



भारतीय प्रौद्योगिकी संस्थान मण्डी

Indian Institute of Technology Mandi



सरदार वल्लभभाई राष्ट्रीय प्रौद्योगिकी संस्थान,सूरत

Sardar Vallabhbhai National Institute of Technology, Surat

IIT Mandi - SVNIT Surat PhD Joint Degree Program Information Brochure

Admissions for Even Eemeter
Academic Year: 2024-2025





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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

About SVNIT Surat

Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat is to be a leading technical Institute not only at national level but also at International level for imparting training to manpower as per the needs of technology. It is also envisaged to provide the necessary infrastructure to take up research work and to provide the mechanism to interact with industries effectively.

The Institute has been granted the status of 'Institute of National Importance' w.e.f. Aug. 15, 2007. At present, the Institute is offering Ten UG Programmes, Twenty Two PG Programmes and Four Five Years Integrated Programme including doctoral programme in various disciplines of Engineering, Sciences, English and Management.

Institute Webpage: www.svnit.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 SVNIT Surat, 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 & 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/svnit/>
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. **Mode of Payment: SBI Collect Portal.**
 - b. Applicant should submit fee on SBI collect portal of the IIT Mandi and submit generated transaction number to the admission application portal Link:
<https://www.onlinesbi.sbi/sbicollect/icollecthome.htm>)
 - c. 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 2024-25 by the Competent Authority in the prescribed format must be uploaded in the ONLINE application form.
 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.

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	27 th November, 2024
Last date for filling Online Application	10 th December, 2024
Declaration of shortlisted candidates list	Will be Published on IIT Mandi and SVNIT Surat 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

For Technical Problem Kindly contact:

Section	Contact No.
Academic Section	01905-267754



For School/Centre details Kindly contact:

Name of School/Centre	Email ID	Contact No.
Centre Artificial Intelligence and Robotics (CAIR)	cairoffice@iitmandi.ac.in	-----
School of Biosciences & Bioengineering	sbboffice@iitmandi.ac.in	01905-267061
School of Chemical Sciences	scsoffice@iitmandi.ac.in	01905-267277
School of Civil & Environmental Engineering	scene_admissions@iitmandi.ac.in	01905-267180
School of Computing and Electrical Engineering	sceeooffice@iitmandi.ac.in	01905-267071
School of Humanities & Social Sciences	shssoffice@iitmandi.ac.in	01905-267719
Indian Knowledge System and Mental Health Application (IKSMHA)	iksmha@iitmandi.ac.in	01905-267786
School of Management	somoffice@iitmandi.ac.in	01905-267119
School of Mathematical & Statistical Sciences	smssoffice@iitmandi.ac.in	01905-267929
School of Mechanical and Materials Engineering	smmeadmissions@iitmandi.ac.in	01905-267138
School of Physical Sciences	spsoffice@iitmandi.ac.in	01905-267812
Centre for Quantum Science and Technologies (CQST)	arvindthapliyal@iitmandi.ac.in	01905-267899
Centre for Human Computer Interaction (CHCI)	hcioffice@iitmandi.ac.in	01905- 267187

SVNIT Surat

For Technical Problem Kindly contact:

Section	Email ID	Contact No.
Academic Section	acad_phd@svnit.ac.in	0261-220-1534

For Department Kindly contact:

Name of Department	Email ID	Contact No.
Department of Artificial Intelligence	hod@aid.svnit.ac.in	0261-220-xxxx
Department of Chemical Engineering	hod@ched.svnit.ac.in	0261-220-1641
Department of Chemistry	hod@chem.svnit.ac.in	0261-220-1971
Department of Civil Engineering	hod@ced.svnit.ac.in	0261-220-1841
Department of Computer Science & Engineering	hod@coed.svnit.ac.in	0261-220-1611
Department of Electrical Engineering	hod@eed.svnit.ac.in	0261-220-1571
Department of Electronics Engineering	hod@eced.svnit.ac.in	0261-220-1681
Department of Humanities and Social Sciences	hod@dohss.svnit.ac.in	0261-220-1989
Department of Management Studies	kpd@med.svnit.ac.in	0261-220-1910
Department of Mathematics	hod@amhd.svnit.ac.in	0261-220-1981
Department of Mechanical Engineering	hod@med.svnit.ac.in	0261-220-1751
Department of Physics	hod@phy.svnit.ac.in	0261-220-1951



