk analysis and safety issues, subsea engineering for oil and gas fields, petroleum refining methods etc. The students will also undergo summer training in ONGC facilities. The design and thesis projects will equip students to take up careers in challenging problems in both onshore and offshore oil and gas industry.

## **4. USER ORIENTED PROGRAMMES (UOP)**

User Oriented Programmes are designed to meet the specific requirements of the user industries.

### **(i) M.Tech. in Construction Technology and Management (CE7)**

This user-oriented Programme tailored to meet the requirements of the construction Industry and is open only to sponsored candidates from Larsen & Toubro Ltd. and other organizations involved in construction operations - both government and private. The Programme is designed for training construction engineers and managers with undergraduate degree in Civil, Architecture, Mechanical and Electrical Engineering. The contents of the core courses incorporate topics in the areas of construction engineering and management.

Based on the background of the students, elective courses may be taken from courses offered by several Departments including: Civil Engineering, Electrical Engineering, Humanities & Social Sciences, Management Studies, Mechanical Engineering, Metallurgical and Materials Engineering and Ocean Engineering. Two semesters are devoted to project work, which can be done at the institute and/or the sponsoring agency.

### **(ii) M.Tech. in Automotive Technology (ME4)**

The User Oriented Programme in Automotive Technology, started in 2006, is designed based on the requirements of automotive industries. The curriculum and course contents have been prepared in consultation with various user industries. The novelty of this Programme is that some electives are designed to suit the requirements of automotive industries and R&D laboratories so that the participants will benefit from the expertise of faculty members. Industrial visits, expert lectures by eminent people in this field and project work on problems of relevance to industry are expected to make this Programme user-friendly.

### **(iii) M.Tech. in Ocean Technology (OE2)**

This Programme is sponsored by NIOT (vide page 36 for details)

### **(iv) M.Tech. in Offshore Structural Engineering (OE3)**

This Programme is for Larsen & Toubro. Details of curriculum for this Programme are available at [http://www.oec.iitm.ac.in/Curriculum\\_M.tech\\_Offshore.pdf](http://www.oec.iitm.ac.in/Curriculum_M.tech_Offshore.pdf)

### **(v) Post Graduate Diploma in Metro Rail Technology and Management**

Details of curriculum for this one year Programme are available at [http://www.civil.iitm.ac.in/PG\\_Diploma\\_Curriculum.pdf](http://www.civil.iitm.ac.in/PG_Diploma_Curriculum.pdf)

## **5. STUDENT AMENITIES**

### **5.1 Central Academic Facilities**

#### **5.1.1 Central Library**

The central Library, a five-storey, air-conditioned building, houses a large number of books and has subscriptions to most of the renowned journals of engineering, science and technology including e-subscriptions. It is divided into different sections: Text Book/Reference, General Stacks, Reading Halls, Journal and Current Periodicals, Media Research Centre (which regularly screens educational and scientific videos), and a Book Bank.

#### **5.1.2 Laboratories**

In order to fulfill the teaching and research pursuits, IIT Madras has laboratory facilities ranging from the very basic to highly sophisticated ones. The Institute houses many labs with cutting-edge resources built in collaboration with industry partners. The central lab facilities include Sophisticated Analytical Instrument Facility (SAIF), Material Science Research Centre (MSRC) and Central Electronic Centre (CEC). A complete list of all the labs under each department is available at: <http://www.iitm.ac.in/departments>.

#### **5.1.3 Computer Centre**

The computer Centre houses one of the supercomputing facilities of the country with high performance computing environment (HPCE), high speed Networks catering the needs of approximately 18,000 nodes spread over the campus, Data Centre , E-services and workflow.

#### **5.1.4 Central Workshop**

The workshop is an educational platform where science and technology intersect. The central Workshop is one of the support services of the Institute that enhances the academic process of B. Tech., M. Tech. students and Ph. D. Research Scholars. Experiment set ups are routinely fabricated in this facility with utmost quality within the stipulated time to support research projects and teaching lab requirements of the Institute.

### **5.2 Residential Facilities**

#### **5.2.1 Hostels**

IIT Madras is a residential Institute and provides on-campus accommodation to all students, faculty and staff. For students, there are 20 hostels out of which three are girls hostels. All Hostels are named after the prominent rivers of India. In view of unique and ecologically diverse nature of IITM , the students are not allowed to drive

powered vehicles in the campus. They can use bicycle or walk. The Institute operates buses and vans from the main gate to different parts of the campus and also around the Hostel and Institute Zone at frequent intervals for easy travel. Most hostels have capacity of 350 to 400 rooms. Internet and Local Area Network (LAN) facility is provided in every room and there is a computer room in all hostels as well. Students are also given an email account on the Institute Server.

