Applications are invited throughout the Academic Year 2019-20

- Registration of Application forms open from :: 01.03.2019
- Last date of receipt of completed application form :: 31.03.2019
- Written Test and Interview or Interview [on or before]* :: *
- Selected Candidates to join on :: 22.07.2019

* Intimation on “written test and interview” or “interview” indicating the date, time & venue will be provided by the respective Departments through email to the shortlisted candidates.
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I. Important Guidelines for Ph.D. & M.S. Application:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Please read the instructions given in the admission brochure carefully before filling up the application form.</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Online Application Form &amp; Admission Brochure</strong> (including the admission schedule along with the important dates) is available on the Institute Website <a href="https://research.iitm.ac.in">https://research.iitm.ac.in</a></td>
</tr>
<tr>
<td></td>
<td>You are required to submit the application <strong>ONLINE</strong>. No Downloadable Forms will be available. After filling the form, you are advised to take a print of your application and keep the same for the record.</td>
</tr>
<tr>
<td>3.</td>
<td>The application fee is as follows:</td>
</tr>
<tr>
<td></td>
<td>GN/EWS/OBC-NCL Male candidates : Rs.100/-</td>
</tr>
<tr>
<td></td>
<td>GN/EWS/OBC-NCL Female candidates : Rs.50/-</td>
</tr>
<tr>
<td></td>
<td>SC/ST and PwD candidates : Rs.50/-</td>
</tr>
<tr>
<td></td>
<td><strong>APPLICATION FEE IS NON-REFUNDABLE.</strong></td>
</tr>
<tr>
<td>4.</td>
<td>You can submit separate application to departments of your choice by paying separate application fee.</td>
</tr>
<tr>
<td>5.</td>
<td>The <strong>OBC (Non-Creamy Layer) certificate issued after 01.10.2018</strong> (financial year for 2018-2019) in the prescribed format must be uploaded in the ONLINE application and submitted at the time of admission.</td>
</tr>
<tr>
<td>6.</td>
<td>You should check the admission website for important announcements and department website for result.</td>
</tr>
<tr>
<td>7.</td>
<td><strong>Candidates called for written test/interview should bring with them</strong> <strong>Printed copy of the application submitted online along with Original and photo copies of relevant certificates.</strong></td>
</tr>
</tbody>
</table>
II. Schedule of M.S/Ph.D. & Direct M.S.+Ph.D. admission for the Academic Year 2019-20

Admission Schedule for July 2019:

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Description</th>
<th>Important Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Activation of the website for submission of online application</td>
<td>01.03.2019</td>
</tr>
<tr>
<td>2.</td>
<td>Last date for submission of completed application form through on-line for July 2019 admission</td>
<td>31.03.2019</td>
</tr>
<tr>
<td>3.</td>
<td>Date of Admission</td>
<td>22.07.2019</td>
</tr>
<tr>
<td>4.</td>
<td>Photo session &amp; Data Entry</td>
<td>23.07.2019</td>
</tr>
<tr>
<td>5.</td>
<td>Orientation</td>
<td>24.07.2019</td>
</tr>
</tbody>
</table>

Applications are invited throughout the Academic year 2019-20:

Applications received from 01.04.2019 will be considered through anytime admission mode by the respective department. Shortlisted candidates will be called for test and interview or interview from time to time.

For Admission schedule and details of “test and interview or interview” for “Anytime admission”, see the concerned department website in which you have applied.

Note: For detailed eligibility criteria refer Clause 5.1.1 & 5.2.1 for Ph.D. and M.S.
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 19 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 Organisation, Ministry of Non-Conventional Energy Sources and Defence Research & Development Organisation, Naval Research Board, Department of Electronics, IGCAR, Atomic energy agencies and other Organisations 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. 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.

Research works are carried out in the interdisciplinary areas among the Departments which may be pursued by the research scholars for the Ph.D 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 coordinates the sponsored research and consultancy activities.
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 following 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 enrolment, satisfactory progress in research work and good performance during the preceding semester in the discharge of responsibility as research assistant.

### Ph.D.

<table>
<thead>
<tr>
<th>Qualification</th>
<th>Rs.31,000/- p.m.</th>
<th>Rs.35,000/- p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) M.Sc./M.A./M.Com or equivalent qualification with valid GATE/NET</td>
<td>First 2 years</td>
<td>next 3 years</td>
</tr>
<tr>
<td>b) M.E./M.Tech or equivalent qualification</td>
<td>First 2 years</td>
<td></td>
</tr>
</tbody>
</table>

### M.S.

<table>
<thead>
<tr>
<th>In Engineering / Management</th>
<th>Rs.12,400/- p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>for the period of 2 ½ years</td>
</tr>
</tbody>
</table>

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 get admission and the amount of fellowship will be as per the norms of the funding agency. The admission procedure and other requirements are the same as applicable for the Regular HTRA candidates.

