INDIAN
INSTITUTE OF
TECHNOLOGY
MANDI

ANNUAL REPORT

2023-24

INDIAN INSTITUTE OF TECHNOLOGY MANDI

Kamand-175075, Himachal Pradesh, India

Annual Report 2023-24

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VISION

To be a leader in science and technology education, knowledge creation, and innovation, in an India marching towards a just, inclusive and sustainable society.

MISSION

- To create knowledge through team effort and individual for the benefit of society.
- To impart education to produce professionals capable of leading efforts towards innovative products and processes for the development of the Himalayan region in particular and our country and humanity in general.
- To inculcate a spirit of entrepreneurship and to impart the ability to devise globally recognized solutions for the problems of society and industry, particularly in the fragile ecosystem of the Himalayas.
- To train teachers capable of inspiring the next generation of engineers, scientists, and researchers.
- To work intensely with industry in pursuit of the above goals of education and research, leading to the development of cutting-edge and commercially-viable technologies.
- To operate in an ambiance marked by overriding respect for ability and merit.

Content

From the Director's Desk

It is with immense pride and joy that I present the comprehensive annual report for the academic year 2023-24, shedding light on the exceptional strides and accomplishments that have defined the trajectory of the Indian Institute of Technology Mandi. Since its inception in 2009, IIT Mandi has evolved into a focal point of academic brilliance, fostering innovation and research across a spectrum of disciplines.

The 11th Convocation, held on 16th October, 2023, marked a significant milestone for IIT Mandi, celebrating the graduation of 568 students. Among them were 244 B.Tech. students, 112 M.Tech. students, 134 M.Sc. students, 15 M.A. students, 06 Dual Degree students and 57 Ph.D. scholars. The event was graced by the esteemed presence of Dr. Ajit Kumar Mohanty, Secretary, Department of Atomic Energy, Chairman, Atomic Energy Commission, as the Chief Guest.

The 15th Foundation Day further exemplified the institute's commitment to excellence with the presence of Dr. Samir V. Kamat, Secretary DD (R&D) and Chairman Defence Research & Development Organisation (DRDO) as the Chief Guest, along with Shri G. A. Srinivasa Murthy, DS and Director, Defence Research & Development Laboratory (DRDL), and Shri Manoj Jain, Director R&D, Bharat Electronics Limited, attended as Guests of Honor. Innovative interdisciplinary programs in areas such as the Indian knowledge system, Robotics, and Artificial Intelligence were initiated to propel the institute to new heights.

This year witnessed a significant increase in the student population, with total enrollment surpassing 3200. The South Campus, boasting a robust infrastructure spanning sixty-one thousand six hundred square meters, now accommodates 3000 students with dedicated hostel facilities and quarters for 113 faculty/staff members.

IIT Mandi now spans two campuses - North and South, which were initially separated by mountains, accessible only via a Public Works Department (PWD) road. We are currently constructing an internal road to connect these campuses, significantly reducing travel time and enhancing ease of movement. Notably, IIT Mandi has seen substantial developments, particularly the expansion of the South Campus. This expansion includes the construction of two new hostel blocks, a dining hall, ten 2-BHK apartments, and forty-five 3-BHK apartments, covering a total area of 22,000 square meters. Meanwhile, the North Campus, spread over 1,59,370 square meters, is undergoing developments aimed at expanding the capacity to accommodate 5,000 students and over 350 faculty members.

IIT Mandi has been honored with the Prestigious Green University Award in COP 28 UAE. This prestigious accolade was conferred by Green Mentors, a non-governmental organization holding special consultative status with the United Nations Economic and Social Council (ECOSOC) in the United States. Additionally, Dr. Ajay Soni, a faculty member at IIT Mandi, has been recognized as a prestigious Fellow of the Royal Society of Chemistry (FRSC).

In the financial year 2023-2024, IIT Mandi maintained a steady number of Sponsored Projects, reaching a total of 55, the same as the previous year. The funding for Sponsored Projects saw a significant increase, reaching 63.49 crores INR, a substantial rise from the previous year's 20.31 crores INR.

IIT Mandi experienced a steady growth in Pre-Placement Offers (PPOs) for the academic year 2023-24, with an increase of over 4% compared to the preceding year. This increase reflects the growing recognition of the institution's academic excellence and the heightened desirability of its graduates in the professional landscape. The rise in PPOs attests to the continued success and upward trajectory of IIT Mandi's placement endeavors.

As we reflect on the achievements of the past year, heartfelt gratitude is extended to the entire IIT Mandi community – students, faculty, staff, and esteemed guests for their unwavering contributions to our journey of excellence. Together, we remain committed to pushing the boundaries of knowledge and innovation, steadfastly shaping the future of IIT Mandi.

Prof. Laxmidhar Behera
Director

1. Academics At A Glance

Academic activities, including Teaching, Learning, and Research, are carried out in three orthogonal but complementary structures. These are Academic Schools, Student Degree Programmes and Research Groups. Each of these is designed to serve a distinct purpose. The three interact in flexible ways to best achieve the academic goals of the Institute. The structure encourages interdisciplinary learning and research that evolves in step with the march of technological innovation.

1.1 Schools

Faculty members belong to broadly and loosely defined Academic Schools. Each School provides a home base for faculty whose interests share some fundamental academic principles. Some faculty members also have joint appointments in other Schools. By broadly grouping faculty members into Schools, IIT Mandi has avoided traditional departments and divisions within the Institute. This has been done to foster an interdisciplinary culture and collaborative research and projects across disciplines within the Institute.

Currently, the Schools in the Institute are:

School of Computing and Electrical Engineering (SCEE)

Faculty members in the broad areas of Computer Science, Computer Engineering, Electrical Engineering including Electronics and Semiconductors, Signal Processing, Automation and Control and Electrical Energy Systems are part of this school.

School of Mechanical and Materials Engineering (SMME)

The faculty members of the school are involved in research and teaching in the areas of advanced materials, bio-mechanics, computational mechanics, composite design and manufacturing, energy engineering, smart structure & system, solid mechanics and thermo-fluidics.

School of Civil and Environmental Engineering (SCENE)

The faculty members of the school are involved in research and teaching in the areas of disaster management especially with an interdisciplinary approach involving Structural Engineering, Geotechnical Engineering, Water Resources Engineering, Environmental Engineering and GIS & Remote sensing.

School of Chemical Sciences (SCS)

The faculty members of the school are involved in research and teaching in the areas of subfields of organic, inorganic, physical, materials, polymer, and biological chemistry.

School of Physical Sciences (SPS)

The faculty members of the school are involved in research and teaching in the areas of cutting-edge themes of physics ranging from the physics of atoms, molecules, and quarks to the dynamics of black holes and the early universe, from exploring exotic states of matter to the physics of polymers and glasses.

School of Mathematical & Statistical Sciences (SMSS)

The faculty members of the school are involved in research and teaching in the areas of Differential Equations, Mathematical Control Problems, Nonlinear Dynamics and Chaos, Theoretical and Computational Partial Differential Equations, Optimization, Mathematical Biology, Computational Fluid Dynamics, Harmonic Analysis, Algebra, Topology, Combinatorics, Functional Analysis, Image processing, Machine learning, Statistics and Data Science.

School of Humanities and Social Sciences (SHSS)

Faculty members from English, German studies, Economics, Sociology, Psychology, Management, History and other areas of Humanities and Social Sciences are part of this school.

School of Management (SOM)

The faculty members of the school are involved in research and teaching in the areas of data science tools and techniques like analytics, artificial intelligence machine learning, deep learning, natural language processing, and neural networks with a strong emphasis on problem solving approach.

School of Biosciences & Bio Engineering (SBB)

Faculty members are focused on teaching and cutting edge research in the broad areas of Biotechnology and Bioengineering.

1.2 Degree Programmes

1. Bachelor of Technology (B.Tech.) in the following engineering disciplines:
    a. Civil Engineering (CE)
    b. Computer Science & Engineering (CSE)
    c. Data Science and Engineering (DSE)
    d. Electrical Engineering (EE)
    e. Engineering Physics (EP)
    f. Mechanical Engineering (ME)
    g. B.Tech. in Bio-Engineering
    h. General Engineering
    i. Material Science Engineering
    j. Maths & Computing
    k. Microelectronics & VLSI
    l. BS Chemical Sciences

2. Master of Science (M.Sc.) in the following disciplines:
    a. M.Sc. in Applied Mathematics
    b. M.Sc. in Chemistry
    c. M.Sc. in Physics

3. Master of Technology (M.Tech.) in the following disciplines:
    a. M.Tech. in Structural Engineering
    b. M.Tech. in VLSI
    c. M.Tech. in Power Electronics and Drives
    d. M.Tech. in Computer Science and Engineering
    e. M.Tech. in Biotechnology

4. Master of Arts (MA) in Development Studies

5. Master of Business Administration (MBA) in Data Science and Artificial Intelligence

6. I-Ph.D. (Physics)

7. M.Tech. (Research) in the following schools and centres:
    a. School of Computing and Electrical Engineering
    b. School of Civil and Environmental Engineering
    c. School of Mechanical and Materials Engineering
    d. School of Management
    e. Centre of Indian Knowledge System and Mental Health Application
    f. Centre of Artificial Intelligence and Robotics
    g. School of Mathematical & Statistical Sciences

8. Ph.D. programme in the following schools and centres:
    a. School of Computing and Electrical Engineering
    b. School of Civil and Environmental Engineering
    c. School of Mechanical and Materials Engineering
    d. School of Mathematical and Statistical Sciences
    e. School of Biosciences and Bioengineering
    f. School of Chemical Sciences
    g. School of Physical Sciences
    h. School of Humanities and Social Sciences
    i. School of Management
    j. Centre of Indian Knowledge System and Mental Health Application
    k. Centre of Artificial Intelligence and Robotics
    l. Centre for Quantum Science & Technology

9. M.Tech Research + PhD Dual Degree Programme:
    a. School of Computing and Electrical Engineering
    b. School of Civil and Environmental Engineering

c. School of Mechanical and Materials Engineering
d. School of Biosciences and Bioengineering
e. Centre of Indian Knowledge System and Mental Health Application
f. Centre of Artificial Intelligence and Robotics

10. Ph.D. under Joint Degree Programmes and Joint Research Degree Programmes:
    a. IIT Mandi and IIT Ropar
    b. IIT Mandi and SVNIT Surat
    c. IIT Mandi and IIT Jammu
    d. IIT Mandi and Punjabi Engg. College
    e. IIT Mandi and CPRI

1.3 Statistics of the currently enrolled students based on the Year of Enrolment, Batch, and Category

	B.Tech						M.Sc. (Chemistry/Maths/Physics)						M.Tech.					
Year	GEN	OBC	SC	ST	EWS	Total	Gen	OBC	SC	ST	EWS	Total	Gen	OBC	SC	ST	EWS	Total
2017	0	1	0	1	--	**2**	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2018	0	1	0	0	--	**1**	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2019	5	3	1	2	--	**11**	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2020	120	85	45	22	32	**304**	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2021	114	86	45	20	31	**296**	1	0	0	1	0	**2**	0	0	0	0	0	**0**
2022	128	90	48	28	28	**322**	40	36	18	11	18	**123**	53	24	14	1	13	**105**
2023	172	124	74	37	60	**467**	**28**	**22**	**12**	**5**	**13**	**80**	**36**	**32**	**15**	**3**	**10**	**96**
Total	**539**	**390**	**213**	**110**	**151**	**1403**	**69**	**58**	**30**	**17**	**31**	**205**	**89**	**56**	**29**	**4**	**23**	**201**

	M.A.						I-Ph.D.						M.Tech. (Research)					
Year	GEN	OBC	SC	ST	EWS	Total	Gen	OBC	SC	ST	EWS	Total	Gen	OBC	SC	ST	EWS	Total
2015	–	--	--	--	--	--	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2017	--	--	--	--	--	--	4	2	0	0	0	**6**	0	0	0	0	0	**0**
2018	--	--	--	--	--	--	0	0	0	0	0	**0**	2	0	0	0	0	**2**
2019	0	0	0	0	0	**0**	2	1	0	0	0	**3**	2	1	0	0	0	**3**
2020	0	0	0	1	0	**1**	2	1	0	0	1	**4**	2	2	0	0	2	**6**
2021	0	1	1	0	0	**2**	1	0	0	0	0	**1**	13	4	0	0	3	**20**
2022	6	4	2	1	2	**15**	3	1	0	0	1	**5**	23	9	2	0	2	**36**
2023	5	3	1	1	2	**12**	**3**	**1**	**0**	**0**	**0**	**4**	54	27	12	1	9	**103**
Total	**11**	**8**	**4**	**3**	**4**	**30**	**15**	**6**	**0**	**0**	**2**	**23**	**96**	**43**	**14**	**1**	**16**	**170**

	Ph.D. including Joint degree Programme and Upgraded PhD						M.Tech. R+PhD (Dual Degree)						MBA					
Year	GEN	OBC	SC	ST	EWS	Total	Gen	OBC	SC	ST	EWS	Total	Gen	OBC	SC	ST	EWS	Total
2014	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	**0**
2015	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	0	0	0	0
2016	1	0	0	0	0	**1**	0	0	0	0	0	**0**	0	0	0	0	0	0
2017	14	4	1	0	0	**19**	0	0	0	0	0	**0**	0	0	0	0	0	0
2018	28	2	3	0	0	**33**	0	0	0	0	0	**0**	0	0	0	0	0	0
2019	33	13	1	2	0	**49**	0	0	0	0	0	**0**	0	0	0	0	0	0
2020	29	17	3	2	8	**59**	0	0	0	0	0	**0**	0	0	0	0	0	0
2021	53	16	6		11	**86**	0	0	0	0	0	**0**	0	0	0	0	0	0
2022	81	41	17	6	20	**165**	0	0	0	0	0	**0**	19	5	6	0	1	**31**
2023	140	51	37	8	21	**257**	8	4	5	0	1	**18**	31	10	4	1	1	**47**
Total	**379**	**144**	**68**	**18**	**60**	**669**	**8**	**4**	**5**	**0**	**1**	**18**	**50**	**15**	**10**	**1**	**2**	**78**

2. Research Activities at a Glance

The Office of Sponsored Research and Industrial Consultancy (SRIC) provides administrative support for the operation of sponsored research, industrial consultancy, and other R&D related activities of the Institute. It facilitates interaction with external agencies, both national and international. Additionally, it promotes and manages Institute-Industry interaction and all externally funded research and development projects.

In FY23-24, SRIC revised the consultancy institute overhead norms to attract more consultancy work. Nineteen MoUs were processed with various institutes, industry partners, and universities, including DDRL Hyderabad, RITES Ltd. Haryana, UPES Uttarakhand, and Edfora Infotech Pvt. Ltd. The fund flow through PFMS for central sector schemes was implemented for ISRO and DIC. The project staff count at the close of FY23-24 was approximately 110. A total of 55 sponsored projects were sanctioned in FY23-24 with a sanctioned value of Rs. 63.49 Crores, marking a 212% increase in sanctioned value and a 57% increase in project count compared to FY22-23. There was also a significant increase in the number of consultancy projects, rising from 28 in FY22-23 to 44 in FY23-24, with a total sanctioned value of Rs. 3.13 Crores, representing an approximate increase of 219%.

Table 1: Information on new projects sanctioned during the last three years

	Sponsored Projects	Consultancy Projects		
Year	Number	Sanctioned Outlay (Rs. In crores)*	Number	Projects Outlay (Rs. In crores)*
2023-24	55	63.49	44	3.13
2022-23	55	20.31	28	0.98
2021-22	43	17.48	18	1.35

*: includes applicable GST

Table 2: Funds received for R&D in 2023-24

Project Type	Funds received (Rs. in crores)
Sponsored Projects	25.34
Consultancy Projects	3.14
Total	28.48

Table 3: Externally Sponsored Research Projects

Sr. No.	Project No.	Project Title	Sponsoring Agency	Principal Investigator	Co-Principal Investigator	Deptt/ School	Amount Sanctioned (In Rs.)	Duration of project
1	IITM/IITG-TI&DF/JKd/421	Design and development of an underwater cleaning robot for marine applications	IIT Guwahati Technology Innovation and Development Foundation	Dr. Jagadeesh Kadiyam		SMME	2000000	3 years
2	IITM/iHub & HCIF-IIT Mandi/AP/423	Developing AI - based cognitive function enhancement app by applying Artificial Intelligence	iHub & HCIF-IIT Mandi	Dr. Amit Prasad	Dr. Varun Dutt Dr. Dinesh Singh Dr. Arnav Bhavsar	SBB & SCEE	8113600	2 years

3	IITM/DBT/TPS/425	Technological innovations for development of functional foods from ethnic fermented foods of the Indian Himalayas	DBT	Dr. Tulika P Srivastava Prof. Jyoti Tamang from Sikkim University, Dr. K Jeyaram from DBT Institute of Bio resources and Sustainable Development (IBSD), Imphal (Manipur), Prof. Naveen Kumar Navani from IIT Roorkee, Dr. Shantibhusan Senapati from DBT Institute of Life Sciences, Bhubaneswar, Dr. Sarita Devi from CSIR-Institute of Himalayan Bioresources Technology (IHBT) Palampur (H.P.) Prof. Manzoor A Shah from University of Kashmir as PIs	Dr. Namrata Thapa from Nar Bahadur Bhandari College Sikkim, Dr. S. Indira Devi, Dr. Amit Kumar Rai, Dr. Sushil Kumar Kumar Chaudhary from DBT-IBSD, Imphal, Prof. Ranjana Pathania, from IIT Roorkee, Dr. Subrata Kumar Das, Dr. Tushar Kant Beuria from DBT-ILS Bhubaneswar, Dr. Mahesh Gupta, Dr. Vikram Patial, Dr. Vidyashankar Srivatsan from CSIR-IHBT, Dr. Adil Gani from University of Kashmir	SBB	4177120	3 years
4	IITM/DST-FIST/Chairperson-SBB/426	FIST life Sciences level B C or D	DST	Chairperson (SBB)		SBB	45000000	5 years
5	IITM/C3iHub-IIT Kanpur/VD/427	Team- HacklT : a web - based testbed for multi player cyber deception experiments	iHub- IIT Kanpur	Dr Varun Dutt		SCEE	3368133	3 years
6	IITM/SERB/PKU/428	Development of an organic Rankine cycle based system for recovery of waste heat from IC engine	SERB	Dr. Parmod Kumar	Dr. Atul Dhar	SMME	3900090	3 yeras
7	IITM/MoT-NTTM/RRK/429	Multi -metal and hetero atom decorated lignin derived carbon fibers as energy storage materials	Ministry of Textiles (National Technical Textile Mission)	Dr. Rik Rani Koner	Dr. Sumit Sinha Ray (from IIT Delhi)	SMME	7972000	2 years

8	IITM/DST/ABP/430	Creation of Nodal Centre for development and production of key starting materials, intermediates and other raw materials that are required by the health care sector	DST	Dr. Amit B Pawar	Prof. Subrata Ghosh (IIT Mandi)Dr. Suman Lata Jain from Indian Institute of Petroleum, Dr. Debasis Benerjee from IIT Roorkee, Dr. Rajendra Srivastava from IIT Ropar and Dr. Valmik Shinde from CSIR Central Drug Research Institute	SCS	2499941	1 year
9	IITM/iHub & HCIF-IIT Mandi/GSR/431	Development of artificial skin integrated with multipurpose sensors and creating perceptual explanations through artificial skin	iHub & HCIF-IIT Mandi	Dr. G. Shrikanth Reddy as Lead Principal Investigator, Dr. Ranbir Singh, Dr. Narendra Kumar Dhar, Dr. Rohit Saluja and Dr. Mrityunjay Doddamani as Principal Investigators	Prof. Satinder Sharma as lead Co-PI, Dr. Atul Dhar, Dr. Viswanath Balakrishnan, Dr. Jagadeesh Kadiam, Dr. Deepak Sachan and Dr. Anuj Nandanwar (Faculty fellow- IIT Mandi iHub & HCI Foundation)	SCEE & SMME	22429000	2 years
10	IITM/SERB/TB/432	Decoding the dynamics of cardiac ECM matrisome during post - MI (myocardial infraction) remodeling	SERB	Dr. Trayambak Basak		SBB	6538972	3 years
11	IITM/iHub& HCIF- IIT Mandi/SUM/433	Edible nano- composite based 3D printing for gustatory interface	iHub & HCIF-IIT Mandi	Dr. Sumit Murab	Dr. Garima Agrawal, Dr. Tanushree Parsai, Dr. Prateek Saxena	SBB & SCS & SMME	10747000	2 years

12	IITM/IKS-AICTE-MoE/RSA/435	Digitization and content creation on Sankhya Dharshan, Yoga Sutra, Prana and Swara with a case study on mental benefits of Mantra Dhyaan	AICTE-MoE	Dr. Rohit Saluja	Dr. Arnav Bhavsar, Prof. Manoj Thakur	SCEE & SMSS	1180000	9 months
13	IITM/MeitY/HS/436	ASIC and package design of ultra small atomic clock	MeitY	Dr. Hitesh Shrimali	Dr. Rahul Shrestha, Dr. G. Shrikanth Reddy as Co-PIs from IIT Mandi and other institute involved are Dr. Rohit Sharma, Dr. Devarshi Das, Dr. Mahendra Sakare from IIT Ropar and Sh. Kumar Sambhav Pandey, Dr. Gargi Khana from NIT Hamirpur	SCEE	9500000	5 years
14	IITM/SERB/ASR/437	Characterizing CERN gas electron multiplier detector and producing the best quality in the country for future high energy physics experiments and improving radiation therapy in cancer treatment	SERB	Dr. Amal Sarkar		SPS	3754360	3 years
15	IITM/LU-SW/SYS/438	Indoor biomass burning contributes to significant particulate matter exposure, chronic human health burden, and an economic drain in rural households	Linkopings University Sweden	Dr. Sayantan Sarkar	Dr. Shyamasree Dasgupta	SCENE & SHSS	4856568	3.5 years
16	IITM/ICSSR/NC/439	The landscape of tribal reverberations: Myths, Folklores and Cultural geographies in Lahaul	ICSSR	Dr. Nilamber Chhetri		SHSS	500000	1 year
17	IITM/DBT/BB/440	The landscape of tribal reverberations: Myths, Folklores and Cultural geographies in Lahaul	DBT	Dr. Baskar Bakthavachalu	Dr. Shashank Tripathi from IISc Bangalore as Project Coordinator, Dr. Sanjay Ghosh from IBAD Bengaluru as Principal Investigator	SBB	8624920	3 years

18	IITM/DBT/PM/441	Mechanisms linking elevated circulating insulin to systemic insulin resistance	DBT	Dr. Trayambak Basak	Dr. Rajesh Ghosh	SBB & SMME	5950800	3 years
19	IITM/DBT/MT/442	National Network Project of CSIR- IHBT, Palampur	DBT	Dr. Manoj Thakur	Dr. Samar Agnihotri as Co-PI from IIT Mandi and Dr. Ravi Shankar from CSIR-IHBT Palampur as Project Coordinator, Dr. Ravi Shankar from CSIR-IHBT Palampur, Dr. Kuljeet Singh Sandhu from Indian Institute of Science Education and Research Mohali, Dr. Lal Mohan Bhar from ICAR-IASRI, New Delhi are as Principal Investigators and Mr. Prakash Kumar, Mr. Upendra Kumar Pradhan from ICAR- IASRI, New Delhi, Dr. Rituraj Purohit, Dr. Vishal Acharya from CSIR-IHBT	SMSS & SCEE	5134780	5 years
20	IITM/SERB/VG/443	Exploring catchment storage controls storage controls on drought propagation and recovery	SERB	Dr. Vivek Gupta		SCENE	2379520	2 years
21	IITM/ICSSR/MA/444	A multi- stage evaluation of implementation and effectiveness of Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB- PMJAY) in rural Himachal Pradesh	ICSSR	Dr. Mayanka Ambade	Dr. Ramna Thakur, Dr. Saumya Dixit, Dr. Manu V Devadevan	SHSS & SoM	1000000	6 months
22	IITM/SERB/PM/445	Small molecule oral agonist of the glucagon - like - peptide - 1 receptor to improve glycemic control and nonalcoholic fatty liver disease in diabetes mellitus	SERB	Dr. Trayambak Basak		SBB	5698870	3 years
23	IITM/SERB/SHP/446	Stability analysis of concrete gravity dams subjected to air explosions	SERB	Dr. Shashank Pathak		SCENE	2377510	2 years

24	IITM/RD-GoHP/RT/447	Socio economic impact assessment of beneficiaries under PMAY (G) in Himachal Pradesh	RD-GoHP	Dr. Ramna Thakur		SHSS	1705000	1 year
25	IITM/CSIR/NKU/448	Development of a deep learning alogrithm to solve partial differential equations describing ecological phenomenon	CSIR	Dr. Nitu Kumari		SMSS	2017000	3 years
26	IITM/CSIR/CKN/449	Unveiling the photo luminescence mechanism of atomically precise gold nanoclusters at Single Particle Level	CSIR	Prof. Chayan Kanti Nandi		SCS	900000	3 years
27	IITM/MoEsS/MRD/450	Development of low density syntactic foams for manned submersible	MoES	Dr. Mrityunjay Doddamani	Dr. Satvasheel Powar	SMME	6785000	2 years
28	IITM/BS-USA/LB/451	P300 science- based technology products	Brainwave Sciences (USA)	Prof. Laxmidhar Behera		SCEE	25,00,000	2 years
29	IITM/MoES/NRT/452	Next generation integrated contactless- hybrid power source brushless cruise based docking system for unmanned deep ocean vehicles	MoEs	Dr. Narsa Reddy	Dr. Gopi Shrikanth Reddy	SCEE	4106720	2 years
30	IITM/BEL/APT/453	Development of algorithm for classification of all identified digital modulations with known channel impairments	Bharat Electronics Ltd. (BEL)	Dr. Adarsh Patel	Dr. Varun Dutt, Dr. Arnav Bhavsar	SCEE	1995000	9 months
31	IITM/SERB/DJ/454	Earthquake source characterization for physics – based seismic hazard estimation	SERB	Dr. Dhanya J		SCENE	5430832	3 years
32	IITM/SERB/DDP/455	Protein - nucleic acid interaction - understanding molecular recognition mechanisms in viral genomic molecules	SERB	Dr. Dube Dheeraj Prakashchand		SMME	3050786	2 years
33	IITM/SERB-SIRE/MM/456	Development of novel simulation tool for modeling debris flow of Western Himalaya	SERB-SIRE	Dr. Mousumi Mukherjee		SCENE	1734900	6 months
34	IITM/ICMR/TPS/457	Multi – OMICS analysis of the human gut microbial ecosystem in Autoimmune hemolytic anemia and Immune thrombocytopenia condition in the Indian Population	ICMR	Prof. Tulika P Srivastava (IIT Mandi), Dr. Arihant Jain (PGIMER Chandigarh)	Dr. Aditya Nigam	SBB & SCEE	4217130	42 months

35	IITM/ICMR/AP/458	Pan- India multicentric study on NeuroCYSTicercosis (NCC) : Unravelling its metaboIOMICs and proteOMICs architecture to enable its diagnosis and understand epilepsy (CYST – OMICS	ICMR	Dr. Amit Prasad	Dr. Trayambak Basak from IIT Mandi, Dr. Gagandeep Singh from Dayanand Medical College Ludhiana	SBB	28539721	3 years
36	IITM/SERB/BM/459	Computational mechanistic investigation of reduction of N - and C- substrates by nitrogenase	SERB	Dr. Bhaskar Mondal		SCS	3597000	3 years
37	IITM/SERB/SN/460	Understanding the role of self – assembly of nanoparticles in tailoring the thermal conductivity of nanofluids using in – situ liquid phase electron microscopy	SERB	Dr. Sarthak Nag		SMME	3152830	2 years
38	IITM/HIMCOSTE/TJ/461	Development and implementation of climate controlled agriculture technique for Himachal Pradesh environmental condition	HIMCOSTE Shimla	Dr. Tushar Jain	Prof. Laxmidhar Behera	SCEE	685000	2 years
39	IITM/SERB/ABP/462	Harnessing anthranil as a nitrene precursor for intramolecular C- H amination: A modular approach for the synthesis of nitrogen heterocycles	SERB	Dr. Amit Balkrishna Pawar		SCS	5714500	3 years
40	IITM/SERB/PCP/463	Post- functionalized polyoxometalate – organic hybrids as tunable pre-catalysts for early transition metal based mixed metal oxides / chalcogenides @ C for electrocatalytic hydrogen evolution reaction	SERB	Prof. Pradeep C Parameswaran		SCS	5577120	3 yeras
41	IITM/SERB/PFS/464	Sustainable green hydrogen production from Glycerol using continuous flow photoreforming: Process and Catalyst development	SERB	Prof. Prem Felix Siril		SCS	2999832	3 years
42	IITM/SERB/PK/465	Calculation of thermal radiation flux for the near field problems	SERB	Dr. Pradeep Kumar		SMME	660000	3 years
43	IITM/SERB/BRN/466	Development of solution processed metal oxide semiconductor for low power consumption display backplane	SERB	Dr. Bukke Ravindra Naik		SMME	3164830	3 years

44	IITM/IGSTC /RRK/467	Engineering hybrid MOF composite materials with rationally designed ligands for photocatalytic hydrogen evolution	DST-IGSTC	Dr. Rik Rani Koner	Prof. Thomas Sheppard as Host from Universitat Leipzig, Germany	SMME	3900000	3 years
45	IITM/SERB/ SUS/468	Physics – informed neural network (PINN)- based component – wise condition assessment approach for floating offshore wind turbine (FOWT) using non- intrusive sensor measurements	SERB	Dr. Subhamoy Sen		SCENE	4319656	3 years
46	IITM/SERB/ SSH/469	Development of expected seismic vulnerability models and AI- assisted rapid visual screening (ARVS) tool for RC buildings in the Indian Himalayan regions	SERB	Dr. Sandip Kumar Saha		SCENE	3770668	3 years
47	IITM/MeitY/ SKS/470	Establishment of Center for promotion of additive manufacturing (CPAM): Renewable Energy & Distributed manufacturing using customized 4D & 3D technologies (CPAM: RE & DM)	MeitY	Prof. Satinder Kumar Sharma	Dr. Viswanath Balakrishnan, Dr. Ranbir Singh, Dr. Mrityunjay Doddamani from IIT Mandi and Dr. Vinod Kumar Sharma from PGIMER, Chandigarh	SCEE & SMME	343548000	5 years
48	IITM/NG-USA/HVK/ 471	Investigating the impacts of landslides on the water resources in the lesser Himalayan regions	National Geographic Society (USA)	Dr. Harshad Kulkarni		SCENE	1650427	13 months
49	IITM/DST/ MRD/472	Design and development of new generation perovskite solar cells by additive manufacturing	DST	Dr. Mrityunjay Doddamani	Dr. Satvasheel Powar	SMME	4970938	2 years
50	IITM/SERB/ KS/473	Study of meso-climatic influences on the hygrothermal state of concrete exposed to natural environment and their modelling for pragmatic durability design	SERB	Dr. Kaustav Sarkar		SCENE	6678221	3 years
51	IITM/SERB/ SUM/474	Mineralized injectable bioink for bones regeneration	SERB	Dr. Sumit Murab		SBB	2816000	2 years
52	IITM/IIT Ropar-AWaDH/TJ/ 475	Design of an advanced control system using AI/ML and recent control alogrithms for an IoT-based hydroponic growing system with aerator / temperature / water level monitor	IIT Ropar-AWaDH	Dr. Tushar Jain	Prof. Laxmidhar Behera	SCEE	800000	6 months

53	IITM/DRDO-LSRB/AJ/476	Reinforcement of glass ionomer cement using 2D nanomaterial and cationic pullalan for application in conservative dentistry	DRDO-LSRB	Dr. Amit Jaiswal	Dr. Shyam Kumar Masakapalli	SBB	4073200	2 years
54	IITM/SERB/DS/477	Spatio- temporal variability of soil moisture and associated flash drought in lower Himalayan region: Assessment and application	SERB	Dr. Deepak Swami		SCENE	1952500	3 years
55	IITM/SB/AM/479	Documenting Mandi international Shivaratri festival	Mr. Surender Behl, 58 Kennett Road, Headington, Oxford UK	Dr. Aparna Malaviya	Dr. Surya Prakash Upadhyay	SHSS	236000	1 month

Table 4 : Internal Projects

S. No.	Project No.	Project Title	Sponsoring Agency	Principal Investigator & Co-ordinator(s)	Department/ School	Amount Sanctioned (In Rs.)	Duration of Project
1	IITM/INT/CSY/31	Establishment of the Centre for Quantum Science and Technologies	IIT Mandi	Dr. C. S. Yadav (PI), Prof. Suman K Pal (Co-PI)		15,00,000	5 years

Table 5: Sponsored Consultancy Research Projects

S. No.	Project No.	Project Title	Principal Investigator & Co-Principal Investigator(s)	Department/ School	Agreement signed with	Amount Sanctioned (In Rs.)	Period
1	IITM/CONS/SM/RS/94	Third party site inspection of A type kendriya Vidyalaya at Khanpur, District Rupnagar Punjab	Dr. Rajneesh Sharma	SCENE	Satinder Mahajan	76700	2 years

2	IITM/CONS/MAXROOF/ASK/95	Vetting of design calculations of Max Roof sheet of fasteners	Dr. Ashutosh Kumar (PI) Dr. Sandip Kumar Saha (Co-PI)	SCENE	Max Roofing System Pvt. Ltd. Pune	32214	1 month
3	IITM/CONS/BULKMRO/RS/96	The Ash Dyke audit of the thermal power plant Talwandi Sabo Power Limited (TSPL) of capacity 1960 MW (3x660 MW)	Dr. Rajneesh Sharma	SCENE	Talwandi Sabo Power Ltd Operation (Bulk MRO Industrial Supply Pvt. Ltd	295000	1 month
4	IITM/CONS/NPCC/RS/97	Third party site inspection of 'A' type Kendriya Vidyalaya at Khanpur, Sandhol Mandi (H.P.)	Dr. Rajneesh Sharma	SCENE	NPCC	76700	2 years
5	IITM/CONS/BSNL/RS/98	Third party quality insurance inspection for the improvement of the parking at HRTC / Volvo bus stand near aloo ground Manali H.P	Dr. Rajneesh Sharma	SCENE	BSNL Civil Division Kullu H.P.	69030	6 months
6	IITM/CONS/JCC/SKS/99	Vetting of structural design and drawing of 100 MLD WTP	Dr. Sandip Kumar Saha (PI) Dr. Kaustav Sarkar, Dr. Shashank Pathak (Co-PI)	SCENE	Jain Construction Company, Haryana	1012440	2 months
7	IITM/CONS/NPCC/RS/100	Third part quality inspection for the A Type Kendriya Vidyalaya at Sunderbani J & K	Dr. Rajneesh Sharma	SCENE	NPCC	76700	2 years
8	IITM/CONS/CESIP/SP/101	Going Global Partnerships – Industry academic collaboration on circular economy small improvement projects (CESIPs)	Dr. Satvasheel Powar	SMME	Centre for Responsible Business (CRB) New Delhi	76800	3 weeks
9	IITM/CONS/HPT&CA/KVU/102	Inspection report of office building of tourism & CA Shimla	Dr. Kala Venkata Uday (PI) Dr. Maheshreddy Gade (Co-PI)	SCENE	Joint Director, Land Record, Himachal Pradesh	153400	10 days
10	IITM/CONS/MIPL/HP/103	Vetting of drawings & design calculation of tanks	Dr. Himanshu Pathak	SMME	Motiprabha Infratech Pvt Ltd Faridabad Haryana	21240	3 months
11	IITM/CONS/JSW/SUS/104	Karcham Wangtoo HE Project (1045 MW)	Dr. Subhamoy Sen	SCENE	JSW Hydro Energy Limited	1457300	6 months
12	IITM/CONS/TSL/RoS/105	OCR Proposal	Dr. Rohit Saluja	SCEE	The Sanskrit Library	252000	7 months

13	IITM/CONS/TT-OPC/SSU/106	NIR Spectroscopy based early cancer screening POCT device and AI diagnostics solutions	Dr. Srikanth Sugavanam	SCEE	ThirdI Technologies OPC Pvt. Ltd	91757	2 months
14	IITM/CONS/HPPWD/RS/107	Vetting of the structural design and drawings of the superstructure of 76.0m over Binwa Khad at Khadial on Sagoor to Dhanag via Nagan Road in HPPWD Division Baijnath	Dr. Rajneesh Sharma	SCENE	HPPWD	383500	3 months
15	IITM/CONS/CESIP/SP/108	Circular economy small improvement projects for MSMEs	Dr. Satvasheel Powar	SMME	Centre for Responsible Business (CRB) New Delhi	70800	3 weeks
16	IITM/CONS/AR/KS/109	Design of structural bank protection measures for the safety of a multi- story building against flash flooding	Dr. Kaustav Sarkar (PI), Dr. Sandip Kumar Saha, Dr,. Shashank Pathak (Co-PI)	SCENE	Anja Resort, Manali, Himachal Pradesh	1207258	6 months
17	IITM/CONS/AGICL/ASK/110	Site visit for scope stablisation at multilevel parking site at Dharamshala	Dr. Ashutosh Kumar (PI) Dr R Prasanna (Co-PI)	SCENE	Almmondz Global Infra Consultant	42952	2 weeks
18	IITM/CONS/SHLLC-USA/VD/111	Site enrollment rate predictions in clinical trails via machine learning and deep learning models	Dr. Varun Dutt	SCEE	Syneos Health LLC USA	6818000	3 years
19	IITM/CONS/AGIC/KVU/112	Site visit of proposed parking building Dharamshala	Dr. Kala Venkata Uday (PI), Dr. Ashutosh Kumar (Co-PI)	SCENE	Almmondz Global Infra Consultant	46020	15 days
20	IITM/CONS/SDMA-HP/KVU/113	Preparing the damage assessment technical report for Kullu Town	Dr. Kala Venkata Uday as (PI) and Dr. Ashutosh Kumar, Dr. Vivek Gupta, Dr. Dericks P Shukla, Dr. Maheshreddy Gade as Co-PI's	SCENE	SDMA-H.P.	1150500	30 days
21	IITM/CONS/L&TNTPP/RS/114	Compliance audit for ash disposal of the thermal power plant Nabha Thermal Power Plant, Pot Box – 28, Near Village- Nalash, Distt.- Patiala- 140401, Punjab	Dr. Rajneesh Sharma	SCENE	Abha Thermal Power Plant, Pot Box – 28, Near Village- Nalash, Distt.- Patiala- 140401, Punjab	345150	1 month
22	IITM/CONS/Xceltis/AP/115	Isolation and supply of Taenia solium Cyst fluid antigens (10 mg)	Dr. Amit Prasad	SBB	Xceltics GmbH, Kamenzer Stradde, Germany	438500	60 days

