



# **Information Brochure Ph.D. -JDP Programme between IIT Mandi and IIT Jammu A Y - 2 0 2 5 - 2 0 2 6**

## **Academic Section**

Indian Institute of Technology Mandi  
Kamand, Himachal Pradesh -175075

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## About IIT Mandi

The Indian Institute of Technology Mandi (IIT Mandi), one of the premier technical institutes in India. IIT Mandi was established in 2009 with the aim of providing world-class education and cutting-edge research in engineering, science, and technology. Since its inception, the institute has strived to achieve excellence in education, research, and innovation.

Located in the scenic town of Mandi in the Himalayan foothills, the institute offers a unique learning experience to its students. With state-of-the-art facilities and world-class faculty members, IIT Mandi provides a conducive environment for research and learning. The institute offers undergraduate, postgraduate, and doctoral programs in various disciplines of engineering, sciences, and humanities.

At IIT Mandi, we believe in fostering an environment of innovation and creativity. Our faculty members are renowned experts in their fields and are committed to providing their students with the best possible education. With our multidisciplinary approach to education, we aim to produce graduates who are well-rounded and equipped to solve real-world problems.

We take pride in our research culture and encourage our students to engage in cutting-edge research in various fields. Our research facilities are equipped with state-of-the-art equipment and resources, providing our students with ample opportunities to explore their interests and pursue their passions.

Institute Webpage: [www.iitmandi.ac.in](http://www.iitmandi.ac.in)

## About IIT Jammu

The plan to establish IIT Jammu, along with four other IITs in Chhattisgarh, Goa, Andhra Pradesh, and Kerala, was announced by the Hon'ble Finance Minister in the Union Budget 2014-15.

The Indian Institute of Technology Jammu was inaugurated on 6th August 2016, and welcomed the first batch of students into the campus in Paloura, Jammu. In the initial phases, the establishment of IIT Jammu was done under the mentorship of IIT Delhi.

In 2018, IIT Jammu shifted its primary operations to the 400 acres of lush green land in Jagti village, just outside Jammu city, provided by the Government of Jammu and Kashmir for establishing its main campus. Currently, Phase 1A of the main campus, spread across 25 acres, is operational. Phase 1B and 1C are undergoing rapid construction. The main campus of the Institute is located on National Highway-44, 17 km from the Jammu Airport and 19 km from the Jammu Tawi Railway Station.

The campus in Paloura now accommodates PhD scholars. It also houses the high-end research facility: Central Instrumentation Facility (CIF or SAPTARSHI Labs), equipped with highly sophisticated state-of-art instruments to enable researchers in basic sciences and engineering.

Institute Webpage: <https://www.iitjammu.ac.in/>

## About PhD JDP

The Joint Degree Program (JDP) offers PhD students enrolled in both institutions the chance to collaborate on a multidisciplinary research project with faculty members and research teams from IIT Mandi and IIT Jammu, as well as to take advantage of the facilities and professional development opportunities offered by both institutions.

## Important Guidelines for PhD Application

1. Please read the instructions given in the brochure carefully before filling up the applications.
2. Online Application form link & Information brochure (Including the admission schedule along with the important dates) is available on the institute website at the following link: <https://alliance.iitmandi.ac.in/iitjammu/>
3. You are required to submit the application form ONLINE. No Downloadable Forms will be available after filling the form, you are advised to take a print of your application for your records.
4. For each project, candidate should submit a separate application with the application fee.
5. The application fee is as follows:

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

- a. One application fee is valid for the single application. The application fee is **NON-REFUNDABLE**.
6. OBC candidates may note that the limit for annual income is Rs. 8 Lakhs for determining the creamy layer among Other Backward Classes (OBCs) candidates. The OBC (NCL) certificate issued for the financial year 2025-26 by the Competent Authority in the prescribed format must be uploaded in the ONLINE application form. (*certificate issued after 31<sup>st</sup> April, 2025*)
  7. Economically Weaker Sections (EWS) candidates may note that the limit for 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 uploaded in the ONLINE application form and submitted at the time of admission. (*Certificate issued after 31<sup>st</sup> April, 2025*)
  8. Seats are reserved for Economically Weaker Sections (EWS) / Other Backward Class Non-Creamy Layer (OBC-NCL) / Schedules Caste (SC) / Scheduled Tribe (ST) and Person with Benchmark Disability (PwD) categories as per Government of India norms.