3.2 Admission without Assistantship:

A few candidates may also be considered for admission to the Ph.D./M.S. programme without assistantship also (Non-HTRA) under Regular category.

The eligible qualifications are the same as for the Regular HTRA candidates.

Such candidates have to enclose a letter along with the Application Form stating that they may be considered for admission even without assistantship (Non-HTRA).

(Candidates selected from HTRA list can move to N-HTRA and revert back to HTRA later. Candidates selected from N-HTRA list can move to HTRA category only after acquiring appropriate additional qualifications)

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 Departmental Selection Committees of the respective departments.

For candidates who have obtained PG degree 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

Reservations are applicable to EWS/SC/ST/OBC-NCL/Persons with Disability (PwD) candidates as per Govt. of India rules but the final selection is based on the performance of the candidate in “test and interview” or “interview” conducted by the respective Departmental Selection Committee.
### 3.5 Fees and Deposits:

**INDIAN INSTITUTE OF TECHNOLOGY MADRAS**

Fees for the research scholars to be admitted in the academic year **2019-20**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Items of Fees &amp; Deposits</th>
<th>(Value in INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M.S.</td>
</tr>
<tr>
<td>I.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>A. One time Fees:</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td><strong>Admission fee</strong></td>
<td>150</td>
</tr>
<tr>
<td>2</td>
<td><strong>Grade card/Thesis fee</strong></td>
<td>450</td>
</tr>
<tr>
<td>3</td>
<td><strong>Provisional certificate</strong></td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td><strong>Medical Exam fee</strong></td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td><strong>Student welfare fund</strong></td>
<td>1000</td>
</tr>
<tr>
<td>6</td>
<td><strong>Modernisation fee</strong></td>
<td>500</td>
</tr>
<tr>
<td>7</td>
<td><strong>Alumni Life Membership Fee (NS)</strong></td>
<td>1500</td>
</tr>
<tr>
<td>8</td>
<td><strong>Publication fee (NS)</strong></td>
<td>250</td>
</tr>
<tr>
<td></td>
<td><strong>Total A (One Time Fees)</strong></td>
<td>4050</td>
</tr>
<tr>
<td>II.</td>
<td><strong>B. Semester Fees:</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td><strong>Tuition fee</strong></td>
<td>2500</td>
</tr>
<tr>
<td>2</td>
<td><strong>Examination fee</strong></td>
<td>300</td>
</tr>
<tr>
<td>3</td>
<td><strong>Registration-Enrolment fee</strong></td>
<td>300</td>
</tr>
<tr>
<td>4</td>
<td><strong>Gymkhana</strong></td>
<td>1500</td>
</tr>
<tr>
<td>5</td>
<td><strong>Medical fee</strong></td>
<td>700</td>
</tr>
<tr>
<td>6</td>
<td><strong>Hostel Seat Rent #</strong></td>
<td>6000</td>
</tr>
<tr>
<td>7</td>
<td><strong>Fan, Elec. &amp; Water Charges #</strong></td>
<td>1000</td>
</tr>
<tr>
<td>8</td>
<td><strong>Student Wellness fee</strong></td>
<td>200</td>
</tr>
<tr>
<td>9</td>
<td><strong>Medical Insurance Premium (subject to revision)</strong></td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td><strong>Total B (semester fees)</strong></td>
<td>14100</td>
</tr>
<tr>
<td>C.</td>
<td><strong>Deposits (Refundable):</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Institute Deposit and Library Deposit (each Rs 1000)</strong></td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td><strong>Institute fees payable through online at <a href="http://www.iitm.ac.in/academics">www.iitm.ac.in/academics</a> Hostellers (A+B+C)</strong></td>
<td>GE/EWS/OBC-NCL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC/ST/PwD</td>
</tr>
<tr>
<td></td>
<td><strong>Day scholars [A+(B-#) +C+ II(3)]</strong></td>
<td>GE/EWS/OBC-NCL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SC/ST/PwD</td>
</tr>
<tr>
<td>II.</td>
<td><strong>Hostel Fees &amp; Mess Charges per semester</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td><strong>Hostel Admission fee</strong></td>
<td>250</td>
</tr>
<tr>
<td>2</td>
<td><strong>Hostel Deposit (NS)- (refundable)</strong></td>
<td>3000</td>
</tr>
<tr>
<td>3</td>
<td><strong>Estt.’A’ charges</strong></td>
<td>6000</td>
</tr>
<tr>
<td>4</td>
<td><strong>Estt ‘B’ charges</strong></td>
<td>1500</td>
</tr>
<tr>
<td>5</td>
<td><strong>Advance Dining charges</strong></td>
<td>13530</td>
</tr>
<tr>
<td></td>
<td><strong>Hostel Fees payable through online at <a href="https://hosteldine.iitm.ac.in">https://hosteldine.iitm.ac.in</a></strong></td>
<td>24280</td>
</tr>
</tbody>
</table>