23	IITM/CONS/SC/SHS/116	Vetting of the fabrication drawings for the pre engineered building, storage depot shed Danapur	Dr. Shivang Shekhar	SCENE	Shree Construction	64900	4 weeks
24	IITM/CONS/KMN/VG/117	Vetting of DPR for Barsiani 0.90 MW Small Hydel Project in Manikaran Distt.-Kullu. H.P.	Dr. Vivek Gupta	SCENE	KMN Engineering Construction Pvt Ltd	300000	15 days
25	IITM/CONS/RPPL/SUS/118	Vetting of dam left bank abutment excavation & support design and bailey bridge foundation	Dr. Subhamoy Sen (PI), Dr. Mousumi Mukherjee (Co-PI)	SCENE	Rithwik Project Pvt. Ltd. Hamirpur, H.P.	324500	6 months
26	IITM/CONS/RBIHP/SUS/119	Non destructive testing of RBI Holiday Home Shimla	Dr. Subhamoy Sen	SCENE	Reserve Bank of India Main Market Kasumpti Shimla (H.P.)	306800	6 months
27	IITM/CONS/NH-PWD/KVU/120	Site visit for inspection settlement potion of NH 154 A	Dr. Kala Venkata Uday	SCENE	NH- PWD Pathankot	199420	2 weeks
28	IITM/CONS/BRO-H.P./KVU/121	Site visit for slides on the road and building of CE office, BRO, Shimla	Dr. Kala Venkata Uday, Dr. Maheshreddy Gade	SCENE	BRO Shimla, H.P.	39884	3 days
29	IITM/CONS/PSI/SHS/122	Vetting of fabrication drawings for pre – engineered building, new Demu Shed Structure	Dr. Shivang Shekhar	SCENE	Pinax Steel Industries Pvt. Ltd., Patna, Bihar	168740	45 days
30	IITM/CONS/DDMA-L&S/DPS/123	Ground visit at Lindoor village	Dr. Dericks P Shukla (PI), Dr. Kala Venkata Uday (Co-PI)	SCENE	DDMA, Distt.-Lahaul & Spiti (H.P.)	383500	3 months
31	IITM/CONS/SDMA-HP/KVU/124	Preliminary studies for landslides mitigation for Mandi Lahaul & Spiti	Dr. Kala Venkata Uday, Dr. Ashutosh Kumar, Dr. Prasanna R (PI's)	SCENE	SDMA- H.P.	567700	2 months
32	IITM/CONS/VKG/KS/125	Structural audit of minor highway bridge in Jammu	Dr. Kaustav Sarkar (PI), Dr. Sandip Kumar Saha (Co-PI)	SCENE	V K Gupta & Associates, Panchkula Haryana	207680	2 months
33	IITM/CONS/RCICPL/PAR/126	Vetting of soil investigation of PGIMER Una (H.P.)	Dr. Prasanna R (PI) and Dr. Thainswemong Choudhury (Co-PI)	SCENE	Rama Civil India Construction Pvt. Ltd. Delhi	295000	30 days
34	IITM/CONS/JSV-M/DS/127	Request for source sustainability study for surface sources in Himachal Pradesh rural water supply project NDB funded	Dr Deepak Swami (PI), Dr. Vivek Gupta (Co-PI)	SCENE	Engineer In Chief, Jal Shakti Vibhag, Mandi (H.P.)	804760	3 months

35	IITM/CONS/ BRPL/KS/128	Energy absorption capacity study of FRC for RVNL Bilaspur Bhanupali package 5 site	Dr. Kaustav Sarkar	SCENE	Bajaj Reinforcement Pvt. Ltd. Maharashtra	162250	2 weeks
36	IITM/CONS/PSI PL/SSH/129	Vetting of GA drawings and fabrication drawings for PEB covered shed area and storage shed at bondamunda	Dr. Shivang Shekhar	SCENE	Pinax Steel Industries Pvt. Ltd. Maharashtra	624663	45 days
37	IITM/BRPL/KS/ 130	Energy absorption capacity study of FRC for RVNL Bilaspur Bhanupali Package 4 site	Dr. Kaustav Sarkar	SCENE	Bajaj Reinforcement Pvt. Ltd. Maharashtra	121688	14 days
38	IITM/CONS/VT /SP/131	Product validation and technical sanction of IoT & AI based flood forecasting and alert system	Dr. Satvasheel Powar (PI), Dr. Dinesh Singh (Co-PI)	SMME & SCEE	Veloce Techlnsights Private Limited	778800	1 month
39	IITM/CONS/ AuD/RS/132	Analysis of audit data using AI/ ML techniques	Dr. Rohit Saluja (PI), Dr. Arnav Bhavsar (Co-PI)	SCEE	Auditorsdesk New Delhi	597080	6 months
40	IITM/CONS/ HWC/133	Efficient production and R & D of microgreens - optimisation nutrient analysis and scaleup for various health application	Dr. Shyam Kumar Masakapalli	SBB	Himalaya wellness Company	3740000	2 years
41	IITM/CONS/HP -IDP-IITB/DPS/ 134	Institutional Collaboration for HP - IDP -IITB project	Dr. Dericks P Shukla	SCENE	HP-IDP through IIT Bombay	6810960	1 year
42	IITM/CONS/ JSW/SUS/135	Survey to verify the claimed e – flow water depth for the sustenance of aquatic life in Satluj basin downstream of Karcham Dam & Kuppa Barrag	Dr. Subhamoy Sen	SCENE	JSW Hydro Energy Limited	292050	6 months
43	IITM/CONS/N MRE&W/SHS/ 136	Vetting of sewage pumping station drawings for Kamruddin Nagar Group of colonies in Mundka Assembly Consultancy AC-08, Delhi	Dr. Shivang Shekhar (PI), Dr. Vivek Gupta (Co-PI)	SCENE	NMR Engineering & Works	194700	45 days
44	IITM/CONS/ BCPL/SHS/137	Proof checking of structural drawings for the major bridge, Kanjirapally bypass in Kottayam district	Dr. Shivang Shekhar (PI), Dr. kala Venkata Uday (Co-PI)	SCENE	Backbone Construction Pvt. Ltd., Rajkot, Gujrat	162250	45 days

Table 6: Seed Grant Projects						
Sr. No.	**File No.**	**Proposal Title**	**Faculty name**	**Department/ School**	**Amt.**	**Period**
1	IITM/SG/ABS/90	Compact, Highly efficient microwave, mm- wave and THz antenna subsystems for cutting – edge solutions for emerging IoT, 5G, 6G, Radars and next gen wireless communications	Dr. Anirban Sarkar	SCEE	1400000	2 years
2	IITM/SG/MUD/91	Controlling driven transport through reshaping of potential barrier; theory and applications	Dr. Moupriya Das	SCS	1500000	2 years
3	IITM/SG/HRS/92	Dynamics of active chiral rings in two dimensions	Dr. Harsh Soni	SPS	1500000	2 years
4	IITM/SG/SKSh/93	Study of unimodular row and homotopy- commutativity principle	Dr. Sampat Kumar Sharma	SMSS	240000	2 years
5	IITM/SG/SWA/94	Study of some integral operators associated with dunkl operators and jacobi cherednik	Dr. Saswata Adhikari	SMSS	470000	2 years
6	IITM/SG/SMS/95	Topology of vietoris – rips complexes	Dr. Samir Shukla	SMSS	700000	2 years
7	IITM/SG/TUP/96	Fate of mixture of nanoplastics in environmental media	Dr. Tanushree Parsai	SCENE	1500000	2 years
8	IITM/SG/PAR/97	Climate change impact on landslide risk in Himalayan region	Dr. Prasanna Rousseau	SCENE	1500000	2 years
9	IITM/SG/DJ/98	Earthquake forecast and prediction model for Himalayas using machine learning approaches	Dr. Dhanya J	SCENE	1500000	2 years
10	IITM/SG/SHS/99	Multi- hazard risk assessment of bridges in the Himalayan regions	Dr. Shivang Shekhar	SCENE	1500000	2 years
11	IITM/SG/PAS/100	Additive manufacturing of metal parts using fused filament fabrication technique	Dr. Prateek Saxena	SMME	1500000	2 years
12	IITM/SG/MRD/101	Additively manufactured smart sensor	Dr. Mrityunjay Doddamani	SMME	1500000	2 years
13	IITM/SG/VKG/102	Climate change impact on landslide risk in Himalayan region	Dr. Vivek Gupta	SCENE	1500000	2 years

14	IITM/SG/AMD/103	Designing new and redesigning existing chemistry experiments imbibing educational technologies for achieving higher order thinking skills	Dr. Abhimanew Dhir	SCS	1500000	2 years
15	IITM/SG/RBS/104	Multifunctional nanofibers – based self – powered piezoelectric nanogenerators (PENGs)	Dr. Ranbir Singh	SMME	1500000	2 years
16	IITM/SG/SN/105	Investigating the effectiveness of water filtration through xylem tissue of Himalayan trees from fundamentals to optimization to applications	Dr. Sarthak Nag	SMME	1500000	2 years
17	IITM/SG/TC/106	Dry stack masonry with stabilized hollow earth blocks for high altitude regions of Himachal Pradesh	Dr. Thainswemong Choudhury	SMME	1500000	2 years
18	IITM/SG/SM/107	Aesthetics , Science and self: A poet's search for form in late – colonial and early postcolonial India	Dr. Saumya Malviya	SHSS	507485	2 years
19	IITM/SG/NVA-TC/108	Literature of the Himalayan Region: A Contemporary Overview	Dr. Neethi V Alexander and Dr. Thirthankar Chakraborty	SHSS	3000000	2 years
20	IITM/SG/NKD/109	Cloud- facilitated optimal control of connected and autonomous vehicles	Dr. Narendra Kumar Dhar	CAIR / SCEE	1500000	2 years
21	IITM/SG/JKD/110	Over – actuated tethered underwater robot for remote operation towards inspection and tracking application	Dr. Jagadeesh Kadiyam	CAIR / SCEE	1500000	2 years
22	IITM/SG/DIS-ROS-SPA/111	Visual big data analytics: large – scale computer vision for security and road safety in smart city	Dr. Dinesh Singh, Dr. Rohit Saluja and Dr. Siddharth Panwar	SCEE	4500000	2 years
23	IITM/SG/GR/112	Development of low cost thin film based optoelectronics devices	Dr. Gopal Rawat	SCEE	1500000	2 years
24	IITM/SG/HVK/113	Development of a novel and sustainable process to enhance freshwater recovery and minimize waste from reverse osmosis (RO) based water treatment using microbial sulfate reduction	Dr. Harshad Viijay Kulkarni	SCENE	1500000	2 years
25	IITM/SG/PRE/114	Solution approach for multi-dimensional control problem	Dr. Preeti	SHSS	650000	2 years

26	IITM/SG/KP/115	Learned media compression and compression and compressive domain analytic	Dr. Kancharla Parimala	SCEE	1500000	2 years
27	IITM/SG/KH/116	Robust control of connected and autonomous vehicles	Dr. Kaushik Halder	SCEE	1500000	2 years
28	IITM/SG/DSA/117	Modeling and experimental investigation of rainfall – triggered landslides	Dr. Deepak Sachan	SMME	1500000	2 years
29	IITM/SG/ASR/118	Development and characterization of micropattern foils and implementing it to micropattern gas detectors (MPGDs) for next generation particle tracking	Dr. Amal Sarkar	SPS	1500000	2 years
30	IITM/SG/KMP/119	Fluctuations on cosmic scales: possible quantum origin	Dr. Krishna Mohan Parattu	SPS	1084000	2 years
31	IITM/SG/SK/120	Design and Synthesis of π-Conjugated Organic Materials and their Radical ions for Conductivity and Magnetism	Dr. Sharvan Kumar	SCS	1500000	2 years
32	IITM/SG/NS/121	Abundant 3d6 metal complexes as alternatives to rare and expensive 4d6 and 5d6 metal luminophores with metal-to-ligand charge transfer (MLCT) excited states	Dr. Narayan Sinha	SCS	1500000	2 years
33	IITM/SG/RK/122	Micro/Nano-electronic devices development for switching and storage applications	Dr. Robin Khosla	SCEE	1500000	2 years
34	IITM/SG/SS/123	Computational markers for response prediction to therapies in rectal cancer : Multisite study	Dr. Sneha Singh, Dr. Sukarn Agrawal, Dr. Dhiraj Dube, Dr. Kharerin Hungyo and Dr. Rahul; Kothari	SCEE, SMME, SBB & SPS	7500000	2 years
35	IITM/SG/BRN/124	Development of low – cost solution – processed metal oxide thin films for thin film transistors	Dr. Bukke Ravindra Naik	SMME	1500000	2 years

36	IITM/SG/MHA/125	On the effect of oil prices on exchange rate in India: a nonlinear ARDL framework	Dr. Masudul Hasan Adil	SoM	1500000	2 years
37	IITM/SG/MA/126	A comprehensive approach to enhance health system performance in Himachal Pradesh	Dr. Mayanka Ambade	SHSS	1350000	2 years
38	IITM/SG/ABHD/127	Development of synergistic bimetallic catalysis for olefin – assisted distal aliphatic C- H activation	Dr. Abhishek Dewanji	SCS	1500000	2 years
39	IITM/SG/PP/128	Design optimization and characterization of low gain avalanche detectors (LGAD) for future high - energy particle tracking detectors	Dr. Prabhakar Palini	SPS	1500000	2 years
40	IITM/SG/PRM/129	Association of battery storage technologies with solar inverters to improve power management and ability of autonomous microgrid	Dr. Priyatosh Mahish	SCEE	1500000	2 years

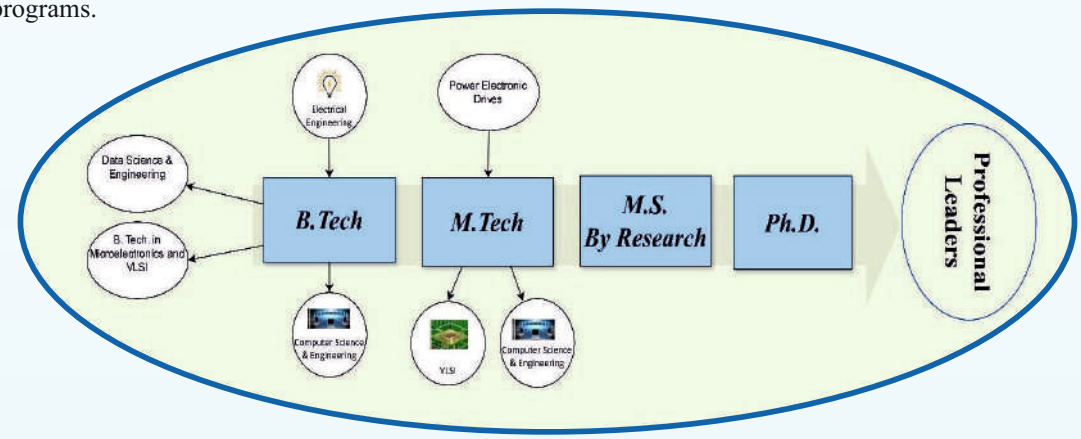
3. Academic Schools

3.1 School of Computing and Electrical Engineering (SCEE)

The School of Computing and Electrical Engineering (SCEE) of IIT Mandi aims to maintain excellence in teaching and research in technologies related to Computing, Communication, Electronics and Electrical Engineering.

The School of Computing & Electrical Engineering has 39 Regular Faculty members, 04 other Faculty members, 9 Staff Members and around 118 Ph.D. Students, 152 Masters Students, and 823 B.Tech. Students. It has five broad areas namely Power Electronics & Drives, Microelectronic & VLSI, Signal Processing and Communications, Computer Science & Engineering (Theoretical Computer Science & System Engineering, Intelligent Systems), Power Electronics and Control.

The School offers two UG degrees namely B.Tech. in Computer Science & Engineering, and B.Tech. in Electrical Engineering, B.Tech. in Microelectronics & VLSI. The School is also associated with two other UG degrees namely Data Science & Engineering and a Dual degree program in Bioengineering (offered jointly with the School of Basic Sciences.) The School has three M.Tech. program namely in VLSI and Computer Science & Engineering in addition to regular PhD and M. Tech. by Research programs.



Various programs in SCEE with their intake capacity and year of starting

Program	Year	Intake
B. Tech. (Computer Science & Engineering)	2009	**80**
B. Tech. (Electrical Engineering)	2009	**80**
B. Tech. Data Science and Engineering	2019	**50**
B. Tech. (Microelectronic & VLSI)	2024	**30**
M. Tech. (VLSI)	2016	**20**
M. Tech. (Computer Science & Engineering)	2021	**18**
M. Tech. by Research	2010	**As per requirement**
Ph.D.	2010	

The areas of research cover a broad spectrum of theoretical and application-based topics such as: smart grid, renewable energy, materials for efficient semiconductor devices, next-generation communication and efficient human-computer interaction, artificial intelligence and applications like computer vision, speech and audio processing, medical image analysis etc.

At the undergraduate level, the School emphasize a hands-on learning approach by providing students with a firm foundation of both theory and practice of Computer Science and Electrical Engineering. The school also actively collaborates with other schools to expose students to the social, ethical, and inclusive dimensions of their chosen area of study, enabling them to make significant contributions to society.

The first batch of B.Tech. Students completed their graduation in 2013 and entered the world of innovation as capable engineers. At the post-graduate level, our faculty provides a deeper mastery of the basics and opportunities for research and professional capabilities for students in the field of Computer Science and Electrical Engineering.

Our faculty members are engaged in both practical and theoretical research, often in partnership with government agencies, private industry and non-governmental organizations. National and international collaborations are a priority of the faculty. This aims towards the advancement of knowledge within our disciplines and also to contribute to society.

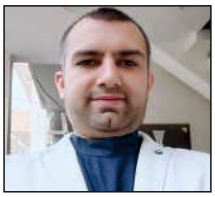
There were 28 Journal Papers, and 37 Peer Reviewed Conference Papers, 03 book/book chapters and 07 patents filed in 2023-24

For more information visit Website: https://scee.iitmandi.ac.in/faculty.php

Faculty Members			
1.	**Dr. Aditya Nigam** Chairperson, SCEE http://faculty.iitmandi.ac.in/~aditya/	Deep Learning, Biometrics, Computer Vision, Image Processing, Computer Vision and Machine Learning.	
2.	**Dr. Adarsh Patel** http://faculty.iitmandi.ac.in/~adarsh/	Wireless Communications and Networks with the applications of signal processing, Game Theory, Machine Learning, Tensors, and Optimization based techniques.	
3.	**Dr. Amit Kumar Singha** http://faculty.iitmandi.ac.in/~amit/	GaN-Based High-Frequency DC-DC Converters, DC-DC Converters for IoT Applications & Bifurcation Analysis of Digitally Controlled DC-DC Converter.	
4.	**Dr. Anirban Sarkar** https://sites.google.com/view/anirban-sarkar/homer	Developing IoT based smart reconfigurable, Advanced leaky-wave beam scanning antennas, On-body/off-body/invasive/non-invasive advanced, non-destructive, highly-sensitive and rapid-detecting electromagnetic intelligent Bio-sensors and Biomarkers.	
5.	**Dr. Arnav Bhavsar** Vinayak http://faculty.iitmandi.ac.in/~arnav/	Computer Vision, Medical Image Analysis, Machine Learning, Deep Learning.	

6.	**Dr. Dinesh Singh** https://faculty.iitmandi.ac.in/~dineshsingh/	Computer Vision, Machine Learning and Big Data Analytics.	
7.	**Dr. Gopi Shrikanth Reddy** http://faculty.iitmandi.ac.in/~gopishrikanth/	Antenna and Wave propagation, Microwave passive components, FSS and EBG structures, Electrically Samll Antenna, MIMO/Diversity Antenna, Metamaterials.	
8.	**Dr. Himanshu Misra** http://faculty.iitmandi.ac.in/~himanshumisra/	Electrical Drives, DFIG systems, Electric Vehicle, Renewable Energy, Power Converters.	
9.	**Dr. Hitesh Shrimali** http://faculty.iitmandi.ac.in/~hitesh/	Analog and Mixed signal VLSI design, analog-to-digital converters and design of radiation hard circuits (space application).	
10.	**Dr. Indu Joshi** Assistant Professor https://scee.iitmandi.ac.in/faculty_personal.php?id=2	Biometrics, Medical Image Analysis, Computational Biology, Deep Learning.	
11.	**Dr. Jinesh Machchhar** http://faculty.iitmandi.ac.in/~jinesh/	Geometric modeling, Simulation, Design.	
12.	**Dr. Kunal Ghosh** http://faculty.iitmandi.ac.in/~kunal/	Silicon solar cells, Performance and reliability analysis of photovoltaic modules.	
13.	**Dr. Kaushik Halder** https://sites.google.com/view/drkaushikhalder/home?authuser=0	Control Systems, Intelligent Systems and Cyber-physical Systems.	

14.	**Prof. Laxmidhar Behera** https://faculty.iitmandi.ac.in/director/	Robotics and Artificial Intelligence Intelligent Systems and Control, Cognitive Robotics, Nano-robotics, Vision based Control, Soft Computing, and Information Retrieval in music and language, Semantic Information Processing, Physics of Complex Systems, Cyber Physical Systems. Formation Control of UAVs, Brain-Computer Interface (BCI), Sanskrit Computational Linguistics.	
15.	**Dr. Moumita Das** http://faculty.iitmandi.ac.in/~moumita/	Electric Vehicles: Power Converters and Control, Storage Aspect, Application of Wide Bandgap Devices (SiC, GaN) in Power Electronics & Use of Renewable Energy Sources for Charging of Electric Vehicles.	
16.	**Dr. Narendra Kumar Dhar**	Cyber-Physical System, Robotics and its Intelligent Control, Dynamical Systems.	
17.	**Dr. Padmanabhan Rajan** http://faculty.iitmandi.ac.in/~padman/	Speech and audio processing , Analysis of music, Bioacoustics (analysis of natural sounds - bird calls, animal vocalisations) , Machine learning and pattern recognition, especially applied to audio signals.	
18.	**Dr. Parimala Kancharla** http://faculty.iitmandi.ac.in/~parimala/	Generative Modeling, Deep Learning Based Video Compression, Multimedia Quality Assessment.	
19.	**Dr. Pratim Kundu** http://faculty.iitmandi.ac.in/~pratim/	Development of techniques for enhancing the reliability of power system operations using wide area measurements to avoid cascading failures. The research focuses on developing computational algorithms to improve smart grid operations.	
20.	**Dr. Prateek Vishnoi** Assistant Professor https://scee.iitmandi.ac.in/faculty_personal.php?id=45	Algorithmic Randomness, Algorithmic Information Theory, Theoretical Computer Science.	
21.	**Dr. Priyatosh Mahish** https://scee.iitmandi.ac.in/faculty_personal.php?id=39	Smart grid operation, Wide area power system monitoring and control, Grid-integration of renewable energy resources.	

22.	**Dr. Radhe Shyam Sharma** https://rsiitk.github.io/	Robotics, Visual Servoing, Imitation Learning.	
23.	**Dr. Rahul Shrestha** http://faculty.iitmandi.ac.in/~rahul_shrestha/	VLSI Design and Circuits & Systems for Signal Processing and Wireless Communication.	
24.	**Dr. Rohit Saluja** https://rohitsaluja22.github.io/	Optical Character Recognition, Road Safety, Computer Vison Applications related to Environment and Agriculture.	
25.	**Dr. Robin Khosla** Assistant Professor https://scee.iitmandi.ac.in/faculty_personal.php?id=43	Nanoelectronics, Semiconductor Materials and Devices, Non-Volatile Memories.	
26.	**Dr. Samar Agnihotri** http://faculty.iitmandi.ac.in/~samar/	Information Theory, Wireless Communications and Networks, Computational and Communication Complexity.	
27.	**Dr. Satinder Sharma** http://faculty.iitmandi.ac.in/~satinder/	VLSI Technology, CMOS Device Fabrication & Characterization, Advanced Lithography, Nanoelectronics.	
28.	**Dr. Satyajit Thakor** https://sites.google.com/site/satyajitthakor/	Communication Theory, Information Theory, Network Coding.	
29.	**Dr. Shubhajit Roy Chowdhury** http://faculty.iitmandi.ac.in/~src/	Biomedical Embedded Systems, Non-invasive diagnostic systems, Near Infrared Spectroscopy, VLSI Architectures.	

30.	**Dr. Siddharth Panwar** https://scee.iitmandi.ac.in/faculty_personal.php?id=37	Multivariate signal processing, Diagnostic predictive modeling, Data-centric machine learning.	
31.	**Dr. Siddhartha Sarma** http://faculty.iitmandi.ac.in/~siddhartha/index.html	Resource allocation in wireless networks, Wireless sensor network and IoT, Wireless energy harvesting.	
32.	**Dr. Sreelakshmi Manjunath** http://faculty.iitmandi.ac.in/~sreelakshmi/	Communication Networks, Vehicular Networks, Control Theory, Non-linear Dynamics, Non-linear Controller Design & Time-delayed Systems.	
33.	**Dr. Srinivasu Bodapati** http://faculty.iitmandi.ac.in/~srinivasu	VLSI Design, Nanoelctronics, Hardware security, Cryptography and FPGA based system design.	
34.	**Dr. Srikanth Sugavanam** https://www.srikanthsugavanam.com/	Fibre Lasers, Real-Time Laser Characterization Techniques.	
35.	**Dr. Sukarn Agarwal** Assistant Professor https://scee.iitmandi.ac.in/faculty_personal.php?id=44	Emerging Memory Technologies, Memory System Design, Network-on-Chip design, Heterogeneous System and Thermal Aware Chip Management.	
36.	**Dr. Tushar Jain** http://faculty.iitmandi.ac.in/~tushar/	Control theory, fault tolerant control, industrial process control.	
37.	**Dr. Varun Dutt** http://faculty.iitmandi.ac.in/~varun/	Artificial Intelligence, Human-Computer Interaction, Cognitive Science, Judgment and Decision Making.	

38.	**Dr. Varunkumar Jayapaul** http://faculty.iitmandi.ac.in/~varunkumar/	Algorithms and Data Structures.	
39.	**Dr. Venkata Ratnam Vakacharla** https://scee.iitmandi.ac.in/faculty_personal.php?id=40	Power Electronics for Renewables, EV and WPT.	

List of Other Faculty Members			
1.	**Prof. A. P. Tiwari** Visiting Professor	Control and Estimation, Singular perturbation and two time—scale methods in control, Sliding mode control, Multirate output feedback control, Large scale systems control, Kalman filtering.	
2.	**Prof. Kailash Srivastava** Adjunct Professor	Power systems.	
3.	**Prof. Rajan Kapur** Adjunct Professor President, Larankelo Ventures LLC Boulder, Colorado, USA Adjunct Professor	Renewable Energy. Industrial Electronics. Head Mounted Displays.	
4.	**Prof. Yvonne Dittrich** **Adjunct Professor, IT University Copenhagen** **https://www.itu.dk/~ydi/ShortCV.htm**	Software Engineering.	

3.1.1 Major Research Achievements including Products/Technologies Developed or Outcomes from ISTP/DP/MTP

1. Dr. Himanshu Misra proposed the problem of dual side field oriented control of SRIM has been which is unique way to control the machine as two independent machine. This work is published in the IEEE Transaction on Industrial Electronic.

2. Dr. Tushar Jain's recent accomplishment in securing a project under AWaDH signifies a notable advancement in the field of agricultural technology. The project focuses on the development of an IoT-based hydroponic system at TRL Level 4+, and aims to enhance the efficiency and sustainability of soil-less agriculture.

- Under climate-controlled agriculture, new polyhouses have been installed with an in-house data logger and controller to manage the internal climate. This system uses real-time data monitoring, accessible via a website, to optimize growing conditions within the polyhouse.
- The deployment of in-house sensor nodes at a cost lower than market price represents a significant advancement for farmers under the NABARD project. These sensors provide critical data that can help in enhancing agricultural productivity and sustainability.
- Under the NABARD project, developed an app that provides farmers with advisories on irrigation, disease identification, soil health, and improved agricultural practices. The app's model, with 97% accuracy, identifies plant types, detects diseases, and specifies the disease present, aiding farmers in effective crop management.

3.1.1.1 Major Technical Project

1. Final year UG students developed an adaptive machine learning algorithm to accurately distinguish between tomato and potato plants, identify fresh versus diseased leaves, and classify specific diseases affecting these plants. The algorithm evolves over time to accommodate various growth stages, aiming for high precision and accuracy in plant type identification and disease detection. This work is essential for integration into the NABARD project for farmers' benefit and mobile app deployment, facilitating real-time guidance and disease prevention strategies. Ultimately, this effort aims to revolutionize agricultural practices, improve crop yield, and enhance farmer livelihoods.

3.1.2. Publications

Patents/Books/Book Chapters/ Papers National and International Journals/Conferences

3.1.2.1 Patents

1. S. Dhiman, N. Gupta, and H. Shrimali , "Method of running an unrolled binary search or multiple level search for pipeline ADC", Patent no. 520561, Application Number: 202211014204, Granted in Mar. 2024.
2. U. Kunwar, P. Chaturvedi, H. Shrimali, "Fully automated electrostatic page turning technique and device for document scanning", Patent No. 534670, Application number 201911044970, granted in Apr. 2024.
3. Puneet Agarwal*, Siddharth Panwar*, S. D. Joshi, and A. Gupta, "A Novel System and Method to Diagnose and Predict Different Systemic Disorders and Mental States". Patent India 510624.
4. S Powar, V Duhan, and T. Jain, "Power Management System and Method thereof for Solar Powered Sensor Node," Publication date - 2024/1, Patent office – IN, Patent number – 499034, Application number – 201721024116.
5. Ramana Manohar Reddy and Moumita Das, "System for battery self-heating based on automotive traction, Application No. 202411007371, Filed on February 2, 2024.
6. S Powar, V Duhan, T Jain, "POWER MANAGEMENT SYSTEM AND METHOD THEREOF FOR SOLAR POWERED SENSOR NODE," Indian Patent Application No. 201721024116, January 2024.
7. Anurag Singh, Laxman Singh, Tushar Jain, SYSTEM AND METHOD FOR FAULT DIAGNOSIS OF 3-PHASE UNCONTROLLED RECTIFIER IN A RENEWABLE ENERGY SYSTEM, Indian Patent Application No. 202411028446, 2024 (filed).

3.1.2.2 Book/book Chapters Published

1. A. K. Yadav, S. P. Malik, G. S. Baghel, and R. Khosla, Current Status and Future Perspectives of Tunnel Field Effect Transistors for Low Power Switching Applications, Micro and Nanoelectronics Devices, Circuits and Systems. Springer Lecture Notes in Electrical Engineering, vol. 1067, Springer, Singapore, pp. 159–177, 2024.
2. S. P. Malik, A. K. Yadav, and R. Khosla, Design and Simulation of Si and Ge Double-Gate Tunnel Field-Effect Transistors with High-κ Al2O3 Gate Dielectric: DC and RF Analysis, Micro and Nanoelectronics Devices, Circuits and Systems, Springer Lecture Notes in Electrical Engineering, vol. 904. Springer, Singapore, pp. 215–226, 2023.
3. A. K. Singha, "A control scheme to optimize efficiency of GaN-based DC–DC converters." Intelligent Control of Medium and High Power Converters (2023): 91. Publisher: IET.

3.1.2.3 Journals

1. S. Dhimaan, H. Shrimali, "On Minimizing Charge Injection Error Using Multi-Dummy Switches With Enhanced Linearity" in Elsevier VLSI Integration, vol. 97, pp. 102175, July 2024, (DOI: 10.1016/j.vlsi.2024.102175).
2. A. K. Yadav, C. V. Kumar, G. S. Baghel, and R. Khosla, "Performance and Reliability Assessment of Source Work Function Engineered Charge Plasma based Al/HfO2/Al2O3/Ge, Double Gate TFET," Engineering Research Express., vol. 6, pp. 025323, 2024. doi: 10.1088/2631-8695/ad3c14.

3. A. K. Yadav, S. P. Malik, G. S. Baghel, and R. Khosla, "Influence of Charge Traps on Charge Plasma-Germanium Double-Gate TFET for RF/Analog & low-power switching applications," Microelectronic Reliability, vol. 153, pp. 115312, 2024. doi: 10.1016/j.microrel.2023.115312.

4. C. V. Kumar, A. K. Yadav, A. Deka, and R. Khosla, "Investigating the Effects of Doping Gradient, Trap Charges, and Temperature on Ge Vertical TFET for Low Power Switching and Analog Applications," Material Science and Engineering B, vol.299, pp.116996, 2024. doi: 10.1016/j.mseb.2023.116996.

5. S. Mattaparthi, D. K. Sinha, A. Bhura, and R. Khosla, "Design of an eco-friendly perovskite Au/NiO/FASnI3/ZnO0.25S0.75/FTO, device structure for solar cell applications using SCAPS-1D," Results in Optics, vol. 12, pp. 100444, 2023. doi: 10.1016/j.rio.2023.100444.

6. S. Sharma, S. Das, R. Khosla, H. Shrimali and S. K. Sharma, "Two-Dimensional Van Der Waals Hafnium Disulfide and Zirconium Oxide-Based Micro-Interdigitated Electrodes Transistors," IEEE Transactions on Electron Devices, vol. 70, no. 4, pp. 1520-1526, 2023. doi: 10.1109/TED.2022.3202510.

7. Duc Anh Pham, Minjae Lee, Anirban Sarkar and Sungjoon Lim, "High–Gain Elevational–Scanning Multibeam Planar SSPP Antenna Array with Large Ground–Clearance for Millimeter–Wave UAM Applications" IEEE Transactions on Vehicular Technology, vol. 73, no. 4, pp. 5139-5149, April 2024.

8. Anirban Sarkar, Duc Anh Pham and Sungjoon Lim, "60 GHz Electronically Tunable Leaky-wave Antenna Based on Annular Surface Plasmon Polariton Media for Continuous Azimuth Scanning," in IEEE Transactions on Antennas and Propagation, vol. 70, no. 11, pp. 10017-10031, Nov. 2022.

9. Meenakshi Kansal, Animesh Roy, Dibyendu Roy, Srinivasu Bodapati, and Anupam Chattopadhyay ``Priority Arbiter PUF: Analysis", Discrete Applied Mathematics, Accepted, 2024.

10. K. Halder, and S. Das "Stabilizing Regions of Dominant Pole Placement for Second Order Lead Processes with Time Delay using Filtered PID Controllers", PLOS ONE, 2024. (Accepted)

11. S. Saha, S. Chakraborty, S. Agarwal, M. Själander and K. D. McDonald-Maier, "ARCTIC: Approximate Real-Time Computing in a Cache-Conscious Multicore Environment," in IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 2024. (Accepted)

12. A. Satapathi, N. K. Dhar, A. R. Hota and V. Srivastava, "Coupled Evolutionary Behavioral and Disease Dynamics Under Reinfection Risk," in IEEE Transactions on Control of Network Systems, doi: 10.1109/TCNS.2023.3312250.

13. Nandanwar, A., Dhar, N. K., Behera, L., & Sinha, R. (2023). Near-optimal sliding mode control for multi-robot consensus under dynamic events. Advanced Robotics, 37(1–2), 115–129. https://doi.org/10.1080/01691864.2022.2155489.

14. Irshad Karim and H. Misra, "Regenerative Braking with Load Emulation for Three-Wheeler Electric Vehicle Traction in Hilly Region Using IPMSM Coupled IM Drive" IEEE Trans. Ind. Appl. May 2024 (Accepted).

15. L. S. Barik and H. Misra, "Dual Side Field Oriented Control of Slip Ring Induction Motor," in IEEE Transactions on Industrial Electronics, doi: 10.1109/TIE.2024.3390714, May 2024 (early access).

16. S. S. P, N. R. Tummuru and H. Misra, ""Power management of Hybrid Energy Storage System based Wireless Charging system with Regenerative Braking capability," IEEE Trans. Ind. Appl., vol. 59, no. 3, pp. 3785-3794, May-June 2023.

17. S. Patra and A. K. Singha, "An Event-Driven Sampling Mechanism for Digital Average Current-Mode Controlled Boost Converter," in IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 71, no. 3, pp. 1456-1460, March 2024, doi: 10.1109/TCSII.2023.3321890.

18. A. Banerjee, K. K. Bera, A. K. Singha, "Enhanced vibration control using non-reciprocal piezoelectric beam having sensing and actuating bimorph: Spectral element formulation," Composite Structures, Vol. 329, 2024, https://doi.org/10.1016/j.compstruct.2023.117793.

19. R. M. Reddy and M. Das, " Reconfigurable Resonant DC-DC Bidirectional Converter for Wide Output Voltage Applications," IEEE Transactions on Industry Applications. (In-press)
20. R. M. Reddy and M. Das, "A Reconfigurable Bidirectional DC-DC Converter with Integrated Battery Heating for Electric Vehicle Applications," in IEEE Journal of Emerging and Selected Topics in Industrial Electronics, doi: 10.1109/JESTIE.2023.3289388. (pre-print)
21. H. Arya and M. Das, "Fast Charging Station for Electric Vehicles Based on DC Microgrid," in IEEE Journal of Emerging and Selected Topics in Industrial Electronics, doi: 10.1109/JESTIE.2023.3285535. (pre-print)
22. R. M. Reddy, M. Das and N. Chauhan, "Novel Battery-Supercapacitor Hybrid Energy Storage System for Wide Ambient Temperature Electric Vehicles Operation," in IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 70, no. 7, pp. 2580-2584, July 2023.
23. M. Das, "Review of the Wide-Input-Wide-Output Bi-directional DC-DC Converter for Electric Vehicle Applications" IETE Technical Review, pp. 1-13, April 2023.
24. Singh, V. Pal, B. Jain T. "A Unified Framework for State and Time-Dependent Parameter Estimation of Automotive Engines", Mechanical Systems and Signal Processing (2024).
25. Kumar, Avinash, and Tushar Jain. "Suboptimal consensus protocol design for a class of multiagent systems." Journal of the Franklin Institute 360.18 (2023): 14553-14566.
26. Subramaniam A, Mona, Tushar Jain, and Joseph J. Yamé. "Bilinear observer-based robust adaptive fault estimation for multizone building VAV terminal units." Journal of Building Performance Simulation 16.6 (2023): 717-733.
27. Halim, A., Kumar, B.V.R., Niranjan, A. Nigam, A. et al. A colour image segmentation method and its application to medical images. SIViP 18, 1635–1648 (2024). https://doi.org/10.1007/s11760-023-02817-3.
28. Singh, L., Gupta, A. & Nigam, A. Vibration Recognition of a Distant Pendulum Using Smart phone. J. Vib. Eng. Technol. 12, 2371–2379 (2024). https://doi.org/10.1007/s42417-023-00984-8.

