

INDIAN INSTITUTE OF TECHNOLOGY DHARWAD



॥ सा विद्या या विमुक्तये ॥

भारतीय प्रौद्योगिकी संस्थान धारवाड
Indian Institute of Technology Dharwad

Department of Mechanical Engineering Information Brochure

M.S. Admissions

Autumn Semester (2020-2021)

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A. SCHEDULE OF MASTER OF SCIENCE (M.S.) ADMISSION

Detailed schedule of admission process will be announced later on the institute website.

Deadline for submission of online application: ~~5th May~~ 21st May 2020, 11:59 pm.

First shortlist of eligible applicants: 28th May 2020 (tentative)

All potential candidates are requested to visit institute website regularly for updated information about the schedule, especially in context on ongoing Coronavirus (COVID-19) related developments. Future updates regarding the admission process will be made available on the institute website under section Academics >> Admissions >> MS.

B. ELIGIBILITY FOR ADMISSION

B.1.General Criteria

1. B.Tech. /B.E. or equivalent degree in Mechanical Engineering.
2. A valid GATE score in relevant stream*

*Valid GATE score is essential for candidates applying in TA category (except for candidate who have B.Tech. or equivalent degree from IITs or BS degree from IISc with minimum CPI/CGPA of 8.0 on the scale of 10).

B.2.Minimum score in the qualifying degree

For General/OBC category candidates and/or for candidates where no concession in academic performance is called for, the eligibility criteria in the qualifying degree (B.Tech./B.E.) is either:

1. a minimum of 60% marks (without round off) in aggregate over the entire duration of the undergraduate program.
2. a minimum Cumulative Grade Point Average (CGPA) or Cumulative Performance Index (CPI) of 6.0 on the scale of 0-10; with corresponding proportional requirements when the scales are other than on 0-10, (for example, 4.8 on a scale of 0-8).

For SC/ST/PwD category candidates, a relaxation of 5% in the performance at the qualifying degree is applicable.

Merely satisfying the eligibility conditions does not guarantee selection into the programme.

B.3.Applicants who are in the final phase of getting qualifying degree

Students who are in the final phase of receiving above mentioned qualifying degree and who are likely to graduate before commencement of Autumn 2020 semester of IIT Dharwad are also eligible to apply. However, if offered, the admission to those candidates would be provisional. To join academic program at IIT Dharwad, such candidates need to furnish necessary documents regarding completion of the degree on the date of joining IIT Dharwad. The date of joining will be mentioned later on Institute website. They need to meet the criteria specified in section B.2 above considering updated score in the qualifying degree, in the meanwhile, the aggregate academic performance announced by the respective university till the last date for submission mentioned in section A should be used to determine eligibility for application and same to be reported in the online application.

C. APPLICATION CATEGORIES AND FINANCIAL SUPPORT

The Department of Mechanical Engineering admits candidates for full time M.S. Programme, under Teaching Assistantship (TA), Financial Assistantship (JRF from UGC/CSIR NET, INSPIRE Fellowship etc.) and External (EX) schemes.

C.1. Teaching Assistantship (TA)

Funded by MHRD, the TAs are expected to assist in the academic/administrative work for smooth functioning of the Institute. Students under this category are entitled to the financial support as per the MHRD norms.

1. The assistantship is payable for a maximum duration of two and half years or till the date of defence whichever is earlier. At present, the monthly rate of assistantship is ₹ 12400.
2. To get the Teaching Assistantship stipend, the students concerned must assist in teaching, research and/or administrative work as assigned by the respective Academic Unit to the extent of 8 hours work per week.
3. The continuation of the assistantship will be subject to the satisfactory performance of the duties assigned by the Departments as well as satisfactory academic performance.
4. As per MHRD directives, the employees on the rolls (with or without pay) of any organization are not eligible for admission under this category. Candidates selected in this category have to resign from the current job and submit a relieving letter from their employer before joining the programme.

C.2. External (EX)

The candidates employed in recognized R&D organizations and desirous of pursuing M.S. programme while continuing in employment may apply for admission as external candidates. After fulfilling the coursework requirement at the Institute, these candidates will be allowed to register for M.S. with a Supervisor (internal) from the Institute and a Co-supervisor (external) from their parent organization where they will be doing the research work. The admissions are based on the following norms:

1. The competence of these candidates will be assessed along with the regular candidates.
2. On the day of selection process, the candidate should submit a Sponsorship Certificate (Appendix A) from the organization in which he/she is employed giving an undertaking that the candidate would be released from the normal duties to fulfil the coursework requirement (and qualifier examination, if applicable). The certificate should also provide details of the facilities in the organisation relevant to the research programme and that would be made available to the candidate for carrying out his/her thesis work.
3. The candidate is required to be at the Institute as a full-time student for the coursework (and qualifier examination, if applicable) of his/her M.S. Programme. The coursework requirement is likely to be a period of 1-2 semesters. Depending on the student's background and the programme requirements, an additional semester may be needed to complete the coursework/qualifier examination.

