RESEARCH ADMISSION BROCHURE

INDIAN INSTITUTE OF TECHNOLOGY MADRAS

CHENNAI - 600 036

Updated on February 02, 2026

Applications are invited for July 2026 Admission

Registration of Online Application	::	**11.11.2025**
Last date of Receipt of Online Application	::	**30.03.2026 @ 5.00 p.m.**
Written Test and Interview	::	***Intimation on "written test and interview" or "interview" indicating the date, time & venue will be communicated by the respective Departments through email to the shortlisted candidates.***

No hard copy application will be entertained.

CONTENTS

I. Important Guidelines for Ph.D. & M.S. Application:

1.	**Please read the instructions given in the admission brochure carefully before filling up the online application form.**
2.	**Online Application Form & Admission Brochure (including the admission schedule along with the important dates) is available on the Institute Research Admission Website https://research.iitm.ac.in** **You are required to submit the application ONLINE. No Downloadable Forms will be available. After filling the form, you are advised to take a printout of your application and keep the same for your record.**
3.	**The Application fee is as follows:** **⚥ GN/EWS/OBC-NCL Male candidates : Rs.1000/-** **⚧ GN/EWS/OBC-NCL Transgender candidates : Rs.1000/-** **⚢ GN/EWS/OBC-NCL Female candidates : Rs.500/-** **⚦ SC/ST candidates : Rs.500/-** **♿ PwD candidates : Rs.500/-** **APPLICATION FEE IS NON-REFUNDABLE.**
4.	**Candidates who wish to apply to multiple departments or research programmes should register individual application and pay the application fee separately subject to fulfilling the eligibility criteria for applying to the concerned department/research programme as mentioned in the research admission brochure & website.**
5.	**The *OBC (Non-Creamy Layer) certificate and Income & Assets certificate [for EWS category] issued after 01.04.2025* (for financial year 2024-2025) in the prescribed format must be submitted at the time of interview/admission. Please upload current certificate available in the ONLINE application.**
6.	**You should check the admission website for important announcements and department website for shortlisting updates and results.**
7.	***Shortlisted Candidates called for written test/interview should submit soft copy of the online application along with relevant certificates/documents.***

II. Important dates for Ph.D. & M.S. Admission for the Academic Year 2026-27

Admission Schedule for July 2026

Sl. No	Description	Important Dates
1	Activation of the website for submission of online application	**11.11.2025**
2	Closing date	**30.03.2026 @ 5.00 p.m.**

Applications are invited throughout the Academic year 2026-27:

Applications received **upto 30.03.2026** will be considered against July 2026 Admission by the respective department. Shortlisted candidates will be called for test and interview or interview. Please refer the Department's website regarding the selection process.

For any information / updates regarding schedule of test / interview, details of shortlisted for test/interview and declaration of results, see the concerned department website in which you have applied. Click Here

Note: ***For detailed eligibility criteria refer Clause 5.1 & 5.2 for Ph.D. and M.S.***

General

1. THE INSTITUTE

The Indian Institute of Technology Madras (IITM) is established as an autonomous institute of national importance in 1959 by the Government of India with an initial technical and financial support from Germany. IIT Madras with a number of well equipped laboratories, advanced research facilities, sophisticated services and computing & 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.), Integrated M.A, M.Tech., M.B.A, M.Sc., M.S. and Ph.D. in various disciplines. Located in about 225 hectares of natural flora and fauna, with 21 student's hostels and about 1000 faculty/staff quarters, IIT Madras is one of the greenest residential campuses in the country. Faculties 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 IITM.

2. ABOUT RESEARCH PROGRAMMES

The IITM is internationally renowned for the quality and diversity of its research, with over 692 academic staff and 5200 post-graduate students. Ample opportunities are provided for research-minded students to hone their research skills and participate actively in pioneering research studies through Ph.D and M.S (by research) programmes. The faculties of Engineering, Science, Humanities and Management departments, along with their scholars do active research in frontier areas, which often results in highly acclaimed publications in International and National Journals and patents. Most 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 & Technology, Aeronautical Research & Development Board, Indian Space Research Organization, Ministry of Non-Conventional Energy Sources and Defence Research & Development Organization, Naval Research Board, Department of Electronics, IGCAR, Atomic energy agencies and other Organizations for tackling the challenging research issues of national interest. Fellowships are also available from certain industries and organization. Our faculty also undertakes several application-oriented industrial consultancy projects with industries in India and abroad and collaborative research projects with foreign universities. Opportunities are available for interested students to participate in such sponsored research, industrial consultancy or collaborative research projects. The Engineering, Science, Humanities and Management Departments of our Institute are equipped with excellent laboratories, facilities with state-of-the-art equipment. Research is being carried out on many areas of topical interest worldwide. 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. The details of areas of research in the departments and research centres are given in this brochure. More detailed description of the research work undertaken in each department is available in the Institute website www.iitm.ac.in Strong expertise exists among the faculty on both theoretical and experimental methods of research.

Opportunities exist for candidates to do Joint Ph.D. in Engineering & Sciences offered by IIT Madras & National University of Singapore, University of Melbourne, Swinburne University, Australia, National Tsing Hua University, Taiwan, University of Passau, Germany, University of Technology, Sydney, Australia, Curtin University, Australia, University of Duisburg, Germany, Queensland University of Technology, Australia, Deakin University, Australia, RWTH Aachen, Germany, University of Bordeaux, France, Michigan State University, Heidelberg University, Germany, Ecole Centrale De Nantes, France & National Chiago Tung University, Taiwan.

Research works are carried out in the interdisciplinary areas among the Departments which may be pursued by the research scholars for the Ph.D. & M.S (by research) degree. A list of interdisciplinary areas is given in section 8.18.

While the Office of the Dean, Academic Research administers the academic research activities, the Industrial Consultancy & Sponsored Research (IC & SR) wing of the Institute co-ordinates the sponsored research and consultancy activities.

Joint Ph.D. programme is also offered by IIT Madras, Sree Chitra Tirunal Institute for Medical Sciences & Technology, Trivandrum and Christian Medical College, Vellore in the area of Biomedical Devices and Technology. From the Academic Year 2021-2022 and onwards, the BMD Joint Degree Program at IIT Madras will be coordinated by the Department of Applied Mechanics and Biomedical Engineering Group (https://apm.iitm.ac.in/bio_medical.html). For more details please visit https://biotech.iitm.ac.in/jointdegreeprograms/

3. Ph.D. AND M.S ADMISSIONS

3.1 Financial Assistance:

Scholars admitted to Ph.D. and M.S. programmes under Regular scheme are eligible for the Half-Time Research Assistantship (HTRA) for which:

(a) They should work for 8 hours per week in the Departments to earn this assistantship.

(b) Renewal of assistantship every semester will be contingent on enrollment, satisfactory progress in research work and good performance during the preceding semester in the discharge of responsibility as research assistant.

(c) PhD HTRA scholars are eligible for Institute Fellowship of Rs.37,000/- per month for the first two years and Rs.42,000/- per month for the next three years. In addition, they are also eligible for HRA as per GoI norms.

(d) MS by Research HTRA Scholars are eligible for Institute Fellowship of Rs.12400/- per month for initial 2 years + additional 6 months with specific recommendation of GTC.

Other scholarships like UGC-JRF, CSIR-JRF, DBT-JRF, NBHM, INSPIRE etc. may also be available for those who had qualified for these schemes and if admitted under any one of these scholarships then the amount of fellowship will be as per the norms of the funding agency. The admission procedure and other requirements are same as applicable for the Regular HTRA candidates.

3.2 Admission without Assistantship:

Candidates may also be considered for admission to the Ph.D./M.S. programme without assistantship such as External, QIP, Staff, Foreign Nationals and Project-NHTRA. Please refer section 4.1 for more details.

3.3 Selection Procedure:

Eligible candidates possessing the minimum educational qualifications (as given in section 5) & eligible degree (as given in section 6) and satisfying additional and stiffer criteria set by the departments from time to time, will be called for an "test and interview" or "interview" by the Selection Committees of the respective departments.

For candidates who have obtained UG/PG qualifying degree (as applicable) 10 years earlier as on the last date prescribed for receipt of the completed application, a departmental test will be conducted.

The applications of foreign nationals may be considered without a personal interview / test (details vide section 7).

Based on the academic record and the performance of the candidates in the interview and/or test, the Departmental Selection Committee will recommend to the Chairman, Senate the names of candidates found suitable for admission to the M.S. / Ph.D. programme.

3.4 Reservation of Seats:

The final selection is based on the performance of the candidate in "test and interview" or "interview" conducted by the respective Departmental Selection Committee.

Reservation is applicable as per Govt. of India rules.

3.5 TA for attending Interview for Ph.D./Direct Ph.D. programme (thro' offline mode):

Candidates called for Ph.D./Direct Ph.D. interview under the Regular (HTRA) category will be paid second sleeper class single to & fro rail/bus fare from their place of residence to Chennai by the shortest route. A candidate is entitled for a single TA as above even if he/she may attend interview in more than one department in the same trip.

3.6 Completing the Qualifying Degree and production of Provisional Certificate:

Candidates joining Ph.D/M.S programme in July-December/January-June session have to submit their original mark/grade sheets along with provisional certificates at the time of admission. They should also produce their required degree certificate for having passed the qualifying examination within three months from the date of registration i.e. on or before 30th September for July admission / 31st March for January admission.

3.7 Original Documents to be submitted for verification at the time of interview/admission:

At the time of Interview:

(a) Printed copy of application obtained after online registration.

(b) All the semesters Mark sheets/Grade cards & Course completion certificate / Provisional certificate / Degree certificate beginning from first degree towards proof of qualification.

(c) Copy of GATE score card or Original UGC - JRF/NET/CSIR-JRF/ DAE-JEST or other fellowship award letter.

(d) SC/ST/OBC-NCL community certificate for the candidates belonging to SC/ST/OBC-NCL category issued by the respective State Government. [OBC-NCL candidates should produce the latest valid OBC Non-creamy layer community certificate in the prescribed format obtained after **01/04/2025**].

The candidates claiming for EWS (Economically Weaker sections) reservation should submit valid Income & Assets certificate in the prescribed format obtained after **01/04/2025.**

(e) Authorised Doctor's Certificate with disability descriptions in the case of Person with Disability (PwD) candidates.

(f) Project Co-ordinator's certificate in the prescribed format and a copy of project appointment letter from Dean IC & SR of IITM in the case of Project Associate if already appointed.

(g) For External/Staff candidates, NOC from the present employer should be submitted.

At the time of Admission:

(a) Offer of admission.

(b) Birth Certificate.

(c) Aadhaar Card.

(d) First page of SSLC/SSC/Matriculation certificate.

(e) Degree certificate/Provisional certificate & Mark sheets/ Grade Cards of all the semesters of degree's obtained.

(f) Copy of GATE score card or Original UGC - JRF/NET/CSIR-JRF/ DAE-JEST or other fellowship award letter.

(g) SC/ST/OBC-NCL community certificate for the candidates belonging to SC/ST/OBC-NCL category issued by the respective State Government. [OBC-NCL candidates should produce the latest valid OBC Non-creamy layer community certificate in the prescribed format obtained after **01/04/2025**].

The candidates claiming for EWS (Economically Weaker sections) reservation should submit valid Income & Assets certificate in the prescribed format obtained after **01/04/2025.**

(h) Authorised Doctor's Certificate with disability descriptions in the case of Person with Disability (PwD) candidates.

(i) Relieving order/Resignation acceptance letter from the employer in the case of Regular candidates (HTRA / PROJECT / CSIR-JRF / UGC-JRF etc.), if employed except candidates selected under IITM Staff scheme.

In addition to the above….