3.1.2.4 Conferences Attended And Papers Presented

1. A. Yaseen NJ, H. Shrimali, D. Das, "A 66-dBΩ 5-GHz and 44.88-√Hz/(pA·pW) Inductorless Transimpedance Amplifier in 65-nm CMOS" in IEEE MIXDES, Jun. 2024.
2. S. Dhimaan, H. Shrimali, "A 12.7 Bit Accurate and 5.3 nJ·μV2·ns Comparator with Dynamic-cum-Body Bias Technique in SOI" in IEEE ISCAS, May. 2024.
3. S. Sowmyasree, H. Shrimali, "An On-chip Thermoelectric Cooler Controller With Improved Driving Current of 2A at 0.5 Ω Load" in IEEE VLSI Design conference, Jan. 2024.
4. S. Sowmyasree, H. Shrimali, "Fully Monolithic 1A Thermoelectric Cooler Controller with 90% Efficiency" in IEEE International Conference on Electronics, Circuits and Systems (ICECS), Dec. 2023. (DOI: 10.1109/ICECS58634.2023.10382722)
5. A. K. Yadav, S. P. Malik, G. S. Baghel, and R. Khosla, Current Status and Future Perspectives of Tunnel Field Effect Transistors for Low Power Switching Applications, 3rd International Conference on Micro and Nanoelectronics Devices, Circuits and Systems, vol. 1067, Springer, Singapore, pp. 159–177, 2024.
6. Varunkumar Jayapaul, Seungbum Jo, Krishna Palem, Srinivasa Rao Satti: Energy Efficient Sorting, Selection and Searching. WALCOM 2023: 179-190.

7. R. Prasad and A. Sarkar, "A Novel Miniaturized Spoof Surface Plasmon Polaritons-based Monopulse Antenna for Advanced Target Detection and Tracking," 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, Florence, Italy, July, 2024.

8. H. Senapati, R. Anand, R. Prasad and A. Sarkar, "Ultrawideband RCS Reduction and Performance Analysis Using Phase Gradient Metasurface", 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, Florence, Italy, July, 2024.

9. R. Anand, R. Prasad, H. Senapati, A. Mezghani, G. S. Reddy and A. Sarkar, "Programmable Hybrid Spoof Planar Plasmonic Waveguide-based Fixed Frequency Beam-scanning Antenna," 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, Florence, Italy, July, 2024.

10. D. Dutta, N. Mendiratta, A. Sarkar, "Novel SSPP Based Highly Sensitive EM Biosensor for Noninvasive Measurement of Blood Glucose", 2024 IEEE Applied Sensing Conference (APSCON), Goa, India, 2024, pp. 1-4, doi: 10.1109/APSCON60364.2024.10466051.

11. N. Mendiratta, R. Anand, D. Dutta, G. S. Reddy and A. Sarkar, "Dual-mode Non-invasive Highly Sensitive Electromagnetic Square-shaped slotted Bio-Sensor for Brain Disease Detection", 2024 IEEE Applied Sensing Conference (APSCON), Goa, India, 2024, pp. 1-4, doi: 10.1109/APSCON60364.2024.10465829.

12. N. Mendiratta, R. Anand, D. Dutta, G. S. Reddy and A. Sarkar, "Multi-mode Non-invasive Highly Sensitive Electromagnetic Fern Shaped Bio-Sensor for Skin, Heart, and Muscle Abnormality Detection", 2024 IEEE Applied Sensing Conference (APSCON), Goa, India, 2024, pp. 1-4, doi: 10.1109/APSCON60364.2024.10466014.

13. D. Dutta, R. Anand, P. Shah, N. Mendiratta and A. Sarkar, "Novel Metamaterial Inspired SSP-WGM Resonator Based Highly Sensitive EM Biosensor for Noninvasive Measurement of Blood Glucose Using Aqueous Glucose Solution and Saliva", 2023 IEEE Microwaves, Antennas, and Propagation Conference (MAPCON), Ahmedabad, India, 2023, pp. 1-5, doi: 10.1109/MAPCON58678.2023.10464024.

14. R. Anand, D. Dutta, N. Mendiratta, and A. Sarkar, "Sub-6 GHz Asymmetric Spoof Surface Plasmon Polaritons based Broadband Beam Scanning Antenna for Wide Angle Coverage", 2023 IEEE Microwaves, Antennas, and Propagation Conference (MAPCON), Ahmedabad, India, 2023, pp. 1-4, doi: 10.1109/MAPCON58678.2023.10464158.

15. R. Anand, H. S. Senapati, D. Dutta, and A. Sarkar, "Design and Analysis of Spoof Surface Plasmon Polaritons based Leaky-wave Antenna for Continuous Beam Scanning", 2023 IEEE Microwaves, Antennas, and Propagation Conference (MAPCON), Ahmedabad, India, 2023, pp. 1-4, doi: 10.1109/MAPCON58678.2023.10463911.

16. R. Anand, A. Mezghani, A. Sarkar, "Advanced Spoof Surface Plasmon Polaritons based Wide Angle Broadband Dual-Beam Scanning Leaky-wave Antenna for sub-6 GHz Applications", IEEE 2023 Asia-Pacific Microwave Conference (APMC2023), 5-8 December 2023, Taipei, Taiwan, 2023, pp. 707-710, doi: 10.1109/APMC57107.2023.10439696.

17. R. Anand, A. Mezghani, A. Sarkar, "Via-loaded Complementary Spline-based Periodic Leaky-wave Antenna for Broadband Radiation Coverage", IEEE 2023 Asia-Pacific Microwave Conference (APMC2023), 5-8 December 2023, Taipei, Taiwan, 2023, pp. 717-720, doi: 10.1109/APMC57107.2023.10439825.

18. R. Anand, D. Dutta, and A. Sarkar, "On the Road to the Development of Noninvasive Highly Sensitive Electromagnetic Bio-Sensor for Bone Crack Detection," 2023 IEEE SENSORS, Vienna, Austria, 2023, pp. 1-4, doi: 10.1109/SENSORS56945.2023.10324914.

19. D. Dutta, R. Anand, and A. Sarkar, "Independently Operational Dual-Frequency Band Metamaterial based EM Biosensor for Identification and Quantification of Impurities in Vegetable Oils", 2023 IEEE SENSORS, Vienna, Austria, 2023, pp. 1-4, doi: 10.1109/SENSORS56945.2023.10325059.

20. S. Thakor, "Constrained Entropy Vectors: Some Direct and Converse Results," in 8th Annual Conference on Information Sciences and Systems (CISS), pp. 1-6, Princeton, USA, March 2024. DOI: 10.1109/CISS59072.2024.10480180.

21. S. Thakor and M. I. Qureshi, "On Computing the Partition Bound for Undirected Multi-Source Unicast Network Information Flow," in 30th National Conference on Communications (NCC), pp. 1-6, Chennai, India, February 2024. DOI: 10.1109/NCC60321.2024.10485795.

22. A. Deshwal and A. Patel, "Blind Distributed Detection in MIMO Networks," 2024 16th International Conference on Communication Systems & Networks (COMSNETS), Bengaluru, India, 2024, pp. 433-435.

23. G. Chamarthi, A. Patel and R. Pratap, "Towards obtaining SEP via Orthogonality of Projection Matrix in massive MIMO Networks," 2023 IEEE IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), MNIT Jaipur, India, 2023, pp. 1-4.

24. G. Chamarthi, A. Patel and R. Pratap, "Random Projection Based Efficient Detector in Massive MIMO Communication Networks," 2023 IEEE 24th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Shanghai, China, 2023, pp. 426-430.

25. L. Hemanth Krishna and B. Srinivasu " Approximate Ternary Matrix Multiplication for Image Processing and Neural Networks ", 2024 IEEE Computer Society Annual Symposium on VLSI (ISVLSI), 2024. (Accepted)

26. Kamal Raj, B. Srinivasu and Anupam Chattopadhyay " PUF-Based Lightweight Mutual Authentication Protocol for Internet of Things(IoT) Devices ", 2024 IEEE International Symposium on Circuits & Systems, 2024. Accepted.

27. L. Hemanth Krishna, B. Srinivasu and Nandit Kaushik " Energy Efficient Accurate and Approxi- mate Modified Adders for Ternary Multipliers ", 2024 IEEE International Symposium on Circuits & Systems, 2024. (Accepted)

28. Nandit Kaushik, B. Srinivasu and L. Hemanth Krishna " High-Speed Serial and Semi-Parallel IMPLY - Based Approximate Adders Through Memristors for In-Memory Computing ", 2024 IEEE International Symposium on Circuits & Systems, 2024. (Accepted)

29. S. Agarwal, S. Chakraborty and M. Sjlander, "TEEMO: Temperature Aware Energy Efficient Multi-Retention STT-RAM Cache Architecture" In 38th IEEE International Parallel & Distributed Processing Symposium (IPDPS), pp. 1-11, 2024, San Francisco, USA. (Accepted)

30. N. K. Dhar and A. Nandanwar, "Dynamic Updates in Stochastic Control for Networked System with Uncertainties," 2023 Ninth Indian Control Conference (ICC), Visakhapatnam, India, 2023, pp. 162-167, doi: 10.1109/ICC61519.2023.10442442.

31. A. Sharma, S. Gupta, P. Thakur, N. K. Dhar, and L. Behera, “Evolutionary Search of Optimal Hyper parameters for Learning Various Robot Manipulation Tasks”, IEEE World Congress on Computational Intelligence (IEEE WCCI 2024), Yokohama, Japan, 2024.

32. P. Ingle and H. Misra, "Four Quadrant Operation of Switched Reluctance Motor with Online Turn ON Angle Control," 2023 11th National Power Electronics Conference (NPEC), Guwahati, India, 2023, pp. 1-5, doi: 10.1109/NPEC57805.2023.10384973.

33. P. Verma, H. Misra and B. Singh Rajpurohce, "Detection Study of Static Eccentricity and Demagnetization Faults in IPMSM Renewable Energy and Hydrogen Technologies (GlobConHT), Male, Maldives", 2023, pp. 1-6, doi: 10.1109/GlobConHT56829.2023.10087871.

34. Thakur, Ankush, and Tushar Jain. "Practical Time-Varying Formation Tracking Control for Multi-Agent Systems." 2023 American Control Conference (ACC). IEEE, 2023.

35. Singh, Laxman, Anurag Singh Chauhan, and Tushar Jain. "Machine Learning based fault diagnosis method for 3-phase passive rectifiers in a Wind Energy Conversion System." 2023 11th National Power Electronics Conference (NPEC). IEEE, 2023.

36. Rajput, Akash and Tushar Jain. “Modeling and analysis of thermal dynamics of polyhouses for precision agriculture.” 2024 International Conference on Agriculture-Centric Computation (ICA) - IIIT Delhi.

37. K.N. Ajay Shastry, K. Ravi Sri Teja, Aditya Nigam, Chetan Arora; Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2024, pp. 759-768.

3.1.3 Outreach/Continuing Education Activities Organized

1. Dr. Akhilanand Pati Tiwari organized the DAE Outreach programme during April 12-13, 2024 at IIT Mandi with the participation of 7 (seven) experts from the Department of Atomic Energy, HPTU, IIT Mandi Faculty members and PG students.

2. Created content (approximately 30 hours of lectures' videos, presentation files, assignments and question papers) of the 12 week course 'State--space Approach to Control System Analysis and Design' and transferred the same to NPTEL for running of the course during January 18, 2024 to April 20, 2024 and examination thereof.

3. Dr. Adarsh and his team, Dr. Satyajit Thakor, Dr. G. Shrikanth Reddy, Dr. Sreelakshmi PM, Dr. Srikanth Sugavanam and Dr. Siddhartha Sarma, hosted the inauguration ceremony of the 5G use case lab, where over 950+ participants gathered in the main auditorium at IIT Mandi. The program was telecasted live where the Hon'ble Prime Minister graced the inaugural India Mobile Congress (IMC)-2023 event & in his August presence, Dept. of Telecommunications (DoT) officially awarded the 5G use case Lab to the SCEE, IIT Mandi on 27th October 2023 at IMC 2023 in the Pragati Maidan, Delhi.

4. The outreach committee, led by Dr. Adarsh Patel along with the team members Dr. G. Shrikanth Reddy, Dr. Varun Kumar Jayapaul and Dr. Kaushik Halder, has initiated and visited multiple institutions to showcase the work done by the SCEE

faculty members and encourage faculty interaction with the visiting institutions. The visits helped in SCEE publicity and encouraged the UG/PG students at the visiting institutes to join IIT Mandi Mtech-R/PhD programmes via the campus drive admissions. The committee facilitated visits to NIT Kurukshetra, NIT Uttarakhand, HPU, DTU, and SLIET.

5. An MoU between the institutes IIT Mandi and IIT Roorkee was signed and put on record, an initiative by Dr Adarsh Patel to establish a state-of-the-art research facility for next-generation wireless technologies.

6. SCEE celebrated Research Scholar Day (RSD-2024) on the 27th of April 2024. RSD offered a unique opportunity for interdisciplinary learning, aiming to bridge the gap between different areas of study, fostering a deeper understanding and appreciation of each other's work, and creating a sense of camaraderie among scholars. RSD was conducted by the SCEE outreach committee led by Dr. Adarsh Patel with team members Dr. Srinivasu Bodapati and Dr. Sneha Singh.

7. An MoU between IIT Mandi and Bharat Electronics Limited (BEL) was signed and put on record. It was an initiative by Dr Adarsh Patel to promote collaboration and actively provide solutions to the industry partner.

8. Dr. Varunkumar Jayapaul participated in the COSCOE workshop conducted at IIT Jodhpur in December 2023.

9. A high-end workshop on the Technologies for 5G and Beyond was organized by Dr. Adarsh Patel at the SCEE, IIT Mandi from March 9, 2024 to March 15, 2024.

10. Dr. Tushar Jain organized a 2 days' workshop for Research scholars across India, working in control systems and related areas for collaboration among research scholars of the country.

11. A short-term course on “Tailor Trade” under the PM Vishwakarma scheme from April 3, 2024 to April 9, 2024. The event was fully sponsored by the PM Vishwakarma scheme fund and was coordinated by Dr. Tushar Jain, Head CCE

12. A State Level Skill competition was held at IIT Mandi on March 27, 2024 The event was fully sponsored by HPKVN Shimla and coordinated by Dr. Tushar Jain, Head CCE.

13. A "State Level Camp of Vidyarthi Vigyan Manthan 2023 HP" was held at IIT Mandi. The event was fully sponsored by Vigyan Samiti Himachal (VIGYASA) and coordinated by Dr. Tushar Jain, Head CCE.

14. A short-term program on the Internet of Things (IoT) was held at IIT Mandi in November 2023. The event was sponsored by HPKVN Shimla and coordinated by Dr. Kaushik Halder.)

3.1.4 Conf./Workshops/Other Inst./Industry Visited (India or Abroad) or Invited Lectures Delivered

3.1.4.1 Invited talks

1. Dr. Akhilanand Pati Tiwari delivered an invited talk titled “Optimal Integral Sliding Mode Control of a Nuclear Reactor” in the Indo-French Seminar on Advances in Robust Nonlinear Control for Uncertain Dynamic Systems: Theory and Applications, held at IIT Roorkee, Roorkee, India during April 15 - 19, 2024.
2. Dr. Akhilanand Pati Tiwari delivered a faculty talk titled “Application of Kalman Filter for Dynamic Compensation of Self--powered Neutron Detectors” in the Research Scholars Workshop – 2024 held at IIT Mandi during March 15-16, 2024.
3. Dr. Robin Khosla delivered an Invited Talk on "Integration of alternate materials for computing and storage device applications," Advance Materials for Better Tomorrow (AMBT), Banaras Hindu University (BHU), Varanasi, India, Oct 2023.

4. Dr. Robin Khosla delivered an Invited Talk on "Alternate High-k dielectrics for switching and storage applications," Chitkara University, Punjab, India, Aug 2023.
5. Dr. Anirban Sarkar delivered an Expert talk in Karyashala/workshop on “Design and Fabrication of Modern Antennas for 5G/6G Wireless Communications” at PEC, Chandigarh in Feb, 2024.
6. Dr. Anirban Sarkar delivered lecture in HP Kaushal Vikas Nigam lecture series Delivered Guest Lecture in one week online FDP on "Modeling, Simulation and Measurement of High Frequency Antennas for Advanced Wireless Communication" from 01 Aug 2022 to 05 Aug 2022 in MIET, Meerut in association with Entuple Technologies and ACIC MIET Meerut Foundation.
7. Dr. Anirban Sarkar delivered an Expert Lecture in ATAL sponsored Two Weeks Faculty Development Program on “Soft Computing approach Towards Microwave Application” scheduled from 10th to 21st January 2023.
8. Dr. Anirban Sarkar delivered Expert Lecture on “Microstrip to SIW to Surface Plasmons: Opening new avenues in planar technology for high-frequency 5G antenna applications”, by IEEE Antennas and Propagation Society (APS) Student Branch Chapter (SBC) at IIT Indore on November 5, 2022.
9. Dr. Anirban Sarkar delivered an Expert Lecture on “Microstrip to SIW to Surface Plasmons: Opening new avenues in planar technology for high-frequency IoT and 5G antenna applications” during one-day workshop by IEEE MTTS and APS student branch chapters IIT Jammu on January 7, 2023.
10. Dr. Anirban Sarkar delivered Organized Talk on “RF Subsystems and Beam-scanners for Next-gen 5G/IoT Communications and EM Biosensing”, by IEEE MTTS SBC IIT Kanpur on March 15, 2023.
11. Dr. Anirban Sarkar delivered an Expert Lecture in Webinar 3.0 organized by IEEE MTT-S IIT BHU on “Millimeter-wave and sub-millimeter-wave beam scanning”.
12. Dr. Siddharth Panwar was an Invited speaker at the 20th Anniversary Annual General and Scientific Meeting [AGSM] of the Ghana College of Physicians and Surgeons.
13. Dr. Parimala Kancharla was an invited speaker in SERB - High end workshop on " Multimedia Processing and Analysis: Theory to Practice" at IIT Indore on May 16th, 2024
14. Dr. Parimala Kancharla delivered a tutorial talk on “Generative Image AI” at ICVGIP, 2023 held at IIT Ropar.
15. Dr. Parimala Kancharla was an invited speaker in the FDP program on AI & ML held at VIT AP during 2-6 May 2023.
16. Dr. Parimala Kancharla was an invited speaker in FDP on “AI and its role in Future Communication, Signal Processing and Computing Applications” held at University of Kashmir, Srinagar during May 1-10 2023
17. Dr. Parimala delivered a few lectures in a short course on Machine learning in the TCSion program in collaboration with TCS.
18. Dr. Adarsh Patel was an invited tutorial speaker on, “6G Wireless Communication Networks: Foundations and Trends”, in the conference IEEE ANTS-2023 held at MNIT Jaipur, Rajasthan, India, between 17-20 Dec. 2023.
19. Dr. Adarsh Patel gave an invited seminar on “Post-Mortem of PCA: Evolution of AI, ML, DL and 5G/6G Wireless Communications”, at the department of Electronics Engineering, Aligarh Muslim University, UP, India on 29th Feb. 2024.
20. Dr. Adarsh Patel gave an expert lecture on “Learning in Data Science vs. Detection in 5G/6G communication Networks”, at the department of Electronics and communication Engineering, Jawaharlal Nehru Government Engineering College, HP, India on 25th Apr. 2024.

21. Dr. Sukarn Agarwal delivered an invited talk on "LiNoVo: Longevity Enhancement of Non Volatile Cache in Chip Multiprocessor" at the department of Computer Science and Engineering, IIT Jodhpur, Rajasthan, India on 27 March 2024.
22. Dr. Himanshu Misra delivered an invited lecture on "Recent Advances In Electrical, Electronics & Communication Engineering (REECE-2024), held at Galgotia University Noida UP, May 2024
23. Dr. Himanshu Misra delivered an expert lecture in NPEC conference on "Electrical Motors and its Control in the Electric Vehicles, held at IIT Guwahati Assam India Dec 2023.
24. Dr. Tushar Jain delivered a lecture on "Multiagent systems and control", at Centre de Recherche en Automatique de Nancy (CRAN) France in May 2024.
25. Dr. Tushar Jain taught a course on Machine Learning and Data Analytics at Université de Lorraine, France in May - June 2024.
26. Dr. Aditya Nigam organized a 5-days workshop IWADL-2024 at IIT Mandi from 27-31 May 2024.
27. Dr. Aditya Nigam has delivered a talk/presentation at the Endowment Chair Event held at CHARUSAT Gujarat from 18-22 December 2023.

3.1.4.2 Conferences

1. Dr. Robin Khosla attended the Advance Materials for Better Tomorrow (AMBT) Conference at Banaras Hindu University (BHU), Varanasi, India.
2. R. Prasad and A. Sarkar, "A Novel Miniaturized Spoof Surface Plasmon Polaritons-based Monopulse Antenna for Advanced Target Detection and Tracking," 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, Florence, Italy, July, 2024.
3. H. Senapati, R. Anand, R. Prasad and A. Sarkar, "Ultra wideband RCS Reduction and Performance Analysis Using Phase Gradient Metasurface", 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, Florence, Italy, July, 2024.
4. R. Anand, R. Prasad, H. Senapati, A. Mezghani, G. S. Reddy and A. Sarkar, "Programmable Hybrid Spoof Planar Plasmonic Waveguide-based Fixed Frequency Beam-scanning Antenna," 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting, Florence, Italy, July, 2024.
5. D. Dutta, N. Mendiratta, A. Sarkar, "Novel SSPP Based Highly Sensitive EM Biosensor for Noninvasive Measurement of Blood Glucose", 2024 IEEE Applied Sensing Conference (APSCON), Goa, India, 2024, pp. 1-4, doi: 10.1109/APSCON60364.2024.10466051.
6. N. Mendiratta, R. Anand, D. Dutta, G. S. Reddy and A. Sarkar, "Dual-mode Non-invasive Highly Sensitive Electromagnetic Square-shaped slotted Bio-Sensor for Brain Disease Detection", 2024 IEEE Applied Sensing Conference (APSCON), Goa, India, 2024, pp. 1-4, doi: 10.1109/APSCON60364.2024.10465829.
7. N. Mendiratta, R. Anand, D. Dutta, G. S. Reddy and A. Sarkar, "Multi-mode Non-invasive Highly Sensitive Electromagnetic Fern Shaped Bio-Sensor for Skin, Heart, and Muscle Abnormality Detection", 2024 IEEE Applied Sensing Conference (APSCON), Goa, India, 2024, pp. 1-4, doi: 10.1109/APSCON60364.2024.10466014.
8. D. Dutta, R. Anand, P. Shah, N. Mendiratta and A. Sarkar, "Novel Metamaterial Inspired SSP-WGM Resonator Based Highly Sensitive EM Biosensor for Noninvasive Measurement of Blood Glucose Using Aqueous Glucose Solution and Saliva",

2023 IEEE Microwaves, Antennas, and Propagation Conference (MAPCON), Ahmedabad, India, 2023, pp. 1-5, doi: 10.1109/MAPCON58678.2023.10464024.

9. R. Anand, D. Dutta, N. Mendiratta, and A. Sarkar, "Sub-6 GHz Asymmetric Spoof Surface Plasmon Polaritons based Broadband Beam Scanning Antenna for Wide Angle Coverage", 2023 IEEE Microwaves, Antennas, and Propagation Conference (MAPCON), Ahmedabad, India, 2023, pp. 1-4, doi: 10.1109/MAPCON58678.2023.10464158.
10. R. Anand, H. S. Senapati, D. Dutta, and A. Sarkar, "Design and Analysis of Spoof Surface Plasmon Polaritons based Leaky-wave Antenna for Continuous Beam Scanning", 2023 IEEE Microwaves, Antennas, and Propagation Conference (MAPCON), Ahmedabad, India, 2023, pp. 1-4, doi: 10.1109/MAPCON58678.2023.10463911.
11. R. Anand, A. Mezghani, A. Sarkar, "Advanced Spoof Surface Plasmon Polaritons based Wide Angle Broadband Dual-Beam Scanning Leaky-wave Antenna for sub-6 GHz Applications", IEEE 2023 Asia-Pacific Microwave Conference (APMC2023), 5-8 December 2023, Taipei, Taiwan, 2023, pp. 707-710, doi: 10.1109/APMC57107.2023.10439696.
12. R. Anand, A. Mezghani, A. Sarkar, "Via-loaded Complementary Spline-based Periodic Leaky-wave Antenna for Broadband Radiation Coverage", IEEE 2023 Asia-Pacific Microwave Conference (APMC2023), 5-8 December 2023, Taipei, Taiwan, 2023, pp. 717-720, doi: 10.1109/APMC57107.2023.10439825.

13 R. Anand, D. Dutta, and A. Sarkar, "On the Road to the Development of Noninvasive Highly Sensitive Electromagnetic Bio-Sensor for Bone Crack Detection," 2023 IEEE SENSORS, Vienna, Austria, 2023, pp. 1-4, doi: 10.1109/SENSORS56945.2023.10324914.

14 D. Dutta, R. Anand, and A. Sarkar, "Independently Operational Dual-Frequency Band Metamaterial based EM Biosensor for Identification and Quantification of Impurities in Vegetable Oils", 2023 IEEE SENSORS, Vienna, Austria, 2023, pp. 1-4, doi: 10.1109/SENSORS56945.2023.10325059.

15 S. Thakor, "Constrained Entropy Vectors: Some Direct and Converse Results," in 58th Annual Conference on Information Sciences and Systems (CISS), pp. 1-6, Princeton, USA, March 2024. DOI: 10.1109/CISS59072.2024.10480180

16 S. Thakor and M. I. Qureshi, "On Computing the Partition Bound for Undirected Multi-Source Unicast Network Information Flow," in 30th National Conference on Communications (NCC), pp. 1-6, Chennai, India, February 2024. DOI: 10.1109/NCC60321.2024.10485795

17 A. Deshwal and A. Patel, "Blind Distributed Detection in MIMO Networks," 2024 16th International Conference on communication Systems & networks (COMSNETS), Bengaluru, India, 2024, pp. 433-435

18 G. Chamarthi, A. Patel and R. Pratap, "Towards obtaining SEP via Orthogonality of Projection Matrix in massive MIMO Networks," 2023 IEEE IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), MNIT Jaipur, India, 2023, pp. 1-4.

19. G. Chamarthi, A. Patel and R. Pratap, "Random Projection Based Efficient Detector in Massive MIMO Communication Networks," 2023 IEEE 24th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Shanghai, China, 2023, pp. 426-430.
20. Dr. Himanshu Misra attended NPEC conference at IIT Guwahati Dec 2023. Chaired confession session and presented a paper.

21. S. K. Gautam and M. Das, "Double–Sided LC with LCC Anti–Resonant Tank–based WPT System for Wide Output Voltage Range" 49th Annual Conference of the IEEE Industrial Electronics Society, Singapore, Singapore, Oct. 2023.
22. D. Kumar and M. Das, "Optimized Charging method for Fast Charging of EV Batteries" 49th Annual Conference of the IEEE Industrial Electronics Society, Singapore, Singapore, Oct. 2023.
23. D. Kumar, S. Saha and M. Das, "Effect of Various Charging Methods on Off-Board and On-Board Chargers on Battery Longevity for EV Applications" published in IEEE PESGRE 2023.
24. Dr. Aditya Nigam attended ICVGIP conference at IIT Ropar from 15-17 Dec. 2023.

3.1.5 Professional Achievements, Honors, and Awards/Membership of Professional Societies

1. Dr. Anirban Sarkar received the IETE-IRSI Young Scientists award 2023 from the Institution of Electronics and Telecommunication engineers.
2. Dr. Anirban Sarkar has been selected as Visiting Professor at Electrical and Computer Engineering, Price Faculty of Engineering, University of Manitoba, Winnipeg, Manitoba, Canada on "Demonstrating novel Reconfigurable Intelligent Surfaces for Massive MIMO" in 2023.
3. Dr. Anirban Sarkar received the SERB-SIRE Fellowship for the year 2023-2024 to perform research at University of Waterloo, Canada on "Advanced Antenna Designing for Next-Generation 5G/6G Joint Communications and Smart Sensing".
4. Dr. Satyajit Thakor received the Teaching Excellence Award from IIT Mandi (2023) in recognition of excellent teaching in the course IC260 (Signals and Systems) with a class strength of 162
5. Gopal Sai Krishna, PhD student of Dr. Adarsh from the InfoCommLab, has received the Prime Minister's Research Fellowship (PMRF) 2024 in cycle 11.
6. Anamika Kumari, M.Tech. Communication and Signal Processing (CSP) student of Dr. Adarsh Patel in the InfoCommLab, has won the Outstanding Academic Achievement Award at the 11th convocation of IIT Mandi.
7. Aditya Sarkar, EE (Btech) student and project staff of Dr. Adarsh Patel in the InfocommLab, won the President of India Gold Medal at the 11th convocation of IIT Mandi.
8. Dr.Sukarn Agarwal received the SERB-ITS travel grant to attend the IPDPS 2024 held at San Francisco, USA.
9. Dr. Moumita Das Selected as associate editor for Sadhana Journal.
10. Dr. Moumita Das Promoted as IEEE Senior Member.
11. Dr. Aditya Nigam received the Teaching Excellence Award at IIT Mandi on 05/Sept/2023.

3.1.6 New initiatives/New Research facilities created/equipment installed/laboratory established

1. Dr. Robin Khosla established Nanoelectronics Lab at A17 Building, SCEE, IIT Mandi where DI Water System, Spin Coater, and Hot Plate equipment's are installed.

2. Dr. Hitesh Shrimali, and co-workers Dr. Robin Khosla, and Dr. G. S. Reddy established B.Tech. (VLSI) Lab at A18 Building, SCEE, IIT Mandi where DC Power Supply, Function Generator, Mixed Signal oscilloscope, FPGA Boards, and Spectrum Analyzer equipment's are installed.
3. Dr. Adarsh Patel coordinated the development of the 5G use case lab under the initiative of the Dept. of Telecommunications to develop 100 5G Use case Labs for Higher Educational institutions.
4. Dr. Himanshu Misra Developing Electric Drives Teaching Lab from Scratch.
5. Dr. Tushar Jain
    - Polyhouse Setup.
    - Hydroponics Lab.
    - Low-cost Experimental setup for Multi Agent Robots to immediately test the algorithms developed in the Lab. (Work in Progress)

3.2 School of Mechanical and Materials Engineering

School of Mechanical and Materials Engineering (SMME) is committed to serve society through innovation and excellence in engineering education and research focused on development of sustainable technologies.

Our mission includes translation of research into the welfare of society, integration of research with engineering education; execution of external research projects towards engineering solutions via cross-disciplinary research approach etc. SMME is committed for high standard of engineering education through outstanding teaching, innovative curricula, and excellent research environment.

Currently, the school offers several diverse academic programs, such as Bachelor of Technology, Master of Technology (by Research) as well as a doctoral program (PhD). The current streams of study are: Fluid and Thermal Engineering, Materials and Energy Engineering, Mechanical Design, Manufacturing, Computational Mechanics, Product Design, Electric Vehicles. Presently, School of Mechanical and Materials Engineering has 27 faculty members including 2 Professors, 13 Associate Professors, 12 Assistant Professor. There are currently **111 Ph.D.** (including 2 ERPD & 3 Part time scholars), MS **32**, **Dual Degree 06**, **M.Tech 14** and **B.Tech 221** students in the school**.**

The main areas of research are Mechanical Design, Fluid and Thermal Engineering, Advanced Manufacturing, Materials Science and Engineering, Interdisciplinary areas like 3D Printing, Computational Mechanics, Product Design, and Electric Vehicles etc. In Materials and Design area, the focus is towards the development of materials for sensor, actuator & energy harvesting and energy storage applications and analysis of smart structures and systems.

In thermo-fluids engineering, faculty members are investigating Radiative heat transfer, Nano-scale heat transfer and Flow analysis & Heat transfer analysis of IC engines along with analysis of other engineering Systems. Energy efficient systems cover climate change studies, applications of phase change materials towards energy efficient buildings and the use of non-conventional energy sources to enhance energy efficiency. Sustainable Himalayan infrastructure encompasses the areas of slope stability, Geohazard zonation, waste management and performance based design. To this end a good number of sponsored research projects have been granted by agencies such as SERB, DRDO, ISRO, MoE, NRDMS, NMHS, MoES, DLR (German Aerospace Centre), BHEL etc. The school of Mechanical and Materials Engineering has several well equipped labs (Advanced Manufacturing lab, Composite Design and Manufacturing Research lab (CDML), Smart Material & Structure Research Laboratory (SMSL), Biomechanics Research Lab, Nano Fabrication for Energy Materials, Acoustics and Vibration lab, Nanoscale Materials & Devices Lab, Solar Thermal utilization and Thermal Energy storage lab.

Faculty Members

1.	**Dr. Atul Dhar** Chairperson & Associate Professor Specialization: IC Engines, Alternative Fuels, Emission Control Ph.D from IIT Kanpur (2013) Home Town: Sultanpur, Uttar Pradesh Phone: 01905-267143 E-mail: add@iitmandi.ac.in	
2.	**Dr. Raj Kiran** Assistant Professor Specialization: Mechanical Design Ph.D from Nanyang Technological University Singapore Phone: 9005823194 E-mail: raj@iitmandi.ac.in	

3.	**Dr. Gaurav Bhutani** Assistant Professor Specialization: Fluid and Thermal sciences Ph.D from Imperial College London (2016) Home Town: Delhi Phone: 01905-267108 E-mail: gaurav@iitmandi.ac.in	
4.	**Dr. Gajendra Singh** Assistant Professor Specialization: Experimental Fluid Dynamics, Spray Atomization & Combustion, Advance Laser Diagnostics & Image Processing Ph.D from The University of Sydney, Australia Phone: 01905-267715 E-mail: gajendra@iitmandi.ac.in	
5.	**Dr. Himanshu Pathak** Associate Professor Specialization: Computational Solid Mechanics, Fracture Mechanics, Functionally Graded Materials Ph.D from Indian Institute of Technology, Patna (2015) Home Town: Muzaffarpur, Bihar Phone: 01905-267908 E-mail: himanshu@iitmandi.ac.in	
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10.	**Dr. Prateek Saxena** Assistant Professor Specialization: Sustainable manufacturing,Tooling process chains, Paper-packaging,Additive Manufacturing and Tribology Ph.D from Technical University of Denmark Home Town: Jaipur Phone: 01905-267110 E-mail: prateek@iitmandi.ac.in	
11.	**Dr. Pyudi Anil Kishan** Assistant Professor Specialization: Computational Fluid Dynamics Ph.D from IIT Kharagpur (2009) Home Town: Tirupati, Andhra Pradesh Phone: 01905-267141 E-mail: kishan@iitmandi.ac.in	
12.	**Dr. Rajeev Kumar** Professor Specialization: Solid Mechanics, Vibration, FEM, Optimization Ph.D from IIT Roorkee in (2008) Home Town: Jaspur, Uttrakhand Phone: 01905-267148 E-mail: rajeev@iitmandi.ac.in	
13.	**Dr. Rahul Vaish** Professor Specialization: Glasses & Glass-ceramics Ph.D (Engg.), Indian Institute of Science Bangalore (2010) Home Town: Badaun, Uttar Pradesh Phone: 01905-267139 E-mail: rahul@iitmandi.ac.in	
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15.	**Dr. Rik Rani Koner** Associate Professor Specialization: Hybrid Materials Ph.D from Indian Institute of Technology Guwahati (2009) Home Town: Ballour, West Bengal Phone: 01905-267220 E-mail: rik@iitmandi.ac.in	
16.	**Dr. Satvasheel Ramesh Powar** Associate Professor Specialization: Dye-sensitized solar cells, Perovskite solar cells Ph.D from Monash University, Australia (2013) Home Town: Kolhapur, Maharashtra Phone: 01905-267136 E-mail: satvasheel@iitmandi.ac.in	
17.	**Dr. Sudhir Kumar Pandey** Assistant Professor Specialization: Condensed Matter Physics and Material Sciences. Ph.D from UGC-DAE Consortium for Scientific Research, Indore (2007) Home Town: Garhwa, Jharkhand Phone: 01905-267852 E-mail: sudhir@iitmandi.ac.in	
18.	**Dr. Sunny Zafar** Assistant Professor Specialisation: Manufacturing Engineering Ph.D from Indian Institute of Technology, Roorkee (2016) Home Town: Chandigarh Phone: 01905-267268 E-mail: sunnyzafar@iitmandi.ac.in	
19.	**Dr. Swati Sharma** Assistant Professor Specialisation: Materials and Manufacturing Ph.D from University of California, USA Home Town: Bhopal Phone: 01905-267830 E-mail: swati@iitmandi.ac.in	
20.	**Dr. Vishal Singh Chauhan** Associate Professor Specialization: Design Engg. Electromagnetic Radiation during Deformation of metals and alloys, Solid Mechanics, FEM Ph.D from BIT Mesra, Ranchi (2009) Home Town: Sanawad, MP Phone: 01905-267044 E-mail: vsc@iitmandi.ac.in	

21.	**Dr. Viswanath Balakrishnan** Associate Professor Specialization: Growth of functional materials/thin films, Electron microscopy &in situ exploration of structure-property relationships Ph.D (Materials Science) from IISc, Bangalore (2008) Home Town: Chidambaram, Tamil Nadu Phone: 01905-267142 E-mail: chairse@iitmandi.ac.in, viswa@iitmandi.ac.in	
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3.2.1 Publication

(i) Published Book

1. Parmod Kumar and Atul Dhar, Basics of Thermodynamics, Published by AICTE.

(ii) Published Book chapters

1. S Pardhe, J Ahamad, I Singh, P Kumar, A Dhar. Strategies for Efficient Utilization of Methanol in Compression Ignition Engines, Renewable Fuels for Sustainable Mobility, 161-182 2023.
2. Singh, Gajendra, and Atul Dhar. "Net Zero-Carbon Emission: Assessing the Role of Ammonia." *Ammonia and Hydrogen for Green Energy Transition*. Singapore: Springer Nature Singapore, 2024. 25-37.
3. 3D Printing and New Product Development: Opportunities and Challenges, in 3D Printing and New Product Development 3D Printing and New Product Development, CRC Press 2023 A.R. Bhat, V. Gupta, N.K. Bankapalli, **P.Saxena**, A. Raina, M.I. UlHaq.
4. Mechanical Properties of 3D printed materials at high strain rates Composite Materials, CRC Press 2023 M. Malik, **P. Saxena.**
5. Nanocomposites and tribology: Overview, Sustainability aspects and Challenges Nanomaterials for sustainable tribology, CRC press 2023 A. Malik, N.S. Jammoria, A.R. Bhat, **P. Saxena**, M.I. UlHaq, A. Raina.
6. Natural fiber-reinforced polymer nanocomposites Nanomaterials for sustainable tribology, CRC press 2023 A.R. Bhat, **P. Saxena.**
7. Rani M., Kumar R., Verma N., Pathak H., Zafar S.(2023), The Application of Microwave Energy for Fabrication of Polymer-Based Composite Materials. In: Bansal A. and Vasudev H. (eds) Advances in Microwave Processing for Engineering Materials, CRC Press doi:10.1201/9781003248743.
8. Carbon for Micro and Nano Device (textbook)
   Publisher: DeGruyter Publishing House, Germany
   ISBN: 978-3110620627.
   Link: https://www.degruyter.com/document/doi/10.1515/9783110620634/html
9. Minku, Ghosh, R. 2024. Influence of Porocoat Beaded Coating Structure on Bone Ingrowth Around the Porous Coated Implant: A Two-Dimensional Finite Element study. In: Ray R. K., Bora S. N., Maiti D. K. (eds). Advances in Theoretical and Applied Mechanics. Lecture Notes in Mechanical Engineering. Springer, Singapore. https://doi.org/10.1007/978-981-97-0418-7.
10. David Bassir, Nadhir Lebaal, Youssef Boutahar, Mohammad Talha, Lhoucine Boutahar:An improved approach for thick functionally graded beams under bending vibratory analysis, Machine Learning Aided Analysis Design and Additive Manufacturing of Functionally Graded Porous Composite Structures, 215-237, Woodhead Publishing,2024.
11. Strain Engineering of Metal Insulator Transition in VO_2 D Verma, V Balakrishnan, American Institute of Physics, AIP, USA 2023.

