

## Centre for Artificial Intelligence and Robotics

### Call for M. Tech (by Research) / Ph.D. / Dual Degree Program (Aug-Dec, 2026)

IIT Mandi invites applications from bright and dedicated young scholars interested in joining the full-time or part-time **M. Tech (by Research)/Ph.D./, or Dual Degree** program in the **Centre for Artificial Intelligence and Robotics (CAIR)**. For this purpose, CAIR seeks applications for the Master of Technology (M. Tech) by Research, Doctor of Philosophy (Ph.D.), and Dual Degree (M.Tech + Ph.D.) programs in the following areas of artificial intelligence and robotics:

Specializations under CAIR	Specific Areas (but not limited to)
Drone robotics	<ul style="list-style-type: none"><li>• Prescribed-Time Adaptive Control of Quadrotor Biplane VTOL Aircraft: Modeling, Control Design, and Hardware Realization</li><li>• Resilient Control of UAV Swarms with Nonlinear Control, and Gimbal-Stabilized Payloads</li><li>• Resilient Micro/Nano Drone Swarms through Integrated VLSI Sensing and Nonlinear Control</li><li>• Drone navigation in GPS denied environment: Deep Learning Computer Vision-based Perception, Communication, and Navigation</li><li>• Drone Development for High Payload Capacity at High Altitude</li><li>• Search and Rescue with Intelligent O-RAN Networking and Multi-Agent Autonomy (UAVs &amp; UGVs)</li><li>• Swarm Drones: Communication, Collaboration, and Formation</li><li>• Drone-based Aerial Manipulation of Industrial Structures</li><li>• Drone and Robotics-Policy Frameworks, Ethics and Governance of Autonomous Systems, Innovation, Industry, and Technology Policy in Drones and Robotics, Socioeconomic and Security Implications.</li><li>• Pothole Detection, Localization, and Repair Using UAV– AGV Coordination</li><li>• DMP-Based Cooperative Path Planning for a Swarm of Drones</li><li>• Drone-Based Video Surveillance</li><li>• Drone Learning by Demonstration with On-the-Fly Scene Change Detection</li></ul>
Mobile robotics	<ul style="list-style-type: none"><li>• Co-Design of Adaptive Regenerative MIMO Antenna and Control Systems for Energy-Harvesting Mobile Robots</li><li>• Prescribed-Time Adaptive Zero-Overshoot Anti-Sway Control of 7-DOF Double-Pendulum Overhead Cranes</li><li>• Multi-agent (UAVs &amp; UGVs) Collaboration in Mission Critical Tasks such as Disaster, Defence, and Industrial Warehouse</li><li>• Vision and Learning-Based Control of Mobile Robots</li></ul>