For External candidates:

- NOC, Relief &/or Sponsorship certificate from the present employer

For Project candidates:

- Project Coordinator letter

4. CATEGORIES OF ADMISSION

4.1 Categories of admission in Ph.D programme:

a. For admission under Regular-HTRA, regular-national level fellowship and the regular-project-HTRA category, departments will adopt common shortlisting criteria and have a common merit list.

(Scholars selected under the HTRA category can move to N-HTRA but the scholars admitted under the Project-NHTRA / External / Staff / QIP categories cannot move to the Regular-HTRA category at any time.)

b. Regular scholars who meets HTRA eligibility criteria but offered under project-HTRA category can be kept under HTRA Waiting List and converted to HTRA later subject to recommendation of DSC/DC and fulfillment of terms and conditions applicable to conversion. This option is not applicable to other national level fellowship scholars.

c. **IIT Madras project staff** with 1 year Project Experience and who do not meet HTRA eligibility criteria will be treated under **Project N-HTRA Category.**

(i) Project staff of IC&SR who have successfully completed two approved courses at IITM (total credits ≥ 18) with CGPA ≥ 7.5, and have obtained at least a 'C' grade in each course can be selected through an interview without having to take a written test. They can join the programme after gaining at least 1 year experience in a project. (ii) Project staff of IC&SR who have gained at least 1 year experience in a project can be selected through a written test and interview. This selection will be for project-NHTRA applicants who do not meet the course requirement criteria.

d. Research scholars sponsored under the **Quality Improvement Programme (QIP).**

e. **Permanent staff members** of the Institute with at least 2 years of experience in IIT Madras are eligible to apply for Ph.D. programme under Staff category. These scholars will be considered under NHTRA category and they cannot move to HTRA category under any circumstances at a later date.

f. *Research scholars under the **external registration** scheme employed in an industry, organization, or institution with at least 2 years of relevant work experience.* They cannot move to HTRA category at a later date.

(Employees of IITM Research Park who have taken and passed at least 2 courses (18 credits) and obtained a minimum 7.5 CGPA and with a minimum of 'C' grade in each course can be directly admitted for interview but they will be considered under NHTRA category. The above candidates cannot move from NHTRA to HTRA category under any circumstances at a later date).

International Faculty can apply to the PhD programme at IIT Madras under the External Category. A Co guide at the home institution is not needed for such candidates.

g. Candidates applying for admission in the External category: **Departments should confirm whether the candidate employed in an industry, organization, or institution is with at least 2 years of relevant work experience.**

i) Should submit NOC &/or Sponsorship certificate at the time of submission of application by External Candidates.
ii) Should submit Relief certificate, NOC &/or Sponsorship certificate at the time of admission [as applicable].
iii) Should submit one page write-up about the research topic

h. The minimum residential requirement for the Ph.D research scholars under External registration not employed in the Institute is one semester.

i. Scholars will be permitted to do course work without the residential requirement with the permission of their institution subject to fulfilling the following requirements:

i) External scholars residing within the commutable distance from IIT Madras may use this option.
ii) The scholar to complete the course work and comprehensive examination requirement within the time limit.
iii) Leave not required for attending the courses.

j. Foreign Nationals may also apply for Ph.D programme and the eligibility requirements is mentioned under S.No.7.

k. Candidates who have qualified for JRF from various funding agencies such as UGC/CSIR/INSPIRE/NBHM/DBT/ICMR etc. and if it is tenable for the year of registration may also apply for Ph.D programme subject to fulfilling the eligibility criteria for admission to various departments.

l. **M.Tech-Ph.D Dual Degree programme in Engineering Design Department:**
The selection of candidates is through Direct PhD admission process. Final selection for admission will be as per the criteria fixed by the departmental selection committee.

4.2 Categories of admission in M.S programme:

a. For admission under Regular-HTRA, regular-national level fellowship and the regular-project-HTRA category, departments will adopt common shortlisting criteria and have a common merit list.

(Scholars selected under the HTRA category can move to N-HTRA but the scholars admitted under the Project-NHTRA / External / Staff / QIP categories cannot move to the Regular-HTRA category at any time.)

b. Person employed on IIT Madras project can apply for admission to M.S. programme with a minimum project experience of six months with valid GATE score subject to qualifying in selection procedure on par with HTRA scholars (interview / written examination) of the concerned department. These scholars can convert to HTRA later subject to fulfillment of criteria for conversion. Candidates without GATE score will be considered under Project NHTRA category.

c. Regular Scholars who meets HTRA Eligibility Criteria but offered under Project-HTRA Category without minimum project experience can be waitlisted under HTRA and revert back to HTRA Later subject to recommendation of DSC/GTC and fulfillment of terms and conditions applicable to conversion.

d. **IIT Madras project staff** with 6 months Project Experience and who do not meet HTRA eligibility criteria will be treated under **Project N-HTRA Category.**

Project staff of IC&SR who have successfully completed two approved courses at IITM (total credits $\geq$ 18) with CGPA $\geq$ 7.5, and have obtained at least a 'C' grade in each course can be selected through an interview without having to take a written test. They can join the programme after gaining at least 6 months experience in a project. (ii) Project staff of IC&SR who have gained at least 6 months experience in a project can be selected through a written test and interview. This selection will be for project-NHTRA applicants who do not meet the course requirement criteria.

e. **Permanent staff members** of the Institute with at least 2 years of experience at IIT Madras are eligible to apply for M.S programme under Staff category. These scholars will be considered under NHTRA category and they cannot move from NHTRA to HTRA category under any circumstances at a later date.

f. *Research scholars under the **external registration** scheme employed in an industry, organization, or institution with at least 2 years of relevant work experience.* They cannot move to HTRA category at a later date.

(Employees of IITM Research Park who have taken and passed at least 2 courses (18 credits) and obtained a minimum 7.5 CGPA and with a minimum of 'C' grade in each course can be directly admitted for interview but they will be considered under NHTRA category. The above candidates cannot move from NHTRA to HTRA category under any circumstances at a later date).

g. Candidates applying for admission in the External category:

Departments should confirm whether the candidate employed in an industry, organization, or institution with at least 2 years of relevant work experience.

i. Should submit Relief certificate, NOC &/or Sponsorship certificate at the time of admission
ii. Should submit Relief certificate, NOC &/or Sponsorship certificate at the time of admission [as applicable].
iii. Should submit one page write-up about the research topic

h. The minimum residential requirement for the M.S research scholars under External registration not employed in the Institute is one semester.

Scholars will be permitted to do course work without the residential requirement with the permission of their institution subject to fulfilling the following requirements:

i) External scholars residing within the commutable distance from IIT Madras may use this option.
ii) The scholar to complete the course work requirement within the time limit.
iii) Leave not required for attending the courses.

i. Foreign Nationals may also apply for M.S programme and the eligibility requirements is mentioned under S.No.7.

j. Candidates may also apply for M.S (Entrepreneurship) programme subject to fulfilling the eligibility criteria as mentioned under S.No.5.2.1.

4.3 Selection of GATE qualified candidates during regular MS / PhD interviews for employment at IITMRP companies / centers / start-up / project staff and simultaneous part-time MS / PhD

a. Candidates at the time of applying should indicate whether they would (i) prefer only regular MS / PhD or (ii) prefer employment plus part-time MS /PhD or (iii) either of the two
b. For candidates who have marked option (iii), they would be first selected for regular seats and part-time option selection will be done only if the regular seats are exhausted
c. Departments will create a list for selected candidates for regular admissions and a separate one for part-time admissions.
d. Part-time admission list will be first exercised by project-coordinators in the department, followed by IITMRP centers / start-ups and companies. IITMRP will coordinate and get the offer of employment to candidates from centers / start-ups and companies within a day of finalizing the list, following which the part-time MS / PhD offers can be given by the institute.

5. MINIMUM EDUCATIONAL QUALIFICATIONS FOR ADMISSION

5.1 Minimum Educational Qualifications for Ph.D.:

5.1.1 For Regular Research Scholars:

Ph.D. in Engineering:

a) Candidates with a Master's degree in Engineering/Technology with a good academic record / Master's degree by Research in Engineering/Technology with a good academic record / 5 Year Dual Degree in Engineering or 5 Year BS+MS Dual degree with a good academic record.

b) 2 Year M.Sc. from IITs (entry through JAM) with 8.0 and above are exempted from qualifying in National Level Examinations otherwise with valid National Level Examination score is required.

c) Candidates with Master's degree in Sciences with a good academic record and of exceptional merit are eligible, for the relevant Engineering disciplines (as decided by admitting departments). Candidates must have a valid GATE score or UGC-JRF/NET/CSIR-JRF or equivalent qualification in the relevant area tenable for the year of registration.

In the case of candidates with Bachelor's degree in Engineering / Technology AND possess more than 5 years relevant work experience after the Master's degree in Engineering/Technology, the requirement of a test score may be waived by the Selection Committee.

Ph.D. in Data Science and Artificial Intelligence:

Candidates need to have completed a PG degree in Engineering/Technology.

Ph.D. in Sciences:

1. Master's degree in Sciences with a good academic record and having a valid GATE score or UGC-JRF/NET/CSIR-JRF/NBHM/INSPIRE/JEST or equivalent qualification tenable for the current year in the relevant area.
2. Master's degree in Engineering/Technology or 5 Year BS+MS Dual degree/ 5 Year Integrated degree are eligible with a good academic record.
3. 2 Year M.Sc. from IITs (entry through JAM) with 8.0 and above are exempted from qualifying in National level examinations otherwise valid national level examination score is required.
4. Students who get more than 8.0 CGPA in M.Sc. in Science Departments of IIT Madras can be admitted directly to their Ph.D programme in Sciences with interview at departmental level.

Ph.D. in Humanities and Social Sciences:

Master's degree / dual degree or equivalent in a relevant discipline other than Engineering / Technology AND Qualifying UGC – NET or JRF / CSIR-JRF / GATE Score or equivalent qualification tenable for the current year in the relevant area or international level post graduate admission examination such as GRE applicable to OCI/NRI/Foreign Nationals (Non-HTRA).

OR

Master's degree in Engineering/Technology or 5 Year BS+MS Dual degree/ 5 Year Integrated degree with a good academic record.

Ph.D. in Management:

a) Master's degree or 2 year PG Diploma in a relevant discipline, and a Bachelor's degree with a good academic record (minimum five years of undergraduate and postgraduate education) OR Five year integrated master's degree / dual degree or equivalent in a relevant discipline with a good academic record AND

Qualifying in national level examinations such as GATE/CAT/UGC-JRF/NET/CSIR-JRF or equivalent OR

International level post graduate admission examination such as GMAT/GRE (Non-HTRA) applicable to OCI/NRI/Foreign Nationals.

b) Master's degree in Engineering / Technology with a good academic record or a Master's degree by Research in Engineering / Technology in a relevant discipline.

c) Candidates with MBA or 2 year PG diploma from Centrally Funded Technical Institute (CFTI) with CGPA of 8 and above are exempted from qualifying in National level examinations.