(iii) Patents

(i) Dr. Viswanath Balakrishnan

S. No.	Patent Title	Name of Applicant(s)	Patent No.	Award Date	Agency/ Country	Status
1	A METHOD TO FORM A HYBRID BIPOLAR SUPERCAPACITOR	Nitika Arya, Yadu Chandran, Bhumit Luhar, Priyanka Kajal, Satvasheel Powar, Viswanath Balakrishnan*	NA	NA	India	Granted

(ii) Dr. Swati Sharma

Authors: Joseph Nishanth (IIT Kanpur), Jyoti Shikhar (IIT Mandi), Swati Sharma (IIT Mandi), Kanwar S. Nalwa(IIT Kanpur)

Application Number : 202411018047

Date of filing : March 13, 2024

Title of invention : A METHOD FOR FABRICATING MONOCLINIC SULFUR AND CARBON NANOFIBER CATHODES FOR HIGH-PERFORMANCE LITHIUM-SULFUR BATTERIES

Applicants : INDIAN INSTITUTE OF TECHNOLOGY KANPUR and INDIAN INSTITUTE OF TECHNOLOGY MANDI

(iii) Dr. Sunny Zafar

1.	Method For Cladding Internal Cylindrical/curved Surface Via Microwave	Indian Patent Application No: 202111033942 Filing Date: 28 July 2021 Granted: 14 March 2024 Patent No.: 526580

(iv) Dr. Rik Rani Koner

Patent filed; *High Performance Asymmetric Supercapacitor*; Application no: 202311019332

(v) Dr. Anil Kishan

A Thermal Energy Storage Device and a Solar Space Heating Assembly, Inventors: P. Anil Kishan, and Pushpendra Kumar Shukla, Patent No: 502815, Application No.: 202211003420, Dated: 24/01/2024.

(vi) Dr. Rajesh Ghosh

Patent Granted: An Ankle Prosthesis. Patent Number: 487763; Patent application number: 201911040321. The Patent office, Government of India, New Delhi.

(vii) Dr. Mrityunjay Doddamani

1. Rahul Sarswat, Abhimanyu Dhir, Satvasheel Powar, Mrityunjay Doddamani, Additive Manufacturing of plant Based Polymer Resin Via Digital Light Processing (DLP), Filed on 13th September 2023. Filing Date 29/11/2023.

2. System and Method of Fabricating Provskite based Solar Cell, Patent No.541823, Patentee - IIT Mandi, Inventors – Priyanka Kajal, Satvasheel Powar, Mrityunjay Doddamani, Date of grant – 14th June 2024.

(viii) Dr. Ranbir Singh

1. Patent "A Novel Bifacial Perovskite Photovoltaic Architecture for Harvesting Energy from Artificial Indoor LED Light Sources" Publication number: 46/2022. (App. No. - 202211063783), 2024. **(Awarded)**

2. Green Bio-Synthesis of Antibacterial Nanoparticles-Based Epithelium Propitious Disinfectant, (App. No. – 202311083391), 2023. **(Filed)**

(ix) Dr. Parmod Kumar

S.No.	Patent Title	Name of Applicant(s)	Patent No.	Award Date	Agency/Country	Status
1.	System and method for separating air from air-liquid mixture	Parmod Kumar and Rahul Kumar Mondal	490294	27/12/2023	India	Granted

3.2.2 Accepted and Published Papers in Reputed National and International Journals

1. Shakir M, and Talha M. "Dynamic investigation of GnP reinforced FG-porous sandwich skewed plates under blast impact considering elastic foundation." Journal of Mechanical Science and Technology (2023).

2. Akshay Gaur, Chirag Porwal, Diwakar Singh, Vishal Singh Chauhan, Rahul Vaish, "Facilitating Flexoelectric Effect in BaTio3 ceramic for Pollutant Removal applications via Piezocatalysis Process" Colloids and Surfaces A: Physiochemical and Engineering Aspects 689, 133563, online Feb. 28, 2024.

3. Deepa Thakur, Chirag Porwal, Vishal Singh Chauhan, ViswanathBalakrishnan, Rahul Vaish, "2D Transition Metal Dichalcogenides: Synthesis Methods and Their Pivotal Role in Photo, Piezo, and Photo-piezocatalytic Processes" Separation and Purification Technology 337, 126462, (13.06.2024), online January 20, 2024, DOI: https://doi.org/10.1016/j.seppur.2024.126462.

4. Akshay Gaur, Chirag Porwal, Vishal Singh Chauhan, Rahul Vaish, "Synergic effect of Photocatalysis and Tribocatalysis for Dye Degradation by BaTiO3 Ceramics", Journal of American Ceramic Society 107(4), 2393-2406, April 2024. first published 27.11.2023. DOI:https://doi.org/10.1111/jace.19565.

(i) Papers published in International Journals

1. Dr. Viswanath Balakrishnan

S. No.	Author(s)	Title	Name of Journal	Volume, Issue/Page	Year	Impact Factor
1	D Thakur, G Singh, BR Naik, M Devi, S Sharma, V Balakrishnan	Direct Integration of Monolayer WS2 with Lithographically Patterned Carbon Contacts for Memristor Application	ACS Applied Electronic Materials	6 (2), 1444-1450	2024	4.3
2	BR Naik, S Choudhary, SK Sharma, V Balakrishnan	Spiral WSe2 with Interlayer Twist for Memristive and Neuromorphic Device Applications	ACS Applied Electronic Materials	6 (3), 1921-1927	2024	4.3

3	BR Naik, N Arya, V Balakrishnan	Paper based flexible MoS2-CNT hybrid memristors	Nanotechnology	35 (21), 215201	2024	2.9
4	M Shakir, D Verma, V Balakrishnan, M Talha	Experimental and numerical investigations of VO2 UHMWPE polymer composite plates across phase change temperature	Polymer Composites	45 (4), 3738-3753	2024	4.3
5	Himanshu Rai, Deepa Thakur, Aayush Gadal, Zhijiang Ye, Viswanath Balakrishnan, Nitya Nand Gosvami	Transforming friction: unveiling sliding-induced phase transitions in CVD-grown WS 2 monolayers under single-asperity sliding nanocontacts	Nanoscale	16 (14), 7102-7109	2024	8.30
6	Deepa Thakur, Chirag Porwal, Vishal Singh Chauhan, Viswanath Balakrishnan, Rahul Vaish	2D transition metal Dichalcogenides: Synthesis methods and their pivotal role in Photo, Piezo, and photo-piezocatalytic processes	Separation and Purification Technology	337, 13 June 2024, 126462	2024	8.1
7	Deepa Thakur, Pawan Kumar, Arjun Barwal, Deep Jariwala, Eric Stach, and Viswanath Balakrishnan	Site-specific optical encryption via nanoscale integration of carbon on monolayer WS2	Carbon	214, 118339	2023	11.0
8	Chandran, Yadu, Deepa Thakur, B Raju Naik, Viswanath Balakrishnan	Arresting the Surface Oxidation Kinetics of Bilayer 1T'-MoTe2 by Sulphur Passivation	Nanotechnology	34 375702	2023	3.5
9	H Rai, D Thakur, D Kumar, A Pitkar, Z Ye, V Balakrishnan, NN Gosvami	Nanoscale friction and wear behavior of CVD-grown aged monolayer WS2: Role of wrinkles and surface chemistry	Nanoscale	15 (23), 10079-10088	2023	8.30

10	Arya, Nitika; Chandran, Yadu; Singh, Arkaj; Sharma, Ravinder; Halder, Aditi; Viswanath Balakrishnan	Substrate versatile roller ball pen writing of nano-porous MoS_2 for energy storage devices	ACS Applied Materials and Interfaces	15, 35, 41447	2023	9.5
11	Arya, Nitika; Chandran, Yadu; Luhar, Bhumit; Kajal, Priyanka; Powar, Satvasheel; Viswanath Balakrishnan	Porosity-engineered CNT-MoS_2 hybrid nanostructures for bipolar supercapacitor applications	ACS Applied Materials and Interfaces	15, 29, 34828	2023	9.5

2 . Prof. Rahul Vaish

- Kumar, P., Vaish, R. Effect of poling and excess Bi2O3 on piezocatalysis by BaBi4Ti4O15. J Mater Sci: Mater Electron 34, 2278 (2023). https://doi.org/10.1007/s10854-023-11614-0.
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- S. Karmakar, R. Kiran, R. Vaish, V. S. Chauhan, S. B. Ahmed, I. Boukhris, W. Hwang, T. H. Sung, A. Kumar, Comparative Study of the Effective Properties of 0–3 and Gyroid Triply Periodic Minimal Surface Cement-Piezocomposites. Global Challenges 2023, 7, 2200122. https://doi.org/10.1002/gch2.202200122.
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3. Dr. Sudhir Kumar Pandey

(i) Improvement in thermoelectric properties of Zn–Mn co-doped nanostructured SnTe through band engineering and chemical bond softening
A Bugalia, V Gupta and Abhishek Pandey
Journal of Physics D: Applied Physics 57 (19), 195502 (2024)

(ii) Enhancement in thermoelectric performance of hydrothermally synthesized Ca and Sb co-doped Bi2Te3 nanostructures
K Rani, V Gupta and Abhishek Pandey
Physica Scripta99(3), 035961 (2024)

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Prakash Pandey and Sudhir K. Pandey
J. Phys.: Condens. Matter **36**, 165602 (2024)

(iv) Thermoelectric properties of Fe 2 VAl in the temperature range 300–800 K: A combined experimental and theoretical study
Shamim Sk, P. Devi, Sanjay Singh, and Sudhir K. Pandey
Physica B: Condens. Matter **673**, 415496 (2024)

(v) Enhanced thermoelectric performance of Mg and Se co-doped Bi2Te3 nanostructures
Kavita Rani, Vivek Gupta, Ranjeet, and Abhishek Pandey
J Solid State Chem. **330**,124486 (2024)

(vi) Investigating the effect of electronic correlation on transport properties and phononic states of Vanadium
Prakash Pandey, Vivek Pandey, and Sudhir K. Pandey
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(vii) Existence of nodal-arc and its evolution into Weyl-nodes in the presence of spin-orbit coupling in TaAs & TaP
Vivek Pandey, and Sudhir K. Pandey
J. Phys.: Condens. Matter **35**, 455501 (2023)

(viii) Improved thermoelectric performance of Se-doped n-type nanostructured Bi2Te3
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(ix) Coexistence of non-Fermi liquid behavior and biquadratic exchange coupling in La-substituted CeGe: Nonlinear susceptibility and DFT+DMFT study
Karan Singh, Antik Sihi, Sudhir K. Pandey, and K. Mukherjee
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(x) Integrated hydrothermal-green approach to synthesize Fe, Ag doped copper sulfide nanopowders and investigations of their thermoelectric properties
Pooja Rawat, Shubhra Kala, Shamim Sk, Sudhir K. Pandey, and Manika Khanuja
Physica B: Condens. Matter 660, 414918 (2023)

(xi) Ab-initio study of phononic thermal conduction in ScAgC half-Heusler
Vinod Kumar Solet and **Sudhir K. Pandey**
Eur. Phys. J. B **96**, 53 (2023)

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Role of Additive Manufacturing in Sustainability and Circular Economy of Growing Emerging Economies: A case study of India, Indonesia, and Saudi Arabia	The International Journal of Advanced Manufacturing Technology. (Impact factor: 3.4)	Under review	N. Radwan, C. Bhat, M. J. Prajapati, M. Malik, **P. Saxena**, Y. S. Romario, M. F. R. Hentihu, C. P. Jiang
Selection of a Suitable Additive Manufacturing Process for Soft Robotics Application Using Three-Way Decision Making	The International Journal of Advanced Manufacturing Technology. (Impact factor: 3.4)	vol. 132, page 2003-2015, 2024	S. Gangwar, **P. Saxena**, N. Virmani, T. Biermann, C. Steinnagel, R. Lachmayer
Stress concentration targeted reinforcement using multi-material-based 3D printing	Applied Materials Today (Impact factor: 8.3)	vol. 36, no. 102010, Feb. 2024	H. Singh, A. B. Santos, D. Das, R.S. Ambekar, **P. Saxena**, C.F. Woellner, N.K. Katiyar, C.S. Tiwary
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18. Dr. Parmod Kumar

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19. Dr. Satvasheel Ramesh Powar

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20. Prof. Rajeev Kumar

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21. Dr. Sarthak Nag

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2. Effect of methane supplementation on the performance, vibration and emissions characteristics of methane-diesel dual fuel engine journal-article Frontiers in Thermal Engineering, Year 2023 DOI:10.3389/fther.2023.1101333

22. Dr. Himanshu Pathak

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23. Dr. Jaspreet Kaur Randhawa

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24. Dr. V Balakrishnan

1. An Approach for Control of Equilibrium Field Profile Through the Real-Time Plasma Current in ADITYA-U and SST-1 Tokamaks
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   Thakur D.; Singh G.; Naik B.R.; Devi M.; Sharma S.; Balakrishnan V.
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10. Transforming friction: unveiling sliding-induced phase transitions in CVD-grown WS2 monolayers under single- asperity sliding nanocontacts
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    Article Nanoscale, **Year** 2024
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(ii) National conferences attended and papers presented

1. Dr. Swati Sharma

1. Mamta Devi, Swati Sharma, Fabrication of all-solid-state flexible micro-supercapacitors with Nitrogen-containing carbon hybrid, National symposium of Research Scholars (NSRS-2024), 8-9th March, 2024, IIT Kanpur.
2. Bhavika Chouhan, Bikash Raut, Swati Sharma. Development of oxidation-resistant carbon fibers for high-temperature applications, Indian Conference on Carbon Materials ICCM 2023, 30th Nov – 2nd Dec 2023, Mumbai, India.
3. Ashish Jaswal. Fabrication of an N-containing carbon-based flexible device for malathion sensors. Indian Conference on Carbon Materials ICCM 2023, 30th Nov – 2nd Dec 2023, Mumbai, India.
4. Jyoti Shikhar. Fabrication of Carbon Material for Sodium Ion Battery. Indian Conference on Carbon Materials ICCM 2023, 30th Nov – 2nd Dec 2023, Mumbai, India.
5. Jyoti Shikhar, Swati Sharma. Fabrication of Non-Graphitizing Carbon Material for Sodium Ion Battery. National symposium of Research Scholars (NSRS-2024), 8-9th March, 2024, IIT Kanpur.
6. Swati Sharma. Flexible, nanomaterial loaded all-carbon devices for energy and sensing applications (online invited talk). ICN 2024, May 10, 11 & 12, 2024, Kottayam, Kerala.
7. Mamta Devi, Swati Sharma, Micro-structural changes in graphitic carbon nitride (g-CN) with increasing temperatures, 33rd International Conference on Diamond and Carbon Materials (DIAM-2023), 10-14 September 2023, Mallorca, Spain. (attended by student)

2. Dr. Gaurav Bhutani

Conference talks:
Sharma V and Bhutani G. “Computational modeling of snow avalanche dynamics: a case study of Teling Nala near Atal Tunnel”. Tenth International and 50th (Golden Jubilee) National Conference on Fluid Mechanics and Fluid Power **(FMFP 2023)**, IIT Jodhpur, Rajasthan, India, Dec 2023.

Invited talk:
Bhutani G. “An open-source computational framework for the solution of the bivariate population balance equation”, International Conference on Advancements in Mathematics **(ICAM 2023)**, Thapar Institute of Engineering and Technology, Patiala, India, Sep 2023.

(iii) International conferences papers/ Conference attended and papers presented

1. Dr. Viswanath Balakrishnan

Delivered invited lecture in international conference in 2D materials(RPGR), Nov20-23, 2023, Bangalore.

2. Prof. Rahul Vaish

1. Conference Participant, "2nd São Carlos School on Glasses and Glass-Ceramics,", April 2024, São Carlos, São Paulo, Brazil. Attended all 40 hours of lectures, laboratory visits, and social activities from April 22 to 27, 2024, at the Department of Materials Engineering, Federal University of São Carlos, São Carlos, SP, Brazil.

2. Conference Participant, "The International Workshop on Advanced Materials," February 2024, Dubai, United Arab Emirates. Presented a poster on water cleaning applications in advanced materials from February 19 to 21, 2024.

3. Dr. Mohd Talha

1. Singh, A., Talha, M., On the free vibration behavior of auxetic metamaterial beams using first-order shear deformation theory, International Conference on International Conference on composites: design, processing, manufacturing and health monitoring, (CDPMHM 2024), IIT Mandi, June 20-21, 2024.

2. Kaur, M., Talha, M., Free vibration characteristics of FG beams using finite element analysis, International Conference oncomposites: design, processing, manufacturing and health monitoring, (CDPMHM 2024), IIT Mandi, June 20-21, 2024.

3. Gupta, V., Talha, M., and Kumar, R., On the natural frequency of grapheme platelets reinforced functionally graded beams, International Conference on Mechanical Engineering Ideas, Innovations& Initiatives (ICMEI3-2024), AMU Aligarh, February, 24-25, 2024.

4. Aadil, Md., Talha, M., and Kumar, R., Vibration characteristics of Auxetic beams: Experimental and Numerical study, in ternational Conference on Mechanical Engineering, Ideas, Innovations& Initiatives (ICMEI3-2024), AMU Aligarh, February 24-25, 2024.

5. Shakir, M., Talha, M., and Rao P. S. Influence of GNP Reinforcement on Large Amplitude Vibrations of FGPoroelastic Plates with Initial Geometric Imperfections. International Conference on Mechanical Engineering Ideas, Innovations & Initiatives
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6. Amir, M., Kim, SW., Lee, SY., and Talha, M.,Vibration analysis of FGM porous curved panels with cutouts: An FE-based multilayered model approach, J oint Conference of APCATS, AJSAE & AAME, JEJU Boo-Young Hotel & Resort, Jeju Island, Republic of Korea, 11-14 October 2023.

7. Shakir, M., Talha, M., and Dileep A. D. ANN modeling for the natural frequency prediction of fluid-filled FGP plates reinforced with GNP. International Conference on Differential Equations and Control Problems (ICDECP23), IIT Mandi, June 15-17, 2023.

4. Dr. Sunny Zafar

1. Manjeet Rani, Rajeev Kumar* and Sunny Zafar, A sustainable approach to low cost and energy efficient manufacturing and recycling of glass fiber reinforced polymer composites, 9th International Conference on Composite Materials and Material Engineering (ICCMME 2024), NUS, Singapore, January 14-16, 2024.

2. Manjeet Rani* and Sunny Zafar , Assessment of rain erosion resistance of glass fiber-reinforced polymer composites using nanoindentation for wind turbine blade applications, 5th Leading Edge Erosion Symposium, Niels Bohr Auditorium, Risø Campus of DTU in Roskilde, Denmark, 6th to 8th February 2024.

5. Dr. Ravindra Bukke Naik

1. A. Singh and **R. N. Bukke***. Solution-processed p-type CuGaO films towards thin film transistor application. ICFM-2024. IIT Kharagpur.

2. **R. N. Bukke***, R. K. Rai, and J. Jang. Improvement in Bias Stability of Zinc Oxide Thin Film Transistor by Tin Doping. IDW-2023, Japan.

6. Dr. Ranbir Singh

Cost-Effective Processing of Flexible Tactile Sensors for e-skin Applications, Sachin Sharma, Sumit Choudhary, **R. Singh,** Gopi Shrikanth Reddy, Satinder Kumar Sharma*, 8th IEEE Electron Devices Technology & Manufacturing Conference (EDTM) Conference, Banglore, India, 1-3, 2024.

7. Dr. Prateek Saxena

Conference Publications			
Title of Paper	**Conference Name**	**Publication Details (Vol, Issue, Year etc. /accepted/submitted)**	**List of Author(s) in same order as appeared in publication**
Influence of process parameters on compression properties of additively manufactured Graphene Reinforced Polylactic Acid (PLA) composites	International Conference on Recent Advances in Design and Manufacturing, NIT Patna	June 2024, Accepted	S. Pandey, S. Shekhawat, V. Gupta, **P. Saxena**
Manufacturing of light-weight metallic components using extrusion-based metal additive manufacturing	International conference on Composites: Design, Processing, Manufacturing, and Health Monitoring, IIT Mandi	June 2024, Accepted	N. K. Bankapalli, **P. Saxena**
Warpage in 3D Printed Nylon-Based Carbon Fiber Composites	International conference on Composites: Design, Processing, Manufacturing, and Health Monitoring, IIT Mandi	June 2024, Accepted	V. Gupta, **P. Saxena**, H. Pathak
Feedstock extrusion, windability, and printability studies of Polylactic Acid material for extrusion-based additive manufacturing	21st Indian Society of Mechanical Engineers (ISME) conference	July 2023	P. Kumar, N.K. Bankapalli, V. Gupta, **P. Saxena**

8. Dr. Pradeep Kumar

1. Vidhate Akshay Santosh, Pradeep Kumar, Samar Agnihotri, Method of Manufactured Solution to Verify Solution TO Near Field Radiative Problems, 10th International Symposium on Radiative Transfer (RAD-23), Thessaloniki, Greece on June 12-16, 2023.
2. Nishad Mahajan, Arumugaraj S., and Pradeep Kumar, Implementation of spectral line weighted-sum-of-gray-gases (SLW) property model in open source software, Proceedings of the 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2023) on December 2023 at IIT Patna (India).
3. Kapil Kumar Patil, Kuljeet Singh, and Pradeep Kumar, Calculation of spectral radiative properties of fly ash and radiative heat transfer, Proceedings of the 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2023) on December 2023 at IIT Patna (India).
4. Rathore, S.S., Mehta, B., Kumar, P. and Asfer, M., "Numerical Validation of Lee's Evaporation Model for Heat Pipe Applications", Proceedings of the 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2023) on December 2023 at IIT Patna (India).

5. Rathore, S.S., Mehta, B., Kumar, P. and Asfer, M., "Numerical Investigation on the Effect of Height Variation of Porous Rib on the Heat Transfer Performance of a Mini-channel: Pore-Scale Simulation", 10th International and 50th National Conference on Fluid Mechanics and Fluid Power (FMFP-2023) on December 2023 at IIT Jodhpur (India).

9. Dr. Anil Kishan

1. Pushpendra Kumar Shukla, Jaideep Shukla, Ketan Arora, P. Anil Kishan, Comprehensive Investigation of a Four-Pass Latent Heat Thermal Energy Storage System with Different Geometric and Flow Configurations: A Numerical and Experimental Analysis, 10th International and 50th National Conference on Fluid Mechanics and Fluid Power (FMFP 2023), December 20-22, 2023, Indian Institute of Technology Jodhpur.

2. PK Shukla, J Shukla, K Arora, PA Kishan, Numerical and Experimental Analysis of Double Pass Latent Heat Thermal Energy Storage System with Different Geometric and Flow Conditions, 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference, December 14 -17, 2023, Indian Institute of Technology Patna.

10. Dr. Atul Dhar

Track Owner of the Track on Energy Technology in the International Conference on Sustainable Energy and Environmental Challenges (VIII SEEC) organized by Malaviya National Institute of Technology Jaipur, India during 4-6 December 2023.

11. Dr. Parmod Kumar

1.Patel, S. and Kumar, P., Effect of inclination of steam injection pipe on steam bubble profile and frequency characteristics in direct contact condensation, IHMTC-2023.
2.Mondal, R.K., Rohilla, L. and Kumar, P., Experimental and numerical study of air-entrained patterns in liquid extraction using two outlets, IHMTC-2023.
3.Debnath, D, Misra, S., Kumar, P. and Mitra, S., Understanding the dynamics of underliquid drop spreading, ICMF-2023.

(iv) Invited Lecturers/Talks/Continuing Education Programs

1. Dr. Rajesh Ghosh

Keynote Lecture: 4th International Conference on Functional Materials, Manufacturing, and Performances (ICFMMP 2023), 25th – 26th August, 2023. Lovely Professional University, Jalandhar, Punjab.

2. Dr. Mohd Talha

1. Mathematical Modelling and Analysis of Graphene Reinforced Functionally Graded Porous Panels, International Conference on Mechanical Engineering Ideas, Innovations& Initiatives (ICMEI3-2024), AMU Aligarh, February 24-25, 2024.

2. Finite Element Modelling and Analysis of Functionally Graded Porous Panels with Graphene Platelets Reinforcement, The 3rd International Conference DIGITECHON 2024 - 4th & 5th April, 2024 at Sona College of Technology, Salem - 636005.

3. Dr. Sunny Zafar

S.No.	Title	Program	Date	Institution
1.	Manufacturing and Recycling of Light Weight & High Strength Composites using Microwave Energy	SERB Karyashala on Recent Advancements in FGMs fabrication and characterisation	19th March 2024	NIT Warangal
2.	Development of Slurry Erosion Resistant Surfaces through Microwave Cladding for Hydro Turbine Application	SERB Karyashala on Current Trends and Future Aspects on Microwave Processing of Metallic Materials	19th March 2024	NIT Warangal
3.	Technology Sourcing: Support available from R&D Institutions	DST Sponsored -Faculty Entrepreneurship Development Program (FEDP)	05th March 2024	CGC, Mohali **[online]**
5.	Hybrid machining processes	Expert talk	11th August 2023	NITTTR, Chandigarh
6.	Manufacturing and recycling of advanced structural composites using microwave energy	Expert talk	27th July 2023	UIET, PU, Chandigarh
7.	Basics of additive manufacturing	Short Term Course on Additive Manufacturing	19th July 2023	NITTTR, Chandigarh **[online]**

4. Dr. Rik Rani Koner

1. Delivered an invited talk at "International Conference on Functional Materials-2024" (ICFM-2024) from January 9-11, 2024 (IIT Kharagpur).
2. Delivered an invited talk at"National conference on Recent Trends in Chemical Science and Technology (RTCST)" on the 1st and 2nd of March, 2024 (IIT Patna).

5. Dr. Ranbir Singh

1. **Invited Lecture** "Solar Energy Materials and Technology" at Two Weeks Refresher Course in Nanoscience and Instrumentation conducted during 11.09.2023- 22.09.2023 (O. Plan No. ICT -70) Topic: NITTTER, Chandigarh 15.09.2023.
2. **Invited Lecture** "Advances in Energy Conversion Materials and Technologies" at 5 – Day Faculty Development Program on NEW FRONTIERS IN SEMICONDUCTOR TECHNOLOGY AND QUANTUM TECHNOLOGY, 13 to 17th May 2024.

6. Dr. Prateek Saxena

1. Delivered an expert talk on additive manufacturing and industry 4.0 is scheduled on 1st April, 2024 at NIT Kurukshetra, as a part of an online short-term course (e-STC) on Smart Manufacturing Practices for Industry 4.0: Potentials and Challenges (01 - 05 April 2024).
2. Delivered an expert talk on metal additive manufacturing in the one-day workshop on 3D Printing for Entrepreneurs, organized by Technology Innovation Hub, Shri Mata Vaishno Devi University, Katra, Jammu & Kashmir on 1st March, 2024.
3. Delivered an expert lecture on additive manufacturing in five days FDP on "Advances in materials technology for next generation manufacturing" (1st to 5th February 2024). organized by Ballari Institute of Technology & Management, Ballari, Karnataka.
4. Delivered a session on metal additive manufacturing, in AICTE-ISTE approved two weeks STTP on Recent developments in materials and manufacturing processes (15 Jan. - 29 Jan. 2024) at Smt. Kashibai Navale College of Engineering, Vadagaon, Pune.

5. Delivered a session on "Filament fabrication, 3D printing, debinding, and sintering for extrusion-based metal additive manufacturing", in one-week AICTE Training and Learning (ATAL) Academy Program on "Advanced 3D Design and Printing for functional applications (25 - 30 Dec 2023)", at Oriental Institute of Science & Technology Bhopal.

7. Dr. Pradeep Kumar

- Invited Lectures at NIT GOA and BITS Pilani, GOA Campus.

8. Dr. Parmod Kumar

- Delivered a lecture on Waste Heat Recovery Technologies at MGGEC, Jeori, H.P.

(v) Short Term Course/Workshop organized during 1-4-2023 to 31-3-2024

1. Prof. Rahul Vaish

This year, we organized a series of workshops focused on school learning with our Tinkering Lab, aimed at promoting hands-on, demonstrative education. We invited students from various schools across Himachal Pradesh to participate in these interactive sessions, which allowed them to explore and experiment with cutting-edge technologies and scientific principles. Through engaging activities and practical experiments, we aimed to ignite curiosity and foster a love for STEAM education among young learners.

12-01-2024, 86 Students
Navodaya Vidyalaya, Pandoh H.P.

20-12-2023, 45 Students
G.S.S.S. Khuhan H.P.

22-12-2023, 18 Students
G.S.S.S. Kataula H.P.

09-01-2024, 18 Students
G.S.S.S. Baryara H.P.

2. Dr. Swati Sharma

Organizing committee member for Indian Conference on Carbon Materials ICCM 2023, 30th Nov – 2nd Dec 2023, Mumbai, India.

3. Dr. Sunny Zafar

S.No.	Title	Sponsorship	Participant numbers	Dates	Role
1	Hands-on Course on Product Design and Manufacturing	HPKVN	30	13 Dec 2022-03 Jan 2023	Coordinator

4. Dr. Prateek Saxena

- Successfully organized Indo-German Science and Technology Centre sponsored workshop on Engineering for Sustainable and Resilient Development (Jan. 18 – 20, 2024), at IIT Mandi.

- Organizing committee member for international conference on composites: Design, Processing, Manufacturing, and Health monitoring scheduled from 20 – 21 June 2024, IIT Mandi.

(vi) Professional Faculty/students Achievements/Honours/Awards

1. Dr. Mohd Talha

1. Featured among the Top 2% Scientists and Researchers of theWorld for the year 2022 & 2023 − a joint exercise published by Stanford University and Elsevier.
2. Visiting Professor, Universit´e de Technologie Belfort-Montbeliard, 90010 Belfort Cedex, France, France, October - December, 2022.
3. Guest Lecturer, International Summer School, School of Mechano-Electronic Engineering, Xidian University, China, 01- 15 July 2023.
4. Received Best Paper award in the Joint Conference of APCATS, AJSAE &AAME 2023 held in JEJU Boo-Young Hotel & Resort, Jeju Island, Republic of Korea during 11-14 October 2023, hosted by The Society for Aerospace System Engineering (SASE), South Korea. The paper Vibration analysis of FGM porous curved panels with cutouts: An FE-based multilayered model approach".Received IEI NMLC-FCRIT Excellence Awards 2023 for recognition under Research Excellence in Teaching Faculty National category on 15 September 2023, The Institution of Engineers (India).

2. Dr. Sunny Zafar

Life member of Tribological society of India.

3. Dr. Rik Rani Koner

(i) Awarded the WISER fellowship from IGSTC.

4. Dr. Gajendra Singh

1. Stanford "Bio Design Innovation Garage" Award
2. Dr K Radhakrishnan "Young Scientist Award"

5. Dr. Gaurav Bhutani

Teaching Excellence Award, IIT Mandi, India, Sep 2023.

6. Dr. Mrityunjay Doddamani

(a) Featured in Top 2% Scientists, 2023 Ranking List by Elsevier BV.
(b) Young Faculty Fellow 2024, IIT Mandi.

7. Dr. Parmod Kumar

- Received Young Achiever Award from IIT Mandi

(vii) Membership of Professional Societies

1. Dr. Ranbir Singh

- Membership of Perovskite Society in India
- Membership of IEEE

2. Dr. Gajendra Singh

1. Research Affiliate – The University of Sydney, Australia
2. Society of Automotive Engineers

Outreach Activities

1. Dr. Mohd Talha

- Member, Research and Development Committee (R.D.C), Department of Mechanical Engineering, Integral University, Lucknow, January 2024 to present
- International Steering Committee Member, Joint Conference of APCATS, AJSAE & AAME 2023,JEJU Boo-Young Hotel & Resort, Jeju Island, Republic of Korea, October 11-14, 2023.

2. Dr. Ravindra Bukke Naik

(1) Nodal officer for the tribal activities: November 2023 – present.

(2) Institute Selection Committee member for the post of Junior Assistant (Level-03, Group-C): March 2024 – present.

(3) Co-coordinator of the Textiles Engineering Education for Undergraduate & Postgraduates under the National Technical Textiles Mission (NTTM).

(4) Member of the pre-doctorial preparatory program (PPP), IIT Mandi.

3. Dr. Prateek Saxena

1. Participated in a conference on Innovation and Global Partnership for Sustainability (12 – 14 March 2024) in New Delhi, organized by DAAD Germany to foster industry – academia collaboration as a part of Indo – German partnership.
2. Received visiting researcher fellowship from TU Berlin, Germany. Research stay at the Institute for Machine Tools and Factory management, Berlin (Germany) from 6th June to 31st July 2024.
3. Hosted Mr. Christian Lahoda from TU Berlin, Germany in the month of March – April 2023, and visited TU Berlin in June – July 2023 with a support received from Indo-German Science and Technology Center through Paired Early Career Fellowship in Applied Research (Rs. 10 lakhs approx.).
4. Participated in the Aero India event (13 Feb. - 17 Feb. 2023) in Bengaluru for interaction with the industries working in the area of defense automotive technologies.
5. Visited Intech Additive Solutions Pvt. Ltd (Feb. 2023) in Bengaluru for collaboration in the area of metal 3D printing.

4. Dr. Pradeep Kumar

Expert Talk in Aerothermal Heat Transfer Group of Aerothermal Design and Analysis Division, VSSC, ISRO.

5. Dr. Anil Kishan

Gave lectures on Calculus, FDP for SCERT Teachers, 19-9-2023, 20-2-2023, Two Sessions.

6. Dr. Dube Dheeraj Prakashchand

IIT Jodhpur Meity Consortium

Proposed work: Olfactory Neuropathology in Alzheimer's Disease (AD): A Potential Clinical Marker for AD Severity and Progression.

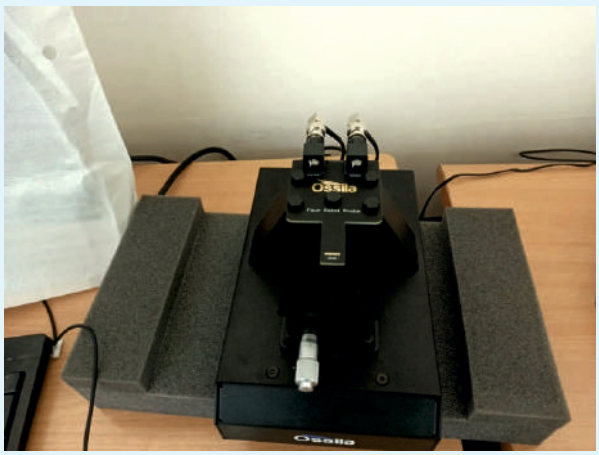
7. Dr. Prateek Saxena

Mentoring the team "Prithvi systems & innovations" incubated at catalyst, IIT Mandi under Nidhi-Prayas Scheme.
Established and heading the Additive manufacturing (AM) research lab.

(a) Electric Vehicle Lab

(i) Four Probe System

The four-probe system, also known as the four-terminal sensing or 4-wire sensing method, is a technique used to measure the resistivity of semiconductor samples. It involves using four equally spaced, co-linear probes to make electrical contact with the material. By passing a current through two outer probes and measuring the voltage through the inner probes, the substrate resistivity can be determined. This method is commonly used for measuring sheet resistance (surface resistance) and is applicable to any conductive sample.



(ii) Solar Cell I-V Test System

It is a reliable and cost-effective solution for characterizing photovoltaic (PV) devices. The system measures the current-voltage (I-V) curve of a solar cell using the classic four-probe (Kelvin) technique. This setup simplifies the measurement process and automatically calculates essential device properties based on the I-V curve. Periodic I-V measurements track the stability of device properties over time.

(iii) Optical Microscope

An optical microscope, also known as a light microscope, uses lenses and visible light to magnify small samples. By placing lenses between the sample and the viewer's eye, it allows scientists, doctors, and engineers to examine tiny objects in greater detail. These microscopes are widely used in scientific research, medical diagnosis, and manufacturing.

