भारतीय विज्ञान संस्थान

M.Tech. (Online) Degree Programme for Sponsored Candidates

Information Brochure

M.Tech. (Online) Degree Programme for Sponsored Candidates

In keeping with India's recent National Education Policy (NEP 2020), the Indian Institute of Science, Bengaluru, launched the Master of Technology (Online) degree programme, a fully online programme, for practicing engineers and scientists. The degree programme is for professionals who are sponsored by organisations, who already have a BE/BTech/Equivalent degree and wish to upskill or re-skill themselves. The following streams are open for admission in the academic year 2022-23:

- [Data Science and Business Analytics](#)
- [Artificial Intelligence](#)
- [Electronics and Communication Engineering](#)

We expect the Online degree programme will extend to other areas in the next few years.

The M.Tech. (Online) degree is equivalent to our residential Master of Technology (M.Tech.) degree in all respects: number of credits, project work, rigor and the level of the courses. The term "Online" in the name of the degree refers to the *means* by which the instructor-led lectures are conducted.

This programme will be available only in sponsored mode to sponsoring organisations. IISc will enter into a Memorandum of Agreement (MoA) with the sponsoring institution. The professionals should be employed full time in their organisations while pursuing this programme. Classes and content will all be delivered online, during evenings and weekends. Assessment will be based on online and proctored examinations, as determined by IISc.

Admission will be through nominations by the sponsoring organisations having an MoA, followed by a further online written test and/or interview conducted by IISc for the nominated candidates. Candidates who successfully clear the admissions process are offered admission into the programme.

The nominal duration of the programme is about three years.

Fee Structure
- About 8.8 lakhs – 10 lakhs, depending on the stream, for the entire duration of the programme. The sponsoring organisation is responsible for the fees.

For more information on the programme and the streams, please visit https://iken.iisc.ac.in//mtech-online/ or Email office.iken@iisc.ac.in

About IISc

- **Best University in India** according to the Ministry of Education's National Institutional Ranking Framework (**NIRF**), 2022.

- One of the 11 institutions in India to be granted the **Institute of Eminence (IoE)** status.

- **Highest-ranked Indian University** in the **Times Higher Education (THE)** World University Rankings, 2023.

- Ranked among the **top 200 Global Universities** as per the **Quacquarelli Symonds (QS)** World University Rankings, 2023.

- Over **250 students** from 25 companies enrolled in the two M.Tech.(Online) batches across the 3 streams

Admissions & Eligibility

- Applicants must be **nominated** by an organization having an MoA with IISc for the M.Tech.(Online) Degree Programme. Self-nominations are not allowed.
  - *Please contact office.iken@iisc.ac.in if your organization would like to join this program!*
- All applicants should have a **four-year BE, BTech or equivalent degree**. The **Minimum CGPA/percentage** in all degrees and specific streams requirements are given below.
- The employees should have a minimum **two years of industry experience** at the time of joining the programme (1st August of the start of the academic year).
- All applicants should also have strong **mathematical and programming experience**.

Stream	Prior Degree	Minimum Score/CGPA	Selection Process
Data Science and Business Analytics	BE, BTech, BS(4yrs) or an Equivalent 4-year degree/diploma after 12th standard (or) a Masters' degree, in any discipline	At least 50% or equivalent in all degrees	Online test, and online interview for shortlisted candidates
Artificial Intelligence	BE/BTech in CS/ECE/EE or an equivalent discipline	At least 70% or equivalent in all degrees	Online test
Electronics and Communication Engineering	BE/BTech in ECE/EE or an equivalent discipline	At least 60% or equivalent in all degrees	Online test

Tentative Schedule for 2023 Academic Year (Starting 1st August, 2023)

Applications Portal Open for Nominated Candidates	**15 March, 2023**
Applications Portal Closes	**7 April, 2023**
Online Written Test & Interviews	**6-11 May, 2023**
Offer of Admission to Selected Candidates	**1 June, 2023**
Payment of Fees & Deposit by Selected Candidates	**1 July, 2023**
Classes Start for Academic Year	**1 August, 2023**

Data Science and Business Analytics (DSBA)

The Master of Technology (Online) programme in Data Science and Business Analytics is offered by the Division of Interdisciplinary Sciences at IISc. It is designed for early-career professionals with 2-8 years of experience to upskill them to become technology and business leaders in information-driven enterprises. The coursework establishes the foundations of data science, trains on data engineering and machine learning techniques, and imparts practical business analysis skills. These learnings are coupled with a unique in-house project that applies the learnings to a hands-on project relevant to the industry. Faculty from the Departments of Computational and Data Sciences, Management Studies, Cyber Physical Systems, etc. lead the courses through online lectures and tutorials.