5.1.2 Candidates who have qualified for the award of Bachelor's degree in Engineering/Technology/ Bachelor of Science (Research) of 4 year duration with exceptionally good academic record in an eligible discipline will be considered for **Direct Ph.D. Programme** in various Engineering/Sciences/Humanities & Social Sciences/Management stream as a Regular scholar subject to fulfilling any one of following criteria:

- a B.Tech. degree holder of Centrally Funded Technical Institute with a minimum CGPA of 8.0 on a 10.0 point scale or with a valid GATE score.
- a BS (Research) 4 year degree holder of Centrally Funded Technical Institute with a minimum CGPA of 8.0 on a 10.0 point scale or with a valid GATE score.
- a Bachelor's degree holder in Engineering/Technology with a minimum CGPA of 8.0 on a 10.0 point scale or equivalent from any other University and having a valid GATE score.
- a Bachelor's degree holder in Engineering/Technology with a minimum CGPA of 8.0 on a 10.0 point scale or equivalent from any other University and working in a reputed R & D organization & having a proven research record (External Category).
- a MBBS/BDS degree holder with minimum first class and valid NEET PG qualifying score will be eligible to apply for direct Ph.D. programme under HTRA category in Engineering Design department. If the candidate meets the above degree requirement but doesn't possess valid NEET PG qualifying score then they can apply under NHTRA category (External / Project) to the same department.
- Candidates possessing M.Sc (Maths) or M.Sc. (Computer Science) from CFTI or a highly recognized institute such as Indian Statistical Institute and Chennai Mathematical Institute with the minimum CGPA of 8.0 on 10.0 scale and valid GATE (Maths) or GATE (CS) score can apply under HTRA category in Computer Science & Engineering department.
- Candidates with Bachelor's degree in Engineering / Technology or 4 year online / any recognized 4yr B.Sc / 4yr BS Degree (of IITs / CFTIs/ UGC) in Engineering / Technology/Sciences/Management with valid GATE score with a good academic record in the relevant areas.

5.1.3 For Permanent Institute Staff members / Research Scholars under QIP / Research Scholars under External Registration:

For Research Scholars in the above categories, the minimum educational qualifications are the same as prescribed for Regular Research Scholars in 5.1.1 for admission to the Ph.D. Programme in the respective categories.

However, valid GATE score or CSIR-JRF/UGC-JRF/NET or equivalent qualification as applicable for Regular research scholars **may not be required** in these cases.

One year PG programme from Accredited Universities is considered as one of the eligibility criteria for admission to Ph.D. at IIT Madras. Following are the conditions:

1) The Selection committee may consider the applicant for direct Ph.D., if the candidate found suitable and meet eligibility requirements.
2) Courses completed already in one year PG programme may be considered by the Doctoral Committee towards course requirement for Direct Ph.D.
3) The scholar will be eligible for HTRA, if they have valid GATE score (equivalent to Direct Ph.D. scholars)

Ph.D. and Direct Admission to M.S. + Ph.D. in School of Interdisciplinary Studies (SIDiS)

The School of Interdisciplinary Studies (SIDiS) was introduced with the aim of creating a platform for encouraging research scholars from any relevant background to perform research in certain specialised areas without the restrictive academic boundaries of departments. Faculty members of two inter related departments of IIT Madras will define interdisciplinary research projects. The selection is done for specific projects and the selected candidate will have guide from both primary and secondary Departments. For details please visit https://sites.google.com/a/smail.iitm.ac.in/iitm-idrp/home

THREE INSTITUTE JOINT DEGREE (BMD) PROGRAMME

Indian Institute of Technology Madras (IITM), Sree Chitra Tirunal Institute for Medical Sciences & Technology Trivandrum (SCTIMSTT) & Christian Medical College Vellore (CMC) The Ph.D. (major: Biomedical Devices and Technology) Programmes aim to develop capable people, who will go further to make significant contributions as high-level engineers, researchers, entrepreneurs, academicians, etc. in the relevant areas. It is a unique undertaking and exploits the innate strengths and facilities of the three institutes — SCTIMST, IITM and CMC. These organizations together hold strong backgrounds in Technology, Biomedical Engineering and Medical Sciences.

5.2 Minimum Educational Qualifications for M.S:

5.2.1 For Regular Research Scholars:

M.S. in Engineering:

a) Candidates with Bachelor's degree in Engineering / Technology or 4 year online / any recognized 4yr B.Sc / 4yr BS Degree of IITs / CFTIs/ UGC or a Master's degree in appropriate Engineering / Technology /Sciences/Management with valid GATE score with a good academic record in the relevant areas.

b) Candidates having Associate Membership of the following professional bodies will also be eligible for admission to the M.S. programme of their parent discipline provided they have a valid GATE score and have passed both part A and part B of the Membership examinations with a good academic record.

The Institution of Engineers (India) (Civil, Mechanical, Electrical and Electronics, Electronics and Communications), the Aeronautical society of India, the Indian Institute of Metals, the Indian Institute of Chemical Engineers, the Institute of Electronics and Tele-communication Engineering and other professional bodies approved by the Senate from time to time.

c) Candidates having qualified in MFT (Major Field Test) will also be eligible for admission to the M.S. programme if the concerned department opt for it.

d) 4yr B.S/B.Sc/BE/B.Tech candidates from CFTI (Centrally Funded Technical Institutes) with a CGPA of 8.0 and above, are eligible to apply for M.S. Programme without valid GATE score.

e) Candidates without valid GATE score will be eligible for NHTRA (External/Project) categories as per their eligibility.

M.S. in Data Science & Artificial Intelligence:

Masters in Data Science & Artificial Intelligence will be offered by the Department of Data Science & Artificial Intelligence. The eligibility to apply for admission are as below. Students who have completed online BS in Data Science from IIT Madras (4 year programme) can also apply.

a) Any 4 year UG degree of IITs / CFTIs / UGC / AICTE.

b) In case of a 3 year UG degree (such as B.Sc.), an additional Master's degree would be required for eligibility.

c) Valid GATE score in any discipline.

M.S. in Management:

A) Bachelors degree or equivalent in any professional discipline of minimum four years duration or Masters degree or equivalent in a relevant discipline, with a good academic record.

AND

B) A good score or pass in:

- National level post graduate admission qualifying examination such as GATE for HTRA.
- International level post graduate admission qualifying examinations such as GMAT/GRE (Non-HTRA) for OCI/NRI/Foreign Nationals.

C) Candidates having qualified in MFT (Major Field Test) will also be eligible for admission to the M.S. programme if the concerned department opt for it.

M.S. in Entrepreneurship:

IIT Madras is widely admired as the leading Institute in India promoting Start-ups, incubation, and entrepreneurship promotion and support systems, more particularly entrepreneurial ventures of the deep technology variety, with an enviable start-up ecosystem. Offered since 1982-83, the MS (Entrepreneurship) by Research programme is India's torchbearer among all Institutions of higher learning that have aimed to promote entrepreneurship via their programmes. Over the last four decades, it has matured steadily and strongly to emerge as a benchmark among all entrepreneurship-focused Institutional programmes, as can be evidenced by the prestigious international and national awards and honours conferred on the scholars and their start-ups.

Selected scholars will be guided to systematically and diligently discover entrepreneurial opportunities and formally establish their start-ups via an effective combination of taught courses, intense research supported by astute supervision, and mentorship by highly accomplished entrepreneurs and others of the start-up ecosystem. The minimum eligibility requirement for admission will be graduates with a B.Tech./B.E. or any postgraduate degree in appropriate Engineering/Technology/Sciences/Management stream.

Candidates need to qualify in GATE or any of the approved national level qualifying exams eligible for scholarship. At the time of accepting offer of admission, CGPA above or equal to 8.0 for graduates from Centrally Funded Technical Institutes (including IITM) is required for waiving the requirement of qualifying in national level examinations. Under the non-HTRA category (External and Project-NHTRA), anyone with a B.Tech./B.E. or any postgraduate degree in appropriate Engineering/Technology/Sciences/Management stream with required experience can apply. In addition all candidates must submit a Proposal for a start-up, which will be evaluated by the Screening Committee first, before recommending selected applications to the Admissions/Selection Committee for a one - to- one interview.

5.2.2. For Permanent Institute Staff Members/Research Scholars under External Registration:

Bachelor's degree in Engineering/Technology or a Master's degree in appropriate Sciences/Management stream where eligible with a good academic record.

However, valid GATE score or equivalent qualification as applicable for Regular research scholars **may not be required** in these cases.

General:

A list of eligible discipline in which the minimum educational qualifications have to be obtained by the candidate is given in section 6.

Additional and stiffer *criteria than the minimum educational qualifications given in 5.1(Ph.D) and 5.2 (M.S) may be set by the Department/Selection Committee from time to time for short listing candidates to be called for test and interview or interview.*

The Department Selection Committee may find fit to consider meritorious candidates from disciplines other than listed in the Research Admission Brochure if there is a good match between the educational/ research background of the candidate and the proposed area of research.

Research works are carried out in the interdisciplinary areas among the Departments which may be pursued by the research scholars for their M.S/Ph.D degree. A list of interdisciplinary areas is given in section 8.18.

6. ELIGIBLE DEGREES FOR ADMISSION TO Ph.D AND M.S PROGRAMMES

6.1 Eligible Degrees for Admission to Ph.D. programme

Sl.No.	Department	Eligible Degree for Ph.D
1.	**Aerospace Engineering**	**Master's degree or its equivalent in Aerospace / Civil / Applied Mechanics & Biomedical Engineering /** Mechanical/Electrical/allied branches(such as Instrumentation, Energy Engg., Production, etc.) OR Master's degree in Mathematics / Physics with an excellent academic record. OR For Direct Ph.D., Bachelor's degree in Aerospace/Civil/Chemical/Computer Science/ Electrical/Mechanical/Metallurgical/Naval Architecture/ allied branches (such as Instrumentation, Energy Engg., Production, etc.) with fulfilment of additional conditions as specified under 5.1.2 is required. The GATE score requirement is waived for candidates with at least two years experience in aerospace organizations and applying under the EXTERNAL category."
2.	**Applied Mechanics & Biomedical Engineering**	***Areas of research*:** 1. Biomedical Engineering Group, 2. Solid Mechanics Group and 3. Fluid Mechanics Group **Eligibility:** Master's degree in Mechanical Engineering/ Civil Engineering/Aerospace Engineering/Electrical Engineering/Chemical Engineering/Metallurgical Engineering, or any other related areas of Engineering and/or Technology (M.Tech/M.E./M.S.). We also welcome applicants with the following non-engineering degrees who demonstrate a strong interest and aptitude for research in our faculty's areas of expertise: **Biomedical Engineering Group -** MSc in all areas of sciences and mathematics **Solid Mechanics Group -** MSc in Physics / Mathematics/ Chemistry / Nanoscience and nanotechnology / Material science and relevant departments **Fluid Mechanics Group -** MSc in all areas of sciences and mathematics
3.	**Biotechnology**	a. Master's degree in any area of Engineering. Candidates with Master's in biotechnology, chemical engineering, computer science and electrical engineering are particularly encouraged to apply. b. Master's degree in any area of Science. Candidates with Master's in any branch of life sciences, chemistry, mathematics and physics are particularly encouraged to apply. Master's in Science must have qualified in GATE or any other national level examinations such as CSIR-JRF, UGC-JRF, DBT-JRF, ICMR-JRF. c. Master's degree in Pharmaceutical Sciences d. Master's degree in Agricultural Sciences e. Master's degree in Veterinary Sciences f. For Direct Ph.D., B.Tech/B.E/BS (4 year) with a CGPA of 8.0 and above on a 10 point scale or 75% aggregate with valid GATE score is required. GATE requirement is waived if the UG degree is from a Centrally Funded Technical Institute (CFTI) & CGPA >= 8.0.
4.	**Chemical Engineering**	Master's degree in Chemical Engineering or any other discipline of Engg. or Technology or equivalent. Science/Mathematics postgraduates to be considered should have exceptional merit and/or Research / Industrial experience in the appropriate field. B.Tech/B.E in Chemical Engineering, allied disciplines (eg. petroleum, petrochemical, pharmaceutical, environmental, polymer, biochemical, biotechnology, electrochemical, instrumentation) and other disciplines of engineering/technology with exceptional merit can also be considered for direct Ph.D. admissions.