(iv) Superconductivity Experiment Kit

Superconductivity experiments explore the fascinating properties of materials that exhibit zero electrical resistance below a critical temperature. **Superconductors:** These materials, when cooled below their critical temperature (Tc), allow electric current to flow without any resistance. This phenomenon is crucial for applications like MRI machines, particle accelerators, and high-speed trains.

Meissner Effect: When a superconductor expels magnetic fields from its interior, it "locks" them out. This results in magnetic levitation (e.g., a floating magnet above a superconductor).

Critical Temperature (Tc): Each superconductor has a specific Tc. Below this temperature, it transitions into the superconducting state.

3.3 School of Civil and Environmental Engineering (SCENE)

School of Civil and Environmental Engineering (SCENE) is committed to serve the society through innovation and excellence in engineering, education and research with main focus on sustainable development and technological advancement. Our mission includes translation of research into the welfare of society, integration of research with engineering education; execution of external research projects towards engineering solutions via cross-disciplinary research approach etc. We are engaged in multidisciplinary and holistic teaching and learning to achieve global standards in skill and research development towards self-reliant nations. Developing innovative and sustainable solutions for resilient infrastructure with specific focus on mountain hazards. Developing socio-techno-economic-green solutions to alleviate climatic and anthropogenic catastrophes. Imbibing flexible, critical, creative and ethic centered principles in the education and research process.

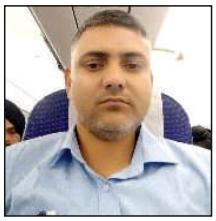
We are committed to a high standard of engineering education through outstanding teaching, innovative curricula, and an excellent research environment. SCENE offers B.Tech. in Civil Engineering; M.Tech. in Structural Engineering, M.Tech.(Research), M.Tech. (Research) +Ph.D. (dual degree) and Ph.D. (Doctor of Philosophy) in a number of different branches such as Structural Engineering, Geotechnical Engineering, Water Resource Engineering, Remote sensing & Geoinformatics Engineering and Environmental Engineering.

Presently, School of Civil and Environmental Engineering has 19 Regular Faculty members and 4 other Faculty members including 08 Associate Professors, 11 Assistant Professor, 2 Adjunct Professors, 1 DST inspire fellow and 1 professor on Practice. There are 9 Staff Members and around 79 Ph.D. Students, 4 Ph.D. Dual degree, 20 M.Tech. (Research), 26 M.Tech. and 149 (25+37+38+49) B.Tech. Students in our school.

The School has state-of-the-art laboratory and computational facilities to support cutting-edge research in the various disciplines of Civil and Environmental Engineering. We have several well equipped UG labs such as Structural Analysis Lab (SAL), Construction Material Lab (CML) Lab, Transportation Lab, Survey Lab, Geotechnical Lab, Environmental Engineering Lab, Rock Mechanics and Earth Science (RoMES) Lab, Water Resource Engineering (WRE) Lab. Along with these, we also have many advanced laboratories such as Advanced Structural Engineering lab (ADSEL), I4S Lab, Geohazard Lab, Advanced Hydrology Lab, Disaster Extremes and Environmental Remote Sensing (Dexter) Lab, Sigma HVR L ab, Atmospheric Chemistry and Climate Change Lab, Multi-Hazard Analysis and Infrastructure Design (MH-AID) laboratory etc. We have successfully secured research and consultancy projects from several renowned external funding agencies such as SERB, DRDO, ISRO, MoE, NRDMS, MoES, DLR (German Aerospace Centre), SDMA, NDMA etc. Currently, there are several ongoing research and consultancy projects with SCENE faculty. We are striving our best to bring excellence in all domains of Civil and Environmental Engineering.

Website: https://scene.iitmandi.ac.in/pages/faculty_list

Faculty Members		
1.	**Dr. Dericks Praise Shukla** Chairperson & Associate Professor Specialization: Remote Sensing & GIS Geinformatics; Natural Hazards; Landslides; Permafrost; Glacial Studies; Environmental Geology Ph.D. from University of Delhi (2012) Home Town: Allahabad, Uttar Pradesh Contact: 01905-267147 E-mail: dericks@iitmandi.ac.in, chair_scene@iitmand.ac.in	

2.	**Dr. Deepak Swami** Associate Professor Specialization: Water Resources Engineering Groundwater flow and transport modelling, Water resources development and management, Disaster mitigation specially related to floods and flash flood. Ph.D. from IIT Roorkee (2014) Home Town: Kota, Rajasthan Phone: 01905-267265; E-mail: deepak@iitmandi.ac.in	
3.	**Dr. Venkata Uday Kala** Associate Professor Specialization: Geotechnical Engineering Landslide Monitoring, Landslide mitigation, Innovations in Disaster management, Environmental Geotech Ph.D. from Indian Institute of Technology, Bombay (2013) Home Town: Hyderabad Phone: 01905-267703; E-mail: uday@iitmandi.ac.in	
4.	**Dr. Kaustav Sarkar** Associate Professor Specialization: Structural Engineering Durable Infrastructure; Climate-sensitive design; Construction Materials Ph.D. from Indian Institute of Technology, Delhi (2016) Home Town: Kolkata, West Bengal Phone: 01905-267901; E-mail: srkr@iitmandi.ac.in	
5.	**Dr. Rajneesh Sharma** Associate Professor Specialization: Structural Engineering Mechanics of Composite materials, Design of nontraditional structures, Fracture and failure of mater Ph.D. from Indian Institute of Technology, Delhi Home Town: Hamirpur, (H.P) E-mail: rsharma@iitmandi.ac.in	
6.	**Dr. Subhamoy Sen** Associate Professor Specialization: Structural Engineering Bayesian filters, Stochastic estimation, Structural health monitoring, Mass concrete Ph.D. from Indian Institute of Technology, Kharagpur (2016) Home Town: West Bengal Phone: 01905-267261; E-mail: subhamoy@iitmandi.ac.in	
7.	**Dr. Maheshreddy Gade** Assistant Professor Specialization: Structural Engineering Wave propagation in elastic half-space, Rotational seismology, Earthquake source modelling Ph.D. from Indian Institute of Technology, Madras (2016) Home Town: West Bengal E-mail: maheshreddy@iitmandi.ac.in	

8.	**Dr. Sandip Kumar Saha** Assistant Professor Specialization: Structural Engineering Multi-hazard resilient infrastructure; Passive vibration control; Seismic Soil-Structure interaction Ph.D. from Indian Institute of Technology, Delhi (2014) Home Town: Binodia, Mursidabad, West Bengal Phone: 01905-267907; E-mail: sandip_saha@iitmandi.ac.in	
9.	**Dr. Ashutosh Kumar** Assistant Professor Specialization: Geotechnical Engineering Geotechnical Earthquake Engineering, Soil-structure interaction, pavement geotechnics Ph.D. from IIT Bombay (2018) Home Town: Bihar Phone: 01905-267825; E-Mail: ashutosh@iitmandi.ac.in	
10.	**Dr. Dhanya J.** Assistant Professor Specialization: Structural Engineering Random field modelling, Computational Earth Model, Earthquake data analysis, Seismic Hazard, Predict Ph.D. from Indian Institute of Technology, Madras Home Town: West Bengal E-mail: dhanya@iitmandi.ac.in	
11.	**Dr. Harshad Vijay Kulkarni** Assistant Professor Specialization: Environmental Engineering Environmental engineering; Aqueous biogeochemistry; Advanced water purification and desalination Ph.D. from Kansas State University, Manhattan, Kansas, USA (2016) Home Town: Maharashtara E-mail: harshad@iitmandi.ac.in	
12.	**Dr. Mousumi Mukherjee** Assistant Professor Specialization: Geotechnical Engineering Theoretical and Computational Geomechanics, Constitutive Modeling of Frictional Material Ph.D. from Indian Institute of Technology, Kanpur (2016) Home Town: West Bengal Phone: 01905-267997; E-mail: mousumi@iitmandi.ac.in	

13.	**Dr. Sayantan Sarkar** Assistant Professor Specialization: Environmental Engineering Atmospheric aerosols; Air quality; Climate forcing; Source apportionment; Population exposure Ph.D. from Jawaharlal Nehru University (2012) Home Town: West Bengal Phone: 01905-267714; E-mail: sayantan@iitmandi.ac.in	
14.	**Dr. Shashank Pathak** Assistant Professor Specialization: Structural Engineering Structural Dynamics; Uncertainty Analysis Ph.D. from Indian Institute of Technology, New Delhi Home Town: Kanpur (U.P) Phone: 01905-267716; E-mail: shashank@iitmandi.ac.in	
15.	**Dr. Shivang Shekhar** Assistant Professor Specialization: Structural Engineering Bridge Engineering, Earthquake Engineering, Risk and Reliability of Infrastructure Systems Ph.D. from Indian Institute of Technology, Bombay (2020) Phone: 01905-267724; E-mail: shivang@iitmandi.ac.in	
16.	**Dr. Surya Kant Sahdeo** Assistant Professor Specialization: Transportation Engineering; Analysis and Design of Pavements; Construction Materials Ph.D. from Indian Institute of Technology, Roorkee (2022) Phone: 01905- E-mail: suryasahdeo@iitmandi.ac.in	
17.	**Dr. Prasanna Rousseau** Assistant Professor Specialization: Geotechnical Engineering Experimental Geotechnique, Geotechnical Earthquake Engineering, Critical State Soil Mechanics Ph.D. from Carleton University, Ottawa, Canada (2020) Phone: 01905-267118; E-mail: prasanna@iitmandi.ac.in	
18.	**Dr. Thainswemong Choudhury** Assistant Professor Specialization: Structural Engineering Masonry structures, Retrofitting, Heritage structure Ph.D. from Indian Institute of Technology, Guwahati (2020) Phone: 01905-267725; E-mail: thainswe@iitmandi.ac.in	

19.	**Dr. Vivek Gupta** Assistant Professor Specialization: Water Resource Engineering Hydroclimatic Extremes, Floods and Droughts, Forecasting, Stochastic modelling, AI & ML, DSS Ph.D. from Indian Institute of Technology, Roorkee (2020) Phone: 01905-267117; E-mail: vivek@iitmandi.ac.in	

List of Other Faculty Members

1.	**Dr. Anand Giri, Inspire Fellow** Specialization: Environmental Engineering Carbon dioxide capture and utilisation, Microbial remediation, Enzyme Purification Ph.D. from Central University, Hamirpur Home Town: Uttrakhand E-mail: anand_giri@projects.iitmandi.ac.in	
2.	**Prof. Ing. Balthasar Novák, Adjunct Professor** Specialization: Structural Engineering Ph.D. from Technical University Darmstadt (1995) E-mail: balthasar.novak@iitmandi.ac.in	
3.	**Prof. Narendra Kumar Goel, Adjunct Professor** Specialization: Stochastic Hydrology, Extreme value estimation, Flood estimation and forecasting, Power generation projects and pipeline projects, hydrological analysis, and planning, Dam Engineering Ph.D. in Hydrology from Indian Institute of Technology, Roorkee (1991) E-mail: nkgoel@hy.iitr.ac.in, goelhy@gmail.com	
4.	**Dr. Dharmendra Gill, Professor of Practice** Engineer in Chief Jal Shakti Vibhag, Shimla Ph.D. from Indian Institute of Technology, Delhi (2017) E-mail: dharmendra.gill@gmail.com	

3.3.1 Published Book and Published Book Chapters

1. Thainswemong Choudhry, KVNS Raviteja, Lakhveer Singh, Elisa Bertolesi, "Sustainable Materials in Civil Infrastructure (2024)" Elsevier. ISBN-10 (0443161429), ISBN-13 (978-0443161421).

Sr. No	Title of the Book	Author(s) Name(s)	Publication Year	Publisher	Book Chapter	ISBN (if available)
1.	Environmental Geotechnics: Waste and Geotechnical Stabilization	Ammavajjala Sesha Sai Raghuram, **Rousseau Prasanna**, Anasua Guharay, and Priyadharshini Perumal	2024	Nova Science Publishers	Chapter 9. Efficacy of Alkali-Activated Fly Ash-Based Deep Soil Mixing Column to Stabilize Expansive Clay	ISBN: 979-8-89113-651-9
2.	Recent Advances in Mechanics of Functional Materials and Structures	Ganesh Jaiswal, **Rajneesh Sharma**	2024	Springer nature	The Effective Mechanical Properties of the Cement Mortar Based on the Greyscale Marker of Microstructure Images	ISBN978-981-99-5918-1
3.	Trends in Mathematics	**Shashank Pathak**	2024	Springer	Fractional Differential Equations: A Primer for Structural Dynamics Applications.	https://doi.org/10.1007/978-3-031-42539-4_31
4.	Role of Green Chemistry in Ecosystem Restoration to Achieve Environmental Sustainability	Drouiche, N., Soni, R., & **Shukla, D. P.** Arun Lal Srivastav, Ajmer Singh Grewal, Markandeya, Tien Duc Pham	2024	Elsevier	Chapter 17. Sustainable approaches to heavy metal removal from water (179-189)	https://doi.org/10.1016/B978-0-443-15291-7.00020-1
5.	River, Sediment and Hydrological Extremes: Causes, Impacts and Management	Sharma, S., & **Swami, D**. Pandey, M., Gupta, A.K., Oliveto, G,	2023	Springer	Spatial and Temporal Variability of Soil Moisture, Its Measurement and Methods for Analysis: A Review (131—164)	https://link.springer.com/chapter/10.1007/978-981-99-4811-6_8
6.	Advances in River Corridor Research and Applications	Thomas Varner, Deeksha Kumari, **Anand Giri,** Peter S.K. Knappett, Saugata Datta, **Harshad V. Kulkarni**	2023	Springer Nature, Singapore	Occurrence of Sedimentary Iron and Arsenic Along the Beas River and Implications for Arsenic Enrichment in the Sutlej-Indus River Basin, India	https://doi.org/10.1007/978-981-97-1227-4_15

7.	Advances in River Corridor Research and Applications	Thomas S Varner, Saptarshi Saha, Kyungwon Kwak, Mesbah Uddin Bhuiyan, **Harshad V Kulkarni,** Ananya Mukhopadhyay, Peter SK Knappett, Saugata Datta	2023	Springer Nature, Singapore	Distribution of Arsenic and Iron in Hyporheic Zone Sediments Along the Hooghly River	https://doi.org/10.1007/978-981-97-1227-4_16
8.	Arsenic in the Environment: Bridging Science to Practice for Sustainable Development	**Harshad V. Kulkarni,** Shovon Barua, MG Kibria, Prosun Bhattacharya, Saugata Datta	2023	CRC Press	Understanding the interactions among dissolved organic matter, fecal contamination, and arsenic in the groundwaters of southeast Bangladesh	https://doi.org/10.1201/9781003317395-30
9.	Smart Geotechnics for Smart Cities: : Proceedings of the 17th Asian Regional Conference (17ARC 2023)	Aman Ujjwal, Sureka S., **Mousumi Mukherjee** and Arindam Dey	2023	CRC Press, Oxon, USA	Influence of aspect ratio and gully width on the run-out distance and velocity profile of dry granular debris flow	ISBN No. 978-1-003-29912-7
10.	Proceedings of the 2022 Eurasian OpenSees Days. EOS 2022. Lecture Notes in Civil Engineering, vol 326	Atharv A. Saurkar, **Mousumi Mukherjee,** Nishant Sharma and Arindam Dey	2023	Springer Cham	Nonlinear analysis of coupled building-foundation system subjected to lateral loading condition	ISBN No. 978-3-031-30124-7
11.	Life-Cycle of Structures and Infrastructure Systems	**S. Shekhar,** B. Panchireddi, J. Ghosh	2023	CRC Press	Quantifying the effects of long duration ground motions on the lifetime seismic losses of aging highway bridges	ISBN No. 978-1-003-32302-0
12.	Recent Developments in Structural Engineering, Volume 1	**Shivang Shekhar,** Mayank Gangwar, & Vikram Kumar R	2023	Springer	Influence of Mainshock Aftershock Sequences on the Seismic Vulnerability of Bridges in	ISBN No. 978-981-99-9624-7https://doi.org/10.1007/978-981-99-9625-4_45
13.	Integrated Drought Management, Volume 2	**Vivek Gupta,** Manoj Kumar Jain., & Shivam Gupta	2023	CRC Press	Copula-Based Bivariate Frequency Analysis of Drought Characteristics over India	ISBN No. 978-1-003-27654-8

14.	Integrated Drought Management, Volume 2	Jain, M. K., & Gupta, V.	2023	CRC Press	Multimodel Ensemble–Based Drought Characterization over India for 21st Century	ISBN No 978-1-003-27654-8 https://doi.org/10.1201/9781003276548

3.3.2 Patents

S. No.	Patent Application No.	Title of the Patent	Inventor detail	Year of filing	Patent Grant No.	Patent Grant Date
1	202111001337	A low-cost subsurface landslide monitoring and early warning system	Dutt, V., Uday K, V, P., Priyanka	2021	466410	07-11-2023
2	201711045337	Low-cost sensor-based system for landslide monitoring and alerts	Dutt, V., Uday K, V, Dutt, V., Agrawal, K., Agrawal, S., Mali, N., & Kala, U	2017	516584	28/02/2024

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1. Singh , A., Chhetri, N. K., , N., Gupta, S. K., & Shukla, D. P. (2023). Strategies for sampling pseudo-absences of landslide locations for landslide susceptibility mapping in complex mountainous terrain of Northwest Himalaya. Bulletin of Engineering Geology and the Environment, 82(8), 1-21. https://link.springer.com/article/10.1007/s10064-023-03333-x.
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3.3.4 National conferences attended and papers presented

1. A. Kumar and S. K. Saha, "Dynamic Characteristics and Seismic Response Analysis of Rectangular Tanks", 13th Structural Engineering Convention (SEC-2023), December 07 - 09, 2023, VNIT, Nagpur, India.(Paper presented by Former M.Tech student, Aman Kumar).
2. S. Baddipalli, M. Kulariya1 and S. K. Saha, "Effect of Dynamic Material Strength on Blast Response of Earthquake-Resistant Reinforced Concrete Buildings", 13th Structural Engineering Convention (SEC-2023), December 07 - 09, 2023, VNIT, Nagpur, India. .(Paper presented by Ph.D. student-Mahipal Kulariya).
3. K. K. Sengar, S. K. Saha and M. Gade, "Efficient and Sufficient Intensity Measures for Seismic Risk Assessment of Base-Isolated Liquid Storage Tanks", 13th Structural Engineering Convention (SEC-2023), December 07 - 09, 2023, VNIT, Nagpur, India. .(Paper presented by Ph.D. student-Sengar Ketan).
4. Varner, T.S., Kumari, D., Giri, A., Knappett, P.S., Datta, S. and Kulkarni, H.V., 2023, June. Occurrence of Sedimentary Iron and Arsenic Along the Beas River and Implications for Arsenic Enrichment in the Sutlej-Indus River Basin, India. In International Conference on River Corridor Research and Management (pp. 203-214). IIT Jammu Online. .(Paper presented by Ph.D. student-Diksha Kumari).
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10. Madhusudan Negi, Mousumi Mukherjee and Dharani Raj S.V. (2023), Implications of adopting up-scaled particle size distribution in DEM for simulating the mechanical and instability response of sand, 9th International Congress on Computational Mechanics and Simulations (9ICCMS), Gandhinagar, India.
11. Km Shraddha, Shashank Pathak and Mousumi Mukherjee (2023), Identification of Soil Constitutive Parameters Employing Markov Chain Monte Carlo Simulations, 9th International Congress on Computational Mechanics and Simulations (9ICCMS), Gandhinagar, India.(Paper presented by Ph.D. student- Km Shraddha).
12. Govind Kant Mishra, Mousumi Mukherjee and Parmod Kumar (2023), Impact of Rheology and Aspect Ratio of Dislodged Debris Mass on the Depositional Characteristics of Debris Flow, Indian Geotechnical Conference (IGC-2023), Roorkee, India. .(Paper presented by Ph.D. student- Govind Kant Mishra).
13. Adil Nazir, Madhusudan Negi and Mousumi Mukherjee (2023), Micro-mechanical Analysis of Strain Rate Effect on Static Liquefaction of Sand in Undrained Triaxial Test Employing 3D DEM, Indian Geotechnical Conference (IGC-2023), Roorkee, India. .(Paper presented by Ph.D. student- Adil Nazir).
14. Siddharth Pathak and Mousumi Mukherjee (2023), Effect of Soil Dilatancy and Stiffness on Load Capacity of In-place Pile: A Finite Element based Numerical Study, Indian Geotechnical Conference (IGC-2023), Roorkee, India.(Paper presented by Ph.D. student- Siddharth Pathak).
15. K.N. Manohara, S.K. Mondal, A. Dey, Mousumi Mukherjee and R. Bharti (2023), Numerical investigation of the rainfall-induced mud-flow at New Haflong, Assam using depth-averaged model and geospatial techniques, Indian Geotechnical Conference (IGC-2023), Roorkee, India.

16. Jayesh Jeevani, Siddharth Pathak, Saloni Pandya and Mousumi Mukherjee (2023), Assessment of lateral load carrying capacity and p-y curve of single pile incorporating varying slenderness ratio, 12th Annual Conference of DFI-India: Sustainability on Deep Foundations, Vadodara, India.
17. Soni, H., Prasanna, R., and Manmatharajan, V. (2023). A critical review of factors affecting the critical state behaviour of soil. In Proc. of Indian Geotechnical Conference 2023, December 2023, IIT Roorkee, India. .(Paper presented by Ph.D. student- Himashu Soni).
18. Prasanna, R., and Boominathan, A. (2024). Geotechnical and Geophysical Investigation of Foundation Soil for a Historic Temple in Andhra Pradesh. In Proc. of International Symposium on Geotechnical Aspects of Heritage Structures ISGHS 2024, February 2024, NIT Trichy, India.
19. Patil, B.R., Sivakumar G., and Prasanna, R. (2024). Influence of dynamic loading on crack propagation in discontinuous rock. In Seminar on Innovation in Tunneling Technologies, April 2024, IIT Jammu, India. .(Paper presented by B.R Patil (PhD student from IIT Jammu).
20. Sarhosis, V., & Kumar, A. (2023). Kath-Kuni architecture: field investigations and material characterisation. Proceedings of the Institution of Civil Engineers, Proceedings of the Institution of Civil Engineers (2023).
21. Kala Venkata Uday., Maheshreddy Gade, & P. S. Nayek, Seismic Landslide Hazard Assessment of Mandi Town, Himachal Pradesh. Symposium in Earthquake Engineering, (2023).
22. Dr. K V Uday delivered an invited theme lecture on 'Landslides and Slope Stability' at Indian Geotechnical Conference IGC2023 , IIT Roorkee, Dec. 14-16 2023.
23. Priyanka, P., Chaturvedi, P., Kumar, P., Dutt, V., & Uday, K. V. (2023). Data-Driven Approach for Predicting Surface Subsidence Velocity from Geotechnical Parameters. International Advanced Computing Conference.
24. Reddy, Y. P., Bharti, N., & Sen, S. (2023). Mode Specific Damping Estimation—An Inverse Damping Modelling Technique. Indian Structural Steel Conference.
25. Gade, M., & Gade, M. (2023). A Comparative Study on Application of Machine Learning Algorithms in Ground Motion Prediction Equations. Symposium in Earthquake Engineering.

3.3.5 International conferences papers / Conference attended and papers presented

1. Mahanta, K. K., Singh , A., & Shukla, D. P. (2023, July). Tracking and Investigating Land Subsidence in Himalayan town using PSInSAR techniques: Lessons from Joshimath. XXVIII General Assembly of the International Union of Geodesy and Geophysics (IUGG), Berlin. https://doi.org/10.57757/IUGG23-4156.
2. U Thahira, DP Shukla, Geomorphic Analysis of an Unnamed Crater in The Diarcia Quadrangle (MC-2): For The Presence of Water Ice Signatures Using Sharad Radargrams, 2023 IEEE India Geoscience and Remote Sensing Symposium (InGARSS), 1-4.
3. N Tiwari, IP Pradhan, DP Shukla, Identifying Glacier Lake Dynamics and vulnerable zones for GLOF using AHP, AGU23.
4. IP Pradhan, KK Mahanta, N Tiwari, DP Shukla ,Debris-covered Glacier mapping using Random Forest algorithm of Kinnaur district, Himachal Pradesh, AGU23.
5. Pradhan, I. P., Mahanta, K. K., Gupta, P., & Shukla, D. P. (2023, June). Machine Learning based probable Permafrost mapping of Higher Himalayas in Kinnaur district, Himachal Pradesh.. European Conference on Permafrost, Puigcerdà, Spain.
6. A Singh, N Kc, DP Shukla, Assessment of Landslide Susceptibility in NH-3 Kullu-Manali Highway using Support Vector Machine (SVM) and Predisposing Factors, AGU23 (Dec.2023).
7. Nikita Gupta, Kirti Kumar Mahanta, Dericks P Shukla, Urban flood vulnerability mapping and assessment of National capital territory, Delhi, AGU23 (Dec.2023).
8. Ankit Singh, Dericks P Shukla, Role of Joint spacings of the strata in Landslide occurrences in the vicinity of IIT Mandi, AGU23 (Dec.2023).
9. KK Mahanta, IP Pradhan, SK Gupta, DP Shukla, Quantitative Risk Assessment of Geo hazards along the proposed Leh Manali Railway Line for Sustainable Railway Management, AGU23. (Dec.2023).

10. Ramesh P Singh, Son V Nghiem, Ramesh Singh, Impacts of Climate Change and Natural Hazards in Mountainous Regions II Oral, AGU23. (Dec.2023).
11. N Tiwari, R Singh, V Gupta, DP Shukla, Catastrophic 2023 Floods of Himachal Pradesh: A Scientific Overview of 20 years precipitation data, AGU23(Dec.2023).
12. S Raaj, V Gupta, V Singh, DP Shukla, Enhancing Peak Flow Prediction in Beas River Basin, India by Integrating SWAT Model with machine Learning, AGU23. (Dec.2023).
13. HK Romana, R Singh, DP Shukla, Agricultural Practices in the western parts of Indo-Gangetic Plains affecting the land-soil-ground water quality during 2000-2020. AGU23. (Dec.2023).
14. Saran Raaj, Vivek Gupta, Vishal Singh, Dericks Shukla, Integrating machine learning technique with SWAT model to optimize the prediction of peak flow in the Beas River basin, India, EGU24 (March-2024).
15. Dubey, A., Swami, D., Gupta, V., & Joshi, N. (2023). Characterization of Indian Summer Monsoon Drought and its Elevation Dependence over Indus River Basin, India. European Geosciences Union General Assembly, Vienna, Austria.
16. P Priyanka, Praveen Kumar, U Kala, Varun Dutt, Enhancing Landslide Prediction in the Himalayan Region Using Machine Learning Models and Antecedent Rainfall Data: A Case Study of Kamand Valley, Himachal Pradesh, India, 9th International Congress on Information and Communication Technology (ICICT 2024), London, UK (2023).
17. Dubey, A., Sharma, S., & Swami, D. (2023). Estimating Optimal Sampling Locations of Surface Soil Moisture at Different Scales Using Various Methods and comparing them for a Lower Himalayan Watershed Region. EGU23, Vienna, Austria.
18. Joshi, N., Dubey, A., Swami, D., & Gupta, V. (2023). Characterization of Indian Summer Monsoon Drought and its Elevation Dependance over Indus River Basin, India. EGU23, Vienna, Austria.
19. Chandel, A., Swami, D., & Swami, D. (2023). Determination of optimal number of Soil moisture and electrical conductivity sensors deployment in field. EGU23, Vienna, Austria.
20. Premnath, S., Pouragha, M., Sivathayalan, S., & Rousseau, P. (2024). Experimental Assessment of Undrained Soil Behavior a.long Generalized Strain Paths. Geo-Congress 2024, Canada (22-2-2024).
21. Sengar, K. K., Gade, M., & Saha, S. K. (2023). Efficient and Sufficient Intensity Measures for Seismic Risk Assessment of Base-Isolated Liquid Storage Tanks. Structural Engineering Congress 2023, Singapore.
22. Sharma, N., Goyal, A. K., & Gade, M. (2023). Effect of Soil Material Uncertainty on Seismic Response of Medium-Rise RC Frames Considering Soil-Structure Interaction. Eurasian Conference on Open Sees.
23. M. Kulariya and S. K. Saha, Efficient Intensity Measure for Landslide Vulnerability Assessment of Hillside Buildings, 6th World Landslide Forum, November 14-17, Florence, Italy, .(Paper presented by Ph.D. student-Mahipal Kulariya).
24. Tusshar Goel and Shashank Pathak, Effect of Air-Blast on the Crest Displacement of Concrete Gravity Dam. .(Paper presented by Ph.D. student Tusshar Goel).
25. Banerjee, P., Veach, A., Kulkarni, H.V., Nagaraja, T., Das, S.R. and Datta, S. Influence of Land Use on Geochemistry and Microbial Population and Their Subsequent Effects on Soil Phosphate Mobilization Across a Climatic Transect in Kansas. AGU23.
26. Hollan, S., Heathman, I., Kulkarni, H.V., Medley, J.J., Hathaway, J.J.M., Philips-Lander, C.M., Northup, D.E. and Datta, S., Volcanic (Lava Tube) Caves Water Chemistry influenced by High Magnitude Wildfires on Surface. In Goldschmidt 2023 Conference. GOLDSCHMIDT.
27. Varner, T.S., Kulkarni, H.V., Cardenas, M.B., Knappett, P.S. and Datta, S., Variation in Sedimentary Organic Matter properties along the Meghna River-Aquifer Interface and its Implications on As Mobility. In Goldschmidt 2023 Conference. GOLDSCHMIDT.
28. Madhusudan Negi and Mousumi Mukherjee, A DEM based micromechanical study on influence of lateral boundaries on instability response of sand under biaxial shearing, 10th European Conference on Numerical Methods in Geotechnical Engineering (NUMGE 2023), London, UK. .(Paper presented by Ph.D. student-Madhu Sudan).
29. Aman Ujjwal, Sureka S., Govind Kant Mishra, Mousumi Mukherjee and Arindam Dey, Static and dynamic impact forces on a rigid barrier due to dry debris flow simulated by a DEM-based granular column collapse, E3S Web of Conferences, Vol. 415 (8th International Conference on Debris Flow Hazard Mitigation, DFHM8, Torino, Italy), Paper No. 06019, pp. 1-4, DOI: https://doi.org/10.1051/e3sconf/202341506019.

30. Prasanna, R., Premnath, S., Pouragha, M., and Sivathayalan, S., Experimental Assessment of Undrained Soil Behavior along Generalized Strain Paths, GeoCongress 2024. ASCE GSP 348, 81-89.
31. Prasanna, R, Monotonic behaviour of sand under generalized loading and drainage conditions. Technological Advances in Science, Medicine and Engineering TASME 2023, 27th Annual conference, July 2023, Toronto, Canada.

3.3.6 Workshops/Other Institute/Industry Visited and Invited Lectures Delivered in India

(i) Dr. Sandip Kumar Saha

1. Delivered a Talk in person on "Vulnerability of Buildings in Hilly Region under Multi-Hazard Scenarios" in an Indo-German Science and Technology Centre (IGSTC) sponsored workshop on "Engineering for Sustainable and Resilient Development", January 18 - 20, 2024, IIT Mandi, Himachal Pradesh.
2. Delivered a talk in person on "Seismic Vulnerability and Earthquake Resistant Construction Practices" in a A Workshop "on Training and Capacity Building on Safe Construction Practices", organized by the District Disaster Management Aurthority (DDMA), Mandi, on the occassion of International Day for Disaster Risk Reduction and SAMARTH 2023, October 13, 2023, Mandi Himachal Pradesh.
3. Delivered an online lecture on "Multi-Hazard Vulnerability of Buildings in The Hilly Region" in a one-week Short Term Course (STC) on "Disaster Risk Reduction and Management", organized by Department of Civil Engineering, NIT Kurukshetra, Kurukshetra, Haryana, during June 12 - 16, 2023.

(ii) Dr. Kaustav Sarkar

1. Invited talk through online mode on "Durability design for sustainable concrete structures" in the online short term course on "Sustainable and Durable Green Concrete-Future and Applications" organized by the Department of Civil Engineering, NIT Jalandhar during 18-22 December, 2023.
2. Attended in person a workshop on Safety Aspects in Residential Technical Institutions and Best Practices at IIT Bombay during 3-4 November 2023.

(iii) Dr. Sayantan Sarkar

1. Health effects of traditional biomass-based cooking: a case study from Northeast India. Invited Lecture at UNDP-sponsored "National Workshop on Biomass-based Clean Cooking Solutions" at Sardar Swaran Singh National Institute of Bioenergy (SSS-NIBE), Ministry of New and Renewable Energy from 29th Feb to 1st March 2024. (In-person)
2. Aerosols from traffic emissions and impacts on air quality, health and climate. Invited lecture at SERB-sponsored online Faculty Development Program on "Traffic emissions in urban areas and challenges towards sustainable cities" at the National Institute of Technology (NIT) NIT Warangal – 14th December 2023. (Online talk)

(iv) Dr. Shashank Pathak

1. Uncertainties in Rock Mechanics Investigations, in Short-term Course on Application of Geology & Rock Mechanics in Tunnel Engineering, National Institute of Technology (NIT) Warangal, 02 October 2023. (Online talk).

(v) Dr. Harshad Vijay Kulkarni

1. Investigating Biogeochemical Alterations in the mid-Himalayan Mountain Ecosystem due to Natural and Anthropogenic Stressors. Invited Talk International Conference on Mountain Ecosystem Processes and Sustainable Livelihood, 5-7 March 2024, Kullu, Himachal Pradesh. (In-Person)

(vi) Dr. Mousumi Mukherjee

1. Resource person for the short course on Soil Constitutive models in the Center for Continuing Education in Indian Institute of Science (IISc), Bangalore, India, May 15-19, 2023. Delivered expert lectures on (1) Nonlinear Elasticity, (2) Stress-Dilatancy Relationship and Plastic Potential Function, (3) Soil Behavior Prediction by Modified Cam-Clay and (4) Predicting Rate-dependent Constitutive Response of Geomaterials Employing Visco-plastic Model. (In-Person).

2. Delivered In-person talk on "Implications of adopting up-scaled particle size distribution in DEM for simulating the mechanical and instability response of sand" in the Mini-Symposium on Recent Advances in Computational Geomechanics, 9th International Congress on Computational Mechanics and Simulations (9ICCMS), Gandhinagar, India on December 21, 2023.

3.3.7 Workshops / Other Institute/Industry Visited and Invited Lectures Delivered in Abroad

(i) Dr. K.V. Uday, presented the paper in 6th World Landslide Forum, Florence Italy, 14-17 Nov 2023.

(ii) Pathak, S. (2023), given an online talk on Finite element modelling of complex structures with model reduction & sub structuring, University of Liege, Belgium, 28 September 2023

(iii) Dr. Mousumi Mukherjee, delivered Modeling the constitutive response of geomaterials across the length scale: Universita degli Studi del Molise, Campobasso, Italy on July 3rd, 2023.

(iv) Dr. Mousumi Mukherjee, presented the paper 17th Asian Regional Conference (17ARC 2023), Astana, Kazakhstan, 14-18 August, 2023.

(v) Dr. Prasanna R, attended the online seminar on Monotonic Response of Sand Under Shear-Volume Coupled Deformation, In Geotechnical Society of Singapore Seminar series, 26th March 2024, Singapore.

(vi) Dr. Prasanna R, Monotonic response of sand under shear-volume coupled deformation". Keynote lecture in IITK - UOJ Joint workshop on Recent Advances in Construction and Civil Engineering Technologies, 7-12th December 2023, University of Jaffna, Sri Lanka. Keynote (Online)

3.3.8 Short Term Course/Workshop organized during 1-4-2023 to 31-3-2024

(i) ***Dr. Mousumi Mukherjee,*** organised a Mini-Symposium on "Recent Advances in Computational Geomechanics", 9th International Congress on Computational Mechanics and Simulations (9ICCMS), December 21, 2023, IIT Gandhinagar, India.

(ii) ***Dr. Ashutosh Kumar and Dr. Shivang Shekhar,*** organized a Five-Day Training Program for PMGSY Engineers and Personnel at PIU and SRRDA Level at the Indian Institute of Technology (IIT) Mandi from December 4th to 8th, 2023. The program aims to train PMGSY officials on planning, design and construction of rural roads and bridges.

3.3.9 Professional Faculty Achievements/Honours/Awards

S.No.	Faculty Name	Name of Achievements / honours / award	Granted By	Date of receiving
1.	Dr. Sandip Kumar Saha	Appointed as Editorial Board Member for ISET Jornal of Earthquake Technology	Indian Society of Earthquake Technology (ISET)	9/1/2023
2.	Dr. Sandip Kumar Saha	Appointed as a member of the "Multi Hazard analysis for Design of Structures- Subgroup B 2.8" of the Indian Road Congress (IRC)	Indian Road Congress (IRC)	5/1/2023
3.	Dr. Shashank Pathak	Appointed as Junior Associate Editor of Journal of Structural Dynamics in March 2023	Journal of Structural Dynamics, University of Liege	March 2023
4.	Dr. Kaustav Sarkar	Guest Editor	Indian Concrete Journal	10/1/2023
5.	Dr. Sayantan Sarkar	Appointed as Associate Editor for the journal "Air Quality, Atmosphere and Health"	Springer Nature	3/1/2023
6.	Dr. Harshad V. Kulkarni	Awarded title of "National Geographic Explorer 2024"	National Geographic Society, Washington D.C., USA	9/1/2024
7.	Dr. Harshad V. Kulkarni	Nodal Officer for the Mission LIfestyle for Environment	Ministry of Environment, Forest and Climate Change, GoI	31/5/2023
8.	Dr. Harshad V. Kulkarni	Committee Expert on the "Framework on identification material generated from industrial processses as waste or byproduct"	H.P. State Pollution Control Board	1/1/2024
9.	Dr. Mousumi Mukherjee	Honored by Indian Geotechnical Society as one of the top 75 Indian women leaders in the field of Geotechnical Engineering in 2023	Indian Geotechnical Society	14/12/2023
10.	Dr. Mousumi Mukherjee	Awarded SERB International Research Experience (SIRE) Fellowship to support visit to Monash University, Australia for 6 months	SERB, India	18/06/2023
11.	Dr. K.V.Uday	Awarded with “Young Faculty Fellow award” on the 15th Institute Foundation’s day	IIT Mandi	27/02/2024
12.	Dr. Subhamoy Sen	Awarded with “Young Faculty Fellow award” on the 15th Institute Foundation’s day	IIT Mandi	27/02/2024

3.3.10 Professional students Achievements/Honours/Awards

(i) **Mr. Himanshu Rana,** M.Tech Structural Engineering student secures fully funded PhD position in the Doctoral School at University of Technology of Compiegne, France. He will be working on the project “New multi-scale model for fatigue failure of composite structures under variable transient loads” for his three years of doctoral studies at University of Technology of Compiegne. Himanshu’s M.Tech research at IIT Mandi was focused on the development of floor response spectrum for multi-storied buildings using machine learning techniques under the supervision of Dr. Sandip Kumar Saha.