Program Structure

- **Core courses (12 credits):** These are typically taken in the first and second semesters.

    - Introduction to Data Science
    - Introduction to Computing for AI and ML
    - Data Engineering at Scale

- **Sample elective courses (at least 20 credits):**

    - Financial Analytics
    - Probabilistic Machine Learning: Theory and Applications
    - Data Mining
    - Artificial Intelligence for Medical Image Analysis
    - Practical Machine Learning
    - Deep Learning
    - MLOps at Scale
    - *Students may also take courses from any of the three streams as an elective. These are the minimum number of elective credits. More may be taken as well.*

- **Project (32 credits):** Students can start this three-term project for 32 credits after successfully completing all the core courses. Students will complete 20 project credits over two terms followed by a midterm evaluation, and the remaining 12 project credits in an exclusive semester for the final evaluation.

    Student will propose the topic in consultation with their Guide from within the organization, and an IISc faculty mentor will approve project goals. The faculty mentor will offer high-level feedback on the project and its progress, and coordinate the evaluations, while the in-house company Guide will offer active feedback and close support. The evaluation committee, which includes the faculty mentor and company guide, is appointed by the PCC.

Admission Process

- **Minimum Eligibility:** All candidates must be nominated by their organisation and meet all these eligibility requirements:
    - BE, BTech, BS(4yrs) or an Equivalent 4-year degree/diploma after 12th standard (or) a Masters' degree, in any discipline
    - At least 50% of marks or equivalent CGPA in all degrees
    - Two years of industrial experience by the start of the programme
    - A strong mathematical and programming background

- **Selection:** Online test followed by an online interview of the shortlisted candidates. This will evaluate the technical ability of the candidate to succeed in the coursework and may include topics such as mathematics, basic programming, problem-solving, etc. at the undergraduate level.

Artificial Intelligence (AI)

The Master of Technology (Online) programme in Artificial Intelligence is offered by the Division of Electrical, Electronics, and Computer Sciences (EECS) at IISc. The vision of the programme is to impart rigorous training in the foundations and deep technology of Artificial Intelligence to early-career professionals with 2-8 years of experience to upskill them to become technology and business leaders in information-driven enterprises. These learnings are coupled with a unique in-house project that applies the learnings to a hands-on project relevant to the industry. Faculty from the Division of EECS, the Department of CDS, and the RBCCPS will offer contemporary courses in AI through online lectures and tutorials and will provide mentorship on capstone projects.

Program Structure

- **Core courses (14 credits):** These are typically taken in the first and second semesters.
    - Random Processes
    - Linear Algebra
    - Linear and Non-linear Optimization
    - Machine Learning

- **Sample elective courses (at least 23 credits):**
    - Data Structures and Graph Analytics
    - Foundations of Robotics
    - Digital Image Processing
    - Reinforcement Learning
    - Deep Learning for Computer Vision
    - Data Analytics
    - *Students may also take courses from any of the three streams as an elective. These are the minimum number of elective credits. More may be taken as well.*

- **Project (27 credits):** Students can start this three-term project for 27 credits after successfully completing all the core courses. Students will complete 3 project credits in the 1st term to identify the topic, 12 credits in the 2nd term followed by a midterm evaluation, and the remaining 12 project credits the 3rd term for the final evaluation.

    Student will propose the topic in consultation with their Guide from within the organization, and an IISc faculty mentor will approve project goals. The faculty mentor will offer high-level feedback on the project and its progress, and coordinate the evaluations, while the in-house company Guide will offer active feedback and close support. The evaluation committee, which includes the faculty mentor and company guide, is appointed by the PCC.