5.	**Chemistry**	Master's degree in Sciences (in areas such as chemistry, applied chemistry, biochemistry, chemical physics, physics, material sciences, mathematics, pharmacy, or similar such area) with a good academic record and having a valid GATE score or UGC/CSIR-NET-JRF. Master's degree in Engineering/Technology (in areas such as electrical engineering, computer sciences, chemical engineering, materials engineering, biotechnology or similar such area) with a good academic record.
6.	**Civil Engineering**	Master's degree in Civil Engineering or Ocean Engineering (including integrated M.Tech. / M.E. degree) with First Class or equivalent grade for specialisation in Civil Engineering. In addition, the following non-Civil Engineering degrees qualification are also eligible for different specializations: **Building Technology, Construction Materials and Management (BTCM)**: Master's degree in Industrial Engineering / Industrial Management / MBA after obtaining a basic degree in Civil Engineering with first class. First class Bachelor's and Master's degree in Architecture, Town and Country Planning. **Geotechnical Engineering**: Master's degree in Engineering Mechanics/ Master's degree in Mining Engineering with 2 years relevant experience. **Hydraulics and Water Resources Engineering**: M.Tech. or M.S. or equivalent degree in Engineering Mechanics/Aerospace Engineering / Agricultural Engineering / Environmental Engineering or M.Tech. or M.S. or equivalent degree in Environmental Science & Engineering /Chemical Engineering/Biotechnology/Applied Geology. **Environmental Engineering:** M.Tech. or M.S. or equivalent degree in Engineering Mechanics/Aerospace Engineering / Agricultural Engineering / Environmental Engineering or M.Tech. or M.S. or equivalent degree in Environmental Science & Engineering /Chemical Engineering/Biotechnology/Applied Geology. or M.Sc in Zoology, Botany, Meteorology and other Biological Sciences with a valid GATE score or valid UGC-JRF / NET / CSIR-JRF/ INSPIRE fellowship. **Structural Engineering:** Master's degree in Engineering Mechanics / Aerospace Engineering /Naval Architecture / Mechanical/Architectural/Ocean Engineering/Master's degree in Computer Science & Engineering with basic degree in Civil Engineering. **Transportation Engineering:** Master's degree in Transportation Engineering/Architecture/Town and Country Planning/Regional Planning/ City Planning/Urban Engineering or 2 years Regular Postgraduate Diploma in Town and Country Planning with specialization in Traffic and Transportation Planning from the School of planning and Architecture, New Delhi/MBA after obtaining a basic degree in Civil Engineering with first class. M.S., M.Tech., or equivalent degree in Industrial Engineering / Operations Research.

7.	**Computer Science and Engineering**	Master's degree in Engineering/Technology. Preference will be given to those with M.Tech. / M.S. degree in Computer Science & Engineering. Candidates possessing M.Sc (Maths) or M.Sc. (Computer Science) from CFTI or a highly recognized institute such as Indian Statistical Institute and Chennai Mathematical Institute with the minimum CGPA of 8.0 on 10.0 scale and valid GATE (Maths) or GATE (CS) score can apply under HTRA category in Computer Science & Engineering department.
8.	**Data Science and Artificial Intelligence**	For full Time Ph.D. positions in Department of Data Science and Artificial Intelligence a) Candidates need to have completed a PG degree in Engineering/Technology. b) Project HTRA and NHTRA categories as per their eligibility (Ref 4.1 (d) & (e)). For external Ph.D. positions in Department of Data Science and Artificial Intelligence. a) Candidates need to have completed a PG degree in Engineering/Technology. b) At least 2 years of experience in an organization approved by DST, GoI, or IIT Madras. For direct Ph.D. positions (M.S. and Ph.D.) in Department of Data Science and Artificial Intelligence. a) Any 4 year UG degree of IITs / CFTIs / UGC / AICTE. or a Master's degree in appropriate Engineering / Technology. b) Valid GATE score in AE, AG, BM, BT, CE, CH, CS, DA, EC, EE, ES, IN, MA, ME, MN, MT, NM, PE, PI, ST.
9.	**Electrical Engineering**	Master's degree in Electrical Engineering (Electrical and Electronics Engineering)/ Electronics Engineering (Electronics and Communication Engineering) / Instrumentation Engineering or Master's degree in Sciences with a good academic record and a valid GATE score.
10.	**Engineering Design**	Master's degree in Aerospace, Automobile, Biomedical, Chemical, Civil, Computer Science, Engineering Design, Electrical, Electronics, Engineering Physics, Instrumentation, Mechanical, Metallurgical, Material Science, Naval Architecture, Production / Manufacturing, Power electronics, Robotics / Automation, Data science, or Master's degree in Design (Engineering) (B.Des/ M.Des.) or M.Tech. (Industrial Mathematics) or MS (Medicine), MD, MDS with minimum first class. Candidates possessing MBBS/BDS degree with minimum first class and valid NEET PG qualifying score will be eligible to apply for direct Ph. D. programme under HTRA category.

11.	**Humanities & Social Sciences**	Master's degree or equivalent with a minimum of 55% aggregate marks or 6.0 CGPA on a 10-point scale in Humanities and Social Sciences and allied disciplines
12.	**Management Studies**	Masters degree or 2 year PG Diploma in a relevant discipline, and a Bachelor's degree with a good academic record (minimum five years of undergraduate and postgraduate education) OR Five year integrated masters degree / dual degree or equivalent in a relevant discipline with a good academic record AND Qualifying in national level examinations such as GATE / CAT / UGC or CSIR / NET / JRF or equivalent or international level post graduate level examination such as GMAT/GRE (Non-HTRA). OR At least 5 years of managerial experience in lieu of the above examination. (This clause is applicable for Non-HTRA candidates only) Master's degree in Engineering / Technology with a good academic record or a Master's degree by Research in Engineering / Technology in a relevant discipline are exempted from qualifying in National level examinations. Candidates with MBA or 2 year PG diploma from Centrally Funded Technical Institute (CFTI) with CGPA of 8.0 and above are exempted from qualifying in National level examinations.
13.	**Mathematics**	Master's Degree in Mathematics/Statistics/Physics/Computer Science with GATE/UGC/CSIR/NBHM or M.Tech. (Industrial Mathematics & Scientific Computing) or any M.Tech. degree and Master's degree in Mathematics/Physics/Statistics/ Computer Science.
14.	**Mechanical Engineering**	Master's degree in Mechanical Engineering, Aerospace Engineering, Automobile Engineering, Automotive Engine Tech, Bio-Medical Engineering, Chemical Engineering, Computer Science, Electrical Engineering, Electronics, Energy Engineering, Industrial Engineering, Instrumentation, Maintenance Management, Metallurgical Engineering, Production/ Manufacturing Engineering/Agricultural Engineering and in related areas depending on the research topics. Master's degree in Physics / Mathematics / Chemistry / Biology with a good academic record and a valid GATE score or valid UGC-JRF / NET / CSIR-JRF/ INSPIRE fellowship.
15.	**Medical Sciences & Technology**	Master's degree in Biomedical, Biotechnology, Biological/Biochemical Sciences, Chemical, Civil (structural), Computer Science, Engineering Design, Electrical, Electronics, Engineering Physics, Instrumentation, Mechanical, Material Science, Naval Architecture, Production/Manufacturing, Robotics/Automation, Data science, or Master's degree in Design (Engineering, M.Des.) or M.Tech. in Industrial Mathematics or MS (Medicine), MD, MDS, Master of Physiotherapy/ Sports Physiotherapy/Sports. Candidates possessing MBBS/BDS degree and valid NEET PG qualifying score will be eligible to apply for direct Ph. D. programme under HTRA category. Notes: M.Sc. graduates require a valid GATE score.

16.	**Metallurgical & Materials Engineering**	Master's degree or equivalent in Metallurgical Engineering or other appropriate branch of Engineering/Technology. Science postgraduates to be considered should have exceptional merit and research or industrial experience in the appropriate field.
17.	**Ocean Engineering**	Master's degree in Engineering/Technology and preference to those with Master's degree in Ocean Engineering. M.Sc degree in Physics, Mathematics, Oceanography, Geology and / Or Geophysics and Statistics and having valid GATE score.
	For Petroleum Engineering	Master's degree in Engineering / Technology in any area relevant to research in Petroleum Engineering. M.Sc degree in Physics, Mathematics, Oceanography, Geology and / Or Geophysics and Statistics and having valid GATE score.
18.	**Physics**	M.Sc/M.Sc (Tech) in Physics, Applied Physics, Materials Science/M.Tech (Solid State Technology)/M.Tech (Materials Science) or equivalent with Valid GATE / JEST Score.
19.	**School of Interdisciplinary Studies (SIDiS)**	Master's degree in any branch of Engineering / Technology or M.S. by research in Engineering or 5 year integrated Masters or Dual Degree in engineering. 2 year M.Sc. from IITs (entry through JAM) with CGPA ≥ 8. B.S. + M.S. (5-year integrated) from CFTI with CGPA ≥ 8. M.Sc or any Master's degree from any recognized university or Institute with valid GATE score / UGC-JRF / NET /CSIR-JRF / NBHM /Inspire /DBT-JRF is required for Regular-Fellowship Valid GRE eligible only for OCI/NRI/foreign students'admission without HTRA.

6.2 Eligible Degrees for Admission to M.S programme

Sl.No.	Department	Eligible Degree
1.	**Aerospace Engineering**	Bachelor's / Master's degree in Aerospace/Civil/Chemical/Computer Science/ Electrical/Mechanical/Metallurgical/Naval Architecture/allied branches (such as Instrumentation, Energy Engg., Production, etc.) OR Master's degree in Physics/Mathematics/Chemistry and aptitude for research. OR Any engineering graduate with at least two years relevant experience in aerospace Industry/Research Organization and applying under EXTERNAL category.
2.	**Applied Mechanics & Biomedical Engineering**	***Areas of research*:** 1. Biomedical Engineering Group, 2. Solid Mechanics Group and 3. Fluid Mechanics Group **Eligibility:** Bachelor's degree in Mechanical Engineering/ Civil Engineering/Aerospace Engineering/Electrical Engineering/Chemical Engineering/Metallurgical Engineering, or any other related areas of Engineering and/or Technology (M.Tech/M.E./M.S.). We also welcome applicants with the following non-engineering degrees who demonstrate a strong interest and aptitude for research in our faculty's areas of expertise: **Biomedical Engineering Group -** MSc in all areas of sciences and mathematics **Solid Mechanics Group -** MSc in Physics / Mathematics/ Chemistry / Nanoscience and nanotechnology / Material science and relevant departments **Fluid Mechanics Group -** MSc in all areas of sciences and mathematics MBBS candidates with Mathematics in +2 and having 2 years research/teaching experience may also apply for M.S sponsored program in the area of Biomedical Engineering.
3.	**Biotechnology**	Bachelor's / Master's Degree in Engineering or Pharmacy or M.B.B.S or B.D.S Selection Process: The candidate should have a valid GATE score/NEET PG Score (as applicable) or equivalent in order to be called for the interview. The final selection process will be based on performance in the Departmental written test and interview.
4.	**Chemical Engineering**	Bachelor's / Master's degree in Chemical Engineering, allied disciplines such as polymer, petroleum, petrochemical, pharmaceutical, environmental, biochemical, biotechnology, electrochemical, instrumentation etc and other disciplines of engineering/technology. M.Sc.(Mathematics/Physics/Chemistry/Env.Science/Biochemistry/ Biology etc.) with aptitude for research.
5.	**Civil Engineering**	Bachelor's / Master's degree in Civil Engineering from any recognised University for all specialisations in Civil Engineering. In addition, the following non-Civil Engineering Degree Qualifications are also eligible for different specialisations but M.Sc. degree holders in Science with two years work experience admitted to the M.S. programme should take additional Engineering Courses to acquire enough engineering background. **Building Technology, Construction Materials and Management:** Bachelor's / Master's degree in Architecture or First Class M.Sc degree in Physics/ Applied Science/Material Science in Civil Engineering area. **Geotechnical Engineering:** M.Sc. degree in Mathematics/Physics/Chemistry/Applied Geology in Civil Engineering area. Bachelor's degree in Mining Engineering with one year relevant experience. **Hydraulics and Water Resource / Environmental Engineering:** Bachelor's degree in Agricultural Engineering or Master's degree in Applied Mathematics/Applied Geology/ Geophysics in Civil Engineering area. or Bachelor's degree in Environmental Engineering/Chemical Engineering/ Biotechnology or Master's degree in Environmental Science/Microbiology/Bio-Chemistry in Civil Engineering.