9. You should check Institute website for results / important announcements.
10. You should check emails sent to your email address provided in your application for all important communications and announcements if any.
11. Merely fulfilling eligibility criteria does not entitle a candidate to be called for the written test/interview. Decision of Institute authorities will be final. Admission is based on GATE / Written test / Interview performance in addition to general eligibility criterion, the applicants must also satisfy the eligibility criteria specified for the respective Departments / Centres / Schools / Interdisciplinary Groups.
12. Candidates, if called for written test/interview should show/bring with them (i) Photo ID Card, (ii) Printed copy of the application submitted online, (iii) Thesis / dissertation / report / publications (iv) copy of certificates and mark-sheets.

## Important Dates for Admission

Starting date for filling Online Application	24 <sup>th</sup> April, 2025
Last date for filling Online Application	16 <sup>th</sup> May, 2025(5:00PM)
Declaration of shortlisted candidates list	Will be Published on IIT Mandi and IIT Jammu website
Shortlisted candidates will be informed by email	

## Contact Details

In case of any query related to the Ph.D. Programme admission process you may contact respective school / Centre, the contact details are:

### IIT Mandi

Name of School/Centre	Email ID	Contact No.
Centre Artificial Intelligence and Robotics (CAIR)	<a href="mailto:cairoffice@iitmandi.ac.in">cairoffice@iitmandi.ac.in</a>	-----
School of Biosciences & Bioengineering	<a href="mailto:sbboffice@iitmandi.ac.in">sbboffice@iitmandi.ac.in</a>	01905-267061
School of Chemical Sciences	<a href="mailto:scsoffice@iitmandi.ac.in">scsoffice@iitmandi.ac.in</a>	01905-267277
School of Civil & Environmental Engineering	<a href="mailto:scene_admissions@iitmandi.ac.in">scene_admissions@iitmandi.ac.in</a>	01905-267180
School of Computing and Electrical Engineering	<a href="mailto:sceeooffice@iitmandi.ac.in">sceeooffice@iitmandi.ac.in</a>	01905-267071
School of Humanities & Social Sciences	<a href="mailto:shssoffice@iitmandi.ac.in">shssoffice@iitmandi.ac.in</a>	01905-267719
Indian Knowledge System and Mental Health Application (IKSMHA)	<a href="mailto:iksmha@iitmandi.ac.in">iksmha@iitmandi.ac.in</a>	01905-267786
School of Management	<a href="mailto:somoffice@iitmandi.ac.in">somoffice@iitmandi.ac.in</a>	01905-267119
School of Mathematical & Statistical Sciences	<a href="mailto:smssoffice@iitmandi.ac.in">smssoffice@iitmandi.ac.in</a>	01905-267929
School of Mechanical and Materials Engineering	<a href="mailto:smmeadmissions@iitmandi.ac.in">smmeadmissions@iitmandi.ac.in</a>	01905-267138
School of Physical Sciences	<a href="mailto:spsoffice@iitmandi.ac.in">spsoffice@iitmandi.ac.in</a>	01905-267812

Centre for Quantum Science and Technologies (CQST)	<a href="mailto:arvindthapliyal@iitmandi.ac.in">arvindthapliyal@iitmandi.ac.in</a>	01905-267899
Centre for Human Computer Interaction (CHCI)	<a href="mailto:chcioffice@iitmandi.ac.in">chcioffice@iitmandi.ac.in</a>	01905- 267187