Admission Process

- **Minimum Eligibility:** All candidates must be nominated by their organisation and meet all these eligibility requirements:
    - BE/BTech in CSE/ECE/EE or equivalent discipline
    - At least 70% of marks or equivalent CGPA in all degrees
    - Two years of industrial experience by the start of the programme
    - A strong mathematical and programming background

- **Selection:** Online test. This will evaluate the technical ability of the candidate to succeed in the coursework and may include topics such as mathematics, basic programming, problem-solving, etc. at the undergraduate level.

Electronics and Communication Engineering (ECE)

The Master of Technology (Online) programme in Electronics and Communication Engineering is offered by the Division of Electrical, Electronics, and Computer Sciences (EECS). The programme is designed for early-career professionals with 2-10 years of experience to strengthen their fundamentals and expose them to cutting-edge topics in the fast-changing areas of communications, networks, signal processing and information sciences, and high-frequency circuits and systems. The coursework contains core courses, which provide the necessary foundation, and several elective courses, which provide exposure to the state-of-the-art and advanced material. These learnings are coupled with a two-term in-house project that enables the student to apply the knowledge gained to a project relevant to the industry. The courses are taught online by faculty from the Department of ECE.

Program Structure

- **Core courses (15 credits):** These are typically taken in the first and second semesters.
    - Random Processes
    - Digital Communications
    - Statistical Inference for Engineers and Data Scientists
    - Linear Algebra

- **Sample elective courses (at least 21 credits):**
    - Semiconductor devices for nanoelectronics
    - Antenna Theory and Practice
    - Radio Frequency Integrated Circuits and Systems
    - Advanced Deep Representation learning
    - Communication Systems Design
    - *Students may also take courses from any of the three streams as an elective. These are the minimum number of elective credits. More may be taken as well.*

- **Project (28 credits):** This involves a two-term project, with 10 credits in the first term followed by a mid-term evaluation, and 18 credits in the second term with a final evaluation. The second term project is taken up only after all courses are completed in prior semesters.

    Student will propose the topic in consultation with their Guide from within the organization, and an IISc faculty mentor will approve project goals. The faculty mentor will offer high-level feedback on the project and its progress, and coordinate the evaluations, while the in-house company Guide will offer active feedback and close support. The evaluation committee, which includes the faculty mentor and company guide, is appointed by the PCC.

Admission Process

- **Minimum Eligibility:** All candidates must be nominated by their organisation and meet all these eligibility requirements:
    - BE/BTech in EE/ECE or equivalent discipline
    - First Class or 60% of marks or equivalent CGPA in all degrees
    - Two years of industrial experience by the start of the programme
    - A strong mathematical and programming background

- **Selection:** Online test. This will evaluate the technical ability of the candidate to succeed in the coursework and may include topics such as mathematics, basic programming, problem-solving, communications, etc., at the undergraduate level.

Student Guidelines

The following guidelines are common to all Master of Technology (Online) Programmes.