		Structural Engineering: Bachelor's degree in Aerospace Engineering/Naval Architecture/Mechanical/ Architectural Engineering or First Class M.Sc. degree in Applied Mathematics/ Chemistry/Materials Science/ Physics in Civil Engineering area. **Transportation Engineering**: Bachelor's degree in Architecture or First Class B.E/B.Tech (Mechanical) working in Transportation Field
6.	**Computer Science and Engineering**	Bachelor's / Master's Degree in any branch of Engineering / Technology or Master's Degree in Mathematics/Statistics/ Physics/Computer Science/ MCA with Mathematics/ Physics/ Statistics basic degree.
7.	**Data Science and Artificial Intelligence**	Full-Time Masters: a) Any 4 year UG degree of IITs / CFTIs / UGC / AICTE. b) In case of a 3 year UG degree (such as B.Sc.), an additional Master's degree would be required for eligibility c) Valid GATE score in any discipline. d) Project HTRA or NHTRA (External/Project) categories as per their eligibility (Ref 4.2). External Masters: a) Any 4 year UG degree of IITs / CFTIs/ UGC / AICTE. b) In case of a 3 year UG degree (such as B.Sc.), an additional Master's degree would be required for eligibility. c) At least 2 years of relevant work experience.
8.	**Electrical Engineering**	Bachelor's degree in Electrical Engineering (Electrical and Electronics Engineering)/ Electronics Engineering (Electronics and Communication Engineering) / Instrumentation Engineering or Master's degree in Sciences with a good academic record and a valid GATE score.
9.	**Engineering Design**	Bachelor degree in Aerospace, Automobile, Biomedical, Chemical, Civil, Computer Science, Electrical, Electronics, Engineering Physics, Instrumentation, Mechanical, Metallurgical, Material Science, Naval Architecture, Production / Manufacturing, Robotics/Automation, Data science, or Bachelor degree in Design (Engineering) (B.Des)
10.	**Management Studies**	Qualifying Test :National-level entrance/eligibility test such as GATE (HTRA). or International level post graduate admission qualifying examination such as GMAT/GRE (Non-HTRA) for OCI/NRI/Foreign Nationals. Candidates having qualified in MFT (Major Field Test) will also be eligible for admission to the M.S. programme if the concerned department opt for it. Minimum Educational Qualifications : B.E./B.Tech or equivalent with First class or 60% marks in aggregate or Four-year professional degree (like AMIE) or equivalent programmes in a relevant discipline with First class or 60% marks in aggregate. or A Master's degree in a relevant discipline with 55% marks in aggregate from a recognized Institution or University. Minimum Work Experience : 1. NIL for those fulfilling the above conditions for Qualifying Test and Minimum Educational Qualifications. 2. THREE years' managerial experience for those who fulfill the Minimum Educational Qualifications condition but have not taken or are ineligible

to take the Qualifying Test. Such applicants will be administered by a Departmental test to evaluate their eligibility. These candidates are not eligible for HTRA.

11.	**Mechanical Engineering**	Bachelor's / Master's Degree in Mechanical Engineering, Aerospace Engineering, Agricultural Engineering, Architectural Engineering, Automobile Engineering, Chemical Engineering, Computer Science, Electrical Engineering, Electronics, Energy Engineering, Industrial Engineering, Instrumentation, Metallurgical Engineering, Mining Engineering, Naval Architecture, Marine Engineering, Production/ Manufacturing Engineering and in related areas depending on the research topics
12.	**Medical Sciences & Technology**	Bachelor degree in Biomedical, Biotechnology, Biological//Biochemical Sciences, Chemical, Civil, Computer Science, Electrical, Electronics, Engineering Physics, Instrumentation, Mechanical, Mechatronics, Metallurgical, Material Science, Naval Architecture, Production / Manufacturing, Robotics/Automation, BS in Electronic Systems, BS in Data science, or Bachelor degree in Design (Engineering, B.Des), Bachelor of Physiotherapy/Sports Physiotherapy/Sports Science, MBBS/BDS degree. Notes: 1. Duration of the eligible Bachelor degree programs listed above should not be less than 4 years. 2. Candidates possessing MBBS/BDS degree require a valid NEET PG qualifying score, to apply under the Half-time Teaching/Research Assistantship (HTRA) scheme. 3. GATE Branches Accepted: BT, BM, EE, EC, IN, CS, ME, CE, CH, XL.
13.	**Metallurgical & Materials Engineering**	Bachelor's degree or equivalent in Metallurgical Engineering or other appropriate branch of Engineering/ Technology or Master's degree in Physics/Chemistry/Materials Science or allied fields with GATE with 'XE'. Master's Degree in Mathematics with GATE in Metallurgy.
14.	**Ocean Engineering**	Bachelor's degree or its equivalent in Civil/Mechanical/ Aerospace/Naval Architecture or Master's degree in Oceanography/Applied Mathematics/Physics.
	For Petroleum Engineering	Bachelor's degree in Civil / Mechanical / Chemical / Naval Architecture / Ocean / Aerospace / Metallurgical / Materials / Electrical and Electronics / Marine / Mining / Aerospace or its equivalent. Master's degree in Oceanography / Earth Sciences / Applied Physics / Applied Mathematics / Geology / Geophysics / Remote Sensing or its equivalent.
15.	**School of Interdisciplinary Studies (SIDiS)**	Bachelor's degree in any branch of Engineering / Technology or 4 year online degree or any recognized 4 year B.Sc. or 4 year BS of IITs / CFTIs /UGC / or Master's degree in sciences or equivalent Valid GATE score is required for Regular-HTRA, and Regular - Project-HTRA categories, except 4yr B.S / 4yr B.Sc. / B.E / B.Tech from a Centrally Funded Technical Institute (CFTI) with CGPA ≥ 8. or UGC-JRF/NET/CSIR-JRF/NBHM/Inspire/DBT-JRF is required for Regular-Fellowship Valid GRE eligible only for OCI/NRI/foreign students' admission without HTRA.

7. INTERNATIONAL SCHOLARS – ADMISSION (M.S/Ph.D)

Foreign Nationals are those with foreign passport including those who are Person of Indian Origin (PIO) / Overseas Citizen of India (OCI) card holders.

Foreign nationals can only register as full-time scholars. Foreign nationals with eligible degree from Indian Universities will be treated on par with Indian nationals for admission purposes with prescribed fee for foreign national. Foreign nationals with foreign degrees must meet the minimum educational requirements as given in M.S/Ph.D. Regulations (**clause R.2.1)** i.e. equivalent to a Indian Bachelor's/Master's degree in the relevant disciplines. In addition, Foreign nationals applying to Management Studies dept. should have a valid GMAT score. International candidates should have cleared either IELTS/TOEFL with minimum 6.5(overall) and 80(overall) score respectively, if the medium of instruction for their qualifying degree is not in English. Interested candidates may visit IIT Madras Global Engagement website for more details https://www.iitm.ac.in/the-institute/global-engagement

I. Fees for Foreign National research scholars to be admitted in the academic year 2026-27.

[Note: Foreign Nationals holding PIO/OCI cards are eligible for admission with prescribed fee for Indian National as given in 3.5:]

Sl.No.	Items of Fees & Deposits for Foreign M.S/Ph.D. scholars to be admitted in the academic year 2024-25	Institute Fees (in INR)	
A. One Time Fees: (Only for New Admissions)			**50,000**
B. Semester Fees per semester:			
1.	**Tuition Fees**	**SAARC Countries**	**75,000**
		Non-SAARC Countries	**1,50,000**
2.	**Enrolment fee**		**1,500**
3.	**Medical Fee**		**1,500**
4.	**Seat Rent**		**7,500**
5.	**Extra- Curricular Fee**		**2,000**
6.	**Student Wellness Fee**		**500**
Total B (Jul-Nov 2026 Semester fees)		**SAARC Countries**	**88,000**
		Non SAARC Countries	**1,63,000**
C. Caution Deposit			**5,000**
Grand Total Fees (A+B+C) (Only for New Admissions)		**SAARC Countries**	**1,43,000**
		Non SAARC Countries	**2,18,000**
Semester fees payable through online at https://fees.iitm.ac.in/			
Hostel Fees Structure please visit https://fees.iitm.ac.in/			
Hostel Fees payable through online at https://hosteldine.iitm.ac.in			

8. RESEARCH AREAS

8.1 Department of Aerospace Engineering:

Aerodynamics: Subsonic, Transonic, Supersonic, Hypersonic, Rarefied Gas flows (Theoretical and Experimental), Boundary Layers and Stability of Flows, Turbulent Flows, Shock Tubes and Related Problems, Development of Algorithms and Code for Numerical Methods in Gas Dynamics and Computational Fluid Dynamics, Vortex Dynamics, Supersonic Mixing and Combustion, Optical Flow Diagnostics.

Aircraft Structures: Finite Element Methods, Numerical Methods, Photo Elasticity, Moire and Holographic Methods of Structural Analysis. Composite Structures, Fatigue and Fracture Mechanics, Contact Mechanics, Vibrations and Impact Mechanics.

Aerospace Propulsion: Rocket Propulsion and Solid Propellant Combustion, Air breathing Propulsion and Combustion, Cascade Flows, Multiphase Flow Simulation, Combustion Instability, Optical Flow/Combustion Diagnostics.

Dynamics and Control: Nonlinear Dynamics in Aerospace Applications, Computational Methods in Nonlinear Dynamics, Nonlinear Control Theory and Applications, Flight Simulations and Controller Development, Design Development of Autonomous Flying Vehicles.

8.2 Department of Applied Mechanics & Biomedical Engineering:

Biomedical Engineering Group:

- **Artificial IntelligenceI/ML/DL and AR/VR Technologies for Medicine:** Artificial Intelligence/Data Science in Biomedical Engineering Analysis & Mechanics, Haptics and VR in human performance measurement, skilling, rehabilitation & medical education, and Computational Neuroscience, Healthcare informatics, AI assisted Biophotonics, AI in Medical Image processing and analysis, AI-assisted Ultrasound imaging, Brain Computer Interface.
- **Modelling and Simulation in Medicine:** Modeling physiological signals, Modeling optical and acoustic signal interactions with tissues, Modeling biomolecular transport in tissues, Constitutive models for pathological tissues/explants/experimental models of diseases.
- **Clinical Diagnostics, Therapeutics and implants:** Biopotentials, Medical Biology, Biophysics, Biomaterials, Biophotonics, Biosensors, Cellular Mechanics and phenotype, Clinical Diagnostics and Theragnostics, Nanosensors, Drug-delivery: design and validation, Nanotherapeutics. Artificial Tissue Engineering, Space Medicine, 3D Printing, Additive Manufacturing.
- **Biomedical Imaging and Instrumentation:** Non-invasive optical imaging and instrumentation in medicine and biology, Ultrasonic imaging and instrumentation in Medicine, Multi-modal Photoacoustic imaging and instrumentation, Brain computer interface, ECG/ EMG/ EEG instrumentation, Biosensors.

- **Biomedical Image and Signal Analysis:** EEG / ECG /EMG Signal Processing, Optical & Ultrasonic image/signal processing and analysis, Analysis of brain MRI, Optical spectroscopy, Optical interferometry, Doppler Signal Processing of Optical and Ultrasound signals.
- **Biomechanics and Rehabilitation:** Biomechanics, Neuromechanics, Behavioral Neuroscience, Rehabilitation Engineering, Applications of AI/ML/DL and AR/VR in rehabilitation.