## IIT Jammu

Name of School/Centre /Department	Email ID
Department of Biosciences and Bioengineering	<a href="mailto:hod.bsbe@iitjammu.ac.in">hod.bsbe@iitjammu.ac.in</a>
Department of Chemical Engineering	<a href="mailto:hod.chemical@iitjammu.ac.in">hod.chemical@iitjammu.ac.in</a>
Department of Chemistry	<a href="mailto:hod.chemistry@iitjammu.ac.in">hod.chemistry@iitjammu.ac.in</a>
Department of Civil Engineering	<a href="mailto:hod.ce@iitjammu.ac.in">hod.ce@iitjammu.ac.in</a>
Department of Computer Science and Engineering	<a href="mailto:hod.cse@iitjammu.ac.in">hod.cse@iitjammu.ac.in</a>
Department of Electrical Engineering	<a href="mailto:hod.ee@iitjammu.ac.in">hod.ee@iitjammu.ac.in</a>
Department of HSS	<a href="mailto:hod.hss@iitjammu.ac.in">hod.hss@iitjammu.ac.in</a>
Department of Materials Engineering	<a href="mailto:hod.materials@iitjammu.ac.in">hod.materials@iitjammu.ac.in</a>
Department of Mathematics	<a href="mailto:hod.mathematics@iitjammu.ac.in">hod.mathematics@iitjammu.ac.in</a>
Department of Mechanical Engineering	<a href="mailto:hod.me@iitjammu.ac.in">hod.me@iitjammu.ac.in</a>
Department of Physics	<a href="mailto:hod.physics@iitjammu.ac.in">hod.physics@iitjammu.ac.in</a>

## Academic Structure

### Program management

A Doctoral Advisory Committee (DC) shall be set up for each JDP Scholar to support and monitor progress of the JDP Scholar throughout the candidature until the thesis has been submitted. The DC shall consist of the following members.

Chair/Head of the School/Department of the Home Institute or his/her nominee	Chairperson
Supervisor from the Home institute	Member
Supervisor from the Host institute	Member
Co-supervisor (s), if any with justification	Member (s)
Subject Expert from the Home Institution	Member
Additional members may be appointed to meet the requirements	Members

### Coursework Requirements

The JDP Scholar shall satisfy the minimum academic coursework requirements of the Home Institution. Additional courses may be taken when recommended by the DC. If a JDP scholar credits a course in one institution, the credits will be automatically transferred to the other institution and will be counted towards the degree requirement.

## Joint Degree Program Structure

- Candidates have a **“Home Institution”** where they begin their studies and spend the majority of time. The expectation is that candidates will spend a minimum of 12 months at the other, **“Host Institution”** the timing and duration of this will depend on the program of research but in general will be in the second or third year of the degree. Travel to and study at the Host Institution will be subject to the usual requirements of the institute.
- As a condition of enrolment on the PhD JDP, candidates are required to:
  - Spend a minimum of one year\* (two semesters) enrolled at each institution.  
\*Candidates registered as part-time PhD or under External Registration program need to spend the minimum residential requirement criteria of both the institute as mentioned in their ordinances and regulations.
  - Undertake a program of progress monitoring and examination that meets the requirements of both institutions.
  - Comply with the rules, regulations, policies, codes and procedures of both institutions.
  - Write and submit a thesis for defense by oral examination at the home Institution.
- Candidates for the PhD JDP will be enrolled in a PhD program in parallel at both institutions. The supervisory team will comprise academics from both institutions who will provide guidance and support throughout the doctoral program. Candidates will benefit from the research community, networking, and collaborations of the IIT Mandi – IIT Jammu. Through enrolment at both institutions, candidates will have access to services and support provided at IIT Mandi and IIT Jammu, including a variety of professional and personal development opportunities for researchers.
- The primary supervisor shall be from the Home Institution. There must be a Joint supervisor from the Host Institution.
- The PhD JDP includes a tailored program of progress monitoring to fulfil the requirements of both institutions. On successful completion of the program requirements, candidates will be awarded a PhD degree jointly by both the Institutions.