Underwater robotics	<ul style="list-style-type: none"> <li>• Aero-amphibious Drone for underwater and aerial surveillance: Underwater computer vision and structure monitoring</li> <li>• Adaptive Control of a torpedo-shaped Autonomous Underwater Vehicle (AUV) with 2 horizontal and 1 vertical thruster controlling surge, yaw, and heave.</li> </ul>
Healthcare robotics	<ul style="list-style-type: none"> <li>• Image-guided diagnosis and interventions</li> <li>• AI-based medical imaging (Ultrasound, CT, MRI) analysis</li> <li>• Learning-based control for surgical and diagnostic robots</li> <li>• Adaptive control for physical human-robot interaction</li> <li>• Teleoperation of a slave robot with transparency, efficiency, and security</li> <li>• 3D reconstruction of anatomy from 2D ultrasound scanning</li> <li>• Simulation Platforms for Training, Validation, and Evaluation in Medical Robotics</li> <li>• Adaptive-Controlled Miniaturized Multipurpose Surgical Robotic System with AI and Secure Portable Operating Console</li> </ul>
Digital Twins	<ul style="list-style-type: none"> <li>• Drone-Assisted Real-Time Crop and Habitat Monitoring in Mountainous Regions</li> <li>• Digital Twin for Estimation of Reactivity in Nuclear Reactors</li> </ul>
Robot perception	<ul style="list-style-type: none"> <li>• Quantum-Inspired Perceptual Decision Dynamics for Robust Micro-Drones</li> </ul>
Social robotics	<ul style="list-style-type: none"> <li>• Socially-interactive robotics for diagnostic imaging</li> <li>• Adaptive Socio-Embodied Robotic Ultrasound Control for Trustworthy AI-Guided Medical Imaging</li> </ul>
Humanoid Robotics	<ul style="list-style-type: none"> <li>• Humanoid Robotics: Modelling, Simulation, Control, and Hardware Realization of Humanoid Robot</li> <li>• Reinforcement learning based Humanoid Robot's interaction with the Physical World (Walking, Running, Jumping)</li> </ul>
Security of CyberPhysical Systems (Drones, Mobiles Robots, Underwater Robots)	<ul style="list-style-type: none"> <li>• Verifiable, Resilient, and Intelligent Transport with Adaptive Security for Autonomous Systems (UAVs and UGVs)</li> <li>• Quantum Communication and security of cyber physical systems</li> <li>• Network Security of Connected Robots (Drones, Mobile Robots) with Blockchain and Advance Cryptography</li> <li>• Angle of Arrival Prediction and Tracking for Energy-Depleted UAVs through Intelligent Reflecting Surface-Aided Integrated Sensing and Communication Networks</li> </ul>

Vision–Language Computing and Physical AI	<ul style="list-style-type: none"><li>• Computer Vision; Generative AI; LLMs, VLM, &amp; VLA; Multimodal Learning; DeepFake Detection; Agentic AI; Quantum AI/ML; Augmented Reality (AR) &amp; Virtual Reality (VR)</li></ul>
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**Link to the online application:** <https://iitmandiadm.samarth.edu.in/admission/index.php>

It is kindly advised to get in touch with faculty members directly for further information regarding the different research areas and positions available with them, listed at:

<https://research.iitmandi.ac.in/cair/faculty.php>

### **General Information**

Information on eligibility, minimum qualifications, and scholarship rules is briefly provided in the following pages of this document. The same can be found at the following links

M. Tech (by research) /PhD/Dual Degree Ordinance and Regulations (O&R) IIT Mandi:

[https://www.iitmandi.ac.in/pdf/ordinances/Ordinances\\_phd\\_mtech.pdf](https://www.iitmandi.ac.in/pdf/ordinances/Ordinances_phd_mtech.pdf)

M. Tech (by research)/PhD/ Dual Degree scholarship Rules:

<https://iitmandi.ac.in/pdf/admissions/Information%20Brochure.pdf>

Project Funding Rules: As per the institute/respective funding agency's norms.

**Note:** The degree awarded will be in “Robotics.” such as a PhD in Robotics, an M.Tech (by Research) in Robotics, or a Dual Degree in Robotics. The program will emphasize core robotics courses.

**For PhD applicants (Full-Time Research Scholars):** Students under this category are entitled to the Scholarship / Assistantship from the Institute / MoE if they qualify for any one of the following criteria:

- Master’s degree in Engineering/ Technology with a good academic record.
- Bachelor’s degree holder in Engineering/ Technology from any CFTIs with a minimum CGPA of 7.5 for General/7.0 for OBC (NCL)/6.5 for SC/ST on a 10.0-point scale.
- Bachelor’s degree holder in Engineering/ Technology from any Non-CFTIs with a good academic record and a valid GATE score. Other relevant National Level examinations are waived off for the HTRA Scholarship.
- BS-MS/equivalent from IITs, IISERs, IISc, IIMs, or any of the top 100 institutes according to NIRF ranking (overall category) at the time of application for the year during which admission is sought, with a minimum CGPA of 7.5 for General/7.0 for OBC (NCL)/6.5 for SC/ST on a 10.0-point scale.