4. To promote interaction between the internal supervisor and external co-supervisor, meeting between them should be arranged at least once in a semester in the Institute or in the sponsoring organization.
5. The M.S. registration of an external candidate would be reviewed at the end of each semester from the date of registration in terms of his progress in courses/seminars/approved research programme by a Research Progress Committee (RPC) nominated by the concerned Department and approved by Academic Program Evaluation Committee (APEC).
6. The option of external registration is for applicants who are working in well-equipped scientific institutions, laboratories, R&D establishments and industrial organizations engaged in research based activities. Persons working in colleges/universities are **NOT** eligible under this category.
7. At the time of joining the programme, the students will have to produce a “Relieving certificate” from his / her employer that he / she has been fully relieved from normal duties during the semester(s) to complete the course work and other academic work at IIT Dharwad

Based on the information provided by the applicants a short-list of candidates called for the selection process will be declared on the Institute website on the date specified in the schedule. Only the short-listed candidates are permitted to participate in the selection process.

D. APPLICATION PROCESS

1. Please read all the instructions given in the brochure carefully before filing up the application form.
2. Application fee has to be paid prior filling online application. The transaction details such as Reference No, Transaction Date and Name of the Account Holder have to be mentioned accurately in the application form. **The contact number mentioned in the remarks/comments field of the online payment mechanism has to match with the one which will be entered while filling the application form.** It is also recommended to upload a proof of payment of application fee in pdf format just before submission of the online form.
3. This information brochure and future updates regarding the admission process will be made available on the institute website under section Academics >> Admissions >> MS.
4. You are required to submit the application form online. There are no downloadable forms available. After filling the form, you are advised to take a print and keep the same for future reference.
5. The application fee is as follows,

S.No.	Category	Application fee
1	Women candidates	Rs. 100/-
2	SC/ST/PwD candidates	Rs. 100/-
3	All other candidates	Rs. 200/-

6. The fee is to be paid by NEFT/RTGS Online Payment System. The details of the institute

bank details are:

BANK: State Bank of India

Account Name: REGISTRAR IIT DHARWAD

Account No.: 35636327083

Branch: Main Branch, Dharwad

IFSC: SBIN0000833

7. The transaction details like: UTR/ITR/Transaction Number with date are to be necessarily provided in filling up the Online Application Form. The Application Form without valid online payment details will not be considered. Application FEE is Non-Refundable.
8. Applicants may find it convenient to keep following information handy while filling the application form online (whichever relevant): i) Skype Id, ii) passport size photo whose size is less than 50 kb, iii) application fee transaction details of application fee payment e.g. reference no, date of transaction, Name of account holder, phone no used for online payment, iv) Educational details from secondary school onwards, v) GATE qualification details, vi) Statement of Purpose (pdf file), vii) proof of application fee payment (pdf file), viii) list of fellowship/ awards, ix) publications, x) any other achievements/information.
9. Economically Weaker Sections (EWS) candidates may note that the limit of annual income is Rs. 8 lakhs for determining the eligibility for benefit under Economically Weaker Sections (EWS) reservation. The EWS certificate issued by the Competent Authority in the prescribed format must be submitted at the time of selection.
10. Candidates belonging to OBC – NC (Non Creamy layer) as per Government of India norms should produce certificate from competent authority at the time of selection.
11. Check your emails regularly for any updates from the institute regarding the selection process.
12. Keep checking institute website regularly for updates regarding the selection process. Shortlisted candidates list will be uploaded on the institute website as per the schedule.
13. Candidates called for written test / interview should bring with them Photo ID Card, Passport size photographs (3), Admit Card, Printed Copy of Online Application Form, Photocopies of Academic Transcripts & Experience Certificates, Caste Certificate (if applicable), PwD Certificate (if applicable), EWS Certificate (if applicable), Thesis/Dissertation/Report/Publications and all other relevant documents.
14. If the fees are not paid before the due date for 1st round admission by the selected students, then his/her admission is liable to be cancelled and waitlisted candidates may be offered admission if the department admission committee recommends so.

Based on the information provided by the applicants a short-list of candidates called for the selection process will be declared on the Institute website on the date specified in the schedule. Only the short-listed candidates are permitted to participate in the selection process.