## Admissions are currently open under the following research projects:

1.	<b>Development of Biodegradable Active Food Packaging Films</b>	
	Food packaging is critical in guaranteeing the safety and preserving food item's quality during storage and transit. As consumers increasingly demand safer and high-quality food items, food packaging has evolved to introduce active packaging systems to extend shelf life. Active packaging involves functional materials that exhibit antimicrobial and antioxidant properties within the packaging environment, thereby protecting the food from spoilage. Oxidation is a primary contributor to the food spoilage, as it negatively affects the sensory characteristics such as appearance, flavour and freshness.	
	<b>Home Institute:</b> Indian Institute of Technology Jammu  <b>Supervisor:</b> Dr Ankit Tyagi  <b>School/Dept.:</b> Chemical Engineering	<b>Host Institute:</b> Indian Institute of Technology Mandi  <b>Supervisor:</b> Dr Garima Agrawal  <b>School/Dept.:</b> Chemical Sciences
2.	<b>Development of lattice based barrier structures for landslide Prone Areas</b>	
	Structures built in landslide prone areas are susceptible for impact loads. Barrier structures are generally provided to protect structures including people. These structures receive high impact forces due to collision with stones etc. The objective is to develop 3D lattice based barrier structures which can have crumple zones to absorb impact energy and also act as a warning for evacuation.	
	<b>Home Institute:</b> Indian Institute of Technology Jammu  <b>Supervisor:</b> Dr. Sameer Kumar Sarma Pachalla  <b>School/Dept.:</b> Department of Civil Engineering	<b>Host Institute:</b> Indian Institute of Technology Mandi  <b>Supervisor:</b> Dr. Mahesh Reddy Gade  <b>School/Dept.:</b> School of Civil and Environmental Engineering
3.	<b>Development of Metalloradical Catalysis for Novel Synthetic Transformations</b>	
	Traditional radical-mediated organic synthesis faces challenging issues in controlling the reactions and selectivity as they involve high-energy radical intermediates. The metalloradical catalysis (MRC) has recently emerged as a conceptually new technique for addressing the formidable issues. Herein, we aim to design new metalloradical catalysts by synthesizing novel chiral porphyrins and ligating them to inexpensive metals. The metalloradical catalysis will be harnessed to functionalize unconventional bonds and stereoselective transformations. We will also design radical precursors for target-oriented applications and diazo compounds for selective carbene transfer reactions via metalloradical catalysis.	
	<b>Home Institute:</b> Indian Institute of Technology Jammu  <b>Supervisor:</b> Dr. Guru B Ramani  <b>School/Dept.:</b> Chemistry	<b>Host Institute:</b> Indian Institute of Technology Mandi  <b>Supervisor:</b> Prof. Pradeep C Parameswaran  <b>School/Dept.:</b> Chemistry
4.	<b>Experimental and Numerical Investigations on Hydrodynamics of Flow-Debris Interactions in the mountainous rivers</b>	
	The student will conduct the experiments on open channel flume to study the flow-debris interactions in the mountainous rivers under various hydraulic conditions. Instantaneous velocity measurements will be carried using velocimeters at various locations for hydrodynamic analysis. The student will also set up a hydrodynamic and/or morphological model to simulate the flow-debris process at a flume and river scale. The overall study will explore the mechanism of flow-debris interactions and implications on hydrodynamic and morphological processes in mountainous rivers.	