**NS** – Non Statutory fees

*- SC/ST/PwD scholars are exempted from payment of tuition fee irrespective of their parental income.

# - For Hostellers only

Hostel rooms are allotted depending on availability on sharing basis. If you wish to be a day scholar, you should register your name in the Office of the Dean Students and obtain day scholar certificate immediately after admission.
3.6 **TA for attending Interview for Ph.D./Direct Admission to M.S.+Ph.D. programme:**
Candidates called for Ph.D./Direct Admission to M.S.+Ph.D. interview under the Regular (HTRA) category will be paid second 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 as he/she may attend interview in more than one department in the same trip.

3.7 **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.

3.8 **Original Documents to be submitted for verification at the time of interview/Admission:**

**At the time of Interview:**
(a) Printed copy of application mailed to the candidates after online registration.
(b) All the semesters Mark sheet/grade card / provisional / degree certificates beginning from first degree towards proof of qualification.
(c) Community Certificate in the case of SC/ST/OBC-NCL candidates issued by the respective State Government. The candidates claiming for EWS (Economically Weaker sections) reservation should submit valid certificate issued by the concerned authority.
(d) Authorised Doctor’s Certificate with disability descriptions in the case of Person with Disability (PwD) candidates.
(e) Copy of GATE score card or Original UGC - JRF/NET/CSIR-JRF/ DAE-JEST or other fellowship award.
(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/Part-time/Staff candidates, NOC from the present employer should be submitted.

**At the time of Admission:**
(a) Offer of admission.
(b) Birth Certificate.
(c) Aadhar Card.
(d) First page of SSLC/SSC/Matriculation certificate along with Application form.
(e) Original GATE Score Card/UGC-JRF/NET/CSIR-JRF/DAE-JEST or other fellowship award letter.
(f) Degree certificate/Provisional/Course completion certificate/Grade Cards/Mark sheets of all the semesters of degrees obtained.
(g) SC/ST/OBC-NCL community certificate for the candidate belonging to SC/ST/OBC-NCL category. [OBC-NCL candidates to upload the latest valid Non-creamy layer community certificate in the prescribed format obtained after 01/10/2018].
The candidates claiming for EWS (Economically Weaker sections) reservation should submit valid certificate issued by the concerned authority.
(h) Relieving order/Resignation acceptance letter from the employer in the case of Regular candidates (HTRA / NHTRA / PROJECT / CSIR-JRF / UGC-JRF), if employed except candidates selected under IITM Staff scheme.

In addition to the above...

**For External candidates:**
- Research Co-ordinator letter
- Research Co-ordinator Degree certificate
- NOC, Relief & Sponsorship certificate from the present employer

**For Part-time candidates:**
- NOC, Relief & 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. Regular scholars with or without Institute fellowship or with project support.

Scholars selected from HTRA list can move to N-HTRA and revert back to HTRA later. Scholars selected from N-HTRA list can move to HTRA category only after acquiring appropriate additional qualifications.

b. Eligibility requirement of IIT Madras project staff applying for Ph.D. will be treated equivalent to that of External registration candidates under N-HTRA. These scholars cannot move from NHTRA to HTRA category later.

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

d. Permanent staff members of the Institute are eligible to apply for Ph.D. programme under Staff category.

e. Research scholars under the external registration programme sponsored by and employed in industry/or ganization/institution having R & D facilities and recognized by DST or IIT Madras, national laboratories, reputed universities/colleges or employed in research/analysis jobs in public sector/private sector/government in the case of management area.