E. GUIDELINES FOR SHORTLISTED APPLICANTS

The following are the important guidelines of the institute pertaining to the selection process

1. Reporting Time: **To be announced online**
2. Screening test will begin on: **To be announced online**
3. Based on the performance in the screening test, some of the candidates will be shortlisted for the interview.
4. Interviews will be held immediately after the short-list is declared.
5. Very limited accommodation/transportation may be facilitated in the campus during the written test/interview. Details will be decided later and institute reserves the right to cancel the same at short notice depending upon the future circumstances.
6. Applicants should bring:
 - a. Photo ID card
 - b. Printed copy of the application
 - c. Thesis/dissertation/report of M.Tech. or equivalent degree
 - d. Copy of certificates and mark sheets
 - e. Two passport size photographs
 - f. Scientific calculator
 - g. Copy of publications (if any)

Examination policy

1. Mobiles are not allowed in the examination hall or during the interview(s).
2. Candidates are responsible for their own belongings during the selection process, especially, the items that you leave outside before entering the examination hall.
3. Candidates are required to bring all documents mentioned in section E for the selection process.
4. Delayed candidates may not be allowed to take the exam after 20 minutes of exam start time and no one will be allowed to leave the exam hall before 30 minutes once exam is started.

F. MODALITY OF SELECTION PROCESS

Only the short-listed applicants are permitted to participate in the selection process.

The selection process consists of a screening test followed by an interview. The screening test will either be online or written.

Based on the performance in the screening test, some of the candidates will be short-listed for the interviews. The details of the screening test and interview are given in the following sections.

F.1. Screening test and Interview

1. The screening test is common for all the shortlisted applicants
2. The syllabus for the screening test is given in Section G of this document.
3. After the screening test, candidates are instructed to wait till the short-list for the interview round is displayed on the notice board.
4. Interviews will begin immediately after the display of the short-list. It is the responsibility of the candidate to be present at the venue, when (s)he is called for the interview.

No personal intimation will be given after the screening test.

Selection committee decision is final in all matters including any disciplinary matters/malpractice.

G. SYLLABUS FOR THE WRITTEN TEST (MECHANICAL ENGG.)

Engineering Mathematics:

- **Linear Algebra:** Matrix algebra, systems of linear equations, eigenvalues and eigenvectors.
- **Calculus:** Functions of single variable, limit, continuity and differentiability, mean value theorems, evaluation of definite and improper integrals; double and triple integrals; partial derivatives, total derivative, Taylor series (in one and two variables), maxima and minima, Fourier series; gradient, divergence and curl, vector identities, line, surface and volume integrals, applications of Gauss, Stokes and Green's theorems.
- **Differential equations:** First order equations (linear and nonlinear); higher order linear differential equations with constant coefficients; Euler-Cauchy equation; initial and boundary value problems; heat, wave and Laplace's equations.
- **Complex variables:** Analytic functions; Cauchy-Riemann equations; Cauchy's integral theorem and integral formula.
- **Probability and Statistics:** Definitions of probability, Sampling theorem, conditional probability; mean, median, mode and standard deviation; random variables, binomial, Poisson and normal distributions.
- **Numerical Methods:** Numerical solutions of linear and non-linear algebraic equations; integration by trapezoidal and Simpson's rules.

Analytical reasoning

- **Verbal reasoning:** reading comprehension, drawing inferences based on multiple facts stated in short paragraph.
- **Non-verbal reasoning:** inductive, logical, abstract, diagrammatic and spatial reasoning.

Mechanical Design

- **Engineering Mechanics:** Free-body diagrams and equilibrium; trusses and frames; virtual work; kinematics and dynamics of particles and of rigid bodies in plane motion; collisions.
- **Mechanics of Materials:** Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses; strain gauges and rosettes; testing of hardness and impact strength.
- **Theory of Machines:** Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains; flywheels and governors; balancing of reciprocating and rotating masses.

- **Vibrations:** Free and forced vibration of single degree of freedom systems, effect of damping; resonance; critical speeds of shafts.
- **Machine Design:** Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as bolted, riveted and welded joints; shafts, gears, rolling and sliding contact bearings, springs.

Fluid and Thermal sciences

- **Fluid Mechanics:** Fluid properties; fluid statics, manometry, buoyancy, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; Bernoulli's equation; dimensional analysis; viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes and bends, flow in convergent-divergent channels.
- **Heat-Transfer:** Modes of heat transfer; one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; lumped parameter system, thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan- Boltzmann law, Wien's displacement law.
- **Thermodynamics:** Thermodynamic systems and processes; properties of pure substances, behaviour of ideal and real gases; zeroth and first laws of thermodynamics, calculation of work and heat in various processes; second law of thermodynamics; thermodynamic property charts and tables, availability and irreversibility; thermodynamic relations.
- **Applications Power Engineering:** Air and gas compressors; vapour and gas power cycles, concepts of regeneration and reheat. I.C. Engines: Air-standard Otto, Diesel and dual cycles. Refrigeration and air-conditioning: Vapour and gas refrigeration and heat pump cycles; psychrometric chart, basic psychrometric processes.
- **Turbomachinery:** Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines.