Fluid Mechanics Group:

- **Computational Fluid Dynamics (CFD):** Aerodynamics, Morphing wing Aerodynamics, Boundary Layers, Bluff Body Flows, Active and Passive Flow Control, Fluid-Structure Interaction, Bio-Fluid Mechanics, Mechanical Circulatory Support Systems, Astrophysical Fluid Dynamics, Instabilities, Transition and Turbulence, RANS/LES/DNS, Particle-Laden Flows, Multi-phase flows, Mutli-Physics of flow through Porous Medium, Transonic and Supersonic Flows.
- **AI/ML in Fluid Mechanics:** Active Matter, Collective Dynamics, Digital Twin in Mechanics, Physics-Informed Data Science, Pulmonary Fluid Mechanics.
- **Energy Systems and Sustainability:** Industrial Fluid Mechanics, Atomization and Sprays, Geothermal Energy, CO2 Based Oil, Gas and Energy Recovery, Hydrofracking, Wave Powered Desalination and Hydrogen Production, Soft Matter & Complex fluids, Biomicrofluidics & Lab-on-Chip, Climate Physics, Statistical Physics.
- **Thermal Systems:** Heat Transfer, Cooling Technologies, Thermal Hydraulics, Waves and Interfacial Flows, Droplets & Bubbles, Physicochemical Hydrodynamics, Colloids and Interfaces, Micro/Nano Scale Heat Transport & Phononics, Turbulent Convection, Premixed Combustion.

Solid Mechanics Group:

- **Mechanics of materials:** Plasticity, fatigue, fracture, composites, smart materials and structures, nonlinear mechanics, constitutive modelling, continuum mechanics, phase transformation materials, soft matter, polymers, biological materials, sustainable materials, 3D/4D-printing.
- **Computational mechanics:** Finite element methods, multiscale modeling, molecular dynamics, density functional theory, phase-field modelling, computational electrochemistry, inverse problems, reduced order modeling, uncertainty quantification, complex networks, data science based methods.
- **Dynamics:** Vibrations and controls, robotics, energy harvesting, nonlinear dynamics, stochastic dynamics, networked systems, non-smooth dynamics.

8.3 Department of Biotechnology:

Cellular, Molecular and Structural Biology relating to Signal transduction, Lipid Trafficking, Stem cell proliferation etc., Protein crystallography and structure prediction; Drug design and QSAR.

Bioorganic Chemistry; Bio transformations; Enzymes in Organic synthesis; Biosensors; Environmental Biotechnology Bioremediation; Green Chemistry.

Biochemical Engineering, Bioreactor Modelling; Reactive Oxygen species in Bioreactors; Recombinant Systems Cloning of Therapeutic Proteins and Large scale Production; Industrial Microbial Processes; Plant tissue and Animal cell Culture; Downstream Processing; Protein Refolding.

Bioinformatics and Computational Biology; Biomedical Engineering; Biomechanics; Biomaterials; Computational Neuroscience; Molecular Genetics of Plant Development.

8.4 Department of Chemical Engineering:

Chemical reaction engineering and thermodynamics, transport processes, process design and control, environmental engineering, polymer science and technology, semi-conductor materials processing, and particle technology.

Fundamental studies: Electrocatalyst, photocatalyst and heterogeneous catalyst, Light driven chemical reactions, Antibiotics and bacterial resistance. Mathematical modeling of physico-chemical phenomena. Applied statistical mechanics, thermodynamic property estimation, phase equilibria. Flow visualisation using lasers, Microwave assisted thawing. Drying, multicomponent boiling and condensation. Simultaneous heat and mass transfer processes.

Modeling of processes and equipments: Hydrodynamic and kinetic studies of turbulent bed contactors, trickle beds, slurry reactors, fast and inverse bed fluidized beds. CFD analysis of process equipments. Advanced separation processes such as reactive and azeotropic distillation, membrane processes. Modeling of rotary kilns, crushing and grinding equipments, fluid energy mills of Microelectronic fabrication techniques.

Development, characterization and processing of materials: Characterization of materials by light and electron microscopy. Development of polymer blends and composites, polymer based nano-composites. Rheology of polymers and colloids; damping and vibration isolation using polymers. Enzyme design and engineering, protein engineering and production of recombinant proteins.

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.

Environmental engineering and waste reduction: Liquid and solid waste treatment, air pollution monitoring and control, toxic and hazardous waste management, environmental risk assessment, colour removal from waste water. Recycling of mixed plastic waste.

8.5 Department of Chemistry:

Analytical Chemistry, Bioinorganic Chemistry, Chemistry of Main Group Elements, Inorganic Heterocycles, Materials Science, Synthetic and Structural Solid State Chemistry, Nanomaterials, Cage and Cluster Chemistry, Synthetic Organometallic Chemistry, Metalloboranes and Metallocarboranes, Supramolecular Chemistry.

Organic Synthesis, Natural Product Synthesis, Organometallics, Asymmetric Catalysis, Synthetic and Structural Carbohydrate Chemistry, Bioorganic Chemistry, Enzymes in Organic Synthesis, Medicinal Chemistry, Physical Organic Chemistry, Organic Photochemistry.

Homogeneous and Heterogeneous Catalysis, Surface Chemistry, Theoretical and Experimental Electrochemistry, Photochemistry, Polymer Chemistry and Applications, Gas-phase Kinetics, Monolayers and Clusters, Green Chemistry, Host-Guest Chemistry, Reaction Mechanisms, Excited State Photophysics, Energy Systems, Superconductors, Nanoclusters and Nanophases, Colloid and Interface Science Chemical Physics, Quantum and Theoretical Chemistry, Chemical Reaction Dynamics, Theoretical and Experimental Spectroscopy, Magnetic Resonance Spectroscopy and Imaging (especially NMR based), Fluorescence Spectroscopy, Nuclear Spectroscopy, Statistical Mechanics, Molecular Dynamics.

8.6 Department of Civil Engineering:

Building Technology, Construction Materials and Management Division: Technology of Construction Materials, High Performance Concrete, Repair and Rehabilitation of Constructed Facilities, Accelerated and unreinforced / reinforced Masonry, Diaster-Resistant Construction. Functional Performance of Buildings, Energy Efficiency of Buildings, Noise Control in Buildings, Acoustical Modelling, Environmental Noise Control. Construction Project Management, Project Scheduling and Control, Resource Management, Quality Management, Contracts, Productivity, Constructability, Schedule Compression, Risk Modelling in Projects, PPP for Infrastructure Development, Computer Applications in Construction, Geographic Information Systems.

Geotechnical Engineering Division: Strength and Deformation Behaviour of Soils, Expansive Soils, Soil Dynamics and Earthquake Engineering, Pile Foundations, Soil Stabilization, Stone Columns, Reinforced Earth, Geosynthetics, Environmental Geotechnics and Waste Disposal, Computer Methods in Geotechnical Engineering, Soil Structure Interaction, Reliability Methods.

Hydraulics and Water Resources / Environmental Engineering Division: Water Resources Systems Analysis, Design and Management for Water Supply, Irrigation, Drainage, Hydropower, Flood Control, Droughts. Surface and Ground Water Hydrology, Stochastic Hydrology, Physical and Numerical Modelling. Use of Finite Difference, Finite Element and Boundary Element Methods. Instrumentation and Monitoring of Hydraulic Systems, Computer Simulation and Optimization of Hydrosystems. Evolutionary Computing Applications, CAD, Decision Support and Expert Systems in Water Resources Engineering. Environmental Hydraulics, Water Quality Modelling, Industrial Waste Water Treatment, Hazardous Waste Management, Environmental Systems Analysis, Environmental Micro-Biology, Bioremediation, Air quality and Solid Waste Management, Environmental Biotechnology, Water and Waste water Treatment.

Structural Engineering Division: Experimental and Theoretical Study of Reinforced Concrete, Prestressed Concrete and Metal Structures, Plates & Shells, Thin Walled Members, Advanced Fibre Composite Members, Structural Dynamics and Impact Behaviour, Structural Stability, Structural Reliability, Smart Structures, Earthquake Resistant Design and Retrofit of Reinforced Concrete Structures, Bridges, Tall Structures, Structures for Power Plants, Finite Element Analysis of Linear

and Non-Linear Structural Systems, Structural Optimization, Computer Aided Structural Analysis and Design, Expert Systems and Artificial Intelligence Applications in Structural Engineering.

Transportation Engineering Division: Inter-City and Regional Transportation, Urban Transportation Planning, Travel Demand Analysis, Traffic Management, Operations and Safety; Public Transportation Planning, Operations and Management; Planning of Pedestrian and Bicycle Facilities, Intelligent Transportation Systems (ITS), Applications of GIS, Simulation Tools, Advanced Techniques and Decision Support System, Optimization, Transportation Economics; Constitutive Modelling of Asphalt, Modified Asphalt and Asphalt Mixtures; New and Innovating Materials in Pavement Construction; Analysis of Layered Structures, Design of Flexible and Rigid Pavements; Geo-synthetics in Pavements and Pavement Overlays; Pavement Management Systems; Rural Roads Planning, Design, Performance Evaluation and Maintenance Management; Low Cost Road Construction, Socio-economic Benefits Evaluation of Rural Road Projects.

8.7 Department of Computer Science and Engineering:

Automata theory and Formal languages, Analysis of algorithms, Graph theory, Unconventional Methods of Computing, Cryptography.

Software Engineering, Object Oriented Systems, Parallel and Distributed systems, Mobile Computing, Programming languages, Performance evaluation.

Software for VLSI design, Computer architecture, Computer graphics and Visualization.

Computer Communication and networks, Network Protocols and security, Real-time systems, Wireless Sensor Networks.

Data bases, Knowledge based systems, Data mining, Artificial intelligence, Machine learning, Indian language systems, Speech and vision systems, Artificial neural networks.

8.8 Department of Data Science and Artificial Intelligence:

Basic Research in the areas of Deep Learning, Reinforcement Learning, Physics Informed Machine Learning, Computational Mathematics.

Applied Research in the areas of Responsible AI, Deployable AI, Smart Cities and Transportation, Systems Biology and HealthCare, Network Analytics, Manufacturing Analytics, Financial Analytics.

8.9 Department of Electrical Engineering:

Communication Systems: Wireless Communications, Information Theory and Coding, Communication Networks, Optimization, Queuing Theory, Network Theory, Stochastic Networks, DSP Algorithms and Applications, Speech, Image Processing and Computer Vision.

Control: Linear and Nonlinear, Robust stabilization of systems, Control of resonant systems, Mapping and localization in robotics, Nanotechnology in control and digital design, Actuation of Mechatronic Systems, VLSI Architectures for robotics, Control of non-holonomic systems, FPGA-based design.

Electrical Drives and Power Electronics: Power Electronic Converters, Vector Control/Direct control /Torque Control of Motors, Simulation of PE systems, DSP Applications, Permanent Magnet Machines and Special Machines.

Instrumentation: Bio-Medical Instrumentation, Power Systems Instrumentation, Modeling and Simulation, Transducers, Sensors and Signal conditioning, Virtual Instrumentation, Signal Processing applications in Instrumentation.

Microelectronics and MEMs: Modeling, Simulation, Fabrication and Characterization of Silicon and Silicon-on-Insulator (SOI) based devices; Power MOSFETS, HEMTS and HBTs, nanoelectronic, compound semiconductor, polysilicon, porous and amorphous silicon devices; ultra-thin and high-k gate dielectric; Magnetoelectronics; MEMS based sensors and actuators, BioSensors, Microfluidics, RF MEMS, Optical MEMS.