(A research scholar under the external registration programme will normally carry out part or all of his / her research work in the industry/organization/national laboratories/universities employing the scholar under the supervision of a co-guide also employed in the same organization and a guide at IIT Madras.)

The candidate must have at least two years experience in the case of registration under Engineering/Sciences/Humanities & Social Sciences/Management stream.

f. Research scholars on a part-time basis from a reputed University/Institution/ Organization. They should have at least two years experience in a regular position for registration in Engineering, Sciences, Humanities & Social Sciences and Management Departments.

(A research scholar admitted on a part-time basis shall normally carry out the research work at IIT Madras under the supervision of a guide at IIT Madras. The feasibility of doing this with sufficient intensity will be an important consideration in admitting the scholar in this category).

g. Candidates applying for admission in the External/Part-time categories:

i) Should submit a relief certificate at the time of admission
ii) Should submit one page write-up about the research topic.
iii) Must belong to any one of the following category:
   a) Industry/or ganization/institution having R & D facilities and recognized by DST, Gol or IIT Madras
   b) National Laboratories
   c) Reputed Universities / Colleges
   d) Public sector / Private sector / Government Departments engaged in research/analysis jobs of their executives in the case of management area.

h. The minimum residential requirement for the Ph.D research scholars under External registration and Ph.D. research scholars under part-time 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 course requirement.

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

j. M.Tech/Ph.D Dual Degree programme in Engineering Design Department:

The selection of candidates is through MS admission process. Final selection for admission will be as per the criteria fixed by the department selection committee.
4.2 Categories of admission in M.S programme:

a) Regular scholars with or without Institute fellowship or with project support.

(Person employed on a IIT Madras 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.)

b) Permanent staff members of the Institute are eligible to apply for M.S programme under Staff category.

c) Research scholars under the external registration programme sponsored by and employed in industry/organization having R & D facilities and recognized by DST or IIT Madras, national laboratories, reputed universities/colleges or employed in research/analysis jobs in public sector/private sector/government in the case of Management area.

(A research scholar under the external registration programme will normally carry out part or all of his/her research work in the industry/organization/national laboratories/ universities employing the scholar under the supervision of a co-guide employed in the same organization and a guide at IIT Madras. The candidate must have at least two years experience).

d) Research scholars on a part-time basis from a reputed University/Institution/ Organization. They should have two years experience.

(A research scholar admitted on a part-time basis shall normally carry out research work at IIT Madras under the supervision of a guide at IIT Madras. The feasibility of doing this with sufficient intensity will be an important consideration in admitting the scholar in this category).

e) Candidates applying for admission in the External/Part-time categories:

1. Should submit a relief certificate at the time of admission
2. Should submit one page write-up about the research topic.
3. Must belong to any one of the following category:
   - Industry/organization having R & D facilities and recognized by DST, Govt or IIT Madras
   - National Laboratories
   - Reputed Universities / Colleges
   - Public sector / Private sector / Government Departments engaged in research/analysis jobs of their executives in the case of management area.

f) The minimum residential requirement for the M.S research scholars under External registration and M.S research scholars under Part-time registration not employed in the Institute is one semester.
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 from Centrally Funded Technical Institute 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.

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 degrees are in Engineering / Technology OR candidates with more than 5 years relevant experience after the Master’s degree, the requirement of a test score may be waived by the Selection Committee.

d) Candidates who have qualified for the award of Bachelor’s degree in Engineering/Technology / Bachelor of Science (Research) with exceptionally good academic record in an eligible discipline will be considered for direct admission to M.S.+Ph.D. Programme in various Engineering and Science departments as a Regular scholar subject to the following conditions:

- 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) 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 from a reputed R & D organization and having a proven research record.

  Candidates with B.E/B.Tech/BS(4 year) for direct admission to Ph.D. programme will be joining a two-degree (M.S+Ph.D) programme.

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 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 from Centrally Funded Technical Institute 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.

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:

a) (i) Master’s degree / dual degree or equivalent in a relevant discipline AND Qualifying UGC - NET or JRF / CSIR-JRF / GATE Score or any national level examination tenable for the current year in the relevant area or international level post graduate admission examination such as GRE (Non-HTRA). OR
(ii) Master’s degree in Engineering/Technology or 5 Year BS+MS Dual degree/ 5 Year Integrated degree from Centrally Funded Technical Institute with a good academic record.

b) At least 3 years of experience in research/industry in lieu of the above examination. (This clause is only for Non-HTRA candidates)

Ph.D in Management:

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/UGC-JRF/NET/CSIR-JRF or equivalent or international level post graduate admission examination such as GMAT / GRE or equivalent.