(ii) **Mr. Sonu Kumar,** working under the supervision of Dr. Ashutosh Kumar, has been selected for the highly prestigious Commonwealth Split-site Scholarship (CSC-2023) offered by the Government of the United Kingdom. This scholarship will allow Mr. Sonu to conduct his doctoral research for a period of 1 year within the Department of Engineering at Durham University, United Kingdom under the guidance of Professor Ashraf Osman.

(iii) **Mr. Shubham Kumar**, working under the supervision of Dr. Kala Venkata Uday, has been selected for the "LARAM International Summer School on Landslide Risk Assessment and Mitigation, Italy" organized by University of Salerno from September 4th to September 15th 2023. He received the International Travel Support (ITS) scheme fellowship provided by SERB, DST and the financial grant of ₹ 1.00 Lakh by IIT Mandi to attend the LARAM Summer School 2023.

(iv) **Mr. Varun Sharma,** scholar of Dr. Maheshreddy Gade secured the first position in the poster presentation competition at the recently concluded GEOHIM-2023 workshop. This prestigious event, jointly organized by the Central University of Himachal Pradesh and the Geological Society of India, served as a platform for showcasing cutting-edge research in Geodynamics and Natural Disaster Management. His presentation highlighted employing the spectral element method and the ANN function of Sharma et al., 2023, to simulate the time history of the 1905 Kangra earthquake. The 3-day workshop featured keynote talks by eminent scientists, including Padam Shri Dr. H.K. Gupta (Director, GSI), Dr. Sumeer Chopra (Director, IRS Gandhinagar), D. O.P. Mishra (NCS, MoES), and Dr. Himanshu Mittal (NCS).

(v) **Ms. Alpa Rajput,** PhD Scholar of Dr. Harshad V. Kulkarmo in the School of Civil and Environmental Engineering at IIT Mandi received International Association of Geochemistry 2024 PhD Student Research Grant. https://www.iagc-society.org/news/13350717 .

Every year the IAGC provides research funding for 6 students with the generous support of Elsevier. As a recipient of this grant, she will focus on investigating occurrence, transport and fate of pharmaceutically active compounds in the mid-Himalayan ecosystem. Alpa is a member of Applied Environmental and Contaminant Biogeochemistry Laboratory and mentored by Dr. Harshad V. Kulkarni.

(vi) **Mr. Dharani Raj,** research scholar of Dr. Mousumi Mukherjee, earlier M.Tech. Structural Engineering student secured fully funded PhD position in University of Adelaide, Australia.

(vii) **Mr. Armanul Hoda,** M.Tech Structural Engineering student selected as a Graduate Assistant within Department of Civil and Environmental Engineering at the University of New Hampshire in Durham, NH, USA.

(viii) **Mr. Prashant Rawat,** Ph.D Scholar of Dr. Sayantan Sarkar participated in the Indian Arctic Expedition 2023-24 for a project sponsored by NCPOR, MoES to investigate climate forcing aerosols.

(ix) **Ms. Charu Chauhan,** Ph.D Scholar of Dr. K. V. Uday received the 2nd Best paper award at Indian Geotechnical Conference (IGC-2023) held at IIT Roorkee from 14-16 December 2023.

(x) **Mr. Kirti Kumar Mahanta** (Guide-Dr. Dericks P. Shukla) and **Mr. V. Saran Raaj** (Guide-Dr. Vivek Gupta) received the Prime Minister Research Fellowship 2023.

(xi) **Ms. Priyanka Gupta,** PhD scholar of Dr. Dericks P. Shukla published "ML-Based Hybrid SAR and Optical Image LULC Mapping and Change Analysis With Variations in the Air Quality of the Imphal Valley, North-East India 19th March, 2024.

3.3.11 Membership of Professional Societies

(i) ***Dr. Mousumi Mukherjee***
- a) Indian Geotechnical Society (Life Member)
- b) International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)

(ii) ***Dr. Shivang Shekhar***
- a) Institute for Steel Development and Growth (INSDAG)

(iii) ***Dr. Sandip Kumar Saha***
- a) The Institution of Engineers (India)
- b) American Society of Civil Engineers (ASCE)
- c) Earthquake Engineering Research Institute (EERI), USA

(iv) ***Dr. Thainswemong Choudhary***
- a) Indian Society of Earthquake Technology
- b) American Society of Civil Engineers

(v) *Dr. Kaustav Sarkar*
a) Ameciran Concrete Institute (ACI)
(vi) *Dr. K.V.Uday*
a) American Society of Civil Engineers (ASCE)
(vii) *Dr. Subhamoy Sen*
a) Dam Safety Society
(viii) *Dr. Harshad V. Kulkarni*
a) Geological Society of America (GSA)
(ix) *Dr. Prasanna Rousseau*
a) Indian Geotechnical Society (IGS)

3.3.12 New Initiatives / New Research Facilities Created / Laboratory Established

(i) *Dr. Harshad V. Kulkarni*, Applied Environmental and Contaminant Biogeochemistry Laboratory.
(ii) *Dr. Sayantan Sarkar,* established the Atmospheric Chemistry and Climate Change Laboratory.

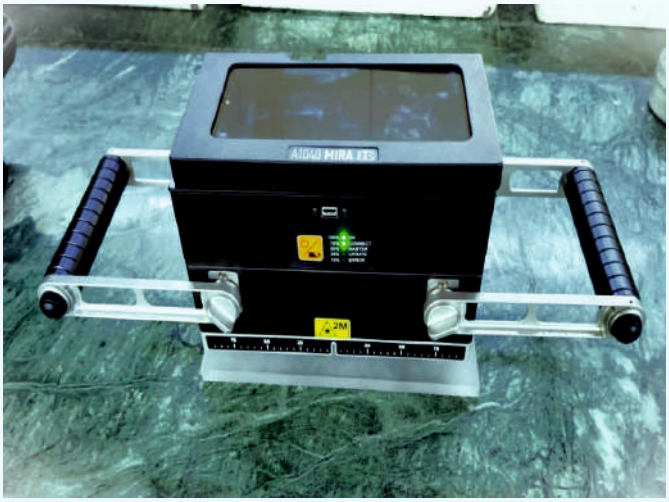
3.3.13 A Few Major Instruments Installed in Labs

Name of the Equipment: Concrete Ultrasonic Tomograph

Specialization: Concrete Technology

Name of the lab: Construction Materials Lab

Description of the Equipment: Concrete Ultrasonic Tomography (UT) is an emerging method of NDT that assays concrete diagnostics that can be used to improve the quality assurance control during concrete structures construction and assist in rehabilitation decisions.



1. Concrete Ultrasonic Tomograph

Name of the Equipment: Rock Triaxial compression Testing machine

Specialization: Rock Triaxial compression Strength

Name of the lab: Rock Mechanics Lab

Description of the Equipment: Triaxial tests are widely used in geotechnical engineering both in soil and rock mechanics. Specimens are axially loaded to failure while a confining pressure is constantly applied. As a result, the behavior of geomaterials is investigated in a three-dimensional stress state.

2. Rock Triaxial compression Testing machine

Name of the Equipment: Freezing and Thawing Cabinet
Specialization: Concrete Technology
Name of the lab: Construction Materials Lab

Description of the Equipment: Freeze-thaw testing is performed to assess the ability of a hardened concrete beam specimen to resist deterioration when subjected to repeated and rapid cycles of freezing and thawing. Freezing and thawing can lead to premature deterioration of concrete in the form of scaling and cracking. Concrete hydraulic structures, pavements, parking lots and bridge decks, can exhibit scaling after the first winter or two if the ingredients used are not adequately resistant to freeze-thaw cycles and the concrete mixture used is not properly air entrained.

3. Freezing and Thawing Cabinet

Name of the Equipment: 3D DIC 3D strain master ecosystem

Specialization: Measure displacement and strain

Name of the lab: Construction Materials Lab

Description of the Equipment: The 3D-DIC method combined with the DIC method and the principle of binocular stereo vision, using two alternating methods with a certain angle of a fixed camera surface-speckle image, and then through the image matching algorithm to calculate the image of the specific image coordinates, coupled with good calibration.

4. 3D DIC 3D strain master ecosystem

Name of the Equipment: UTM (Universal Testing Machine)
Specialization: Measure strength of the material
Name of the lab: Construction Materials Lab

Description of the Equipment: A Universal Testing Machine (UTM) is a type of mechanical testing equipment that is utilized for determining the mechanical properties of various materials, such as tensile strength, compressive strength, bending strength, and shear strength. The machine is capable of conducting stain-controlled tensile test of rebars and prestressing strands. It also has a special frame to facilitate compression testing of large-size mass concrete samples.

5. UTM (Universal Testing Machine)

3.4 School of Chemical Sciences

Chemistry discipline has remained one of the integral parts of the IIT Mandi academic community since its inception. Currently, the School of Chemical Sciences (SCS) is the home to a vibrant group of 15 faculty members, several research scholars, and Masters' students. SCS provides its faculty, students and scholars with a good academic ambiance and ecosystem. The faculty of SCS has established collaborations with scientists worldwide and thrives to excel in its teaching and research at national and international levels. SCS fosters a perfect harmony between fundamental and applied Chemistry through visionary research, innovation, and collaboration and is home to a diverse range of research areas involving synthetic organic chemistry, bioinorganic chemistry, spectroscopy and microscopy, organic and inorganic materials, functional nanomaterials, nano-electronics, drug delivery, polymer chemistry, organic electronics, theoretical and computational chemistry, homogeneous and heterogeneous catalysis, and photocatalysis. Interdisciplinary research lies in the heart of the SCS, which is constantly explored through fruitful research collaboration with biological and physical sciences and other branches of engineering sciences at IIT Mandi. Since its inception, SCS has successfully established many research collaborations with world-renowned institutions and attracted national and international research funding. Several of our alumni are well-placed in academic and industrial jobs in India and abroad. With its highly interdisciplinary and cutting-edge research activities, SCS constantly aims to push the frontiers of Chemistry and Material Science research and innovation.

SCS offers Ph.D. in different branches of Chemistry, M.Sc. in Chemistry and BS-MS Course. BS-MS course is a four year (6-semester) graduate program and 1 year optional in MS (2-semester). MSc Chemistry is a two-year (4-semester) postgraduate program, which was the first master-level program offered under the Basic Sciences discipline at IIT Mandi. MSc Chemistry is now the flagship program of the School of Chemical Sciences. This program aims to provide fundamental knowledge in the broad areas of Chemistry through core courses and simultaneously offers a knowledge base in the allied areas and beyond through elective courses. The MSc Chemistry program is highly research-oriented that enables students to avail a "learn-by-doing" approach through research projects.

Faculty Members

1	**Dr. Pradeep C. Parameswaran** Professor and Chairperson SCS Specialisation: Inorganic/Materials/Nano-Chemistry Ph.D from University of Hyderabad (2006) Home Town: Thrissur, Kerala Phone: 01905-237931/267045 Email: pradeep@iitmandi.ac.in, Chairperson Email: chairscs@iitmandi.ac.in	
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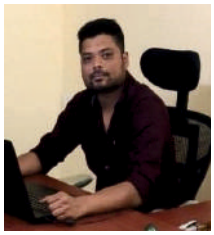
13	**Dr. Abhishek Dewanji** Assistant Professor Specialization: Novel synergistic catalysis, Modular scaffold synthesis Ph.D from University of Munster, Munster, Germany, 2012-2016 Home Town: Kolkata India Phone: 267182 E-mail: abhishek@iitmandi.ac.in	
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- NiFe-Coordination Polymers-Derived Layered Double Hydroxides as Bifunctional Materials: Effect of the Ni: Fe Ratio on the Electrochemical Performance T Kumar, B Devi, **A Halder**, RR Koner ChemPlusChem 88 (8), e202300186 2023.

- Photoelectrochemical Degradation of Organic Pollutants Coupled with Molecular Hydrogen Generation Using Bi2O3/TiO2 Nanoparticle Arrays R Kaushik, S Gandhi, **A Halder** ACS Applied Nano Materials 6 (6), 4297-4308 11 2023.

- Understanding the evolution of catalytically active multi-metal sites in a bifunctional high-entropy alloy electrocatalyst for zinc–air battery application C Madan, SR Jha, NK Katiyar, A Singh, R Mitra, CS Tiwary, K Biswas, **A Halder** . Energy Advances 2 (12), 2055-2068 1 2023.

3.4.1.4 Paper accepted in reputed International Journals

- 'Synthesis and application of sustainable vegetable oil-based polymers in 3D printing, RSC Sustainability, 2024 ACCEPTED, DOI: 10.1039/d4su00060a. Dr. Abhimanew Dhir.

- Indolo [3,2-a]carbazoles as Engineered Materials for Optoelectronic Applications: Synthesis, Structural Insights and Computational Screening. J. Org. Chem. 2024 (Accepted) Krishan Kumar, Diksha Thakur, Anirban Karmakar, Subhendu Patra, Arun Kumar, Subrata Banik, Subrata Ghosh.

3.4.1.5 National conferences attended and papers presented

- **Prof. Subrata Ghosh**, Invited talk in conference on "Recent Trends in Chemical Science and Technology (RTCST)" held at IIT Patna on March 1-2, 2024.

- **Dr. Aditi Halder**, Advanced Materials for Better Tomorrow (AMBT 2023)"from 10th to 13th October 2023 to be held in the Department of Physics, Banaras Hindu University, Varanasi, India.

- HSBC Green Hydrogen Initiative Workshop at IIT Bombay.

3.4.1.6 International conferences attended and papers presented

- **Dr. Garima Agrawal**, Biodegradable Disulfide Crosslinked Chitosan/Stearic Acid Nanoparticles for Dual Drug Delivery for Colorectal Cancer, International Conference on Polymers for Advanced Technology, Goa, India (February 2023) (Invited Speaker).

- **Dr. Abhishek Dewanji** Attended as an invited faculty participant, the International Conference on 'Emerging Trends in Catalysis & Synthesis 2024', 7^{th}-9^{th} March, 2024, organized by the Department of Chemistry, IIT Kharagpur.

- **Prof. Chayan K Nandi**,Ultra long-term Super-Resolution Tracking of Lysosomes in Brain Organoids by Near-Infrared Noble Metal Nanoclusters, Chayan K Nandi, Indo-France Seminar on Metal Nanoclusters (SEFIPRA) , 2-5^{th} October 2023, INST Mohali

- **Prof. Chayan K Nandi**, Rational Design of Fluorescent Nano Probes for Long Term Tracking and Super-Resolution Imaging of Lysosomal Dynamics: Chayan Kanti Nandi, FCS XIV Meeting: IISER Mohali, 12-17^{th} Dec 2023.

- **Dr. Moupriya Das**, Stochastic and Nonlinear Dynamics in Chemistry and Biology, 4^{th}-5^{th} January 2024 S N Bose Centre for Basic Sciences.

- **Dr. Moupriya Das**, Indo-German Science and Technology Centre Workshop, IIT Mandi, 18^{th}-20^{th} January.

- **Prof. Subrata Ghosh**, Invited talk in "International Conference on Functional Materials (ICFM)" at IITK haragpuron January 9-11, 2024.

- **Dr. Bhaskar Mondal**, Invited talk at the "International Conference on Catalysis (IC^2-2024)" international conference at IACS Kolkata, Kolkata, 11-13 March 2024.

- **Dr. Aditi Halder**, attend International Conference On Nanomaterials for Electro-Catalysis Technology (I-CONECT 2023)" in PHYSICAL MODE at Department of Chemistry IIT Delhi on 20, 21, and 22 March 2023.

3.4.1.7 Invited Lecturers/Talks/Continuing education programs

- **Prof. Aniruddha Chakraborty**: Delivered a talk to school teachers, in school teachers training camp at IIT Mandi, H.P 11/03/2023.

- **Dr. Moupriya Das**: Teachers' Training Program 2023 (Organized by State Council of Educational Research and Training, Delhi & Indian Institute of Technology Mandi), IIT Mandi, 10th-15th March, 2023.

- **Dr. Bhaskar Mondal** Talk at the "Faculty Development Program in Science for Govt. School Teachers" in collaboration with SCERT, Govt. of NCR Delhi, at IIT Mandi, March 2023.

- **Dr. Narayan Sinha :** Acted as an organizing committee member of School of Chemical Sciences for Teachers' Training Program (TTP 2023) from 26th October 2023 to 30th October 2023. I also gave a one-hour lecture with hands on practical demonstration to the teachers.

- **Dr. Abhishek Dewanji:** Delivered an Invited Lecture titled as 'Site-selective arene functionalization via EDA-complex photoactivation with aryl sulfonium salts' at the Organic Chemistry Symposium for Early Career Researchers (OCS-ECR 2024), 30th March, 2024, at IIT Jammu, jointly organized by IIT Jodhpur, IIT Jammu and Wiley-VCH.

- **Dr. Moupriya Das**, Advanced Training Program in Sciences for TGT, 26th-30th October 2023, IIT Mandi

- **Dr. Moupriya Das**, Stochastic and Nonlinear Dynamics in Chemistry and Biology, 4th-5th January 2024, S N Bose Centre for Basic Sciences.

- **Prof. Venkata Krishnan**, Delivered an invited talk at Sri G.V.G Visalakshi College for Women, Udumalpet, Tamil Nadu, India on Dec. 22, 2023.

    - Participated and delivered an invited talk at the 60th Annual Convention of Chemists organized by Indian Chemical Society at IIT Delhi, Delhi, India from Dec. 20 to 21, 2023.

    - Participated and delivered an invited talk at the 6th International Conference on Recent Trends in Materials and Devices (ICRTMD 2023), Amity University, Noida, Uttar Pradesh, India from Dec. 19 to 20, 2023.

    - Participated and delivered an invited talk at the Indo-French Seminar on Catalysis for Sustainability (IFSCS23), IISER Thiruvananthapuram, Kerala, India from Dec. 10 to 13, 2023.

    - Delivered an invited talk at e-STC on Recent Trends in Applied Spectroscopy and Microscopy in Materials Research', NIT Hamirpur, Himachal Pradesh, India on Dec. 05, 2023.

    - Delivered an invited talk at FDP on Recent Advances in Chemical Sciences, K.S.R College of Arts and Science for Women, Tiruchengode, Tamil Nadu, India on Nov. 29, 2023.

    - Participated and delivered an invited talk at the Science and Technology for Sustainable Future (STSF-2023), Sardar Patel University, Mandi, Himachal Pradesh, India from Nov. 25 to 26, 2023.

    - Participated and delivered an invited talk at the IGSTC: Indo-German Joint Scientific Workshop on GREEN H_2 held at IIT Bhilai, Chattisgarh, India from Nov. 22 to 24, 2023.

- Delivered an invited talk at University of West Indies, St Augustine Campus, Trinidad on Nov. 10, 2023.
- Delivered an invited talk at Department of Chemical Sciences, IISER Mohali, Punjab, India on Nov. 10, 2023.
- Delivered an invited talk at Department of Chemistry, IIT Bombay, Maharashtra, India on Nov. 06, 2023.
- Participated and delivered an invited talk at the International Conference on Integrative Chemical Science for Health and Environment (ICHE-2023), Deshbandhu College, University of Delhi, Delhi, India from Oct. 06 to 08, 2023.
- Delivered an invited talk at 21st Refresher Course in Physical Sciences & Nano Sciences HRDC, Jawaharlal Nehru University, Delhi, India on Sep. 21, 2023.
- Delivered an invited talk at 3rd International Conference on Recent Advances in Materials Science and Computational Techniques (RAMSCT 2023), Manipal University, Jaipur, Rajasthan, India on Sep. 21, 2023.
- Delivered an invited talk at LOQUITUR - Chemshala Webinar Series, IISER Berhampur, Odisha, India on Sep. 08, 2023.
- Delivered an invited talk at Centre for Functional Materials(CFM) Vellore Institute of Technology (VIT), Vellore, Tamil Nadu, India on Aug. 30, 2023.
- Delivered an invited talk at One Day Workshop on "Chemistry Innovations" Jaypee University of Information Technology, Solan, Himachal Pradesh, India on Aug. 18, 2023.
- Delivered an invited talk at 6th Faculty Development Programme on Perspectives of Recent Research in Chemistry (PRRC-2023), VIT Vellore, Tamil Nadu, India on Aug. 05, 2023.
- Delivered an invited talk at National Technology Day (NTD-2023) Celebration BITS-Pilani, K K Birla Goa Campus, Goa, India on May 10, 2023.
- Participated and delivered an invited talk at the International Conference on Functional Materials for Future Technology (IC-FMFT 2023), VIT Vellore, Tamil Nadu, India from Apr. 19 to 21, 2023.
- Delivered an invited talk at Department of Chemical Sciences, IISER Tirupati, Andhra Pradesh, India on Apr. 17, 2023.
- Delivered an invited talk at 7th International Conference on Nanoscience and Nanotechnology (ICONN 2023), SRMIST, Chennai, Tamil Nadu, India on Mar. 28, 2023.
- Participated in the two day workshop on Road Map for Indian Knowledge System (IKS)/Sanskrit in Technical Institute for Next Five Years at VNIT, Nagpur, Maharashtra, India from Mar. 24 to 25, 2023.
- Delivered an invited talk at Department of Chemistry, National Institute of Technology Nagpur, India on Mar. 23, 2023.
- Delivered an invited talk at Department of Physics, IIT Delhi, India on Mar. 22, 2023.
- Participated and delivered an invited talk at the International Conference on Nanomaterials for Electro-Catalysis Technologies (I-CONECT 2023), IIT Delhi, India from Mar. 20 to 22, 2023.
- Participated and delivered an invited talk at the 1st International Conference on Green Hydrogen for Global Decarbonization (ICGHGD-2023), PDEU Gandhinagar, Gujarat, India from Mar. 17 to 18, 2023.

- Delivered an invited talk at Doon University, Dehradun, Uttarakhand, India on Mar. 06, 2023.
- Participated and delivered an invited talk at the Emergent Materials for Energy and Environment (EMEE-2023), IIT Roorkee, Uttarakhand, India from Mar. 04 to 05, 2023.
- Delivered an invited talk at IIT Kanpur, Kanpur, Uttar Pradesh, India on Feb. 13, 2023.
- Delivered an invited talk at University of Bengkulu, Indonesia on Feb. 03, 2023.
- Delivered an invited talk at PSG Institute of Advanced Studies, Coimbatore, Tamil Nadu, India on Jan. 10, 2023.
- Delivered an invited talk at IIT Palakkad, Kerala, India on Jan. 09, 2023.
- Delivered an invited talk at Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu, India on Jan. 06, 2023.

- **Dr. Bhaskar Mondal**, Talk at the "SCERT-Delhi teacher's training program (TTP) in Science" at IIT Mandi, October 2023.

- **Prof. Prem Felix**, Expert lecture on "Electron microscopy: Fundamental, Characterization and Analysis" One Week FDP on Materials Characterization Techniques, December 04 - 08, 2023 at NITTTR Chandigarh.
  - Expert lecture on "Electron microscopy and analysis" Two Weeks Refresher Course in Nanoscience and Instrumentation, September 11- 22, 2023 at NITTTR Chandigarh.
  - Invited Tak, "Nanotechnology in Environment Remediation" Sikkim Manipal Institute of Technology, Sikkim, 8th September, 2023.
  - Invited Talk "Recent Trends in the Research on High Energetic Materials – A Material Chemist's Perspective" CEP on "High Explosive technology" held during 22-26 May 2023 at TBRL, Chandigarh.
  - Invited Talk "Conducting Polymer Nanocomposites as Highly Active Visible Light Photocatalysts" International conference on polymers for Advanced Technology, 23-25 February, 2023, APA Goa.

3.4.2 Workshop/Conference organized with high resolution soft copies of photographs

- **Coordinator:** Advanced Training Program in Sciences for TGT, 26th-30th October 2023, IIT Mandi.

The School of Chemical Sciences, participated in organizing a six-day Teachers' Training Program for a group of 52 teachers from different government schools located in Delhi. The objective of the Teachers' Training Program was to provide the targeted teachers pedagogic and advanced knowledge about the basic topics of Biology, Physics and Chemistry. The topics related to the chemical sciences were discussed by the expert faculty members of School of Chemical Sciences. Some training on hands-on experiments were also provided at the chemistry lab. Another important goal of this program was to make the teachers aware of the scope of study in Basic Sciences at IITs so that they can convey the gained view to the students with science background. The program offered the trainee teachers a bigger exposure to science and teaching, in general.

Coordinators

Prof. Prem Felix Siril (Chair)
Dr. Garima Agrawal (Co-coordinator)
Dr. Moupriya Das (Co-coordinator

- **Prof. Chayan K Nandi**, Mind, Brain, and Consciousness Conference 2023, IIT Mandi, IKSMHA Centre, 14-16th Dec 2023.

- **Dr. Aditi Halder: Catalysis for Energy, Environment and Sustainability-2023**

Sustainable Development Goals of the United Nations aims to protect the environment and the earth through the transformative steps of sustainable consumption of natural resources and adopting urgent action to mitigate the detrimental effects of climate change. Depletion of fossil fuels and escalation of global warming due to emission of greenhouse gases necessitate the generation of alternative energy production. We had organized another meeting on "Catalysis for Energy, Environment and Sustainability **(CEES-2023)**". The aim of this meeting was to discuss the persistent issues related "Sustainable Development Goals" defined by the United Nations.

The Conference was held at the Indian Institute of Technology Mandi from Sept. 25 to 27,2023. It provided an integrated platform of scientists, academicians and researchers working in the area of hydrogen generation, environmental remediation, CO_2 mitigation by capture-conversion towards a bigger goal to address the issue of climate change, and bringing in them together on a regular basis to meet in-person for exchange of knowledge/ideas toward this noble goal. The aim of this meeting and the conference is to discuss the persistent issues related to "Sustainable Development Goals" defined by the United Nations. Director, IIT Mandi Prof Laxmidhar Behera had inaugurated the function in the presence of around 30 eminent speakers starting from Indian Institute of Science (IISC) Bangalore, TIFR Mumbai and different IITs like IIT Madras, Delhi, Kanpur, Gandhinagar, Roper, Indore to NCl Pune, IICT-Hyderabad, BARC-Mumbai, INST-Mohali and IISER-Mohali. Industry personnels from Reliance Industry Limited, BPCL have joined the meeting for establishing Industry-Academia collaboration. The convenor of this conference is Dr Aditi Halder, Associate Professor, School of Chemical Science. The co-convenors are Dr Rik Koner, Associate Professor, School of Mechanical and Materials Engineering. and Prof Venkata Krishnan, Professor, School of Chemical Science, Prof Vivek Polshettiwar, Professor, TIFR Mumbai.Many students from different IITs have also participated in this meeting and presented their work. Dr Aditi Halder, convenor of this conference told, "IIT Mandi is committed to the betterment of society and environment and thus we work towards the Sustainable Development Goals".

The topics covered in this conference were :

- CO_2 Capture-Conversion
- Green Hydrogen
- Nanomaterials for Energy Conversion and Storage
- Energy Storage Devices; Supercapacitor and Battery
- Photocatalysis/ Photoelectrocatalysis for Energy Conversion
- Advanced Characterization for Catalysis

- Green Synthesis in Catalysis
- Theories for Energy Applications
- Electrosynthesis in Energy Domain
- Role of Industry in Indian Catalysis Research




3.4.3 Patents filed/ awarded in 2023-24

Sl. No.	Patent Application No.	Patent titled	Inventor	Co-Inventor(s)	Status
1	202141007495	A process for I-line resist dissolution modulation using Hudroxy streyene based ter-poylmer	Santu Nandi, Lalit Khillare, M.Yogesh, Suman Dolai, Chullikatil.P.Pradeep, Satinder K Sharma, Anvesh Bogavelly, Deep Naryan Tiwari, Paritosh Jain, Subrata Gosh, Kennerth E Gonsalves, Surinder Singh	Santu Nandi, Lalit Khillare, M.Yogesh, Suman Dolai, Chullikatil.P.Pradeep, Satinder K Sharma, Anvesh Bogavelly, Deep Naryan Tiwari, Paritosh Jain, Subrata Gosh, Kennerth E Gonsalves, Surinder Singh	Granted
2	202311065063	'Method For Additive Manufacturing of Organic Neem Oil Based Polymer Resin'	Dr. Abhimanew Dhir	-	Filed 27-09-23

3	202011019980	CARBOGENIC FLUORESCENT NANODOT AS NEW PROBE FOR SUPER RESOLUTION MICROSCOPY AND METHOD OF APPLICATION THEREOF	Chethana Rao, Aditya Yadav, Navneet C. Verma and Chayan Kanti Nandi 2024	-	Granted 507194
4	201611044190	A New Class of Non-Chemically Amplified Molecular Photoresists for Next Generation Integrated Circuits (ICs) Technology	Chullikkattil P. Pradeep, Kenneth E. Gonsalves, Midathala Yogesh, Neha Thakur, Pulikanti Guruprasad Reddy, Santu Nandi, Satinder K. Sharma, Subrata Ghosh	Chullikkattil P. Pradeep, Kenneth E. Gonsalves, Midathala Yogesh, Neha Thakur, Pulikanti Guruprasad Reddy, Santu Nandi, Satinder K. Sharma, Subrata Ghosh	Grant No. 452719 Date of Grant: 19.09.2023
5	202111050981	Negative Tone Resist Compositions for Lithography	Santu Nandi, Lalit Khillare, Mohamad G. Moinuddin, Sunil Kumar, Manvendra Chauhan, Satinder K. Sharma, Kenneth E. Gonsalves, Subrata Ghosh	Santu Nandi, Lalit Khillare, Mohamad G. Moinuddin, Sunil Kumar, Manvendra Chauhan, Satinder K. Sharma, Kenneth E. Gonsalves, Subrata Ghosh	Grant No. 460129 Date of Grant: 18.10.2023
6	202211032134	Method for Synthesis of Biofuel Precursors using Orange Peel Hydrochar	Tripti Chhabra, Prachi Dwivedi and Venkata Krishnan	-	Filed
7	202311030929	Method for Synthesis of Nitriles by Ammoxidation of Aromatic Alcohols using Metal-free Sulfonted Boron Nitride as Catalyst	Priyanka Choudhary, Shivangi Singh Chauhan, Devendra Sharma, Sahil Kumar and Venkata Krishnan	-	Granted

8	202311032266	Method for the Synthesis of Phenols and Phenolic Compounds using Hydroxyl Boron Nitride Nanosheets as Catalysts	Priyanka Choudhary, Kamlesh Kumari, Devendra Sharma, Sahil Kumar and Venkata Krishnan	-	Granted
9	202411004178	Facile Low-Temperature Synthesis of Novel Carbon Nitrides for Efficient Carbon Dioxide Conversion into Value-Added Chemicals	Hushan Chand, Preeti Bhumla, Subhadip Goswami, Saswata Bhattacharya and Venkata Krishnan	-	FER Responded

3.4.4 Professional achievements, honours and awards

Dr. Garima Agrawal

- Wrote a proposal jointly with a Ph.D. student, Tanu Sharma (D23168) for the INSPIRE Ph.D. fellowship and it has been accepted (INSPIRE code: IF220510, dated: 1st April 2024). The Ph.D. student received Rs. 5,03,960/- for her fellowship for 2024-2025.

3.4.4.1 Membership of Professional Societies

Dr. Garima Agrawal

- Executive board member of Asian Polymer Association (India)
- Life member of Asian Polymer Association APA (India)
- Life member of Him Science Congress Association HSCA (India)
- Life member of The Society for Polymer Science (India)
- Life member of Soft Materials Research Society (India)

Dr. Moupriya Das: Member of American Physical Society

3.4.4.2 Visit to Academic Institutes and lectures delivered

- **Dr. Amit Pawar:** Invited lecture at NOST-OCC 2024 Conference at ITC, Bhubaneswar.

- **Dr. Abhishek Dewanji**: Visited the **Department of Chemical Sciences, IISER Kolkata** on 26th October, 2023 to deliver an invited lecture titled as **'Carbon-centered Radicals and their Applications in Novel C-C Bond Forming Transformations'** and to interact with its students and faculties.

- **Dr. Moupriya Das**: Research visit to Nordic Institute for Theoretical Physics, 22nd June – 20th July 2023.

- **Dr. Bhaskar Mondal**: Guest Scientist visit at the of Organic Chemistry (IOC), RWTH Aachen University, Germany, July 2023.

3.4.5 Outreach Activities

- **Dr. Amit Pawar** Conducted Yusuf-Hamid Chemistry Camp from School Children's from Mandi District at IIT Mandi from 5th-7th July 2023.

- **Dr. Bhaskar Mondal** Organized the Royal Society of Chemistry (RSC) Yusuf Hamied Chemistry Camps for School Students at IIT Mandi, 5-7 July 2023.




3.4.6. Any Other Information

Dr. Moupriya Das: Composed an authored article for India's most widely circulated magazine India Today's Education Today section on 'Stochastic Resonance in Climate'. The purpose of the article was to explain intricate scientific matters in climate science and complex systems to a general readership. The article was written in a manner so as to serve as a pedagogical document for interested students.

Link: https://www.indiatoday.in/education-today/gk-current-affairs/story/stochastic-resonance-in-climate-iit-prof-explains-earth-switches-between-ice-age-and-greenhouse-periods-1984179-2022-08-06

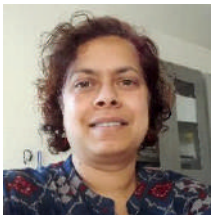
3.5 School of Physical Sciences

Welcome to the School of Physical Sciences (SPS), IIT Mandi. Formed in 2022 after the dissolution of the School of Basic Sciences (SBS), the mission of SPS is to establish itself as an internationally recognised fraternity of academics contributing to knowledge creation in cutting-edge themes of the physical sciences; training future scientists and engineers via rigorous academic programs.

Currently, eighteen bright faculties along with over fifty research scholars, conduct research in cutting-edge themes of physics ranging from the physics of atoms, molecules, and quarks to the dynamics of black holes and the early universe, from exploring exotic states of matter to the physics of polymers and glasses. We offer a vibrant research ambience with state-of-the-art experimental and high-performance computing facilities.

We also conduct teaching programs at the undergraduate, postgraduate, and research levels. Students engage in research at both undergraduate and postgraduate levels, often serving as authors in research publications and frequently presenting their research at national and international conferences. Many of our alums have made us proud with their outstanding academic and research achievements. We aim to foster a friendly and diverse environment in our school, striving for excellence, equity, and inclusiveness.

Faculty Members

1	**Prof. Suman Kalyan Pal** Professor and Chairperson of SPS Specialisation: Fast and Ultrafast Laser Spectroscopy Ph.D from Indian Association for the Cultivation of Science, Jadavpur (2006) Home Town: Katwa, West Bengal Phone: 01905-267040 Email: suman@iitmandi.ac.in Chairperson's E-mail: chairsps@iitmandi.ac.in	
2	**Prof. Arti Kashyap** Professor Specialisation: Magnetism and magnetic materials Ph.D from Indian Institute of Technology Roorkee Home Town: Mandi, Himachal Pradesh Phone: 01905-267042 E-mail: arti@iitmandi.ac.in	
3	**Dr. Prasanth P. Jose** Associate Professor Specialization: Soft condensed matter physics Ph.D from Indian Institute of Science (2005) Home Town: Palakkad, Kerala Phone: 01905-267064 E-mail: prasanth@iitmandi.ac.in	
4	**Dr. Bindu Radhamany** Associate Professor Specialization: X-ray spectroscopy Ph.D from UGC-DAE, consortium for scientific research, Indore (2005) Home Town: Kollam, Kerala Phone: 01905-267060 E-mail: bindu@iitmandi.ac.in	

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10	**Dr. Pradeep Kumar** Associate Professor Specialisation: Raman and Infrared Spectroscopy Ph.D from Indian Institute of Science (2014) Home Town: Rohtak, HR Phone: 01905-267152 E-mail: pkumar@iitmandi.ac.in	

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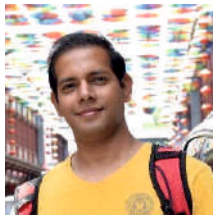
12	**Dr. Arko Roy** Assistant Professor Specialization: Ultracold quantum gases Ph.D from Physical Research Laboratory, Ahmedabad Home Town: Kolkata, West Bengal E-mail: arko@iitmandi.ac.in	
13	**Dr. Harsh Soni** Assistant Professor Specialization: Soft Condensed Matter Physics Ph.D from IISc Home Town: Baran, Rajasthan E-mail: harsh@iitmandi.ac.in	
14	**Dr. NirmalyaKajuri** Assistant Professor Specialization: Theoretical High Energy Physics Ph.D from Institute of Mathematical Science Home Town: Kolkata E-mail: nirmalya@iitmandi.ac.in	
15	**Dr. Amal Sarkar** Assistant Professor Ph.D from IIT Bombay, Mumbai Address : G1 - 102, South Campus E-mail: amal@iitmandi.ac.in	
16	**Dr. PrabhakarPalni** Assistant Professor Ph.D from University of New Mexico, USA Address : G1 - 101, South Campus E-mail: prabhakar@iitmandi.ac.in	

17	**Dr. Krishna Mohan Parattu** Assistant Professor Address – G1-104, South Campus E-mail: krishna@iitmandi.ac.in	
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3.5.1 Books published and Book chapter published

1. Photon and Particle Impact Spectroscopy and Dynamics of Atoms, Molecules, and Clusters Edited by Himadri S. Chakraborty and Hari R. VarmaMDPI-Multidisciplinary Digital Publishing Institute (2024) ISBN978-3-7258-0237-1 (Hardback), ISBN978-3-7258-0238-8 (PDF) (Book published as a reprint of the Special Issue Photon and Particle Impact Spectroscopy and Dynamics of Atoms, Molecules, and Clusters that was published in Atoms.
2. Deepu Kumar and Pradeep Kumar, "Resonant and Non-resonant Raman Spectroscopy" Raman Spectroscopy: Advances and Applications, Springer Nature (2024).DoI: https://doi.org/10.1007/978-981-97-1703-3.