Power Systems and High Voltage: Power System Optimization and Economics, Energy Management Systems, Power system automation, Flexible AC Transmission Systems (FACTS), Restructured Power System Operation, Power Quality monitoring and analysis, Custom Power Devices, Renewable Energy Systems. High Voltage Engineering, Insulation Coordination,Treeing and Tracking Phenomena in insulation material, Condition Monitoring of Power Apparauts Using Multi-Fusion Sensors, Production of Nanoparticles, Sterilization of Liquid Foods.

RF, Optics & Photonics: Remote Sensing, Computational Electromagnetics, Inverse Problems in EM, Millimeter wave Communications. Optical Communication/Networking, Optical Metrology, Components, Plasmonics, Nonlinear Optics, Silicon Photonics and Integrated Optics, Fiber Optic Sensors, Fiber Lasers.

Integrated Circuits and Systems: Analog, RF and Mixed-Signal IC design, Digital Systems including Architectures for Image Processing and Vision, CAD for Digital and Analog Circuits, Reconfigurable Computing.

8.10 Department of Engineering Design:

Automotive Engineering: Vehicle Dynamics, Tyre Mechanics, Mathematical Modelling of Dynamic Systems, Control, Fault Diagnosis, Automotive Systems, Automotive Antennas, Automotive Power Electronics and Drives, Electric Vehicles, Autonomous Vehicles, Intelligent Transportation Systems.

Biomedical Design: Medical Imaging, Biomechanical Modeling, Soft Tissue Mechanics, Bio-fluid Mechanics, Prosthetic and Scaffold Design, Biomedical Devices and Control, Microwave Applications, Tissue Ablation and Hyperthermia Physics, Radiometry, Ergonomics, Rehabilitation Engineering, Bio-MEMS/NEMS, Biomedical Micro/Nano devices.

Materials and Design: Geometric and Solid Modeling, Computational Geometry, Shape Search, Shape Optimization, Machine / Deep Learning in geometry processing, Applications of Data Science in Design and Analysis, Image Based Reconstruction, Solid Free Form Fabrication, Design Theory, Reliability, Fatigue and Fracture, Finite Element Analysis, Impact mechanics, Material Characterization, Design with Smart Materials, Sustainable Manufacturing, Additive manufacturing.

Robotics and Mechatronics: Parallel Manipulators, Underwater Robots, Medical Robotics, Exoskeletons, Rehabilitation robotics, Path Planning, System Dynamics and Control, Opto-mechatronics, Sensing.

8.11 Department of Humanities & Social Sciences:

Economics: Development Economics, Energy and Environmental Economics; Applied Econometrics; Industrial Economics; Micro-finance; Health Economics; International Trade; Economics of Innovation and Technological Change; Financial Economics and Banking; Economics of Education/Labour Markets; Urban Water Management.

Education and Technology Studies: Theories of Learning; Information and Communication Technologies (ICTs) in Higher Education; Science and Engineering Education; Engineering Ethics; Assessment and Evaluation in Higher Education; Quality Assurance.

Development Studies: Gender Studies, Labour Studies; Studies on Migration; Poverty, Social Exclusion and Marginalisation; Governance and Decentralisation; New Social Movements / Political Mobilisations.

History: Modern Indian History, History of Science, Technology and Medicine (since 1700s), Law and Society; Plantation History (Historical Aspects of Science, Technology and Medicine and Circulation of Knowledge concerning the crops).

Linguistics: Language in Education; Sociolinguistics; Applied Linguistics; Syntax/Morphology.

Literature and Media Studies: American Literature; Cultural Studies; Disability Studies; English Literature; ELT, Eco-criticism (American/British); Film and Media Studies; Fashion Studies; Indian Drama; Popular Culture; Life writing; Memory Studies.

Philosophy: Phenomenology; Hermeneutics; Philosophies of Heidegger and Wittgenstein; Indian Philosophy; Philosophy of Mind; Consciousness; Analytical Philosophy; Philosophy of Language; Political Philosophy; Ethics; Bioethics.

Politics & International Relations / Political Science: International Relations Theory; International Political Economy; Taiwan Studies; Chinese Studies; Democracy Theory and Practice.

Public Policy: Health Policy and Planning; Science and Technology Policy.

Sociology/Anthropology: Political Sociology of Corruption; Sociology of Religion; Islam; Sociology of Work and Gender; Anthropology of body; Anthropology of Technology; Gender Studies; Sociology of Science.

Urban Studies: Urban Housing; Land and Peri-urban land; Peri-urban dynamics; Urban Renewal; Poverty; Urban Livelihoods; Urban Infrastructure; East Asian Urbanism.

8.12 Department of Management Studies:

- **Finance -** Corporate Finance: Financial Decision Making; Family Business Management; Financial Modelling & Forecasting; Banking and Risk Management. Financial Markets: Capital Market; Bond Market; Commodity Market; Derivative Market; Market Microstructure. Venture Capital and Private Equity; Small and Medium Enterprises; Real Options; Developmental Finance; Development Studies; Infrastructure Finance; Public Sector Finance; Behavioural Finance.

- **Information Systems -** Information privacy and personalization strategy, social media misinformation and its cure, assistive technologies and human machine interaction, Responsible AI, behavioural cyber security, Artificial Intelligence & Machine Learning, Recommender Systems, Social Media and Network Analysis, Human–AI Interaction, Inclusive Educational Technology & Adaptive Assessment, Data-Driven Decision Sciences, Digital Transformation, Artificial Intelligence, Value Creation, Digital Entrepreneurship, IS in Healthcare, IS Governance and Strategy.

- **Integrative Management -** Strategy and Policy Studies; Technology Management; Business Model Innovation; Entrepreneurship.

- **Marketing** - Sales Person Performance; Branding in emerging economies; Corporate identity; B2B Marketing; Customer Relationships and Communities; Marketing Measures; Entrepreneurial Marketing; Food Marketing.

- **Operations -** Supply Chain and Logistics; Green Concerns; Healthcare and Food Sectors; Game Theoretic Models; Pricing and Revenue Management; Scheduling in Manufacturing and Service Operations; Integrated Production; Logistics and Inventory Optimization in Supply Chain Management; Behavioural Decision Theory.

- **Organizational Behaviour and Human Resource Management -** Organizational Behaviour; Positive Organizational Behaviour; Leadership and Organization Development (L&OD); Cognition; Spontaneous Mental States and Goal Directed Behaviour Across Contexts; Behaviourism - Combining Elements of Philosophy, Methodology, and Psychological Theory; Employee Voice and Silence; Workforce Diversity and Inclusion; Judgement and Decision making; Human Comfort Studies; Social Neuroscience; Human Resource Management; Training & Development; HR Audit; Workplace Teams; Work-Life Balance; Family-Friendly HR Policies and Practices; Employee Wellbeing; Women in Management and Entrepreneurship; Employer Branding; Corporate Sustainability and CSR; Technology and Human Interface; Knowledge Sharing / Hiding Behaviour; Workplace Emotions; Ancient Indian Wisdom in Management; Creativity & Innovation; Cross-Cultural Research; Integral Education; Teaching-Learning Practices.

8.13 Department of Mathematics:

- Commutative Algebra, Algebraic Geometry, Algebraic Topology, Cryptography, Number Theory, Algebraic K-Theory, Homological Algebra, Geometric Group Theory, Low Dimensional Topology.

- Functional Analysis, Operator Theory, Operator Algebras, Operator Equations, Generalized inverses of matrices and operators, positive operators, Nonnegative matrices, Fixed Point Theory, linear and nonlinear optimization, standard and semi definite linear complementarity problems, Non-linear Analysis, Harmonic Analysis, Wavelets, Fractal Signal and Image Compression, CAGD using fractal function, Theory of Fractal Interpolation, Approximation by Fractal functions, Time Frequency Analysis, Special Functions, Complex Analysis, Fuzzy set Theory and Applications,

Summability Theory, Systems and Control Theory, Game Theory, Partial Differential Equations, Inverse problems.

- Differential Equations, Mathematical Modeling, Numerical Analysis, Numerical Linear Algebra, Theoretical and Computational Fluid Dynamics, Transportation Theory of Heat and Mass and Water Waves, mathematical study of ferromagnetic systems.
- Applied Probability and Stochastic Processes, Queuing Theory, Inventory Control, Reliability, Computer Modeling and Simulation.
- Mathematical Logic, Graph Theory, Graph Algorithms, Approximation Algorithms, Theory Of Computation, Theory of Codes, Communication and Coding Theory, Combinatorial Optimization, Combinatorics of words, Complexity Theory, Theory of Programming.

8.14 Department of Mechanical Engineering:

(i) Design Engineering:

Machine Elements: design development, analysis and performance improvements; New materials and design: composites, nano composites, bio materials, surface engineering, contact mechanics, tribology, tyre mechanics, biomechanics, fatigue and failure analysis: computational and experimental fracture mechanics, fatigue crack closure - environment interaction studies, alternate/small specimen test methods, small crack propagation under biaxial/multiaxial loading, multi crack interaction studies, fatigue damage in composites, failure mechanics of biomaterials. Non linear finite element analysis, design process, design optimization, finite element applications including coupled problems, Non destructive evaluation, structural health monitoring, Materials constitutive modeling and Characterisation, Measurements of Material Properties and Behaviour, NVH, machinery signal processing, Condition monitoring of structures/ machines, machinery diagnosis, combustion/flame noise, Acoustics and Noise Control.

(ii) Manufacturing Engineering:

Manufacturing Processes, Conventional and Unconventional Processes, CAD/CAM, Robotics, CNC Machining, Metrology, Surface Engineering, Computer Integrated Manufacturing, Manufacturing Methods in Precision Engineering; Microsystems technology: Micro-sensors and actuators, Embedded systems, Vehicle controls; Robotics: Series and parallel configuration, Networked robots, Under water, space and medical applications; Fluid power technology: Electro-hydraulic servo-valves, Hybrid hydraulics, System Simulation and Modeling; Precision manufacturing; Design, Development, Modeling and Simulation of Unconventional, Micro and Nano Machining Systems.

(iii) Thermal Engineering:

Heat Transfer in Nano-fluids, Heat Transfer in Multi-Phase Flows, Heat Exchangers, transition to turbulence, Heat and Mass Transfer in Fuel Cells, Biomass combustion, Fluidized Bed Combustion, Advanced Coal Power Plants, Solar Power Systems, Optimization of Solar ICs Systems, Concentrating Solar Power, Thermal Photovoltaic systems, The Heat Transfer in Phase Change Material Based Composite Heat Sinks, Experimental and Numerical Methods in Porous Media, Bio-thermo fluids, numerical modeling of heat transfer in biological systems, Conjugate heat transfer

in low and high speed flows, Optimization of heat transfer systems, Inverse heat transfer, Satellite Meteorology, Numerical weather prediction, Radiance Assimilation in Mesoscale Weather Models; Pico, micro and mini hydropower ; Economic choice and use of pumps; Two phase flow in pumps and turbines; Cavitation in pumps, turbines and flow devices ; Pumps using solar power; Control of hydrodynamic cavitation, and Design and development of micropumps; Flow Structure Interaction in High Speed Turbo machinery Seals; Turbine rotor stator interaction, Performance improvement of centrifugal compressor by tip modification, subsonic cascade studies, Investigations on counter rotating turbines, volute casing and mixed flow compressors, active and passive control of turbomachinery flows, Gas turbine blade cooling; IC Engine Combustion and Emissions; Alternative fuels; Multi-component Fuels; Phenomenology and CFD of IC Engines and Gas Turbine Processes, Engine Flow and Combustion Diagnostics; engine management, Advanced IC Engine Technologies; Vapour compression refrigerators operating with new generation HFO, refrigerants and refrigerant mixtures, mixed refrigerant cascade, refrigerators, Simulation and optimization of mixed refrigerant processes, liquefaction of natural gas/bio gas, magnetic and acoustic refrigeration systems, high effectiveness compact heat exchangers used in refrigerators, air conditioners, and liquefiers, vapour absorption refrigerators operating with ionic fluids. desalination systems, solar cooling systems, IAQ (indoor air quality), jet refrigeration systems, heat pipes, heat pumps, micro-miniature and small cryogenic refrigerators, Simulation and optimization of air separation cycles, solid state hydrogen storage, sorption heating and cooling systems, Desiccant / evaporative cooling, air-conditioning and Ventilation , CFD for air distribution; Acoustics of Supersonic Jets, Active and Passive Control of High speed flows, Combustion noise, Emissions, Combustion of solid, liquid and gaseous fuel, Propulsion, CFD of high speed reacting flows, Microfluidics, Bio-MEMS, Micro-scale flows.