OR

At least 5 years of managerial experience in lieu of the above examination. (This clause is only for Non-HTRA candidates)

International level post graduate admission qualifying examination such as GMAT along with TOEFL / IELTS (only for international candidates)

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 and above are exempted from qualifying in National level examinations.

5.1.2 For Permanent Institute Staff members / Research Scholars under QIP / Research Scholars under External Registration / Research Scholars under Part-time 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.

Further the residential requirement is treated as fulfilled for MS/PhD scholars admitted from among the employees of the organizations posted to IITM Research Park.

One year PG programme from Accredited Universalities 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 admission to M.S.+ 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 admission to M.S. + Ph.D.

3) The scholar will be eligible for HTRA, if they qualify GATE (equivalent to Direct admission to M.S. + Ph.D. scholars)
5.2 Minimum Educational Qualifications for M.S:

5.2.1 For Regular Research Scholars:

**M.S. in Engineering:**

a) Candidates with a Bachelor’s degree in Engineering / Technology with valid GATE score or a Master's degree in appropriate Sciences/Management where eligible with a good academic record and a valid GATE score tenable for the current year 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) IIT B.Tech candidates with a CGPA of 8.0 and above, are eligible to apply for M.S. Programme.

5.2.2 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:

a) national level post graduate admission qualifying examinations such as GATE/CAT

b) International level post graduate admission qualifying examination such as GMAT along with TOEFL / IELTS (only for international candidates)

c) at least 3 years of managerial experience in lieu of the qualifying test. (This clause is only for Non-HTRA candidates)

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:**

The minimum eligibility requirement for admission will be graduates with a B.Tech/B.E. or any postgraduate degree (eg. M.A or M.Com will be eligible; not B.A. or B.Com graduate).

The existing admission criteria for Regular HTRA and non-HTRA admissions to be retained. For HTRA, the candidate will need to qualify in GATE/CAT and to any of the approved national qualifying exams eligible for scholarship at the time of accepting offer of admission or CGPA over or equal to 8.0 CGPA for graduates from centrally funded technical institutions (including IITM). Under the non-HTRA category, anyone with a B.Tech or postgraduate degree 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.
5.2.3. For Permanent Institute Staff Members/Research Scholars under External Registration / Research Scholars under Part-Time Registration:

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

However, valid GATE score or CAT 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 the 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

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Department</th>
<th>Eligible Degree for Ph.D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aerospace Engineering</td>
<td>“Master’s degree or its equivalent in Aerospace / Civil / Applied Mechanics / Mechanical/Electrical/allied branches(such as Instrumentation, Energy Engg., Production, etc.) OR Master’s degree in Mathematics / Physics with an excellent academic record. OR 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 5.1.1(c). The GATE score requirement is waived for candidates with at least two years experience in aerospace organisations and applying under the EXTERNAL category.”</td>
</tr>
<tr>
<td>3.</td>
<td>Biotechnology</td>
<td>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, etc. c. Master’s degree in Pharmaceutical Sciences d. Master’s degree in Agricultural Sciences e. Master’s degree in Veterinary Sciences f. B.Tech/B.E/BS (4 year) with a minimum CGPA of 8.0 and above on a 10 point scale or 75% aggregate with valid GATE score. GATE requirement is waived if the UG degree is from a centrally-funded technical institution (CFTI).</td>
</tr>
<tr>
<td>4.</td>
<td>Chemical Engineering</td>
<td>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 (e.g. petroleum, petrochemical, pharmaceutical, environmental, polymer, biochemical, biotechnology, electrochemical, instrumentation) and other disciplines of engineering/technology with exceptional merit can also be considered for direct PhD admissions.</td>
</tr>
<tr>
<td>5.</td>
<td>Chemistry</td>
<td>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 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.</td>
</tr>
</tbody>
</table>
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 and Construction Management**: 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.

**Environmental 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 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.

**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 Architecture/ Master’s degree in Civil Engineering with first class Bachelor’s and Master’s degree in Architecture, Town and Country Planning, City Planning/Urban Planning with specialization in Traffic and Transportation Planning of the School of Planning and Architecture, New Delhi / MBA after obtaining a basic degree in Civil Engineering with first class.

or M.Sc. in the relevant disciplines with valid GATE score or UGC-JRF/NET/CSIR-JRF/NBHM/INSPIRE or equivalent qualification in the relevant area tenable for the year of registration.