	<b>Home Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. Vinay Chemolu <b>School/Dept.:</b> Civil Engineering	<b>Host Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr. Vivek Gupta <b>School/Dept.:</b> Civil and Environmental Engineering
5.	<b>Nondestructive evaluation of laminates and FRP retrofitting</b>	
	<p>Civil infrastructure evaluation with nondestructive methods is a growing requirement. A timely information about the internal defects of members can help plan a maintenance and retrofitting with benefits of cost saving and longevity of structure. Often the composite sheet laminates, such as FRPs, are used for primary or retrofit material, which have a high tensile strength but vulnerable to debonding and degradation of material over time. The defects in laminates can be sensed by traveling Lamb waves which can travel long distances without attenuation losses. They are used for inspecting lamina type structures like pipes and laminated plates. This project aims at inspection of civil engineering infrastructure components using Lamb waves for defect inspection and characterization in laminated elements including retrofitted concrete members. Literature shows that the small defects are challenging to detect with low frequencies pulse input signals, while high frequencies generate multiple overlapping symmetric and anti-symmetric modes, rendering the arrival time information unsuitable for detection. This study also aims to address these issues as well.</p>	
	<b>Home Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. Surendra Beniwal <b>School/Dept.:</b> Civil Engineering	<b>Host Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr. Kaustav Sarkar <b>School/Dept.:</b> School of Civil and Environmental Engineering
6.	<b>Metal -free Organic Photocatalysts for challenging (in)organic transformations</b>	
	<p>Synthesis of novel luminescent purely organic pro-carbene molecules is proposed. An effective pathway to turn on the luminescence in these molecules is hypothesized by their judicious designing and the aid of DFT calculations. Instead of a typical photoactive Ru(II) or Ir(III)-polypyridyl complex, the use of these pro-carbenes as photocatalysts is planned that is supported by theoretical calculations. These photocatalysts by virtue of their high excited state reduction potentials (<math>E^*_{Red} &gt; 2\text{ V}</math>) could serve as champion photocatalysts in challenging organic transformations, e.g., regioselective mono(trifluoromethylation) of polyaromatic hydrocarbons, oxidative C-C and C-N bond formation etc.</p>	
	<b>Home Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr Amlan K. Pal <b>School/Dept.:</b> Chemistry	<b>Host Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Prof. Subrata Ghosh <b>School/Dept.:</b> Chemistry
7.	<b>Self-Lubricating Composite for Bearing Application</b>	
	<p>Bearings are critical components in various engineering applications viz. industrial machineries, automotive, aerospace etc. Operating bearings at elevated temperatures involves unique challenges due to increased friction, wear, and lubrication issues. The development of self-lubricating composites for bearing applications at elevated temperatures is of paramount importance for enhancing bearing performance, longevity, and reliability.</p> <p>The proposed research outlines a comprehensive investigation into the development and characterization of a self-lubricating composite material for bearing applications at elevated temperatures. The proposed research aims to explore the tribological behavior, mechanical properties, and fatigue strength of the composite. Additionally, it will involve multi-scale modeling to understand the constituent and thermo-mechanical effects on material strength.</p> <p>This research aims to contribute to advancements in mechanical design engineering, with potential applications of experimental characterization and finite element modelling computational tool.</p>	

	<b>Home Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. Arvind Kumar Rajput <b>School/Dept.:</b> Department of Mechanical Engineering	<b>Host Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr Himanshu Pathak <b>School/Dept.:</b> School Of Mechanical and Materials Engineering
<b>8.</b>	<b>Influence of Wing Geometry on Fluid-Structure Interaction in Small Fixed-Wing UAVs having continuous morphing capability using Auxetics</b>	
	<p>Wing geometry significantly affects fluid-structure interaction (FSI) in small fixed-wing UAVs with continuous morphing using auxetic materials. Auxetic structures, with their negative Poisson's ratio, enable smooth shape adaptation under aerodynamic loads, improving efficiency and maneuverability. Unlike rigid wings, morphing designs optimize lift, drag, and structural integrity in real-time. This dynamic response enhances UAV performance in varying conditions. Understanding the interplay between wing geometry, aerodynamics, and structural response through simulations and experiments is key to advancing UAV stability and efficiency, making them more adaptable for diverse applications.</p>	
	<b>Home Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr Sahil Kalra <b>School/Dept.:</b> Mechanical Engineering	<b>Host Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr. Deepak Sachan <b>School/Dept.:</b> Mechanical Engineering.
<b>9</b>	<b>Submodular Function Maximization with Machine Learning Based Approaches</b>	
	<p>Submodular Function is a class of discrete functions that satisfies the diminishing return property. This kind of function appears in many domains including operations research, game theory, clustering, etc. In this project our goal will be to develop data driven solution approaches for maximization of submodular functions. We will also look at some of the applications such as multi-agent path finding, combinatorial auction, etc.</p>	
	<b>Home Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. Suman Banerjee <b>School/Dept.:</b> CSE	<b>Home Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Prof. Manoj Thakur <b>School/Dept.:</b> School of Mathematical & Statistical Sciences
<b>10</b>	<b>Design and Development of the medium range wings for drones using natural fiber composites</b>	
	<b>Home Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. R T Durai Prabhakaran <b>School/Dept.:</b> Department of Mechanical Engineering	<b>Home Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr. Rajneesh Sharma <b>School/Dept.:</b> School of Civil and Environmental Engineering
<b>11</b>	<b>3D Printable Metal Hydride-MOF Composites for Hydrogen Storage Applications</b>	
	<p>This research addresses the limitations of metal-organic frameworks (MOFs) and metal hydrides for hydrogen storage by developing a 3D-printable Metal-MOF composite. MOF-5, known for its high surface area but low storage capacity, is combined with metal hydrides, which offer greater capacity but slow kinetics. The proposed approach enhances processability, customizability, and performance, enabling scalable hydrogen storage solutions. By refining the 3D printing process and improving MOF-metal compatibility, this study aims to optimize hydrogen uptake and long-term stability, advancing practical applications in renewable energy storage.</p>	