3.5.2 Papers Published in Reputed National Journals and Papers Accepted in Reputed National Journals

1. Proceedings of the XXV DAE-BRNS High Energy Physics (HEP) Symposium 2022 titled "Investigation of jet quenching effects due to different energy loss mechanisms in heavy-ion collisions" submitted and accepted by the conference committee, Prabhakar Palni, Vaishnavi Desai, and Om Shahi.
2. Proceedings of the XXV DAE-BRNS High Energy Physics (HEP) Symposium 2022 titled "Characterising the jet sub-structure modifications in a QGP medium using multi- stage energy-loss mechanisms" submitted and accepted by the conference committee, Vaishnavi Desai, Om Shahi, and Prabhakar Palni.

3.5.2.1 Paper published in reputed International Journals

1. Lattice Instability induced Concerted Structural Distortion in Charged and van der Waals Layered GdTe3, Prabir Dutta, Sushmita Chandra, Ivy Maria, Koyendrila Debnath, Divya Rawat, Ajay Soni, Umesh V. Waghmare and Kanishka Biswas, Advanced Functional Materials 2312663 (2023).
2. Interaction of Acoustic and Optical Phonons in Soft Bonded Cu-Se Framework of Large Unit Cell Minerals with Anionic Disorders, Kewal Singh Rana, Raveena Gupta, Debattam Sarkar, Niraj Kumar Singh, Somnath Acharya, Satish Vitta, Chandan Bera, Kanishka Biswas and Ajay Soni, Phys Rev B 108, 045202 (2023).
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6. Hund's Matrix: A structure-based descriptor to predict the magnetic properties. Yogesh Khatri, Arti Kashyap Journal of Magnetism and Magnetic Materials, 597, 172026 (2024).

7. Advancing magnetic material discovery through machine learning: Unveiling new manganese-based materials. YogeshKhatri, ArtiKashyapAPL Machine Learning,Vol 1 (4), 046113, 2023.

8. Magnetic MXene: A Machine learning model with small data YogeshKhatri, VaidehiAtpadkar, AashiAgarwal, and ArtiKashyapIEEE Transactions on Magnetics, Vol 59 (11), 9201205, 2023.

9. Magnetization in iron based compounds: A machine learning model analysis Yogesh Khatri, Rajesh Sharma, Ashutosh Shah, Arti Kashyap AIP Advances, Vol 13 (2), 046113, 2023.

10. Enhanced cryogenic magnetocaloric performance and existence of short-range magnetic correlations in frustrated diamond geometries Jogendra Kumar and K. Mukherjee Accepted in J. Phys. D: Appl. Phys. 57, 295304 (2024).

11. Existence of complex magnetic ground state and topological Hall effect in centrosymmetric silicide DyScSiKavitaYadav, Koushik P., S. Singh, M. Hagihala and K. Mukherjee New J. Phys. 25, 123030 (2023).

12. Signature of filamentary superconductivity in centrosymmetric silicide LuScSiKavitaYadav, Koushik P. and K. Mukherjee J. Alloys and Compd. 968, 172100 (2023).

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15. Non-equilibrium dynamics and discretization of energy levels in the inverse spinel LiCoVO4 Dheeraj Ranaut, Manshi Rani and K. Mukherjee Phys. Rev. B 107, 214413 (2023).

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17. Evidence of charge susceptibility and multiple f-c hybridization configurations with the La doping in CeGe: A DFT+DMFT study Karan Singh, A. Sihi, S. K. Pandey and K. Mukherjee J. Phys. Condens. Matter 35, 315602 (2023).

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40. Rajat, Ritu, Arko Roy, and Sandeep Gautam: Temperature-induced super solidity in spin-orbit-coupled Bose gases, Phys. Rev. A 109, 033319 (2024) 5pp, arXiv:2312.08719.

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42. First Measurement of the Forward Rapidity Gap Distribution in p-Pb Collisions at ÖsNN= 8.16 TeV, A Tumasyan ... A Sarkar ... [CMS Collaboration], Phys.Rev.D 108 (2023) 9, 092004.

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47. Investigation of magnetic exchange interactions in Cr-doped Ca0.5Sr0.5RuO3 Jaskirat Brar and R. Bindu J. Phys.: Condens. Matter 36, 325503 (2024).

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57. Self-induced transparency in a semiconductor quantum dot medium at ultracold temperatures Samit Kumar Hazra, P. K. Pathak, and Tarak Nath Dey Phys. Rev. B 107, 235409 – (2023).
58. A study of dipolar signal in distant quasars with various variables, Rahul Kothari, Mohit Panwar, Gurmeet Singh, Prabhakar Tiwari, Pankaj Jain (Aug 30, 2022). Published in: Eur. Phys. JS. 84 2024 1, 75 e. print: 2208.14897 (astro-ph.CO).
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3.5.2.2 Paper accepted in reputed International Journals

1. Programming tunable active dynamics in a self-propelled robot, S. Paramanick, A. Pal, H. Soni, N. Kumar, EPJE (2024, accepted).
2. Sheetal, Pabitra K. Biswas, K. Yokoyama, D.T. Adroja and C.S.Yadav; Muon spin relaxation and disorder-induced dynamic magnetic fluctuations in Dy 2 Zr 2 O 7 ; Journal of Physics: Condensed Matter (2024).

3.5.2.3 National conferences attended and papers presented in the format

1. Effect of chemical pressure on the structural, magnetic and thermodynamic properties of DyVO4 Manshi Rani and K. Mukherjee DAE Solid State Physics Symposium: Dec 2023, Visakhapatnam, India.
2. Crystal Structure and Thermodynamic properties of RTaO4 (R = Ho and Gd) Jogendra Kumar and K. Mukherjee DAE Solid State Physics Symposium: Dec 2023, Visakhapatnam, India.
3. Origin of Low Temperature Resistivity Anomaly in Ti2FeAl Koushik P. and K. Mukherjee DAE Solid State Physics Symposium: Dec 2023, Visakhapatnam, India.
4. Ti2MnAl: A potential spin semimetal candidate Koushik P. and K. Mukherjee MRSI AGM: Dec. 2023, IIT BHU, Varanasi, India.
5. Signatures of low temperature effective spin ½ state in YbTaO4 Jogendra Kumar and K. Mukherjee MRSI AGM: Dec. 2023, IIT BHU, Varanasi, India.
6. Ultrafast Charge Carrier Dynamics in Two-Dimensional Transition-Metal Dichalcogenides, Suman K Pal in DAE-BRNS Theme meeting on Ultrafast Sciences (UFS-2023), NPL Delhi, India, 25-27 November, 2023.
7. Photoionization Dynamics of Na20@C240: Firstevidence of resonant interclusterColumbicdecay,Hari R. Varma, Rasheed Shaik, Himadri S. Chakraborty 23rd NCAMP, IIST, Thiruvanathapuram, Kerala, Feb 20-23 (2023).
8. C60 as a molecular diffractor in elastic scattering, J. Jose, Aiswarya R. R. Shaik, H. R. Varma and H. Chakraborty 23rd NCAMP, IIST, Thiruvanathapuram, Kerala, Feb 20-23 (2023).
9. Summer internship student, Saptarshi Datta, presented a poster on "Optimisation of Low Gain Avalanche Diodes (LGADs) into Ultra-fast Silicon Detectors (UFSDs) for future particle physics experiments "at the 4th Heavy Flavor Meet Conference held at IIT Goa from 2-4 November 2023 and got the Best Poster Award.
10. Master's student Gurleen Kaur presented a poster on "Probing the substructure of extremely hard jets using the multi-stage approach" at the 4th Heavy Flavor Meet conference held at IIT Goa from 2-4 November 2023.
11. Proceedings: X-ray absorption near edge structure studies of Co2MnAl and Ti2MnAl Swati Pathak, S. Khalid, R. Bindu Proceedings of the 67th DAE solid state physics symposium (communicated 2023).
12. Poster's Presented by Students: Electronic transition in BaPb1-xSrxO3-z Sharshad K, M Bharath, R bindu, 67th DAE Solid State Physics Symposium, GITAM, Visakhapatnam, (2023).
13. Electronic Structure Studies of NdBaCo2O5+δ (δ = 0,0.5) Himanshu Pant and R. Bindu 67th DAE Solid State Physics Symposium (SSPS) 2023.
14. Structural, magnetic and transport studies on oxygen deficient double perovskiteNdBaCo 2 O5.75 Himanshu Pant, JaskiratBrar, Swati Pathak and R. Bindu National Science Day'23, IIT Mandi.
15. Local structural studies of Cr doped Co2MnAl Swati Pathak, Saurabh Singh, S. Khalid, Kentaro Kuga Tsunehiro Takeuchi, R. Bindu National Science Day'23, IIT Mandi.
16. Transport and Electronic Structure studies of LaAgSb2 Himanshu Pant and R. Bindu National Science Day'24, IIT Mandi.
17. Orbital hybridisation effects in disordered B2 phase of Cr doped Co2MnAl Swati Pathak. National Science Day'24, IIT Mandi.
18. Crystal and electronic structure studies of doped barium bismuthates. Bharath M. National Science Day'23, IIT Mandi.
19. Lattice effects on the physical properties of half-doped perovskiteruthenates. Jaskirat Brar National Science Day'23, IIT Mandi.

20. SERB school on "Single crystals of functional materials and their applications" SERB SCFM 2023, Shiv Nadar University, Chennai Mode of attending the workshop: offline Name of the attendee: Himanshu Pant.
21. One day workshop "Electronic Materials: Preparation, Characterization and Applications" held at IIT Mandi Mode of attending the workshop: offline Name of the Attendee: Himanshu Pant .
22. Rietveld Refinement of X-Ray Diffraction (online mode) Centre for advanced computational research, New Delhi Name of the Attendee: Sharshad K and Pankaj.
23. 'Exotic phases in Frustrated Magnetic systems' at National seminar on innovation in functional materials held on May 29-30th 2023 at MSCBD University (North Odisha University)Dr. C.S. Yadav.
24. 'Electronic transport and Hal effect in quantum materials' at the Workshop on Quantum Materials held on April 6-8, 2023 at IISER Trivandrum (Kerala) Dr. C.S. Yadav.
25. 'Review on Charge Density wave compounds VSe 2 and ZrTe 3 ' at the Workshop on Quantum Materials held on April 6-8, 2023 at IISER Trivandrum (Kerala) Dr. C.S. Yadav.
26. 'Exotic phases in Frustrated Magnetic systems' at School of Physical Sciences IIT Mandi on national Science Day (28 th Feb 2023)Dr. C.S. Yadav.
27. Electronic Transport and Planar Hall effect in Dirac semimetal PdTe 2 at Conference on Condensed Matter Physics held on Feb 6-8, 2023 at Physical Research Laboratory, Ahmedabad (Gujrat) Dr. C.S. Yadav.
28. Observable Algebras in Quantum Gravity, IIT Mandi, Dr.Nirmalya Kajuri.
29. QMAT conference, NISER Bhubaneswar, Dec 2023. Dr. Gargee Sharma.
30. PSCES conference, IISER Bhopal, April 2024. Dr. Gargee Sharma.

3.5.2.4 International conferences attended and papers presented in the format

1. Light Matter Interactions and Many Body Phenomena in Chalcogenide Materials, Ajay Soni, Invited to talk in conference on "Frontiers of Materials", organized by Oxford INstruments and JNCASR, Bangalore on March 14th, 2023.
2. Jahn-Teller Driven Magnetic Phase Associated With 5th Order Susceptibility in Rare Earth Orthovanadate TbVO4 Dheeraj Ranaut and K. Mukherjee International conference on Strongly Correlated Electron System: July. 2023, Seoul, South Korea.
3. Trends in Emerging Nano Science: Energy, Healthcare & Quantum Materials, 5-8 Nov. 2023, INST Mohali. Title of Presentation:Advancing Photovoltaic Technology: The Potential of Two-Dimensional (2D) Halide Perovskite Materials.
4. Elucidating geometrical features of e-C60 interaction from their elastic scattering spectra R Aiswarya, J. Jose, R Shaik, H R Varma, and H S Chakraborty XXXIII ICPEAC, Ottawa, Canada, July 25-Aug. 1(2023).
5. Angular distribution, spin polarisation and time delay studies of the potassium 4s state in the vicinity of Cooper minimum N Hosea, P Deshmukh, J Jose, H.R .Varma, S Manson XXXIII ICPEAC, Ottawa, Canada, July 25-Aug. 1(2023).
6. Resonant interclusterCoulombic decay in the photoionization of Na20 confined inside C240, R. shaik, K. Prajapat, H. R. Varma, H. S. Chakraborty XXXIII ICPEAC, Ottawa, Canada, July 25-Aug. 1(2023).
7. Quadrupole effects in the photoionization of sodium 3s in the vicinity of dipole Cooper minimum N Hosea, P Deshmukh, J Jose, H.R. Varma, S Manson Bulletin of the American Physical Society 2023.
8. Structural analysis of fullerene from e-C60 elastic scattering Jose, R Shaik, H.R. Varma, H Chakraborty Bulletin of the American Physical Society, 2023.
9. International Conference in Quantum Technologies and Applications (ICQTA) Manipal Academy of Higher Education February 12-14, 2024, Dr. Krishna Mohan Parattu.
10. International Conference on High Energy Particle &Astroparticle Physics (ICHEPAP2023), SINP, 11-15 Dec, 2023, Dr. AmalSarkar.
11. 'Planar Hall effect in noble metal doped type II Dirac semimetal PdTe 2' at International Quantum Matter Conference held on May 23-25, 2023 at Madrid (Spain) Dr. C.S. Yadav.

3.5.3 Invited Lecturers/Continuing education programs

1. Dr. Arti Kashyap

- **Keynote Address:** International Conference on "Mountain Ecosystem Processes and Sustainable Livelihood" on 5th March 2024 at Himachal Regional Centre of the Institute (NIHE), GoI.
- **Invited Talk:** "Emerging phenomena in quantum materials', 11-15 Dec, 2023, Bharatpur, India.
- **Invited Talk:** New Approaches and Machine learning Methods for Ab initio calculations: NAMMA Psi-k Workshop, Bangalore, India, from 24-28 July 2023.
- **Invited Talk:** Brainstorming Workshop on the theme of 'National Award for Women's Development through Application of Science and Technology', being organised by BAIF in collaboration with Technology, Information, Forecasting and Assessment Council (TIFAC), Dept. of Science and Technology, 20th Feb, 2023.
- **Invited Talk:** National Stakeholders' Meet on Women Technology Parks to be held on 12 and 13 July 2022 at India International Centre, New Delhi.
- **Lectures:** Teachers Training program organized by SPS for school teachers.

2. Dr. Kaustav Mekherjee

- Delivered an invited talk on "Entropic topography associated with field-induced quantum criticality in a magnetic insulator DyVO4" at 34th AGM of MRSI conclave from December 12-15, 2023 at IIT(BHU), Varanasi.
- Participated in SCERT Delhi TGT in Science training program (October 2023).
- Participated in SCERT Delhi PGT in Physics training program (November 2023).

3. Prof. Suman Kalyan Pal

- How to observe fast and ultrafast light-induced processes?Refresher Course, The University of Burdwan, 12thDecember, 2023.
- Non-conventional Solar Cells.Refresher Course, The University of Burdwan, 19thDecember, 2023.

4. Dr. Hari Varma

- A lecture titled "Real Effects of Pseudo Forces" for SCERT teacher's training program in Physics held at IIT Mandi from Nov.21-Nov.25, IIT Mandi.

5. Dr. Krishna Mohan Parattu

- Gave a lecture on the nature and history of science as part of teachers training program for high school teachers from Delhi government schools in October 2023.

6. Dr. Prabhakar Palni

- **Delivered an invited talk on "Jets and Heavy Flavor Production at the EIC"** at the International Workshop on Probing Hadron Structure at the EIC, held from 5-9 February 2024 at ICTS, Bangalore.
- Delivered a lecture on Work, Energy, and Power, along with four demonstrations in the **Teacher Training Program for School Teachers from 26-30 October 2023.**
- Delivered a lecture on Work, Energy, and Power, along with four demonstrations in the **SCERT teacher's training program in Physics from 21-25 November 2023**

7. Dr. C.S. Yadav

- 'Exotic phases in Frustrated Magnetic systems' at National seminar on innovation in functional materials held on May 29-30 th 2023 at MSCBD University (North Odishan University).
- 'Electronic transport and Hal effect in quantum materials' at the Workshop on Quantum Materials held on April 6-8, 2023 at IISER Trivandrum (Kerala).
- 'Review on Charge Density wave compounds VSe 2 and ZrTe 3 ' at the Workshop on Quantum Materials held on April 6-8, 2023 at IISER Trivandrum (Kerala).
- 'Exotic phases in Frustrated Magnetic systems' at School of Physical Sciences IIT Mandi on national Science Day (28 th Feb 2023).
- Electronic Transport and Planar Hall effect in Dirac semimetal PdTe 2 at Conference on Condensed Matter Physics held on Feb 6-8, 2023 at Physical Research Laboratory, Ahmedabad (Gujrat).

8. Dr. Nirmalya Kajuri

- Invited Talk in CHEP, IISc, Bangalore (Sep 2023)
- **Workshop Chair:** The eleventh International Conference on Big Data and Artificial Intelligence (BDA 2023), December 07-09, 2023, IIIT Delhi, India

3.5.4 Workshop/ Conference organized with high resolution soft copies of photographs

- **SPS organized a one-day workshop** on the National Science Day, 28th February, 2024

1. Dr. Arti Kashyap

- Program Committee Member: IEEE International Magnetics Conference, INTERMAG 2024, which will be held in Rio de Janeiro, Brazil, on May 5-10, 2024, (https://www.intermag2024.org/).
- Program Committee Member: International Conference on Magnetism ICM2024, 30 June to 5 July 2024 in Bologna, Italy (https://www.icm2024.org).
- Workshop Chair: The eleventh International Conference on Big Data and Artificial Intelligence (BDA 2023), December 07-09, 2023, IIIT Delhi, India.

2. Dr. Prabhakar Palni

- Served as a local organizing committee member of the 4th Heavy Flavor Meet Conference held at IIT Goa from 2-4 November 2023 and successfully conducted this conference.
- Organizing 2nd Hot QCD matter Conference (https://sites.google.com/ iitmandi.ac.in/ hotqcdmatter-2024/), a significant event in heavy ion physics field, to be held at IIT Mandi from July 1-3, 2024.

3. Dr. Nirmalya Kajuri

- Observable Algebras in Field Theory and Gravity (16-17 Feb).

3.5.5 Patents filed/ awarded - Professional achievements, honors and awards

- Sivasankar PM, PhD Scholar won the best poster award on National Science Day conducted by SPS, IIT Mandi.
- Dr. Arko Roy received an invitation from LPTMS UniversiteSaclay Paris for a two-month visit for research collaboration.
- Dr. Arko Roy was granted SERB-International Travel Support.
- Served as a reviewer of Journal of Instrumentation (JINST) in February 2024.

3.5.6 Membership of Professional Societies

1. Dr. Ajay Soni

- Member of Royal Society of Chemistry, UK (M-RSC)

2. Dr. Arti Kashyap

- Member, Program Advisory Committee, VigyanJyoti Scheme, DST, GoI
- Member, PAC, CURIE Program, DST, GoI
- Chairperson, GATI Brainstorming Meeting, DST, GoI
- Expert Member, WISE PhD Scheme, DST, GoI
- Member, Board of Studies, Dept of Physics, NIT Nagpur
- Member, Board of Studies, Dept of Physics, CU Panjab
- Member, Board of Studies, Dept of Physics, Cluster University, HP

3. Dr. Krishan Mohan Parattu

- Member of Indian Association for General Relativity and Gravitation

4. Dr. Amal Sarkar

- Member of DRD1 Collaboration at CERN, Geneva, Switzerland
- Member of EPIC Collaboration at Brookhaven National Laboratory, NY, USA
- Application in process for membership in CMS Experiment at CERN

3.5.7 Outreach Activities

- **SPS organized**two **teachers training programs** in association with CCE, IIT Mandi
- Lecture in JawaharNavodaya School, Pandoh, Mandi **(Dr. Arti Kashyap)**
- Organised a visit of college students from the Department of Physics, Vallabh Govt. College at School of Physical Sciences, IIT Mandi. **(Dr. KaustavMekherjee)**
- An online talk titled "InterclusterCoulombic Decay in endohedral system via plasmonic excitation" given for Kerala Theoretical Physics Initiative on Dec. 2, 2023 **(Dr. Hari Varma)**
- Published 2 popular science articles in The Hindu **(Dr. NirmalyaKajuri)**
- Member of core committee of Kerala Theoretical Physics Initiative(https://keralatpi.github.io/), a group of researchers from Kerala arranging graduate level projects for MSc students from Kerala and organizing outreach and training lectures. As part of Kerala Theoretical Physics Initiative, **(Dr. Krishan Mohan Parattu)**

A. Arranged MSc projects for students from colleges in Kerala with experienced researchers which resulted in three research papers, and at least 3 students going on to do PhDs abroad with one obtaining the prestigious Marie Curie fellowship.

B. Arranged a workshop for presentation of the project after completion.

C. Chaired a panel discussion on career opportunities in physics.

D. Arranged outreach lectures by experts on current research.

E. Arranged lecture on basic research skills like LaTex, Python, artificial intelligence,etc.

F. Have also mentored 4 MSc students in their research projects as part of the initiative.

- **Yuva Sangma Exchange Student Programme in May 2023: (Dr. PrabhakarPalni)**

  A. As a faculty mentor, I led the contingent of 50 students from Himachal Pradesh and Ladakh and successfully carried out all the operations and tasks at IIT Goa. I have contributed to the selection process and managed local accommodation for the IIT Goa contingent during their stay.

  B. Participated in a two-day **outreach activity workshop from 25-26th April 2024 at IIT Madras**, where a delegation from CERN presented the opportunity to participate in CERN research. I have actively participated in discussions with RD50 research collaboration and their group leaders to build an international network in research.

- **Inter-IIT sports meet held at IIT Gandhinagar in December 2023: (Dr. PrabhakarPalni)**

  A. Participated in cricket and won a Gold medal for the Institute.

  B. Also participated in the badminton event and reached pre-quarter finals.

- **Given lectures in (Dr. Bindu Radhamany)**

  A. SCERT teachers' training program (TTP) in Physics November 2023.

  B. SCERT teacher's training program in Science, October 2023.

  C. TTP at IIT Mandi (SCERT-Delhi and IIT Mandi) March 2023.

  D. Vigyan Jyoti programme (a DST Scheme) at IIT Mandi , Talk by role Model (motivational talk) (29th Sept 23).

3.6 School of Management

Tremendous growth in ICT and web enabled platforms has revolutionized how organizations function. Rapid technological advancements have not only driven the technology landscape but are seen to be the drivers of momentum in managerial domains. Technology and data are widely used by organizations to assist in managerial decision making. With these advancements, the boundaries between technology and management roles are continuously diminishing. Business decisions are heavily dependent on technology and data. Although the business arena is seeing rapid changes, there is a dearth of trained professionals who can not only have good working knowledge of management principles but are also proficient in providing technology based solutions and deriving insights from data. Since its inception in 2010, IIT Mandi has consistently worked to nurture professionals with industry ready skills. Thus, in order to cater to fast paced changing industry requirements, School of Management (SOM) was established at IIT Mandi in 2022. The school aims to create leaders who can not only adeptly provide solutions to organizational problems using their managerial expertise but can also use technology and data proficiently.

The school offers MBA in Data Science & Artificial Intelligence and Ph.D. program.

MBA DS & AI program

MBA in Data Science and Artificial Intelligence was launched by SOM, IIT Mandi in 2022. This program has been uniquely crafted by leaders from industry and academia with a strong emphasis on managerial fundamentals and decision making in congruence with the technology-based solutions such as Data Science, Artificial Intelligence and Machine Learning to keep it relevant to the fast-changing global human resource need. The program is a blend of management of contemporary concepts, softer skills towards developing individuals, and relevant applications of data science tools.

The program objectives are

- To provide an exposure to fundamentals of business management with special emphasis on contemporary and emerging topics.
- To help the individuals to develop their personality by adequate exposure to soft skills like communication, creativity, and emotional intelligence etc.
- To provide an in-depth exposure to tools and techniques of data science, artificial intelligence, and machine learning etc. with a strong emphasis on problem solving approach.
- Prepare the graduate of the course to evolve as leaders of an organization who can combine rational and subjective skills in the context of an organization to make appropriate decisions.

The MBA (DS & AI) program is a blend of management of contemporary concepts, softer skills towards developing individuals, and relevant applications of data science tools. MBA (DS & AI) is a 2-year long full-time Masters programme, distributed in 4 semesters. The credit requirement is 70. The program aims to provide an in-depth exposure on data science tools and techniques like analytics, artificial intelligence, machine learning, deep learning, natural language processing, and neural networks with a strong emphasis on problem solving approach.

Number of seats: 80

For more information visit Website: https://som.iitmandi.ac.in

Faculty Members			
1.	**Prof. Manoj Thakur** **Chairperson** Ph.D. from IIT Roorkee E-mail: chairsom@iitmandi.ac.in	**Specialization:** Optimization, Machine Learning **Research Interests:** Optimization, Soft Computing, Machine Learning & Computational Finance.	
2.	**Prof. Anjan Kumar Swain** **Professor** Ph.D. from University of Sheffield. E-mail: anjan@iitmandi.ac.in	**Specialization:** Information Systems **Research Interests:** Computer science and information systems.	
3.	**Dr. Puran Singh** **Associate Professor** Ph.D. from Punjab University, Chandigarh E-mail: puran@iitmandi.ac.in	**Specialization:** Finance, Entrepreneurship **Research Interests:** New Venture Creation Dynamics, Regional Entrepreneurship Ecosystems, Entrepreneurship Policy Research.	
4.	**Dr. Akhaya K Nayak** **Associate Professor** Ph.D. from IIT Kanpur E-mail: akhaya@iitmandi.ac.in	**Specialization:** Ethics **Research Interests:** Business Ethics (Organizational Ethics), Corporate Social Responsibility, Sustainability, Social Movements.	
5.	**Dr. Saumya Dixit** **Assistant Professor** Ph.D. from IIIT Allahabad E-mail: saumya@iitmandi.ac.in	**Specialization:** Marketing Management **Research Interests**: Consumer Behavior; Technology Adoption; Consumer wellbeing.	
6.	**Dr. Ashish Bollimbala** **Assistant Professor** Ph.D. from TAPMI, research center of Manipal Academy of Higher Education, Manipal, Karnataka E-mail: ashish@iitmandi.ac.in	**Specialization:** Marketing Management **Research Interests**: Consumer Behavior; Creativity Management; Advertising; Neural marketing.	
7.	**Dr. Daya Sagar Gupta** **Assistant Professor** Ph.D. from IIT (ISM) Dhanbad E-mail: dayasagar@iitmandi.ac.in	**Specialization:** Computer Science **Research Interests:** Cryptography and Information Security, Post-Quantum Cryptography, Blockchain, Internet of Things.	

8.	**Dr. Masudul Hasan Adil** **Assistant Professor** Ph.D. from Mumbai School of Economics and Public Policy and Institute of Economic Growth, University of Delhi E-mail: masudul@iitmandi.ac.in	**Specialization:** Economics **Research Interests:** Monetary Economics, Macroeconomics, Time Series Analysis.	
9.	**Prof. N Ravichandran** **Visiting Distinguished Professor** Ph.D. from IIT Madras E-mail: nravi@iitmandi.ac.in	**Specialization:** Operations Management.	
10.	**Prof. B. K. Mohanty** **Adjunct Professor** Ph.D. from IIT Kharagpur E-mail: bhaba@iitmandi.ac.in	**Specialization:** Operations Research, Fuzzy logic. **Research Interests:** Multicriteria Decisions Making, Fuzzy Data Mining, Software Risk Management, Fuzzy Sets in e-commerce.	
11.	**Mr. Arun Malhotra** Adjunct Professor of Practice	**Specialization:** Sales and Marketing.	
12.	**Mr. Saurabh Mittal** **Professor of Practice** E-mail: saurabh@iitmandi.ac.in	**Specialization:** Leadership Management.	

3.6.1 Publications

Book chapters published

1. Prakash, A., Jain, A., Singh, P., Sarkar, A. (Eds.). (2023). Technology and Policy. In Technology, Policy, and Inclusion: An Intersection of Ideas for Public Policy (1st ed.). Routledge India. https://doi.org/10.4324/9781003433194
2. Gupta, S., Singh, P. (2023). Technology and financial inclusion : A study of technology's role in continuity of banking agents. In Technology, Policy, and Inclusion: An intersection of ideas for public policy (1st ed.). Routledge India. https://doi.org/10.4324/9781003433194
3. Adil, M. H. (2024). Changing contours of Indian monetary policy, touch wood. Chapter 10047, Encyclopedia of Monetary Policy, Financial Markets and Banking, Elsevier Publication.
4. Ali, I. K. and Adil, M. H. (2024) The Trajectories and Dynamics of Inflation Expectations in India, Encyclopedia of Monetary Policy, Financial Markets and Banking, Elsevier Publication.

Paper published in international journals

1. Gupta, S., Singh, P. (2023) What drives activity of banking agents? Evidence from Rural India. World Development Perspectives. Elsevier. https://doi.org/10.1016/j.wdp.2023.100522
2. Bollimbala, A., & James, P. S. (2024). Impact of chronic physical activity on individuals' creativity. Psychological Research, 88(2), 684-694. https://doi.org/10.1007/s00426-023-01862-4 [ABDC- A, ABS-3, SCOPUS-Q1].
3. Bollimbala, A., James, P. S., & Ganguli, S. (2023). The impact of physical activity intervention on creativity: Role of flexibility vs persistence pathways. Thinking Skills and Creativity, 49, 101313. https://doi.org/10.1016/j.tsc.2023.101313 [SCOPUS-Q1, Top 10% in Education]
4. Parai, K., Gupta, D. S., & Islam, S. H. (2023). IoT-ID3PAKA: Efficient and Robust ID-3PAKA Protocol for Resource-Constrained IoT Devices. IEEE Internet of Things Journal.
5. Islam, S. H., Parai, K., & Gupta, D. S. (2024). PF-IBDA: Provably secure and pairing-free identity-based deniable authentication protocol for MANET environments. Computer Networks, 238, 110113.
6. Gupta, D. S. (2023). PiLike: Post-Quantum Identity-Based Lightweight Authenticated Key Exchange Protocol for IIoT Environments. IEEE Systems Journal.
7. Verma, P., & Gupta, D. S. (2023). An Improved Certificateless Mutual Authentication and Key Agreement Protocol for Cloud-Assisted Wireless Body Area Networks. Wireless Personal Communications, 131(4), 2399-2426.
8. Shekhawat, H., & Gupta, D. S. (2024). A survey on lattice-based security and authentication schemes for smart-grid networks in the post quantum era. Concurrency and Computation: Practice and Experience, e8080.
9. Dutta, S. and Dixit, S. (2023). Virtual Reality Prophecy: Harbinger of Tourism at Australian & New Zealand Marketing Academy Conference 2023, New Zealand, December 4-6 2023.
10. Pathania, A. and Dixit, S. (2023). Seeing the Forest for the Trees: A Review on consumer technology adoption behavior through information lens and future research agenda at the Academy of Marketing (AOM) Conference-From Revolution to Revolutions, University of Birmingham, July 3-6, 2023.
11. Adil, M. H. & Roy A. (2024) Asymmetric effects of uncertainty on investment: empirical evidence from India. Journal of Economics Asymmetries.
12. Adil, M. H. & Chaubal A. (2024). Money demand stability in India: allowing for an unknown number of breaks. Empirical Economics.
13. Adil, M. H. & Haider, S. (2023). On the effect of COVID-19 and policy uncertainty on stock market: evidence from India. International Journal of Social Economics.
14. Sharma, V., Adil, M.H. & Fatima, S. (2023). Oil Prices-Economic Output Nexus in India: Empirical OPEC Energy Review, 11, 1-16.
15. Adil, M.H. & Hatekar, N.R. (2023). How justified is abandoning money in the conduct of monetary policy in India on the grounds of unstable money demand function? Evidence from dynamically simulated ARDL. Cogent Economics and Finance, 11, 1-20.

International Conference

1. Jaswal, N., Singh P. (2023). The Emerging Market Separations in Early-Stage Tech Startups: A Systematic Review of the Market Separation Theory, International Confluence Conference on Startups and Innovation, December 13-15, 2023, Department of Management Studies, IIT Madras.
2. Singh, L., Singh P. (2023). How does mentoring navigate startup innovation?, International Confluence Conference on Startups and Innovation, December 13-15, 2023, Department of Management Studies, IIT Madras.
3. Yadav, D., Singh P. (2023). What drives Student Entrepreneurship? An Empirical Analysis of Entrepreneurial Intention and Activities in Indian Educational Institutions, International Confluence Conference on Startups and Innovation, December 13-15, 2023, Department of Management Studies, IIT Madras.

4. Adil, M. H., & Roy, A. (2024). Asymmetric effects of uncertainty on investment: empirical evidence from India. 7th SANEM Annual Economists' Conference (SAEC) 2024, Feb 23-25, 2024, Dhaka, Bangladesh.
5. Adil, M. H., & Roy, A. (2024). Asymmetric effects of uncertainty on investment: empirical evidence from India. Taiwan (Scheduled).
6. Prem, G. & Adil, M. H. (2024) Impact of ESG performance on dividend payout policy: Evidence from India using CS-ARDL approach, Taiwan, (Scheduled).

National Conference

1. Adil M. H., & Roy, A. (2024). Asymmetric effects of uncertainty on investment: empirical evidence from India. International Conference on Recent Development in Economics Research: Theory and Evidence, CITD, SIS, JNU, Delhi, India, 7-8 March, 2024.

3.6.2 Invited Lecturers/talks/continuing Education Programs

1. Dr. Puran Singh, Expert Speaker, Rich Startup, Poor Startup, Innoventure, NMIS Chandigarh, April 2, 2024.
2. Dr. Puran Singh, Speaker, General Management/Leadership Program for GUVNL, March 11-16, 2024, IIT Mandi.
3. Dr. Puran Singh, Speaker, Panel discussion on "Unveiling the Impact of PMJDY: Integrating Quantitative Outcomes and Qualitative Insights", "The Impact Assessment of Pradhan Mantri Jan Dhan Yojana (PMJDY): With Reference to Rajasthan and Uttar Pradesh", Dept of Economics, University of Rajasthan, March 14, 2024.
4. Dr. Puran Singh, Speaker, Panel discussion on 'Journey from Financial Inclusion to Financial Wellbeing – Focus areas for the next financial inclusion strategy', Reserve Bank of India, Frontline Managers' Conference, March 7, 2024, New Delhi
5. Dr. Puran Singh, Speaker, 2-hour workshop on Problem Statement Canvas, IIT Mandi Catalyst, Feb 28, 2024.
6. Dr. Puran Singh, Speaker, 10-Hour Workshop on Entrepreneurship Development, HP Kaushal Vikas Nigam & Center for Continuing Education, IIT Mandi, Feb 20-21, 2023.
7. Dr. Puran Singh, Speaker, "Fundamentals of Finance for Startups", during IIT Mandi Catalyst's Exploration Program, IIT Mandi, Himachal Pradesh, Feb 19, 2024.
8. Dr. Puran Singh, Speaker, "Mindset to Methodology", during event titled आवर्धन: From spark to unicorn brilliance," Organized by the Incubation Centre, NIT Hamirpur, Himachal Pradesh, Feb 03, 2024.
9. Dr. Puran Singh, Speaker, "Effectuating an Incubator in an Impossible Geography", The International Centre for Entrepreneurship and Technology (iCreate), Gujarat, Dec 22, 2023.
10. Dr. Puran Singh, Speaker, "Effectuating an Incubator in an Impossible Geography", International Confluence Conference on Startups and Innovation, December 13-15, 2023, Department of Management Studies, IIT Madras.
11. Dr. Puran Singh, Chair, Master Session, International Confluence Conference on Startups and Innovation, Department of Management Studies, IIT Madras, December 13-15, 2023.
12. Dr. Puran Singh, Speaker, Panel Discussion on Sustainability of Business Incubator-Good Practices, ISBAcon 2023, Indian STEPS and Incubators' Association, Mumbai, Oct 26-28, 2023.
13. Dr. Puran Singh, "Effectuating an incubator in an impossible geography", UNCONFERENCE ON INCUBATION PRACTICE AND NETWORKING", Indian STEPS & Incubators' Association, April 20–21, 2023, IIT Mandi Campus.
14. Dr. Puran Singh, Speaker, Strengthening the Ecosystem: Incubators as Enablers, Startup Kumbh: G20-DIA National Roadshow, AIC-BIMTECH, March 28, 2023.
15. Dr. Masudul Hasan Adil, Delivered invited talk on topic "Career opportunities in economics" at Khalsa college Mumbai.

16. Dr. Masudul Hasan Adil, Delivered invited talk on topic "Monetary policy approaches in India" at VIT Tamil Nadu.
17. Dr. Masudul Hasan Adil, Scheduled invited talk on topic "Money demand function in India" at Integral University, Lucknow.

Faculty Development Program

1. Dr. Puran Singh, Speaker, 3-Hour Workshop on Entrepreneurship Development, HP Kaushal Vikas Nigam & Center for Continuing Education, IIT Mandi, Nov 14, 2023.
2. Dr. Puran Singh, Speaker, 10-Hour Workshop on Entrepreneurship Development, HP Kaushal Vikas Nigam & Center for Continuing Education, IIT Mandi, Nov 09-13, 2023.
3. Dr. Puran Singh, Speaker, 10-Hour Workshop on Entrepreneurship Development, HP Kaushal Vikas Nigam & Center for Continuing Education, IIT Mandi, July 29-30, 2023.
4. Dr. Puran Singh, Coordinator and Facilitator, 5-day Faculty Development Program on Entrepreneurship, Ideation & Innovation, Oct 9-13, 2023, Organized by SCERT, School of Management-IIT Mandi & Center for Continuing Education, IIT Mandi.
5. Dr. Ashish Bollimbala, 4 sessions (5 hours 30 minutes) FDP for Delhi SCERT, Oct 9-13, 2023.
6. Dr. Ashish Bollimbala, 59 Hours of teaching in continuing education programs by HPKVN.
7. Dr. Daya Sagar Gupta, At NIT Sikkim during March 8-12, 2024.
8. Dr. Daya Sagar Gupta, At Government Autonomous College Rourkela India during Jan 13, 2024.
9. Dr. Masudul Hasan Adil, 15 hours taught to the first batch HPKVN Himachal Pradesh students.
10. Dr. Masudul Hasan Adil, 10 hours taught to the second batch robotics HPKVN Himachal Pradesh students.
11. Dr. Masudul Hasan Adil, 10 hours taught to the third batch IOT HPKVN Himachal Pradesh students.
12. Dr. Masudul Hasan Adil, 4 hours taught to the fourth batch AI HPKVN Himachal Pradesh students.