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.

8. **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 Physics followed by a Master’s degree in Engineering in an area of relevance to the area of research.

Candidates not having Master’s degree in Electrical/Electronics Engineering should qualify in a written test to be eligible for interview.

9. **Engineering Design**

Master’s degree in Aerospace, Automobile, Biomedical, Civil, Computer Science, Electrical, Electronics, Engineering Design, Engineering Physics, Instrumentation, Mechanical, Metallurgical, MS (Medicine), MD, MDS with minimum first class, Naval Architecture, Production / Manufacturing Engineering, or Master’s degree in Design (M.Des.) or M.Tech (Industrial Mathematics.)

Candidates with MBBS/BDS with minimum first class and NEET PG qualifying score will be eligible for direct admission to M.S+Ph.D programme.

10. **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.
11. **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 graduate and undergraduate 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 / UGC or CSIR/NET / JRF or Lectureship or equivalent or international level post graduate admission examination such as GMAT / GRE or equivalent. OR

At least 5 years of managerial experience in lieu of the above examination. (This clause is only for Non-HTRA candidates)

International level post graduate admission qualifying examination such as GMAT along with TOEFL / IELTS (only for international candidates)

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.

12. **Mathematics**

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. **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.

14. **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.

15. **Ocean Engineering**

Master's degree in Engineering/Technology and preference to those with Master's degree in Ocean Engineering.

**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.

16. **Physics**

M.Sc/M.Sc (Tech) in Physics, Applied Physics, Materials Science/M.Tech (Solid State Technology)/M.Tech (Materials Science) or equivalent.

Students who get CGPA of 8.0 and above in M.Sc degree from IIT Madras are also eligible for admission to Ph.D programme in Sciences

*Note:*

DST-INSPIRE Fellowship is treated as eligible criteria for admission to Ph.D programme in all the departments wherever applicable.
### Eligible Degrees for Admission to M.S programme

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Department</th>
<th>Eligible Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aerospace Engineering</td>
<td>Bachelor'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 Organisation and applying under EXTERNAL category.</td>
</tr>
<tr>
<td>2.</td>
<td>Applied Mechanics</td>
<td>Engineering Mechanics and Solid Mechanics areas: Bachelor's degree in Civil/Aerospace/ Mechanical/Naval Architecture Engineering. Fluid Mechanics area: Bachelor's degree in Civil / Mechanical / Aerospace / Chemical Engineering. Biomedical Engineering area: Bachelor's degree in Engineering or Master's degree in Science with Mathematics as optional subject and aptitude for research. MBBS candidates with Mathematics in +2 and having 2 years research/teaching experience may also apply for M.S sponsored programme in the area of Biomedical Engineering.</td>
</tr>
<tr>
<td>3.</td>
<td>Biotechnology</td>
<td>Bachelor'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 or qualified for JRF through CSIR or ICMR exams or all India PGadmission test 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.</td>
</tr>
<tr>
<td>4.</td>
<td>Chemical Engineering</td>
<td>Bachelor’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.</td>
</tr>
<tr>
<td>5.</td>
<td>Civil Engineering</td>
<td>Bachelor'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 experience admitted to the M.S. programme should take additional Engineering Courses to acquire enough engineering background. Building Technology and Construction Management: Bachelor'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. Environmental and Water Resources 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.</td>
</tr>
</tbody>
</table>
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 degree or equivalent in any branch of Engineering / Technology or Master’s Degree in Mathematics/ Statistics/ Physics/Computer Science/MCA with Mathematics/ Physics/ Statistics basic degree

7. **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 Physics. Candidates not having Bachelor’s degree in Electrical/Electronics Engineering should qualify in a written test to be eligible for interview.

8. **Engineering Design**
   Bachelor’s degree in Aerospace, Automobile, Biomedical, Civil, Computer Science, Electrical, Electronics, Engineering Physics, Instrumentation, Mechanical, Metallurgical, Naval Architecture, Production / Manufacturing Engineering, or Bachelor’s degree in Design (B.Des.) or Master’s degree in Physics.

9. **Management Studies**
   Qualifying Test : National-level entrance/eligibility test such as CAT/ GATE or equivalent or International level post graduate admission qualifying examination such as GMAT along with TOEFL / IELTS (only for international candidates)

   Candidates having qualified in MFT (Major Field Test) will also be eligible for admission to the M.S. programme

   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 any 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.

10. **Mechanical Engineering**
    Bachelor’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.

11. **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 with Metallurgy.

