

Centre for Artificial Intelligence & Robotics (CAIR)

Call for M. Tech (by research) / Ph.D. /Dual Degree Program (Jan.-Jun., 2025)

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

Program name: Robotics

Individual specializations	Specific areas (but not limited to)	Branches
Drones	<ul style="list-style-type: none"> ● Aerial manipulation ● Autonomous navigation and control In GPS denied environment. ● Drone analytics ● Nano Drones ● Drone application for Surveillance and Industrial Structure Inspection ● Swarm Drones ● Novel propulsion mechanism for Drones ● Airborne sensors such as Lidar, Multispectral Cameras ● Drone Electronics ● Energy management of Drones 	Bachelor's/Master's degree in: Mechanical Engineering /Electrical and Electronics Engineering/ Electrical and Communication Engineering/Biomedical Engineering/ Computer Science Engineering/Information Technology/ /Instrumentation and control/ /Robotics/Automation Engineering/Avionics/Automobile Engineering/Industrial Engineering/Aeronautical/Aerospace
Multi-Agent Systems	<ul style="list-style-type: none"> ● Visual Servoing ● Visual Robot Programming ● Multi-agent Systems ● Swarm Robotics ● Formation control ● Collision Avoidance ● Autonomous navigation ● Human-Robot Collaboration 	
Robotics	<ul style="list-style-type: none"> ● Grasping and manipulation ● Collaborative manipulation ● Teleoperation 	
Legged Robotics	<ul style="list-style-type: none"> ● Quadruped ● Humanoid 	
Field Robotics	<ul style="list-style-type: none"> ● Marine Robots ● Remotely operable Vehicles ● Autonomous Underwater Vehicles 	

	<ul style="list-style-type: none"> ● Autonomous Surface Vehicles ● Collaborative manipulation for field applications ● Autonomous Navigation ● Structural Health Monitoring using Field Robots ● Amphibious propulsion for drones and underwater systems ● Simulation frameworks for field applications (Mission planner and simulator development) ● Cleaning Robots ● Robots for surveillance, monitoring and inspection ● Nano Drones ● Bioinspired Propulsion for field robots ● Reconfigurable Robots ● Intervention field Robots ● Underwater actuator development ● Underwater sensor development 	Engineering.
AI & Robotics for Biomedical Applications	<ul style="list-style-type: none"> ● Generative AI tools for Enhanced sampling of biomolecules ● Drug Target identification ● In Silico protein-protein interactions ● Machine learning for molecular/drug design ● Nano robots for sensing and diagnosis ● Image-guided surgery intervention ● Robot-assisted surgery 	
Cyber-Physical Systems (CPS) and Connected and Autonomous Vehicles (CAVs)	<ul style="list-style-type: none"> ● Driverless Cars ● Cloud-Facilitated Control of CAVs ● Optimal control of CAVs ● Intelligent control in CPS ● Electric and Hybrid Electric Vehicles 	
Cyber Security	<ul style="list-style-type: none"> ● Cyber security of connected systems ● AI & ML based threat detection and protection ● AI & ML based analysis of cyber-Attack and Deep fake Detection. ● Network Security ● Blockchain for cyber security ● Quantum cryptography 	

AI & ML for Robotics	<ul style="list-style-type: none">● Robot Learning● Robotic Inspection and AI &ML based anomaly detection.● Predictive maintenance of Industrial Structures based on data from Intelligent agents.● NLP (LLM) integration with Robotic Agents● Reinforcement Learning for Robotic Agents● Generative AI for training of Robotic agents● Deep Learning for Robotics	
Sensors for Robotics	<ul style="list-style-type: none">● Developing sensors for Robotics● Robot fabrication● Smart materials for Robots● Developing actuator for Robotics	

Link to the online application:

<https://iitmandiadm.samarth.edu.in/aug24/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 are briefly provided in the following pages of this document. The same can be found at the following links M. Tech (by research) /PhD Ordinance and Regulations (O&R) IIT Mandi:

https://www.iitmandi.ac.in/pdf/ordinances/Ordinances_phd_mtech.pdf

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

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

For PhD applicants (Full-Time Research Scholars):

Students under this category are entitled to the Scholarship/ Assistantship from Institute / MoE if they qualify for any one of the following criteria.

- Master's degree in the above-mentioned streams with a good academic record.
- Bachelor's degree in the above-mentioned streams from any Centrally Funded Technical Institutes (CFTIs) with a minimum CGPA of 7.5/10 (or equivalent).
- Bachelor's degree in the above-mentioned streams from any non-CFTIs with valid GATE score.

For Masters applicants (Full-Time Research Scholars):

Students under this category are entitled for the Scholarship/ Assistantship from Institute / MoE if they qualify any one of the following criteria.

- Candidates with a Bachelor's Degree in the above-mentioned streams must have a valid GATE score for admission to the M. Tech (R) program, and for availing HTRA scholarship.
- Candidate with B.Tech/B.E degree from CFTIs with a minimum CGPA of 7.5/10 (or equivalent).

Exemptions from mandatory requirements of Valid GATE or National Level examination:

- B.Tech/B.E. (or equivalent) degree from CFTI (Centrally Funded Technical Institute)/ any of the top 100 institutes according to NIRF ranking (overall category) at the time of application, with CGPA/CPI at least 7.5 (on a scale of 10) or equivalent.
- BS-MS/M.Sc/equivalent from IITs, IISERs, IISc, IIMs or any of the top 100 institutes according to NIRF ranking (overall category) at the time of application with a CGPA/CPI of at least 7.5 (on a scale of 10) or equivalent.
- NIRF Ranking (within top 100) should be in the overall category granted for the year during which the admission is sought.
- Any Himachal Pradesh Govt. Institutions/Universities, with CGPA/CPI at least 7.5 (on a scale of 10) or equivalent.

For Dual Degree (M.Tech (R) + Ph.D. applicants (Full-Time Research Scholars):

Students under this category are entitled to the Scholarship/ Assistantship from Institute / MoE if they qualify for any one of the following criteria.

- The candidate must possess B.E/B.Tech or equivalent degree with a valid GATE Score.
- GATE Score is waived off for candidates having B.Tech/BE degree from CFTI with CGPA ≥ 8 .

Note:

- 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.
- For any other queries regarding M.Tech (by research)/Ph.D./Dual Degree programs in CAIR, please contact the CAIR office through email: cairoffice@iitmandi.ac.in.
- Upload self-attested documents as a single zip file (Proof of identity (Aadhar card/voter card/PAN card/any other), Class 10 certificate as proof of date of birth, Mark sheets of UG and PG degrees (rank certificate, if any), Qualifying certificate of the GATE/CSIR/UGC/other examination, Caste

Certificate.)

- To apply for other specific areas not listed above, kindly fill “Others” in the specific area section after selecting the Broad Research Area on the Samarth portal.
- Applicants should submit fee on SBI collect portal of the IIT Mandi; and submit generated transaction number to the Samarth admission application portal. One application fee is valid for the single application. The application fee is non-refundable.

Application Fee:

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

For any problems regarding filling out online applications, Please contact ithelpdesk@iitmandi.ac.in

Important Dates:

Start of online application	8 Nov. 2024
Last date for filling Online Application	18 Nov. 2024 (till 5 PM)
Tentative date of Written/Interview	4th week of Nov. (To be announced on website)

Note: IIT Mandi reserves the right to recruit/ not recruit for any of the advertised areas and apply appropriate criteria for shortlisting candidates.