Accommodation in the hostels is provided by the Chairman, Council of Wardens (CCW). The hostel rooms are furnished with a cot, a chair, and a writing table. Students are expected to bring their own bedding. Establishment fees cover the rent for the hostel accommodation (vide Section 2.11 for fees and deposits). Each hostel has a small library for exclusive use of the students of that hostel. Students can borrow novels and other reading material from the hostel library. Most hostels have also a garden. Every hostel has facility for sports such as table tennis, volley ball, ball-badminton courts. Every hostel has a music room and a tech room. Washing machines are provided in all the hostels. Students can also avail the laundry facility in the campus. There is a room with television known as the "common room" where most of the hostel gathering takes place.

Each hostel has a warden, who is a faculty member, and a resident Assistant Warden. They, with the help of the office staff, handle all administrative work concerning the hostel. The hostel council consists of the warden and a number student secretaries, elected by the residents of the hostel, decides issues pertaining the hostel.

### **5.2.2 Open Air Theatre (OAT)**

In between the Gajendra Circle (GC) and the hostel zone, you will spot a large arena called the OAT (Open Air Theatre), where the weekend movies are screened by the Film Club. The best of the latest movies in English, Hindi and regional languages are screened. Movies in other languages are also screened by cultural associations. OAT is the venue where the 'Saarang' (the Institute's cultural festival) pro-shows are held. The capacity of OAT is about 7000 and it looks splendid when it gets lit up during shows of Saarang.

### **5.2.3 Shopping**

The students Facilities Centre (SFC) located in the hostel zone caters the general needs of the students and is a popular location. It houses Patisserie cum coffee shop, general store, gift shop, juice shop, saloon, travel agency, printing and photocopying. The shopping centre in the residential zone hosts grocery shops, vegetable/fruit shops, a general purpose mega store, a tailor, a dry-cleaner and a beauty parlour.

### **5.2.4 Food**

Institute has two large dining facilities namely Himalaya and Vindhya. Students of Sarayu, Sharavati, and Sabarmati hostels dine at the Vindhya dining facility while the other students dine at Himalaya facility. The Institute provides its catering facility in

two other places in Krishna and Cauvery hostels. A multitude of caterers operate the Himalaya dining facility, with a choice of North Indian and South Indian vegetarian and non-vegetarian cuisines. A two-story sprawling food court will be available shortly in the Academic Zone.

### **5.2.5 Bank Facilities**

State Bank of India has a branch near the Gajendra Circle. A branch of Canara Bank is also available in the residential zone Shopping Centre. The SBI has two ATMs - one at the Branch and the other at the Taramani Guest House. Canara Bank has also two ATMs - one at its branch and the other opposite to Narmada Hostel. The SBI ATMs can be used to make all payments to the Institute. There is also an ICICI ATM in the office of Hostel Management (CCW office).

## **5.3 Student Life at Institute**

### **5.3.1 Institute Hospital**

Institute hospital has the facilities to take care of general health problems faced by students. It runs its services round the clock. Apart from the regular doctors, there are a set of visiting specialist including a general surgeon, ENT surgeon, ophthalmologist, orthopedist, cardiologist, and psychiatrist. Well-equipped laboratories for almost all tests, X-Rays, and an in-patient ward are also available. For details, visit: <https://hospital.iitm.ac.in/>

### **5.3.2 Guidance and Counseling**

'*Mitr*' is a body comprising faculty and senior students with an objective to provide guidance to the students on academic and extra-curricular activities in campus, to expose them to various life skills and to counsel students to cope with emotional disturbances they face - curriculum related or otherwise. You can reach *Mitr* at any time for any kind of difficulties and it will solve them just the way your friend would.

To help students who require counseling, expert/professional counselors are engaged by the Institute and are available in a counseling room located at the Central Library. They are also available 24x7 through telephone. Apart from this, the Institute Hospital has 2 specialists Psychiatrists who take care of students who seek their help or who are referred to by *Mitr* or faculty advisors.

### **5.3.3 Weaker Section**

Special help is provided for SC/ST students. The advisor for weaker section provides nurturing wherever required and tutoring by seniors. Students are benefitted significantly through the help provided at different stages.