12. **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.
7. INTERNATIONAL STUDENTS - 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 students 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.

Fees:

- Foreign national with PIO/OCI card holders are eligible for admission with prescribed fee for Indian National as given in 3.5:

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Institute fees for Foreign National</th>
<th>Ph.D.</th>
<th>M.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>One time fee (at the time of admission)</td>
<td>Rs. 18,500</td>
<td>Rs. 18,500</td>
</tr>
<tr>
<td>2a</td>
<td>Semester fees: (Tuition Fees)</td>
<td>Rs. 3,00,000</td>
<td>Rs. 3,00,000</td>
</tr>
<tr>
<td>2b</td>
<td>Other Fees</td>
<td>Rs. 4,424</td>
<td>Rs. 4,424</td>
</tr>
<tr>
<td>4</td>
<td>Institute/Library Caution Deposit</td>
<td>Rs. 2000</td>
<td>Rs. 2000</td>
</tr>
<tr>
<td>5</td>
<td>Hostel Fees</td>
<td>Rs. 27965</td>
<td>Rs. 27965</td>
</tr>
</tbody>
</table>
8. RESEARCH AREAS

8.1 Aerospace Engineering Department:


8.2 Applied Mechanics Department:

8.3 Biotechnology Department:
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; Biotransformations; 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 Chemical Engineering Department:

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


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.


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 Chemistry Department:


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 Civil Engineering Department:


**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

8.7 Computer Science and Engineering Department:

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.


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

8.8 Electrical Engineering Department:


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.


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.

and Tracking Phenomena in insulation material, Condition Monitoring of Power Apparatus Using Multi-Fusion Sensors, Production of Nanoparticles, Sterilization of Liquid Foods.


**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.

**8.9 Engineering Design:**
**Automotive Engineering:** Vehicle Dynamics, Tyre Mechanics, Mathematical Modelling of Dynamic Systems, Control, Fault, Diagnosis, Automotive Systems, 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.


**Robotics and Mechatronics:** Parallel Manipulators, Underwater Robots, Path Planning, System Dynamics and Control, Optomechatronics, Sensing.

**8.10 Humanities & Social Sciences Department:**
**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.

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.

8.11 Department of Management Studies:

- Integrative Management-Strategy and Policy Studies; Technology Management and Innovation; Technology Transfer; Management of Intellectual Property Rights; Entrepreneurship.

- Marketing - Sales Person Performance; Branding in emerging economies; Corporate identity; B2B Marketing; Customer relationships and communities; Marketing Measures; Entrepreneurial Marketing; Food Marketing.


Social Network Mining, Recommender Systems, Mobile App Analytics, Econometric Modeling.

8.12 Mathematics Department:


8.13 Mechanical Engineering Department:

(i) Design Engineering:


(ii) Manufacturing Engineering:


(iii) Thermal Engineering:

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.

8.14 Metallurgical & Materials Engineering Department:

(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,

8.15 **Ocean Engineering Department:**


8.16 **Physics Department:**

Applied Optics, Quantum Optics, Photonics and nonlinear optics, Atomic and Molecular Physics, Complex fluids, 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, Spintronix 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:**

8.17 **Sophisticated Analytical Instrument Facility (SAIF):**

8.18 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) Bioengineering

(11) Advanced sensors, Instrumentation and Control

(12) Energy Technology

(13) Medicine and health care

(14) Communication Technology

(15) Security and Defense

(16) Big Data
9. AMENITIES IN THE CAMPUS

9.1 Accommodation:

IIT Madras is a residential institute and provides on-campus accommodation to all students, faculty and staff. For the students, there are 20 Hostels. Accommodation in the Hostels is provided by the Chairman, Council of Wardens. The hostel rooms are furnished with a cot, a chair and a writing table. Students are expected to bring their own bedding. Establishment fees cover the rent for hostel accommodation. (vide section 3.5 for fees and deposits)

Students residing in the hostels are provided with exclusive dining facility. This covers, breakfast, lunch, evening coffee/tea and dinner. The menu for these is decided by an elected student body. Each hostel has

(i) A small library for the exclusive use of the students of that hostel. The hostel library is normally stacked with books for general reading and story books. The hostel library is maintained by the student body of the hostel.

(ii) A common room for recreation. The common room is provided with a Television, News papers and selected magazines (decided by the student body)

(iii) Limited sports facility such as table tennis, volleyball / ball-badminton courts etc.,

A Guest House provides accommodation for visitors to the Institute faculty, staff and students.