8.15 Department of Medical Sciences and Technology:

(i) Cardiology & Cardiovascular Surgery
(ii) Neurology & Neurosurgery
(iii) Orthopedics
(iv) Nephrology & Urology
(v) Perinatology
(vi) Gastroenterology & Hepatology
Link: https://mst.iitm.ac.in/

8.16 Department of Metallurgical & Materials Engineering:

(i) Materials: Nanostructured materials, Ceramics, Composites, Biomaterials, Medical Materials, Magnetic materials, Optoelectronic materials, Hydrogen storage materials, Fuel cells, energy materials, Chemical sensors, Carbon nanotubes, Smart materials, Shape memory alloys, Metallic foams, Advanced steels (AHSS, DP, Q&P, ODS, etc.), Al, Mg and Ti alloys, Superalloys, Intermetallics, Bulk metallic glasses, High entropy alloys, Polymers and colloids, Printed electronics, Ultra high temperature ceramics, interfaces, Transmission electron Microscopy, Atom probe tomography.

(ii) Processing: Metal casting and solidification, Metal forming, Materials joining, Materials synthesis, Physical and Structural metallurgy, Phase transformations, Mechanical metallurgy, Chemical metallurgy, Powder metallurgy, Surface engineering, Coating, Thermal spraying, Corrosion, Electro chemistry, Non-equilibrium processing, Fatigue and Fracture mechanics, High temperature deformation behaviour of materials and Creep, Nanoindentation, Superplasticity and Superplastic forming, Severe plastic deformation, Thermomechanical processing using Gleeble, Additive manufacturing, spark plasma sintering, grain boundary engineering, Micro and macro texture development.

(iii) Modeling: Integrated computational materials engineering (ICME), Thermodynamics of Metallurgical systems and processes, Computational thermodynamics using CALPHAD approach, Simulation and modelling of materials processing, Modeling of mechanical behavior through crystal plasticity, Phase field modeling of microstructure, Molecular Dynamics, Cellular Automaton, Ab-Initio/electronic structure/first principle calculations, Object oriented finite element analysis, Artificial neural networks, Modeling of transport phenomena.

8.17 Department of Ocean Engineering:

Petroleum Engineering ,Ocean Hydrodynamics, Ship hydrodynamics, Dynamics of Floating systems, Ocean Structures, Coastal processes, Marine Geotechnical Engineering, Materials for marine Environment, Ocean Energy.

8.18 Department of Physics:

Applied Optics, Quantum Optics, Photonics and nonlinear optics, Atomic and Molecular Physics, Biological physics, Complex fluids, Cosmology and Gravitation Dynamical systems, Statistical physics and field theory, Low temperature physics and superconductivity, Magnetism and Magnetic materials, Hydrogen Storage Materials, Microwaves and Dielectrics, Semiconductor Physics, Photovoltaics, Solid State Ionics and molecular electronics, Thin film phenomena, X-ray diffraction and Amorphous systems, Spintronics and Diluted Magnetic Semiconductors, Condensed Matter Physics/Magnetism in Oxides/Magnetic Materials, Electronic structure of solids/Computational material science, Nonlinear Dynamics, Quantum Chaos, Quantum Information, Metal-oxide Thin films, Nanostructured thin films and heterostructures by PLD.

Centres:

8.19 Sophisticated Analytical Instrument Facility (SAIF):

Nanomaterials, Clusters, Self Assembled Monolayers, Chemistry of Ions, Surface Chemistry, and Chemistry of ice surfaces. Bioactive ceramics, Surface science aspects of biomaterials host interface, nano composites, Crystal Twinning, Molecular structure of natural products and biomolecules. Photophysical Chemistry, Fluorescence Spectroscopy.

8.20 Interdisciplinary Research Areas:

(1) Combustion

(2) Atmospheric Sciences and Technology (Climate science and climate change)

(3) Nano Science and Technology

(4) Material Science and Technology

(5) Sustainability

(6) Technology and policy

(7) Computational Engineering

(8) Environmental Science and Engineering

(9) MEMS, NEMS, Lab on a chip, microfluidics

(10) Bio- engineering

(11) Advanced sensors, Instrumentation and Control

(12) Energy Technology

(13) Medicine and health care

(14) Communication Technology

(15) Security and Defense

(16) Big Data

[To be submitted at the time of the Interview]

DATA SHEET FOR Ph.D / M.S ADMISSION

(TO BE FILLED BY CANDIDATES)

Ph.D
M.S ✓

(Please put a tick ( ) mark)

1. Name
(If the boxes provided are not sufficient, Shorten your name)

2. Category Applied for

HTRA	Project - HTRA	NBHM/ INSPIRE	Project- NHTRA	Staff	External	CSIR/ UGC	QIP

3. Department

4. Age as on last date of the receipt of Application form in IITM — Date of Birth:

6. Email ID : _____

7.B.Tech./B.E//M.A./ M.Com./ M.Sc./AMIE. etc.,

(a) University
(Shorten the name, if boxes are not sufficient)

(b) Year of passing

(c) Aggregate Marks/Percentage
(Provide one Box also for point)

(d) Valid GATE Score
(Provide one Box also for point)

(e) UGC-JRF/NET/CSIR-JRF Fellowship holder (state validity date)

8. Category GN / OBC-NCL / EWS / SC / ST / PwD — GN ☐ OBC NCL ☐ EWS ☐ SC ☐ ST ☐ PwD ☐

9. M.Tech//M.E/M.Sc./M.S./M.A./M.Com./M.B.A

(a) University
(Shorten the name if boxes are not sufficient)

(b) Year of passing

(c) Aggregate Marks/Percentage
(Provide one Box also for point)

(d) If result awaited fill up the boxes as R A

10. Experience in years as of April /Oct.

11. No. of Publications

To be filled in by office : Reg. No: …… Ph.D ☐ M.S ☐

Appendix - 1

[To be submitted at the time of Admission]

Admission to Ph.D/M.S programme under External Registration Scheme at IIT Madras

Proforma for Relief Certificate

Shri/Smt/Kumari ……..
employed as ……. is granted leave for 20 weeks (140 days) commencing from ……. to ……. and is relieved of his/her duties with effect from ……. to ……. to enable him/her to pursue Ph.D/M.S Research programme under External Registration Scheme in July / Jan ……. semester at the Indian Institute of Technology Madras, Chennai - 600036 as per his/her offer of admission letter No ……. dated ……..

Date :

Signature of the Officer with name and address of the Organization

Office Seal

[To be submitted at the time of Admission]

Certificate from the reputed University / Institution/ Organization sponsoring their employees for Ph.D / M.S programme of IIT Madras External scheme

The application of ….………..…………………………………………. working as ………..…………………………… in ……………..…………………………………………… since ….……….….….….. is herewith recommended and forwarded for admission under External Registration Scheme of the Indian Institute of Technology Madras for Ph.D./M.S Research programme in the Department of …………………………………………………

1. This organization has adequate facilities for carrying out the research indicated by the applicant and if he/she is selected, these will be made available to him/her during regular working hours till the completion of the programme.

2. The applicant will be deputed / given leave for duration of his/her residence period at IIT Madras. The applicant will be given permission to attend the required class for completing course work.

3. Facilities will be made available to the Co-guide to supervise the work of the applicant and to attend the meetings at IIT Madras whenever necessary.

4. Till the completion of his/her research programme, the applicant will not ordinarily be transferred to another unit or place which may impede his/her work under the scheme. If such a transfer is necessary, IIT Madras will be informed within a month of such transfer. We understand that continuing of registration will depend on the decision of IIT Madras in this regard, taking into account all relevant factors.

5. We note that the facilities of the Institute will be made available to him/her for carrying out the research work and that there will be no separate charge (other than the fees prescribed payable by the candidate from time to time) for the use of laboratory, library and other facilities.

6. No part of the work carried out in fulfillment of the Research programme will be utilized commercially or for applying for a Patent without the approval of Indian Institute of Technology Madras and other than on terms mutually agreed to by IIT Madras and this organization.

Date:

Signature of the Officer:

Seal of the Organization

Name and Designation:

Postal address of the Organization:

[To be submitted at the time of Admission]

Particulars of Co-guide for External Registration Scheme

In addition to being in a position to ensure technical and logistic support to the scholar in his/her research work in the organization, the Co-guide must have a minimum academic qualification of a Master's degree in Engineering/Management/Science/Humanities & Social Sciences and adequate professional experience in the relevant field. The Co-guide should not himself be a scholar working for any higher degree of any university. He will be an invitee to the Doctoral Committee/General Test Committee meetings at IIT Madras.

(1) Name of proposed Co-guide (in block letters) :

(2) Academic qualifications of Co-guide :

(3) Membership (if any) in Professional Societies for Co-guide :

(4) Designation of Co-guide :

Certificate of Co-guide

This is to state that in the event of Mr./Ms. _____ of this organization being selected for Ph.D / M.S programme in the Department of _____ under the External Registration Scheme of IIT Madras, I agree to be his/her Co-guide and shall extend all possible facilities to enable him/her to carry out his/her research programme towards the submission of thesis.

Date: Signature of Co-guide

[To be submitted at the time of Interview]

Admission to Ph.D. / M.S programme under Project Scheme at IIT Madras

Certificate from the Project Co-ordinator

I have noted the conditions stated below concerning the registration of project staff for Ph.D / M.S programme. This is to certify that Sri/Smt/Kum _____ is working under the project title _____ and project number _____ since _____ as _____. He/She is eligible to continue in the project for a minimum period of one more year from the date of his/her joining in the research programme (Ph.D / M.S). The actual duration of the project is upto _____.

Conditions:

1. For a person employed on a project to be eligible for Ph.D/M.S registration, there should be a minimum residual period of one year's service in the project from the date of registration in Ph.D/M.S programme.

2. Person employed on a project can apply for admission to M.S. programme with a minimum project experience of six months without valid GATE score subject to qualifying in selection procedure (interview / written examination) of the concerned department. They will not be eligible for HTRA until they qualify in the GATE examination. The scholars may seek conversion from project to HTRA provided they qualify in GATE with the minimum cut-off prescribed for the selection of scholars admitted in his/her batches.

3. Eligibility requirement of project staff applying for Ph.D. will be treated equivalent to that of External registration candidates under N-HTRA except the experience requirement will be 1 year in the IITM project staff category.

Date: Signature and name of the Project Coordinator

Department of _____

Countersigned:

Date: Head of the Department of _____

Appendix - 5

[To be submitted alongwith the Application at the time of Interview]

Admission to Ph.D/M.S programme under External Registration Scheme at IIT Madras

NO OBJECTION CERTIFICATE FROM THE EMPLOYER

The application of **……** working as **……** in **……** since **……,** is herewith recommended and forwarded to pursue research programme under External registration scheme in July/Jan **……** semester at IIT Madras in the Department of **……**

Date:

Signature of the Officer with name and address of the Organization

Office Seal