Manufacturing Science

- **Metal forming** – Elastic and plastic deformation, Hot and cold working processes -rolling, forging, extrusion, swaging, wire and tube drawing.
- **Sheet Metal working** – Die and punch clearances, blanking, piercing, punching, bending, cup drawing, coining, embossing
- **Metal casting** - Pattern materials, allowances, types of pattern, cores, Element of gating systems, types of gates, Riser design considerations, Casting defects
- **Welding** – welding, brazing, soldering, Manual metal arc, Submerged arc, gas metal arc, TIG. Resistance welding

H. FEES, DEPOSITS & HOSTEL RENT

S.No	Amount (Rs.)	Amount (in INR) for General/OBC/EWS	Amount (in INR) for For SC/ST/PwD
A. One-time payment at the time of admission			
1	Admission fee	2,200.00	2,200.00
2	Graduation transcript fee	500.00	500.00
3	Medical examination	400.00	400.00
4	Provisional certificate	500.00	500.00
5	Student welfare fund	1,000.00	1,000.00
6	Modernisation & upgradation	2500.00	2500.00
7	Identity card	500.00	500.00
	Sub-total (A)	7,600.00	7600.00
B. Fees per semester			
1	*Tuition Fee-Statutory fee	5,000.00	00.00
2	Examination fee	1,000.00	1,000.00
3	Registration fee	750.00	750.00
4	Gymkhana fee	1,750.00	1,750.00
5	Student benevolent fund	500.00	500.00
6	Medical fee	1,500.00	1,500.00
7	Hostel rent	2,000.00	2,000.00
8	Electricity & water charges	3,000.00	3,000.00
9	Hostel establishment charges	3,000.00	3,000.00
10	Mess establishment charges	1,550.00	1,550.00
11	Student association insurance fund	200.00	200.00
	Sub-total (B)	20,250.00	15,250.00
C. Deposits (refundable) to be paid at the time of admission			
1	Institute security deposit	1,000.00	1,000.00
2	Library security deposit	1,000.00	1,000.00
3	Mess security deposit	1,000.00	1,000.00
	Sub-total (C)	3,000.00	3000.00
GRAND TOTAL FEE (A+B+C)		30,850.00	25,850.00

NOTE:

1. All the students are required to submit the **Mess Advance of Rs. 26,000.00/-** per semester by online payment method along with the course fee.
2. * Students admitted under External category (EX) will pay tuition-statutory fee of **Rs. 25,000/-** per semester (**Grand total fee of Rs. 50,850/-**). It shall be noted institute will incur semester continuation fee of **Rs. 5000/-** when a candidate joins parent organization after finishing the required course work at IIT Dharwad.
3. * IIT Dharwad reserves the right to revise the tuition fee-statutory fee.

I. INFORMATION PERTAINING TO HOSTELS

About IIT Dharwad	Kindly visit the website https://www.iitdh.ac.in/ for available facilities
Hostel room allocation	You will be given your room key at the time of registration. Each room accommodates approximately four students and has an attached bath & toilet.
Are hostel rooms furnished?	Each student is given a cot, chair, table and wardrobe. Students can purchase mattress/bedding, bucket etc locally.
Possession of motorized vehicle	NOT ALLOWED, however bicycle is permitted in the campus.
Climatic conditions	Generally, it will be raining, windy & cold. It is suggested that you carry protective clothing accordingly.

APPENDIX A

Sponsorship Certificate for M.S. External Registration (EX)

(To be typed on letterhead of the Sponsoring Organization)

Name of the applicant:

Name of the sponsoring organization:

Address:

Present Designation of the applicant:

Present status of the applicant: (Permanent/Semi-permanent/Temporary)

Division where research work is proposed to be done:

Name of supervisor from the sponsoring organization:

(CV of supervisor is requested to be produced on the day of selection giving details of designation, qualification, research experience, etc.)

Details of facilities relevant to the research problem which will be made available to the candidate by the organization.

Statement of proposed co-supervisor (external)

If Shri / Kum. / Smt. _____

is registered for the M.S. degree, I agree to act as his/ her research Co-supervisor along with the research Supervisor from IIT Dharwad.

Date:

Signature of proposed Co-supervisor (external)

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Statement of sponsoring authority

If Shri. / Kum. / Smt. _____

is admitted to the M.S. programme, we shall allow him/her to undergo the programme of studies at IIT Dharwad.

Further, we shall fully relieve him/her from normal duties to complete the residential course work requirement (and qualifier examination, if applicable) at IIT Dharwad.

During the period of M.S. studies, the candidate will be permitted to carry out his / her research work at our laboratories / organization and will be given the required facilities.

We also give our consent to _____ of our organization to be the Co-supervisor (external) of the M.S. thesis, along with a faculty member of IIT Dharwad as the Supervisor.

Date:

Signature and Seal of the Sponsoring Authority

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