	<b>Home Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr Sandeep Sahu <b>School/Dept.:</b> Mechanical and Materials Engineering	<b>Host Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr Nitesh Kumar <b>School/Dept.:</b> Materials Engineering
<b>12</b>	<b>Algorithm to Hardware Designs of Sub-Nyquist based Cooperative Wideband-Spectrum Sensing for DSA</b>	
	<p>This project deals with the development of low-complexity spectrum sensing algorithms for detecting spectrum holes in wideband spectrum for dynamic spectrum access. In addition, the proposed algorithm will be designed for the cooperative cognitive-radio network where data from multiple secondary users are collected and processed to deliver reliable detection performance. This work will also develop a novel and efficient hardware architectures for such algorithms using some of the unique VLSI-architectural techniques. Furthermore, the proposed micro-architectures will be FPGA emulated and ASIC-chip fabricated for the real-world product development and IP generation. Henceforth, the objective of this work is to apply holistic approach to develop hardware-efficient architectures with short sensing time, delivering excellent detection reliability.</p>	
	<b>Home Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr. Rahul Shrestha <b>School/Dept.:</b> School of Computing and Electrical Engineering	<b>Host Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. Rohit B. Chaurasiya <b>School/Dept.:</b> Department of Electrical Engineering
<b>13</b>	<b>Analysis of driven piles using lab and field scale study</b>	
	<p>Pile driving is one of the extensively used techniques adopted for the installation of displacement piles. Such driven piles can be found in several geotechnical applications involving infrastructural development, such as foundation support, retaining walls, and bridge construction to name a few. However, this method of pile installation often leads to alteration of stress-strain and density state of the surrounding soil. Further, the residual stresses developed during the pile driving can significantly impact the load capacity of such piles. The proposed study envisions to investigate the load capacity of driven piles with due consideration to the developed residual stresses during pile driving through numerical simulations, and extensive lab and field scale study.</p>	
	<b>Home Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr. Mousumi Mukherjee <b>School/Dept.:</b> School of Civil and Environmental Engineering	<b>Host Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. Prasun Halder <b>School/Dept.:</b> Department of Civil Engineering
<b>14</b>	<b>Fracture and fatigue in composite materials: a multi scale study</b>	
	<p>In this study, we will explore the fracture and fatigue phenomena of various composite materials across multiple length scales. To achieve this, we will employ a sophisticated combined discrete element-finite element method, which allows for a detailed analysis of material behavior. Additionally, we will develop analytical methods aimed at predicting how these composite materials respond under combined thermo-mechanical loads. This comprehensive approach will enhance our understanding of material performance, ultimately contributing to the design and optimization of advanced composite structures in various engineering applications.</p>	

	<b>Home Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr. Thainswemong Choudhury <b>School/Dept.:</b> School of Civil and Environmental Engineering	<b>Host Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. Rimen Jamatia <b>School/Dept.:</b> Department of Civil Engineering
<b>15</b>	<b>RS based Himalayan cryospheric studies</b> <p>In the changing climate the Himalayan Glaciers are retreating at an alarming rate. At the same time gathering field data is very challenging. So we plan to estimate the mass balance of different glaciers of NW Himalaya using Geodetic method and that will be used for hydro-logical mass balance studies. Remote sensing analysis, DEM generation using Optical and SAR images and drone data will be used in this project. Cosei-corr, DEM difference and related Hydro-logical models will be applied. We are looking for candidates willing to carry out detailed field work in the glaciated regions, so preference may be given to those having some experience and exposure.</p>	
	<b>Home Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr. Dericks P Shukla <b>School/Dept.:</b> School of Civil and Environmental Engineering	<b>Host Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. Divyesh Varade <b>School/Dept.:</b> Civil
<b>16</b>	<b>Trajectory Planning for Connected and Automated Vehicles in mixed traffic environments</b> <p>Despite decades of traffic control advancements, vehicular accidents and congestion remain global challenges, especially in low- and middle-income countries. Human error and inefficient road use contribute significantly to these issues. This research focuses on developing advanced path planning algorithms for connected and automated vehicles (CAVs) in mixed traffic environments. It aims to enhance safety, optimize traffic flow, and reduce fuel consumption by addressing challenges like human-driven vehicle unpredictability, communication delays, and infrastructure variability. Using simulation and real-world validation, the study will propose distributed control-based solutions, ultimately improving transportation efficiency and safety in urban networks with both automated and human-driven vehicles.</p>	
	<b>Home Institute:</b> Indian Institute of Technology Mandi <b>Supervisor:</b> Dr. Yanumula Venkata Kartek <b>School/Dept.:</b> Computing and Electrical Engineering	<b>Host Institute:</b> Indian Institute of Technology Jammu <b>Supervisor:</b> Dr. Nalin Kumar Sharma <b>School/Dept.:</b> Electrical Engineering