- Each stream will be structured and administered by a Programme Curriculum Committee (PCC).
- The number of course credits will be specified by the PCC and can vary between 32 - 48 credits.
- Project credits will constitute the remainder of the credits, so that the total comes to 64 credits for the entire programme.
- Core course can be between 9-16 credits and will be specified by the PCC. The rest shall be electives.
- Course grading will follow IISc's 10-point grading system: A+ = 10, A = 9, B+ = 8, B = 7, C = 6, D = 5, F = 0.
- Project grading will be Pass/Fail.
- Only two F grades are permitted in the entire programme. If a third F grade is obtained, the registration will be terminated. Additional constraints apply, see F grade handling bullet below.
- Students should get a minimum TGPA (term GPA) of 4.0/10.0 in the first term. Subsequent terms CGPA (cumulative GPA) should be at least 5.0/10.0. Students who do not satisfy these minimum requirements are liable to be discontinued from the course, and the discontinuation can be revoked only by the Director on the student providing a valid reason.
- In the first term, if the TGPA falls between 4.0 and less than 5.0, the student will be advised to register for fewer courses in the following semester (if more than course was credited).
- F grade handling will be as for regular MTech's. (If the course is a core course, the student must repeat the core course. If the course is not a core course, the student must either repeat the F-grade-course to "clear the F grade" or take a replacement course specified by the PCC. Only one chance is given to clear each F grade. If the grade is F in the repetition or in the replacement course, the student must leave the programme. Both initial F and final higher grade will be reflected in the transcript. The F grade will be used in computation of the TGPA and CGPA until it is cleared whereafter it will be omitted in the calculations).
- Candidates can have at most two semesters break in studies. The request must come through the sponsoring organisation. Women can avail a maternity leave of up to a year in case of maternity during the programme, in addition to the above. A registration fee needs to be paid for the break semesters to keep the registration alive.
- In each semester in which the candidate registers for credits, the candidates should register for a minimum of 3 course credits and a maximum of 12 course credits (minimum 0 course credits and maximum 8 course credits in summer term). Project credits are not counted for these limits. This is until course requirements are completed. If projects and courses are both being taken in a term, the maximum is 16 credits (project + courses) in a semester and 12 credits (project + courses) in a summer term. If registration is only for project, with no courses, the maximum is 21 project credits in a semester and 12 project credits in a summer term.
- The normal duration is 2-3 years. In special circumstances, a student may be permitted an extension, due to break in studies or maternity leave, but must complete all requirements within a maximum of 4 years (5 years if maternity leave is availed).

- The computation of final CGPA is done only after the student clears all courses successfully.
- No distinction shall be awarded, since the project grade is Pass/Fail.
- Students shall have listened to 75% of each course's lectures. A mechanism for monitoring attendance will be put in place.
- The PCC will identify a faculty mentor (or committee) during the course programme. Once the project starts, the project mentor (or committee), if different, will take over the role of faculty mentor.
- Course dropping rules (drop without mention, drop with mention) and the dates for these will be as for the regular programmes and will be mentioned in the Student Information Handbook to be given at the start of the year. (Drop requires approval of the faculty mentor and course instructor and is permitted only if the total number of credits does not fall below the stipulated minimum. If course is dropped with mention, the dropped course will be included in the final transcript with a W (Withdrawn) grade. But the fees will not be refunded. The student may register again for a course dropped in a previous term; fees will be payable for the registration.
- No transfer/upgradation to PhD is possible during the programme.
- Assessment: Evaluation is based on instructors' assessment plan which will be pre-approved by the senate curriculum committee (which approves the course). This will be indicated to the students at the start of the course.
- Attendance in the terminal examination is compulsory. Students who are absent will be given an F grade. Absence on medical grounds, after due certification by the sponsoring organisation's appointed medical officer (a registered medical practitioner), may be condoned and the student will take a substitute examination within a prescribed period. Additional examination fees will be payable in case of a substitute examination.
- Project evaluation: An assigned faculty mentor, who may be a part of an evaluation committee as specified by the PCC, will be responsible for approving the project goals, for regular evaluation (as per schedule indicated by the PCC), for bringing in the needed academic rigor, and for the final evaluation. A sponsoring company guide will be identified for each student and will monitor internal progress on a regular basis. One guide (from the sponsoring company) can guide at most 6 students. The internal guide shall have a PhD or five years' experience post Masters. Both the faculty mentor for the project and the organisational guide must be identified prior to start of the project.
- In general, when the guidance is only from the sponsoring company, and IISc's role is restricted to approval of goals and evaluation, IPR rests with the sponsoring company. If guidance from the IISc faculty mentor is sought by the company, a specific IPR agreement for the retainer consultancy will be negotiated and put in place. In this case, the PCC needs to be informed and the agreement must be signed before guidance by the IISc faculty mentor begins.
- Students should complete all core course credits before commencing on projects. See also maximum credits per term constraints. Additional requirements may be set by the individual PCC.
- Privileges and responsibilities: During the tenure and while registration fees are paid to keep the registration ongoing:
  - IISc email id
  - Library access
  - Alumni/Alumnae privileges after the award of the degree.