9.2 Transport:

Campus wide transport is provided by battery operated mini-buses.

9.3 Shopping:

The campus has two shopping centres catering to the needs of the students, faculty and staff. The shopping centre in the hostel zone hosts a xerox shop, a stationery shop, patisserie shop, gift articles shop and a telecom centre. The shopping centre in the residential zone hosts grocery shops, vegetable / fruit stalls, stationery shop and a bookshop.

9.4 Sports Facility:

The Institute has play fields for football, hockey, cricket, volleyball, tennis and a skating ring. A modern Gymnasium, indoor courts for shuttle and volleyball and a beautiful swimming pool are the pride of Institute sports facility.

9.5 Medical Facility:

A full-fledged hospital with 20 beds takes care of the medical needs of the students, faculty and staff. All students of Institute are registered with the hospital and are also covered by a Medical Insurance scheme. Apart from general practitioners, services of leading specialists (on part-time basis) are provided by the hospital.

9.6 Banks:

Two banks, namely State Bank of India and Canara Bank operate branches within the campus. ATM’s of SBI and ICICI are housed near the hostels.

9.7 Other Amenities:

A post office and a BSNL telecom centre are also available on campus.

There are four restaurants, two in the Institute zone and two in the hostel zone, catering to the needs of all IITians.
DATA SHEET FOR Ph.D / M.S ADMISSION

(TO BE FILLED BY CANDIDATES)

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

2. Category Applied for

<table>
<thead>
<tr>
<th></th>
<th>HTRA</th>
<th>Non-HTRA</th>
<th>HTRA INSPIRE</th>
<th>Project</th>
<th>Staff</th>
<th>External</th>
<th>CSIR</th>
<th>UGC</th>
<th>Part-Time</th>
</tr>
</thead>
</table>

3. Department

4. Age as of last date of the receipt of Application form in IITM

5. 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
(Provide one Box also for point)

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

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

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

9. M.Tech/M.Sc.(Engg.)/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
(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
[To be submitted at the time of Admission]

Admission to Ph.D/M.S programme under
External / Part – time 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 M.S/Ph.D. Research programme
under External / Part – time Registration Scheme in July / Jan.......... semester at
the Indian Institute of Technology Madras, Chennai - 600036 as per their offer
of admission letter No................................. dated .........................

Date :                     Signature of the Officer with name
and address of the Organisation

Office Seal
[To be submitted at the time of Admission]

Certificate from the Employing Organisation

For external registration of their employees in Ph.D / M.S programme of IIT Madras

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 is working with in the commutable distance from IIT madras and he/she will be given permission to attend the required class for completing course work. *(strike out what ever not applicable)*

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 when 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 IIT’s decision 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 work and that there will be no separate charge (other than tuition fees payable by the candidate) 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/ Institution Name and Designation:

Postal address of the Organisation:

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Appendix - 3

[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-Part-time scheme

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

1. The applicant has 2 year / 5 year(in the case of management area) experience in the organization.

2. We note that facilities of the IITM will be made available to him/ her for carrying out the
research work under the supervision of a guide and he/ she has to pay full fees every
semester for the use of laboratory, library and other facilities of the Institute.

3. This organization facility will also be made available to him/ her in the case of selection.

4. The applicant will be deputed/given leave for duration of his/her residence period at IIT
Madras. The applicant is working with in the commutable distance from IIT madras and
he/she will be given permission to attend the required class for completing course work.
(strike out what ever not applicable)

5. 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 IITM’s decision in this
regard, taking into account all relevant factors.

6. No part of the work carried out 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/ Institution Name and Designation:
Postal address of the Organisation
[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 or Ph.D. in Science 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 of Professional Societies of 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 to carry out his 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 in the project title _____________________________________________ since ______________ as _________________________________. The candidate is eligible to continue in the project for a minimum period of one more year from the date of his/her joining the research programme (Ph.D / M.S) even though his/her appointment is upto ______________ as per his/her appointment order. 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.

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.

Date: ________________________________
Signature and name of the Project Coordinator

Department of____________________________

Countersigned: ________________________________

Date: ________________________________
Head of the Department of ________________________________
[To be submitted alongwith the Application at the time of Interview]

Admission to Ph.D/M.S programme under External / Part – time 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/Part-time registration scheme in July/Jan............... semester at IIT Madras in the Department of .................................................................

Date: ......................................................................................... Signature of the Officer with name and address of the Organisation

Office Seal