## General Qualifications

In the present call, the students for the PhD JDP will be admitted only in the Regular category. An eligible student in this category works full-time and receives assistantship from the Institute.

The candidate should fulfil the minimum eligibility criteria of the Home institution of the respective projects as mentioned in the below link.

**IIT Mandi :** <https://cloud.iitmandi.ac.in/f/abee554e7294407399ce/>

**IIT Jammu:** <https://iitjammu.ac.in/Programme/phdadmissions/2023-24/PhD%20Advertisement%20Special%20Drive.pdf>

*In addition to general eligibility criterion, the applicants must also satisfy the eligibility criteria specified for the respective Projects/Departments / Centres / Schools / Interdisciplinary Groups. Over and above the general eligibility criteria for admission, candidates need to satisfy additional criteria for financial support / fellowship, as specified under specific admission categories.*

The final selection process to Ph.D. JDP programme for any project will be through written test and/or interview.

## Application and Admissions

The admissions process will be managed by the IIT Mandi - IIT Jammu Joint Admissions Subcommittee (JASC) constituted at the School/Department/Centre level and according to each Institution's admissions procedure. Candidates must meet the admissions requirements of both institutions. The eligibility criteria for enrolling in a joint PhD program will be same as that of a regular PhD program/ERP of the individual institute. The details of the same can be found in the PhD ordinance of the individual institute.

- IIT Mandi [https://www.iitmandi.ac.in/pdf/ordinances/Ordinances\\_phd\\_mtech.pdf](https://www.iitmandi.ac.in/pdf/ordinances/Ordinances_phd_mtech.pdf)
- IIT Jammu <https://iitjammu.ac.in/academics/academics-rules-and-regulations>

All applicants will be expected to apply through an online admissions portal.

## Fees, Scholarships and Funding

- The JDP Scholar shall pay tuition fees only to their Home Institution throughout the duration of the JDP including the duration of study at the Partner Institution as per its fee structure.
- Unless otherwise indicated, candidates who wish to be admitted onto the PhD JDP are entitled to receive fellowship meeting the eligibility criteria. The cost of fellowship will

be borne by the Home Institute even during the candidate's stay in the Host Institute. No tuition fee will be charged by the host institution. However, the student needs to bear the boarding and lodging charges. Scholarships are awarded based on merit, and the value and conditions of any scholarship awarded will be in accordance with the terms and conditions of the awarding institution.

- Regardless of the scholarship awarded, students on the joint PhD program will be personally responsible for the following expenses unless otherwise advised:
  - Incidental fees and charges at either institution
  - Accommodation and living expenses at either institution
  - All personal expenses and non-compulsory additional fees at the host institution
  - All debts incurred by candidates during their stay at either institution
  - Any other debts incurred by candidates during the Joint PhD Program
  - Further the grants in respect of attending conferences will be provided only by the home institute.

### **Fees details:**

The selected candidate needs to pay the fee only to the Home institution and the details about the fee structure can be found below:

- **IIT Mandi** <https://www.iitmandi.ac.in/fees.php>
- **IIT Jammu** <https://www.iitjammu.ac.in/fee>

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