- B.Tech/B.E./equivalent degree from Himachal Pradesh Govt. Institutions/Universities, with CGPA/CPI with a minimum CGPA of 7.5 for General/7.0 for OBC (NCL)/6.5 for SC/ST on a 10.0-point scale.

**For M.Tech (R) and Dual Degree-M.Tech (R) + Ph.D. applicants (Full-Time Research Scholars):** Students under this category are entitled to the Scholarship/ Assistantship from the Institute / MoE if they qualify for any one of the following criteria:

- Bachelor's degree holder in Engineering/ Technology from any CFTIs with a minimum CGPA of 7.5 for General/7.0 for OBC (NCL)/6.5 for SC/ST on a 10.0-point scale.
- Bachelor's degree holder in Engineering/ Technology from any Non-CFTIs with a good academic record and a valid GATE score. Other relevant National Level examinations are waived off for the HTRA Scholarship.
- BS-MS/equivalent from IITs, IISERs, IISc, IIMs, or any of the top 100 institutes according to NIRF ranking (overall category) at the time of application for the year during which admission is sought, with a minimum CGPA of 7.5 for General/7.0 for OBC (NCL)/6.5 for SC/ST on a 10.0-point scale.
- B.Tech/B.E./equivalent degree from Himachal Pradesh Govt. Institutions/Universities, with CGPA/CPI with a minimum CGPA of 7.5 for General/7.0 for OBC (NCL)/6.5 for SC/ST on a 10.0-point scale.

**Notes:**

- The shortlisted candidate can be called for a written test/interview.
- Candidates who have applied in previous rounds will apply through a new email-id.
- Reservation policies as per prevailing GoI rules will be followed.
- IIT Mandi reserves the right to admit/not admit for any of the advertised areas.
- For each specialization and program, candidates should submit a separate application with the application fee.
- Upload all self-attested documents as a single ZIP file, including: proof of identity (Aadhaar Card/Voter ID/PAN Card/any other valid ID), Class 10 certificate (as proof of date of birth), mark sheets of UG and PG degrees (including rank certificate, if applicable), qualifying certificate of GATE/CSIR/UGC or any other equivalent examination, and caste certificate (if applicable).
- All the details furnished in the online application will be treated as final, and no changes shall be entertained. Non-submission of valid/required documents and/or incomplete application shall be summarily rejected.
- Applicants interested in research areas not listed above may select the appropriate Broad Research Area on the Samarth portal and choose "Others" under the specific area section, providing relevant details.

- Industrial or Academic Institute-sponsored/Part-time/Self-sponsored M.Tech (Research)/Ph.D. candidates are not eligible for MHRD/HTRA scholarships.
- Employed candidates seeking admission to M. Tech (by research)/PhD must submit a “No Objection Certificate” from their current employer at the time of interview.
- Eligibility for the project-based funding positions will be as per the institute/respective funding agency's norms.
- The decision of the competent authority in all matters relating to the eligibility of the candidate, the written test/Interview and admission would be final and binding on all the candidates. In the event of any dispute or ambiguity during the admission process, the decision of the Institute shall be final.
- For any other queries regarding M. Tech (by research)/Ph.D./, or Dual Degree programs at CAIR, please contact the CAIR office by email at [cairoffice@iitmandi.ac.in](mailto:cairoffice@iitmandi.ac.in) or by phone at 01905-267791.
- For technical problems regarding filling out online applications, please contact [it\\_helpdesk@iitmandi.ac.in](mailto:it_helpdesk@iitmandi.ac.in).

**Application Fee for M. Tech (by research)/Ph.D./Dual Degree Admission:**

Category	Amount in ₹
General/EWS/OBC/OBC (NCL)/Transgender/Foreign Nationals	200
Women/SC/ST/PD	100

**Mode of Payment:** Online within the application form.

**Important dates:**

Start of online application:	01 April 2026
Deadline for online application:	30 April 2026 ( <b>till 5:00 PM</b> )
Announcement of shortlisted candidates (tentatively):	05 May 2026
Interview (tentatively):	17-18 May 2026