### **5.3.4 Students with Physical Disability**

All the building are installed with elevators and ramps to facilitate access to the students with physical disability, and are assigned specially designed hostel rooms with attached bathroom in the ground floor. An exclusive advisor is assigned to take care of academic and general well-being of these students. Dean (Academic Courses), Advisor (PD) and Dean (Students) meet with each of these students periodically to understand the special attention /requirements on a case to case basis. Additional requirements like large font question paper, extra time during examinations, suitable requirement/assistance in conduct of laboratory experiments and flexible curriculum requirements are also provided.

### **5.3.4 Students' Welfare Fund**

Students' Welfare Fund provides financial assistance to the needy students such as aid for physically handicapped, accident or sudden illness related expenses that are not otherwise met by regular medical insurance, and loan to individual students to meet expenses related to travel and other expenses when they go on to 'study abroad schemes'.

### **5.3.5 Student's Distress Fund supported by Alumni**

IITM Alumni have created a corpus to provide help to deserving students who are identified under financial distress due to any reason such as loss of bread-winner in the family.

### **5.3.6 Medical Insurance Coverage for all Students**

All students are covered under a medical Insurance Scheme exclusively designed for students. Annual premium is paid by each student. All minor ailments are attended to by the Institute Hospital.

### **5.3.7 Travel Money by Alumni**

The IITM Alumni funded IITMAANA Travel Grant programme is designed to assist IITM students, faculty and staff to visit USA and other countries abroad and present their papers at internationally recognized technical conferences. Participation in summits, workshops, competitions and semester exchange programmes may also be funded through this programme. One of the main objectives of IITMAANA is to promote Research and Development in Technical Education by providing an opportunity to deserving students to interact with peers and experts at International level. For more details: <https://alumni.iitm.ac.in>

### **5.3.8 Prizes and Recognition**

No competent and deserving candidate goes unrecognized at IIT Madras. They win prizes for achievements ranging from commendable academic performance to those excelling in extra-curricular activities.

### **5.3.9 Training and Placement**

The Placement Office is involved in securing placements for students graduating from the Institute. The office maintains a close liason with various industrial establishments (both private and public sectors), which conduct campus interviews and select UG and PG students from all disciplines. The placement cell provides the infrastructural facilities to conduct group discussions, placement tests and interviews.

### **5.3.10 Industry and Alumni Relations**

IITM is actively involved with national and international organizations through the Centre for Industrial Consultancy and Sponsored research (IC & SR). Set up in 1973, the IC & SR plays a vital role in bringing together industry professionals and the faculty of the Institute for gaining insight and solving challenging problems. These joint efforts result in significant contributions to technology development. Students are actively involved in all these efforts. For more information, please visit: <https://icandsr.iitm.ac.in/>

### **5.3.11 Recreational/Extra Curricular Activities**

IITM has a vibrant campus with lots of opportunities for students to get involved in co-curricular and extra-curricular activities. With the establishment of Centre for Innovation (CFI), and Students Activities Centre (SAC), there are as many as 25 different co-curricular and cultural clubs with about 2000 students registered with them. These pave way for the students to develop their talents, passion and skills and to showcase their abilities.

Many competitions and festivals are held. The prominent ones are the technical festival, named 'Shaastra' and the cultural festival, named 'Saarang'. There are many smaller scale versions of fests conducted by clubs on campus. Apart from these, some departments also conduct special fests at different times in the year. Some of the prominent ones are CEA Fest, Exebit, Biofest, Amalgam, Forays, Wavez, Mechanica, Samanvay and Chemclave.

### **5.3.12 Student Clubs**

A large number of student-managed clubs are active in the Institute: Astronomy Club, Data Analytics Club, Linux Users Club, Design Club, Music Club, Institute Adventure Club, Quiz Club, Word Games Club, IIT for villages, Prakriti (group of environmentally conscious people), Oratory Club, Colloquium, Reflections (Perception, Introspection and Retrospection), EMLs (Extra Mural Lectures, inspirational lectures).

### **5.3.13 Sports Activities and Facilities**

Sports at IIT Madras generates a lot of enthusiasm, not only within campus, but also from other colleges in the city and the country as well. The academic calendar is packed with sporting events, intra-hostel and inter-hostel events, inter-collegiate and

inter-IIT tournaments. All hostels actively compete to win the coveted Schroeter Cup which is the inter-hostel sports championship.