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 defence 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 – SVNIT Surat. Through enrolment at both institutions, candidates will have access to services and support provided at IIT Mandi and SVNIT Surat, 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

Project No :1	
RIS Aided wireless powered Cell free Massive MIMO system for Sustainable 5G and Beyond Networks	
<p>This research proposal aims to design and develop a Reconfigurable Intelligent Surface (RIS) aided wireless powered Cell-Free Massive MIMO system to enable sustainable operations in 5G and beyond networks. The focal point of the proposal is to harness the potential of RIS technology to manipulate electromagnetic waves, which could significantly enhance signal quality and propagation without additional power consumption. Additionally, the proposal seeks to embed wireless power transfer mechanisms within the cell-free Massive MIMO infrastructure to create a self-sustaining network environment. Through this integration, the project targets to increase the energy efficiency of the network dramatically, contributing to the reduction of the overall carbon footprint.</p>	
<p>Home Institute: IIT Mandi Supervisor: Dr. Adarsh Patel School/Dept.:School of Computing and Electrical Engineering</p>	<p>Host Institute: SVNIT Surat Supervisor: Dr. Shilpi Gupta School/Dept.:Department of Electronics Engineering</p>



Project No :2	
Applications of Ferroelectric materials in Smart Composites	
Home Institute: IIT Mandi Supervisor: Dr. Vishal Singh Chauhan School/Dept.: School of Mechanical and Materials Engineering	Host Institute: SVNIT Surat Supervisor: Dr. Amrut Mulay School/Dept.: Department of Mechanical Engineering

Project No :3	
Biomass to value added Chemicals	
<p>In the world, biomass is mostly present in the form of grasses, municipal waste, animal waste, agricultural residues, etc. Among these, lignocellulosic biomass is renewable, low cost and abundant in nature, which has the potential to replace the non-renewable fossil fuels. In this regard, our motive is to develop different heterogeneous catalysts that can be used for the synthesis of biodiesels from waste biomass using green technologies.</p>	
Home Institute: SVNIT Surat Supervisor: Prof. Jigisha Kamal Parikh School/Dept.: Chemical Engineering Department	Host Institute: IIT Mandi Supervisor: Prof. Venkata Krishnan School/Dept.: School of Chemical Sciences

Project No :4	
Advanced Materials for Energy Storage/Conversion Applications	
<p>Energy conversion/storage devices have accomplished a foremost. Promising energy conversion devices are solar cells/fuel cell. To overcome the well-known drawbacks of commonly used Pt/C catalyst for, developing novel metal-based catalysts without compromising the catalytic activity is required. Another challenge for fuel cell is the low efficiency due to various energy losses. To overcome, energy conversion devices can be coupled with energy storage devices like supercapacitors. Thus, we will prepare novel multifunctional hybrid materials including metal-organic frameworks etc. for dual applications. Furthermore, catalysts will be also prepared for dual application. These materials will be developed through rational designs for strategic applications.</p>	
Home Institute: SVNIT Surat Supervisor: Dr. Jignasa Gohel, School/Dept.: Department of Chemical Engineering, SVNIT, Surat	Host Institute: IIT Mandi Supervisor: Dr. Ranbir Singh School/Dept.: School of Mechanical and Materials Engineering

Project No :5	
Cellulose Nanocrystals and Cellulose Nanofibers from Water Hyacinth and Their Applications	
<p>Water hyacinth is a notorious aquatic weed which is harmful to the environment and its control is a major problem. However, it is a rich source of phytochemicals and lignocellulosic materials. It contains lignin in the range of 2.5-18 %, hemicellulose in the range of 11-49 % and cellulose in the range of 18-46 %. After recovering the phytochemicals, the residues can be used for extracting cellulose nanocrystals (CNCs) and cellulose nanofibers (CNFs). The advanced extraction techniques like sonication, high-speed homogenization techniques, etc. can be explored for the efficient extraction of these compounds. Parametric study and statistical optimization will be employed to</p>	



attain the best outcome. The CNCs and CNFs will further be utilized for their application in preparing the composites.

Home Institute: SVNIT Surat
Supervisor: Dr. Meghal A. Desai
School/Dept.: Department of Chemical Engineering

Host Institute: IIT Mandi
Supervisor: Dr Himanshu Pathak
School/Dept.: School of Mechanical and Materials Engineering

Project No :6

Design and Analysis of Physically Unclonable Function based Authentication and Key Agreement Protocols for IoT based Applications.

The objective is to identify potential vulnerabilities and weaknesses in an IoT based applications and provide technical solution for securing Cyber Physical Systems (CPS). We need to evaluate and assess the potential impact of security attacks on various IoT enabled applications by considering factors such as data integrity, confidentiality, availability, and system reliability. Further, need to design and develop a comprehensive security framework for IoT applications, integrating encryption, authentication, and access control mechanisms. Moreover, introduce a Physical Unclonable Function (PUF) based multifactor authentication mechanism to protect the IoT devices from physical capture attacks and to resist the machine learning modelling attack on PUF based authentication schemes.

Home Institute: SVNIT Surat
Supervisor: Dr. Balu L. Pame
School/Dept.: Department of Computer Science and Engineering

Host Institute: IIT Mandi
Supervisor: Dr Srinivasu Bodapati
School/Dept.: School of Computing and Electrical Engineering

Project No :7

Development of Smart Hybrid Nanomaterials for Biomedical Applications

Nanoscale materials possess tunable physicochemical properties by which various nanomaterials can be manipulated to suit numerous applications, which are not possible at macroscales. Even though there has been a significant progress in biomedical research (drug delivery, dentistry, tissue engineering, biosensor, etc.), integrating organic, inorganic, and biological materials in to a hybrid system will be advantageous and effective. However, the arrangement of inorganic and organic materials in various configurations to impart functionality for a specific biomedical application is challenging. This research work deals with the development and design of hybrid nanomaterials with multiplexed functionalities that can prove to be a breakthrough in the biomedical research.

Home Institute: SVNIT Surat
Supervisor: Dr. Sundar S.K.
School/Dept.: Department of Chemical Engineering

Host Institute: IIT Mandi
Supervisor: Dr. Jaspreet Kaur Randhawa
School/Dept.: School of Mechanical and Materials Engineering

Project No :8

Investigating Machine Learning Approaches in Cyber Security including Adversarial Machine Learning.



The data-driven approach that the machine learning techniques are based on has now been found its sound use cases in Cyber Security as well. By analyzing data to find patterns, the use cases like better detection of malware in encrypted traffic, finding insider threats, predicting where “bad neighbourhoods” are online when browsing, or protecting data in the cloud by uncovering suspicious user behavior - all have become possible. With the advent of deep learning techniques the field is advancing further with an aim to exploit deep learning/machine learning techniques to an advantage while at the same time managing the overheads within reasonable bounds. The research in this project is aimed to explore the existing state-of-the-art with an aim to improve the existing scenario with better approaches in the fields of any of Intrusion Detection, Malware Analysis & Detection, Email Spam Detection, Network Traffic Analysis or User Behaviour Analysis. At the same time, the scope of the research also extends to investigate the attacks on the existing machine learning solutions (Adversarial Machine Learning) in Cyber Security & other areas and devise methods for detection and mitigation.

<p>Home Institute: SVNIT Surat Supervisor: Prof Devesh C Jinwala School/Dept.: Department of Computer Science & Engineering</p>	<p>Host Institute: IIT Mandi Supervisor: Dr Dinesh Singh School/Dept.: School of Computing and Electrical Engineering (SCEE)</p>
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Project No :9

Expermental investigations on Electrolysis for Biofuels production

<p>Home Institute: SVNIT Surat Supervisor: Dr. Kamallesh A. Sorate School/Dept.: Department of Mechanical Engineering</p>	<p>Host Institute: IIT Mandi Supervisor: Dr. Atul Dhar School/Dept.: Department of Mechanical Engineering</p>
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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/>
- **SVNIT Surat**:
<https://www.svnit.ac.in/Data/Notice/2023/October/Academic%20Regulation-2023-24.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 - SVNIT Surat Joint Admissions Sub-committee (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.

- **IITMandi** : https://www.iitmandi.ac.in/pdf/ordinances/Ordinances_phd_mtech.pdf
- **SVNIT Surat**: <https://www.svnit.ac.in/Data/Notice/2023/October/Academic%20Regulation-2023-24.pdf>

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 through out 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://iitmandi.ac.in/fees>

SVNIT Surat : <https://www.svnit.ac.in/Data/fee%20structure/Ph.D.%20admitted%20in%20AY%202024-25.pdf>