The Institute has excellent sporting facilities in the campus which include: IIT Champlast Cricket Field, Athletics stadium, four synthetic floored Tennis & Wood-Floored Badminton Courts, three flood-lit synthetic floored basketball and three volleyball courts, swimming pool of Olympic standards, Hockey & Football fields with flood-lights, well-equipped Gymnasium, and newly constructed word class Squash courts.

## **6. RESEARCH FACILITIES**

Ample opportunities exist for research-minded students to hone their research skills and participate actively in pioneering research studies. The faculty of departments of Engineering, Sciences, Management and Humanities & Social Sciences, along with their students, are involved in academic research, which often results in highly acclaimed publications in International and National Journals. Some of the research work is also presented in International and National conferences. A large number of sponsored research projects are funded by agencies such as the Department of Science and Technology, Aeronautical Research and Development Board, Indian Space Research Organisation, for tackling the challenging research issues of national interest. Several application-oriented industrial consultancy projects and collaborative research projects with foreign universities are also undertaken by our faculty.

Opportunities are available for interested students to participate in such sponsored research, industrial consultancy or collaborative research projects. The Industrial Consultancy & Sponsored Research (IC & SR) wing of the Institute coordinates the sponsored research and consultancy activities, while the Office of the Dean, Academic Research, administers the academic research activities.

The Engineering and Science Departments of our Institute are equipped with excellent laboratories, with state-of-the-art equipment. Research is being carried out on many areas of topical interest. For example, research is carried out in areas such as Laser Diagnostic Applications, Non-destructive Techniques, NMR Spectroscopy, Solid State Physics and Micro-electronic devices. Nano-materials technology, Bio-technology, Bio-medical research, Bio-chemistry, Wireless Local Loop Technology, Alternative Energy Sources and Emission Control, Composite Materials, Finite Element Modeling, Photo Elasticity, Structural Analysis, Computational Fluid Dynamics, Ocean Engineering, Vibration & Acoustics, Rarefied Gas Dynamics, to name a few. A more detailed description of the research work undertaken in each department is available in the Institute website. Strong expertise exists among the faculty on both theoretical and experimental methods of research.

M.Tech. students are required to complete a one year research project, in their third and fourth semesters, under research guide(s), selected in consultation with the respective Head of the Department and Faculty Advisor.

## IMPORTANT DATES

### GATE QUALIFIED CANDIDATES & IIT GRADUATES

Opening of Website for ONLINE applications	07.03.2016 (Monday) 00:01 hrs.
Closing of Website for ONLINE applications	15.04.2016 (Friday) 23:59 hrs.
Suitability Test/ Interview for relevant candidates (Refer Table 3)	30.04.2016 (Saturday)
Date of reporting for admission	25.07.2016 (Monday)
Date for Additional Round after the Admission Day (only if there are any unfilled seats)	26.07.2016 (Tuesday)
Orientation Programme, Photo session and Workflow enrolment	27.07.2016 (Wednesday)
Commencement of Classes	01.08.2016 (Monday)

### FOR SPONSORED & OTHER CATEGORY CANDIDATES

M.Tech sponsored application portal opens	07.03.2016 (Monday)
Portal closes on the given last date at 23.59 hrs.	15.04.2016 (Friday)
Written Test and/or Interview for sponsored candidates	02.06.2016 (Thursday) 03.06.2016 (Friday)
Date of reporting for admission	25.07.2016 (Monday)
Orientation Programme, Photo session and Workflow enrolment	27.07.2016 (Wednesday)
Commencement of Classes	01.08.2016 (Monday)

### ADDRESS FOR CORRESPONDENCE

<b>GATE QUALIFIED CANDIDATES &amp; IIT GRADUATES</b> The Chairman M.Tech. Admission Committee GATE Office, IIT Madras, Chennai 600036 Telephone : (044) 2257 8200/8205 Fax : (044) 2257 8204 Email : mtechadm@iitm.ac.in Website : http://mtechadm.iitm.ac.in	<b>SPONSORED &amp; UOP CANDIDATES</b> The Deputy Registrar (Academic Courses) Indian Institute of Technology Madras Chennai 600036 Telephone : (044) 2257 8046 Fax : (044) 2257 8042 Email : cacad@iitm.ac.in Website : <a href="https://mtechspons.iitm.ac.in">https://mtechspons.iitm.ac.in</a> Website : <a href="http://www.iitm.ac.in">http://www.iitm.ac.in</a>
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