3.6.3 Professional Achievements, Honors And Awards

1. Dr. Puran Singh, Best Paper Award for Jaswal, N., & Singh P. (2023). The Emerging Market Separations in Early-Stage Tech Startups: A Systematic Review of the Market Separation Theory, International Confluence Conference on Startups and Innovation, December 13-15, 2023, Department of Management Studies, IIT Madras.
2. Dr. Puran Singh, Recognized for Contribution to ISBA Governing Body during 2022-23, at ISBAcon 2023, Indian STEPS and Incubators' Association, Mumbai, Oct 26-28, 2023.
3. Dr. Masudul Hasan Adil, Young Scholars' Best Paper Award (2024), International Conference on Recent Development in Economics Research: Theory and Evidence, CITD, SIS, JNU, Delhi, India, 7-8 March, 2024.

3.6.4 Membership of Professional Societies

1. Dr. Daya Sagar Gupta, IEEE Senior Member
2. Dr. Daya Sagar Gupta, ACM Professional Member
3. Dr. Masudul Hasan Adil, Life membership, The Indian Econometric Society, TIES, India, Jan 2024

3.6.5 Eminent Guest/scholars/students/interns Hosted

S. No.	Name	Affiliation	Date	Title of the talk
1	Mr. Sajan Nair	CEO, Agaamin Technologies	7th April 2023	Smart name for IIT Mandi students
2	Arun Malhotra	Professor of Practice, SOM	13th April 2023	Interview Session & Resume Building

3	Sarath Chandran	INDIGO	28th April 2023	Analytics in Aviation Industry
4	Anshuman Ravi	IIM Bengaluru	14th August 2023	Debunking myths of stock markets
5	Rajesha H G	Senior consultant, Infosys	23rd August 2023	AI powered automation in digital banking
6	Amandeep Singh Gill	Project Director, Robert Bosch	24th August 2023	AI in IT&MA business
7	Lalit Verma	Sr. Consultant, EY	16th September 2023	Cultivating self before cultivating a professional career
8	Anantha Krishna Rajpurohit	Zee Entertainment Ltd.	30th Sept 2023	Pitfalls in the age of AI: Insights into data career and strategy.
9	Ganesh Ravi	Samsung R&D Institute India	30th Sept 2023	Pitfalls in the age of AI: Insights into data career and strategy.
10	Venkat Raghavan	TESCO Bengaluru	30th Sept 2023	Pitfalls in the age of AI: Insights into data career and strategy.
11	Shibananda Dash	Hero Group	4th Nov 2023	Entrepreneurship and happiness
12	Sudhir Kumar	SKM Designs	4th Nov 2023	Entrepreneurship and happiness
13	Amitabh Saran	Altigreen Propulsion Labs	17th Nov 2023	Entrepreneurial Insights: Pitfalls, Lessons and Niches in the EV Startup Game
14	John Mathew Sebastian	Vguard Industries Ltd	17th Nov 2023	What MBA students should aspire to achieve
15	Aditya Kumar Yadav	The Akshaya Patra Foundation	2nd December 2023	How to thrive in the changing industry and advance your career
16	Dr. Jayanta Bora	VART Consulting(P) LTD	17-26 January 2024	Data visualisation using power BI
17	Sunil Mishra	Founder & CEO, AceNet Consulting	27 January 2024	Data Driven Marketing

18	Vasanth Rao	Co-Founder and CTO, AceNet Consulting	27 January 2024	Real Life Application of IOT and AI/ML
19	Kajal Ghose	Director of Utkarsh Small Finance bank	10th February 2024	Analytics and Social Media
20	Sudhir Sahu	Operation Director at Jabil	10th February 2024	Management of Product & Technology Transfer
21	Arjit Das	AVP Analytics at Wells Fargo	21st February 2024	Analytics and Data Science In Banking
22	Prachi Sharma	Co founder Vizinfy	24th February 2024	Entrepreneurship
23	Megha Sinha	Vice President AI/ML Practice, Genpact	19th March 2024	Latest Industry Perspectives from the rapidly advancing field of Data
24	Kunjal Pal	Manager-HRBP, Forage AI	28th March 2024	Careers in Data Science and AI
25	Nadia Dsilva	Software Engineer, Forage AI	28th March 2024	Careers in Data Science and AI
26	VL Prabhas Kumar	Lead Data Scientist, Forage AI	28th March 2024	Careers in Data Science and AI

3.6.6 Student Activities/achievements

1. Best Paper Award for Jaswal, N., & Singh P. (2023). The Emerging Market Separations in Early-Stage Tech Startups: A Systematic Review of the Market Separation Theory, International Confluence Conference on Startups and Innovation, December 13-15, 2023, Department of Management Studies, IIT Madras
2. Mallikarjun Gudadinni, PhD Scholar awarded the runners-up position for an outstanding research presentation at Ph.D. & New Faculty Colloquium - 2024 in the management category organized by Indian Institute of Management Mumbai from January 29th to 31st, 2024.

3.6.7 Events

AiXCELRATE, September 23-24, 2023

Hosted in September 2023, "AiXCELRATE" was a two-day event exploring the transformative impact of Data Science and AI on business. AiXcelrate saw 6 industry experts sharing insights on driving change and fostering growth in competitive landscapes. Discussions highlighted the central role of Data Science and AI in optimizing processes, refining decision-making, and fostering innovation. Leadership in the Age of Automation was a key focus, emphasizing the imperative to strike a nuanced balance between human and machine capabilities. Leaders were encouraged to cultivate emotional intelligence while utilizing AI as a tool to enhance, rather than replace, human creativity. The segment on The Changing Nature of Working, highlighted the necessity for adaptability in response to the rapidly evolving technological landscape. The event seamlessly integrated cultural dimensions with industry insights, fostering meaningful interactions among professionals, students, and faculty. AiXCELRATE successfully provided a comprehensive view of the intersection between cultural elements, business strategies, and the dynamic field of Data Science and AI.

Industry Experts for AiXcelerate

S. No.	Name of Guest	Affiliation
1.	Anunay Gupta	Managing Director, J P Morgan Chase
2.	Gaurish Wagh	Global Talent Management, Credit Suisse
3.	Sachin Kalra	Senior Manager, Yum Digital & Tech – India
4.	Srikanth Dahagam	Chief HR Officer, Tirupati Group
5.	Binny Dawson	Global head, People Development, Export Trading Group
6.	Sumant Sood	Head of Innovation, Titan

HiBS, November 18-19, 2023

Himalayan Business Summit Hosted in November 2023, the two-day event, HiBS, provided a remarkable fusion of cultural richness and insightful perspectives from industry leaders, focusing on the fields of data science and AI. The keynote addresses delivered by distinguished speakers from various fields, including Mr. G.A. Srinivasa Murthy, Director at Defense Research &Development Laboratory (DRDL), and Dr. Satya Narayan Sabat, IPS, added immense value to the occasion.

During the event, prominent figures in various industries participated in a meaningful dialogue regarding the vital importance of leadership in cultivating diversity and fostering inclusivity within the workplace. Leading this discussion was Ms. Geetanjali Bhattacharji, the founder of Glassbox; Mr. Venugopal Iyengar, the COO of Digital Planet cast; Mr. Sumit M., a senior director at Capgemini, and Mr. Gaurish Wagh. The event bridged academia with real-world applications, offering insights into the dynamic landscape. It fostered collaboration and networking in data science and AI, highlighting HiBS's commitment to an inclusive community.

Industry Experts for HiBS

S. No.	Name of Guest	Affiliation
1.	John Mathew Sebastian	DGM and head of Talent acquisition, V Guard industries
2.	Nirupa Mary Jacob	Lead Campus and universtiy relations, V Guard Industries
3.	Nitin Khindria	Chief HR Officer, Dalmia Group
4.	Sahil Nayar	Senior Associate Director, KPMG
5.	Mekhola Ganguly	GM HR Buisness partner, Welspun Group
6.	Gaurish Wagh	Global HR Lead, Credit Suisse
7.	Sumit Mehta	Senior Director, Capgemini
8.	Rajeswar Rao	Co-founder of UNMITI Consultancy Services
9.	Venugopal Iyengar	COO Digital, Planetcast
10.	AbdulQuader A Kinariwala	HR and talent head, Accenture
11.	Geetanjali Bhattacharji	Founder, Glassbox
12.	Amitabh Saran	CEO, Alti green Propulsion labs
13.	Sachin Rane	Data Matics Global Ltd

14.	S N Sabat	Director General of Police, UP
15.	Rishi Seth	Head of Strategic Initiatives, Fractal
16.	Aditya Aggarwal	EVP Digital Enterprise at Maruti Suzuki India Limited
17.	G A Srinivasa Murthy	Director DRDL
18.	Dr S Krishna Mohan	Group Director, DHRTM

3.7 School of Humanities and Social Sciences

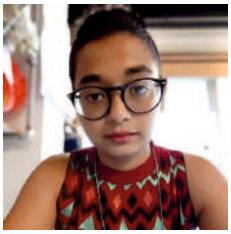
Welcome to the School of Humanities and Social Sciences (SHSS) at the Indian Institute of Technology Mandi (IIT Mandi). SHSS has carved a niche through its academic and research activities in disciplines ranging from Economics to English and World Literature, German Studies, Sociology, History, Himalayan Studies, Development Studies, Population Studies and allied areas. Our academic endeavour focuses on critical thinking and rational enquiry into complex disciplinary and interdisciplinary problems. We have a thriving academic atmosphere, with fourteen faculty members, over forty PhD scholars, and two ongoing batches of postgraduate students in MA Development Studies at SHSS.

We offer a wide range of courses at postgraduate and undergraduate levels, including MA in Development Studies. The unique location of our institute has also inspired several courses and research activities at the School that are particularly focused on the Himalayan region with significant components of fieldwork and community interaction. We also spearhead the Interactive Socio-Technical Practicum (ISTP) for undergraduate students that aims to explore the various issues and challenges faced by society, propose technology-based solutions for these, and evaluate the proposed solutions from social, technical, economic, environmental and other aspects. This year, there were 42 projects floated under ISTP engaging an unprecedented number of ~300 students. All activities of SHSS could be traced in our newly published biannual Newsletter – "Himalayan Chronicles" three issues of which are already published. We are also in the process of reconstructing our School website, which will be ready by the next academic session.

This year, we have established a Library of Himalayan Literature and Culture, housing over 400 books and organised an array of insightful talks by esteemed guests like Prof. Sudha Vasan, Prof. Reetika Khera, Prof. Angelina Multani, Dr Ashish Avikunthak and Dr Easterine Kire, and advanced research-oriented workshops by Prof. Martin Siegel, Prof. Laishram Ladu Singh, and others. These, along screenings of regional-language films and works by Ashish Avikunthak enriched our activities of this academic year. In this academic year, we have proudly hosted the 3rd Young Graduate Meet around the theme "Spatial Transformations and Condensations in South Asia", a national scholars' meet initiated by the research scholars of our School. This year their proposal won a grant from Indian Council of Social Science Research to make the programme financially self-sustained.

As always, we continued to believe in providing equal opportunity to all and in maintaining an inclusive and well-balanced demographic composition in terms of faculty members, research scholars and students. To this end, the school ensures substantial academic freedom and flexibility to explore cutting-edge developments, a space for professional fulfilment with all the necessary infrastructure, and constant collegial support for faculty members and students.

Faculty Members		
1.	**Dr. Shyamasree Dasgupta** Chairperson Associate Professor Specialization: Energy and Environmental Economics, Economics of Climate Change, Applied Econometrics Ph.D. from Jadavpur University, Kolkata Home Town: Kolkata, West Bengal Phone: 01905-267122 E-mail: shyamasree@iitmandi.ac.in	
2.	**Dr. Aruna Bommareddi** Assistant Professor Specialization: Comparative Literature, Indian Literatures in English Ph.D. from University of Hyderabad Home Town: Hyderabad, Andhra Pradesh Phone: 01905-267121 E-mail: aruna@iitmandi.ac.in	

3.	**Dr. Devika Sethi** Assistant Professor Specialization: Modern Indian History, Colonialism and Decolonization, Free Speech and Censorship Ph.D. from Jawaharlal Nehru University, New Delhi Home Town: Allahabad, Uttar Pradesh Phone: 01905-267244 E-mail: devika@iitmandi.ac.in	
4.	**Dr. Manu V. Devadevan** Associate Professor Specialization: Literary practices in South Asia, Political and Economic Processes in premodern South Asia & South Asian Epigraphy Ph.D. from Mangalore University, Mangalagangothri, Mangalore Phone: 01905-267147 E-mail: manu@iitmandi.ac.in	
5.	**Dr. Mayanka Ambade** Assistant Professor Specialization: Demography E-mail: mayanka@iitmandi.ac.in	
6.	**Dr. Neethi V Alexander** Assistant Professor Specialization: English Literature E-mail: neethi@iitmandi.ac.in	
7.	**Dr. Neha Kaushik** Assistant Professor Specialization: Translation Studies, Women's Writing, Comparative Linguistics, German Studies Ph.D. from Jawaharlal Nehru University, New Delhi Home Town: New Delhi Phone: 01905-267267 E-mail: nehakaushik@iitmandi.ac.in	
8.	**Dr. Nilamber Chhetri** Assistant Professor Specialization: Sociology Ph.D. from Jawaharlal Nehru University, New Delhi Home Town: Kalimpong, West Bengal Phone: 01905-267269 E-mail: nilamber@iitmandi.ac.in	

9.	**Dr. Rajeshwari.Dutt** AssociateProfessor Specialization: Latin America, Social and Cultural History Ph.D. from Carnegie Mellon University, USA Home Town: Kolkata, West Bengal Phone: 01905-267043 E-mail: rdutt@iitmandi.ac.in	
10.	**Dr. Ramna Thakur** Associate Professor Specialization: Development Economics Ph.D. from Himachal Pradesh University, Shimla Home Town: Mandi Phone: 01905-267044 E-mail: ramna@iitmandi.ac.in	
11.	**Dr. Saumya Malviya** Assistant Professor Phone: 01905-267829 E-Mail: saumyamalviya@iitmandi.ac.in	
12.	**Dr. Suman** Assistant Professor Specialization: Colonialism, Post colonialism, Imperialism and Romance Literature Ph.D. from Indian Institute of Technology Delhi Home Town: Faridabad Phone: 01905-267919 E-mail: suman.sigroha@iitmandi.ac.in	
13.	**Dr. Surya Prakash Upadhyay** Assistant Professor Specialization: Sociology of Religion, Urban Sociology, Post-Reform India Ph.D. from Indian Institute of Technology Bombay Home Town: Lucknow, Uttar Pradesh Phone: 01905-267136 E-mail: surya@iitmandi.ac.in	
14.	**Dr. Thirthankar Chakraborty** Assistant Professor Phone: 01905-267823 E-mail: thirthankar@iitmandi.ac.in	

Visiting & Adjunct Faculties		
1.	**Dr. Ingrid Shockey** Adjunct Associate Professor Specialization: Environmental Sociology Ph.D. from Brandeis University, USA Home Town: Northampton, MA, USA	

3.7.1 Publication

1. Books Published

1. Dutt, Rajeshwari and Nico Slate eds. (2023) India in the World: 1500 to the Present. New York: Routledge. https://www.routledge.com/India-in-the-World-1500-to-the-Present/Dutt- Slate/p/book/9781032494647.
2. Karunadu (essays in Kannada on the history of Karnataka), Akshara Prakashana, Heggodu, 2024; Dr. Manu V Devadevan.

2. Book Chapters

1. Mayanka Ambade,Rockli Kim,S. V. Subramanian(2023). Socioeconomic and Geographic Patterns of Cost for Latest Hospitalization and Outpatient Service Use Among Older Adults Aged 45 Years and Over in India, Handbook of Aging, Health and Public Policy (pp.1-20), DOI:10.1007/978-981-16-1914-4_241-1.

3. Encyclopaedia Entries

- V. Neethi Alexander. "The Book of Rachel." The Routledge Encyclopedia of Indian Writing in English. Edited by Manju Jaidka and Tej Dhar. Routledge, 2023.
- V. Neethi Alexander. "Bookless in Baghdad." The Routledge Encyclopedia of Indian Writing in English. Edited by Manju Jaidka and Tej Dhar. Routledge, 2023.
- V. Neethi Alexander. "Housing Discrimination." African American Activism and Engagement: An Encyclopedia of Empowerment. Edited by Angela Jones. Santa Barbara, CA: ABC-CLIO, 2023.
- V. Neethi Alexander. "March on Washington." African American Activism and Engagement: An Encyclopedia of Empowerment. Edited by Angela Jones. Santa Barbara, CA: ABC-CLIO, 2023.

4. News Articles

1. Saumya Malviya. "Gandhi the Martyr, Via JPS Uberoi", The Wire, January 2024.
2. Saumya Malviya. "Why Humanities and Social Sciences are gaining Popularity at IITs", The Indian Express, March 2024.
3. Dutt, Rajeshwari (2023), "Emancipation and Imperialism in a Borderland: The Challenge to Settler Sovereignty over Slavery in Belize in the 1820s", The Americas. Cambridge University, 80 (1).

5. Journal Articles

1. Priyadarshini, A., Sigroha, S. and Andermahr, S. "You have to survive": Reading Trauma, Survival and Adolescent Resilience in N.H. Senzai's Contemporary Young Adult War Narrative, Escape from Aleppo. Journal of Postcolonial Writing, Taylor and Francis, 60:1, 28-42 (2024).
2. Sigroha, S. and Priyadarshini, A. In Search of a Sexual Identity: Love, Longing and Trauma in Children's and Young Adult Literature in Japan. In Articulating Childhood Trauma In the Context of War, Sexual Abuse and Disability, Routledge. (2024).
3. Varghese, N. And Sigroha, S. Governmentality and Populism. In Encyclopedia of New Populism and Responses in the 21st Century. Springer Singapore (2024).

4. Priyadarshini, A. and Sigroha, S. The 'Gentle Recitation': Writing Trauma in Contemporary Children's and Young Adult Literature. International Research In Children's Literature (IRCL), 17.2, an Edinburgh University Press journal. (2024).

5. Singh, K. Sigroha, S. and Shokeen, B. Women Singing in a North Indian Rural Community: A Case Study. In Oxford Handbook of Community Singing, edited by Esther Morgan-Ellis and Kay Norton, Oxford University Press. 454-474 (2024).

6. Chakraborty, T. "'NOT I:' Postcolonial Reconfigurations of Samuel Beckett". Interventions: International Journal of Postcolonial Studies, Routledge, 1-21. https://doi.org/10.1080/1369801X.2023.2288083 (2023).

7. Malviya, Saumya. 2024. Ek Parityakt Pul ka Sapna. Lokbharti (Rajkamal): New Delhi.

8. "Angela Carter and the 'sociology of clothes' in The Infernal Desire Machines of Doctor Hoffman." ANQ: A Quarterly Journal of Short Articles, Notes, and Reviews, 13 May 2023.

9. Ranjan, S., & Thakur, R. (2024). The effect of socioeconomic status, depression, and diabetes symptoms severity on diabetes patient's life satisfaction in India. Scientific Reports, 14(1). https://doi.org/10.1038/s41598-024-62814-5

10. Brauer, M., Roth, G. A., Aravkin, A. Y., Zheng, P., Abate, K. H., Abate, Y. H., Abbafati, C., Abbasgholizadeh, R., Abbasi, M. A., Abbasian, M., Abbasifard, M., Abbasi-Kangevari, M., ElHafeez, S. A., Abd-Elsalam, S., Abdi, P., Abdollahi, M., Abdoun, M., Abdulah, D. M., Abdullahi, A., . . . Gakidou, E. (2024). Global burden and strength of evidence for 88 risk factors in 204 countries and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. Lancet, 403(10440), 2162–2203. https://doi.org/10.1016/s0140-6736(24)00933-4.

11. Bhattacharjee, N. V., Schumacher, A. E., Aali, A., Abate, Y. H., Abbasgholizadeh, R., Abbasian, M., Abbasi-Kangevari, M., Abbastabar, H., ElHafeez, S. A., Abd-Elsalam, S., Abdollahi, M., Abdollahifar, M., Abdoun, M., Abdullahi, A., Abebe, M., Abebe, S. S., Abiodun, O., Abolhassani, H., Abolmaali, M., Vollset, S. E. (2024). Global fertility in 204 countries and territories, 1950–2021, with forecasts to 2100: a comprehensive demographic analysis for the Global Burden of Disease Study 2021. Lancet. https://doi.org/10.1016/s0140-6736(24)00550-6.

12. Sujata, S., B, G., & Thakur, R. (2024). A Vulnerability Index for Mitigation and Prevention of Diabetes Growth in India: A Disaggregated Analysis. Value in Health Regional Issues, 40, 89–99. https://doi.org/10.1016/j.vhri.2023.09.009.

13. Thakur, R., & Faizan, M. A. (2024). Magnitude of health expenditure induced removable poverty in India: Some reflections of Ayushman Bharat. Heliyon, 10(1), e23464. https://doi.org/10.1016/j.heliyon.2023.e23464.

14. Ranjan, S., & Thakur, R. (2023). Gender differential in the pattern and severity of perceived symptoms among diabetes patients in India. Diabetology International, 15(2), 223–236. https://doi.org/10.1007/s13340-023-00673-7.

15. Ranjan, S., Kaur, A., & Thakur, R. (2023). Gender Differential In Symptoms, Morbidity, And Case Fatality Rate In The COVID-19 Pandemic In India. Asia Pacific Journal of Health Management. https://doi.org/10.24083/apjhm.v18i3.1227.

16. Ranjan, S., & Thakur, R. (2023a). Gender differential in awareness and risk factors of diabetes among diabetes patients in India. Journal of Public Health/Zeitschrift Für Gesundheitswissenschaften. https://doi.org/10.1007/s10389-023-01933-1.

17. B, G., Sujata, S., & Thakur, R. (2023). Cardiovascular Diseases and Ageing in India: A Propensity Score Matching Analysis of the Effects of Various Risk Factors. Current Problems in Cardiology, 48(5), 101606. https://doi.org/10.1016/j.cpcardiol.2023.101606.

18. Mayanka Ambade,Nidhiya Menon,S. V. Subramanian (2024). The impact of early-life access to oral polio vaccines on disability: evidence from India; Journal of Population Economics (2024) 37:23; https://doi.org/10.1007/s00148-024-01006-x.

19. S.V. Subramanian, Mayanka Ambade, Smriti Sharma, Akhil Kumar (2023). Corrigendum to- "Prevalence of Zero-Food among infants and young children in India: patterns of change across the States and Union Territories of India, 1993–2021"; EClinicalMedicine 61:102047 DOI: 10.1016/j.eclinm.2023.102047.
20. Mayanka Ambade, Sunil Rajpal, Rockli Kim* and S.V.Subramanian * (2023).Socioeconomic and geographic variation in coverage of health insurance across India , Frontiers Public Health 11:1160088.doi: 10.3389/fpubh.2023.1160088.
21. Mayanka Ambade,Rockli Kim,S V Subramanian (2023). Socio-economic distribution of modifiable risk factors for cardio-vascular diseases: An analysis of the national longitudinal ageing study in India. Preventive Medicine 175(3):107696,2023175(3):107696,DOI:10.1016/j.ypmed.2023.107696,
22. Mayanka Ambade(2023). Issues and Challenges in Conceptualization and Implementation of Nyuntam Aay Yojana. Economic and Political Weekly 58(31).
23. Surya Prakash Upadhyay,Isha Jha (2023) Twin Movement: State, Market and the Non-Elite Middle Class in Post-Reform India; Taylor and Francis;54(3):1-17 DOI: 10.1080/00472336.2022.2158120.

6. Conference

1. Animal Tales in a Biospheric Curriculum: An Alternative Ecocritical Pedagogy for the Anthropocene. Jyotishman Kalita and Suman Sigroha at 'Literature and the Anthropocene in EFL Education' conference at Luleå University of Technology, Sweden, 20-21 February 2024. Dr. Suman.
2. North Indian Folk Culture: Stories People Remember. Distinguished guest speaker at the Two-week interdisciplinary Online Refresher course at ARSD College, University of Delhi from October 25 to November 08, 2023 on the theme, "Indian Folk Traditions: A Tapestry of Diversity **(भारतीय लोक परंपरा के विविध आयाम)."** Dr. Suman.
3. Violence, Trauma, and Memory in 'Sleeping on Jupiter' by Anuradha Roy. Shishu Bala and Suman Sigroha at the 23rd International MELOW Conference, 'Borders, Boundaries, Lines of Control: Literature across Disciplines in Contemporary Times', October 06-08, 2023. Dr. Suman.
4. Evolving Nature of 'Centre- Margin' Relationship in New English Short Fiction from Assam. Jyotishman Kalita and Suman Sigroha at the IACLALS' Annual Conference 2023, 'Metropolis and Margins: Shifting Configurations in Literature and Language Studies', 26-29 April, 2023.
5. Invited delegate at CoP28 to showcase its significant achievements in climate change science on the theme "Climate Change Vulnerability in the Himalayan Region: Impacts and Implication" by Department of Science and Technology, Govt. of India. Dubai December 3, 2023. Dr. Shyamasree Dasgupta.
6. Music, Mathematics and the Non-Finality of Truths: Exploring the Resonances. Saumya Malviya at 'the 4th ISME South Asia Regional Conference at KM Music Conservatory in Chennai India, 24-26 November, 2023.
7. Invited as expert to conduct a workshop on 'Translating Poetry' for the Diploma in Literary Translation Programme at Ahmedabad University (supported by JCBLF), Ahmedabad, 22-26 April, 2024. Dr. Saumya Malviya.
8. Invited as external expert to contribute to the 'Usable Pasts, Sustainable Futures: The Housing Lab' conducted by CIAR Ahmedabad University, Ahmedabad, 17-18 February, 2023. Dr. Saumya Malviya.
9. Elements of the Carnivalesque in the Shadow Puppetry Tradition of Andhra Pradesh." Proceedings of WRFASE International Conference, gyakarta, April 2023; ISBN:978-93-90150-32-8. Bommareddi, Aruna.
10. International conference: 15th World Congress of the International Health Economics Association on Diversity in Health Economics, Cape Town International Convention Centre, University of Cape Town, July 8-12, 2023.Dr. Ramna Thakur.
11. National Conference: 11th Annual Conference of the Indian Health Economics and Policy Association on Health Policy:Advancing Research and Communication, FLAME University, Pune, January 18-19, 2024. Dr. Ramna Thakur.
12. Dutt, Rajeshwari (2023) "Emancipation and Imperialism", Invited talk for the NICH at 20 Research Lab Series at the Institute for Social and Cultural History, Belmopan Belize.
    Dutt, Rajeshwari (2023), "The Nicaragua Canal and the Turn Towards Panama," Society for Caribbean Studies Conference, UK.
13. IIPS National Seminar 2024 PreConference Workshop on National Transfers Account, Dr. Mayanka Ambade.
14. 28th IIPS National Seminar on Tracking progress of Sustainable Goals with focus on Uttar Pradesh: February 12 to 13, 2024, Department of Statistics BHU, Varanasi Dr. Mayanka Ambade.
15. 11th Annual Conference of IHEPA-Health Policy: Advancing Research and Communication, January 17 to 19 2024, Flame University, Pune, Dr. Mayanka Ambade.

3.7.2 SHSS Talks

SHSS Talks 2023-24				
Sl. No.	**Speaker**	**Title of the talk**	**Talk Date**	**Mode of Organized Talk**
1	Prof. Sudha Vasan	Development, Devta and Deodar: Socio-Ecological Transformations in the Western Himalayas	03.04.2023 (4 to 5:00 PM)	In person
2	Dr. Ingrid Shockey	“Enabling “Two-Eyed Seeing”: Connecting Indigenous and Western Knowledge in STEM”	19.04.2023 (3 to 5 PM)	In person
3	Prof. Reetika Khera	“Aadhaar and Welfare: Pain without Gain"	28.04.2023 (3 to 5 PM)	In person
4	Dr. Abhilash Malayil	Markers Of Material Change In The Early Modern Southern India: Some Observations On The Coast Of Malabar	08.05.2023 (3 to 5 PM)	In person
5	Prof. Angelina Multani	“History of Indian English Theatre and Mahesh Dattani”	28.08.2023 (4 to 5:30 PM)	Online
6	Dr. Sebanti Chatterjee	“Exploring Christian-musical belonging: an Ethnographic inquiry”	20.09.2023 (03:30 to 04:30 PM)	Online
7	Prof. Ashish Avikunthak	Bureaucratic Archaeology: State, Science, and Past in Postcolonial India (2O21) on	16.11.2023	In person
8	Prof. Martin Siegel	'Vague information and wild assumptions	04.12.2023	In person
9	Dr Easterine Kire	'Writing from the Heart: Direct Dil Se“	25.02.2024	In person
10	Prof. Laishram Ladu Singh	“Stitching Demographic and Epidemiological Transitions"	14.03.2024	In person

School Talks & Workshop

3.7.3 SHSS Events

1. YOUNG GRADUATE MEET 2023

The third Young Graduate Meet 2023 was held from October 10-12, 2024. This year, a total of 32 papers were presented, divided into six panels over the three days. The keynote session was delivered by Prof. Surinder Singh Jodhka from the Centre for the Study of Social Systems at JNU. Additionally, two plenary sessions were conducted by Prof. Dr. Martin Siegel from Technische Universität Berlin and Dr. Avishek Parui from IIT Madras. A cultural event took place later on the first day, where students and scholars from across the institute showcased their talents.

2. ISTP 2023-24

Write up ISTP

The Interactive Socio-Technical Practicum (ISTP) offered by SHSS, IIT Mandi is a highly impactful course designed to heighten students' awareness of societal challenges and instil a strong sense of responsibility by empowering them to be proactive problem solvers. During the 2024 ISTP program, the institute played host to esteemed faculty members Dr. Alex Jefferson Sphar and Dr. Uma Kumar, along with 19 students from Worcester Polytechnic Institute (WPI) and 273 3rd and 4th-year B-Tech students from IIT Mandi, all actively engaged in the design and innovation stream. Throughout the program, 42 teams, under the mentorship and guidance of their mentors, tackled an array of projects, delving into critical issues such as the impact of landslides on communities, echo-friendly tech solutions to solid waste management practices, neonatal healthcare accessibility, and the profound exploration of Himachali folk music traditions. Dr. Rinki Sarkar, a visiting faculty member specialising in environmental studies and field surveys, led students on immersive field visits to nearby villages and locations across Himachal Pradesh, providing valuable experiences for engagement with local residents and making positive contributions to the surrounding communities.

3.7.4 Library Of Himalayan Literature And Culture

The SHSS has set up a Library of Himalayan Literature and Culture which consists of a collection of over 400 books on literature about the Himalayas. The endeavor was funded by the Seed Grant Project on “Literature of the Himalayan Region: A Contemporary Overview", sponsored by IIT Mandi, which aims to build a repository of a diverse range of works that provide insights into different literary, cultural, social and ideological perceptions related to the Himalayan ranges. The library will also work as a space for research that will eventually serve as a major learning centre for future scholars in the fields of humanities and social sciences working in and around Himalayan literary and cultural studies.

1. FILM SCREENING

Ashish Avikunthak speaking on the Cinema of Prayoga

2. Movie Screening on the Eve of International Mother Language Day

- Ashish Avikunthak, an award-winning filmmaker, screened two of his short films "Brihnnlal ki Khel kali" and "Antraal", which are a part of the Cinema of Prayoga, a term coined by critic Armit Gangar in 2006, which situates Indian experimental fil ms within a historical and philosophical context, contrasting them with Bollywood and Indian New Wave cinema. Following the screening on 17 November 2023, there was a short Q&A with Ashish Avikunthak, where he spoke about how his films are antithetical to forms of commercial entertainment in their experimentation drawing from the premodern traditions of innovation.
- The SHSS screened five fiIms in Malayalam, Gujarati, Tamil, Marathi, and Bengali from 13-19 February 2024 as part of the International Mother Language Day Celebrations. These included: Sudani from Nigeria (2018), Chhello Show (2021), The Disciple (2020), Jai Bhim (2021), and Titli (2002).

3.7.5 Workshops

- Dr. Udaya Shankar Mishra, Professor, IIPS Mumbai has conducted a workshop on titles "Dissemination Workshop on A Multistage evaluation of Implementation and Effectiveness of Ayushman Bharat- Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) in Himachal Pradesh" on 03rd March 2024.

- Dr. Easterine Kire conducted a workshop on creative writing titled "Harvesting Memory: Writing on Myths, Folktales and local Narratives" on 26th February 2024. She performed a jazz poem and read out a couple of her works, while also encouraging participants to live and write about localities by experiencing the culture firsthand and speaking to people. Dr. Kire also led a small inauguration of the Library of Himalayan Literature and Culture, at School of Humanities and Social Sciences.

- Prof. Martin Siegel conducted a workshop "Defining access to health care: Methods, concepts and challenges" on 6th December 2023, where he discusses the common challenges in health economic evaluations and presented modern methods of dealing with them.
- Prof. Laishram Ladu Singh, Professor Emeritus, Department of Mathematics, Royal Global University, Guwahati, delivered a workshop on "Survey Methods for Social Science Research" on 15th March 2024. He discussed with the participants the foundational survey methods for social science research, emphasizing hands-on practice.

3.7.6 M.A. Development Studies Field Work (2022-24 Batch)

As a part of the M.A. Development Studies programme, postgraduate students engage in a 4-credit "Field Study" course in the summer term between semester 2 and 3 during which they stay in rural or urban communities across the country. Through exposure to various on site and real-world scenarios during their fieldwork, students learn how to diagnose development challenges and apply their theoretical knowledge to gain a more refined understanding of real-world praxis. During the last summer break, our students went on field visit to West Bengal, Chhattisgarh, Hyderabad and Himachal Pradesh and gained an understanding of challenges pertaining to issues such as water conservation, health care and implementation of government health initiatives, and rural tribal welfare, among others. During this field visit students work with different organizations like Ekta Parishad, Chhattisgarh, Save the Hills, Darjeeling, WB and People for Himalayan Development, Kullu, HP.

M.A. Development Studies 2022-24 (Field Work)

M.A. Development Studies 2022-24 (Field Work)

AWARDS & ACHIVEMENTS

S. No.	Faculty / Student	Achievements, Significant Research	Paper / Awards Description	Guide / Faculty Advisor
1.	Ms. Muskan Dhandhi	Ms. Muskan Dhandhi, our graduate student, who has been awarded the prestigious Charles Wallace India Trust Research Grant for 2023-24. Muskan is 'Translating Haryanvi Folklore' for her Ph.D. thesis.	This grant will allow her to access archives at King's College London and British Museums to 'Translate Haryanvi Material Culture including Haryanvi clothing and jewelry'.	Dr. Suman
2.	Mr. Hare Krishna Doley	The travel grant by ICSSR to attend the 27th European Conference of South Asia to be held in Torino (Italy) from 26th July to 29th July 2023.	ICSSR Travel Grant	Dr. Nilamber Chhetri

3.	Ms. Mithuna	"Best Student Presentation" award at the 2nd International Conference on Women in Colombo, Sri Lanka. The conference was organised by iConferences together with TISS Hyderabad off campus, unit for research on Women and Gender School of Social Sciences, Universiti Sains Malaysia and Sanchi University of Buddhist-indic studies, India.	Forest Management and access to forest resources, through the lens of Gender; Case studies of Kullu and Mandi district, Himachal Pradesh, India	Dr. Rajeshwari Dutt
4.	Mr. Abhilash M	He has won the prestigious N. V. Krishna Warrier best science literature award of the Kerala Bhasha Institute, Government of India, for the year 2023 for his Malayalam book, Ryotwari. The book is partly based on his PhD thesis under the supervision of Dr. Maanu Devadevan at IIT Mandi and partly on the postdoctoral thesis submitted to the Hebrew University, Jerusalem, written under Prof David Shulman's supervision.		Dr. Manu V Devadevan

SHSS Students Enrolled of PG & Ph.D. in 2023-24

SHSS Ph.D. students enrolled

Students enrolled in Ph.D.		
Male	**Female**	**Total**
7	6	13

Ph.D. Scholars, August 2023

PhD Scholars, January 2024

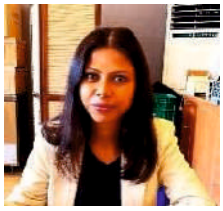
SHSS M.A. Development Studies students enrolled

Students enrolled in M. A.		
Male	**Female**	**Total**
6	6	12

M.A. Development Studies 2023-25 Batch

3.8 School Of Mathematical & Statistical Sciences (SMSS)

The School of Mathematical and Statistical Sciences offers two programs, M.Sc. in Applied Mathematics and B.Tech in Mathematics & Computing. The research within the school covers areas of Mathematics, Statistics, and Data Science. We have a research focus on Differential Equations, Mathematical Control Problems, Nonlinear Dynamics and Chaos, Theoretical and Computational Partial Differential Equations, Optimization, Mathematical Biology, Computational Fluid Dynamics, Harmonic Analysis, Algebra, Topology, Combinatorics, Functional Analysis, Image processing, Machine learning, Statistics and Data Science.

Faculty Members		
1.	**Dr. Muslim Malik,** Chairperson & Associate Professor Specialisation: Differential Equations and Mathematical Control Problems PhD from Indian Institute of Technology Kanpur (2006) Home Town: Balrampur, UP Phone: 01905-267918; E-mail: muslim@iitmandi.ac.in & chairsmss@iitmandi.ac.in	
2.	**Dr. Syed Abbas,** Professor Specialisation: Differential Equations and Ecological modelling PhD from Indian Institute of Technology Kanpur (2009) Home Town: Gonda, Uttar Pradesh Phone: 01905- 267914; E-mail: abbas@iitmandi.ac.in	
3.	**Dr. Nitu Kumari,** Associate Professor Specialisation: Mathematical Modelling, Nonlinear Dynamics, Partial Differential Equations, Data Driven Modeling using Machine Learning Techniques PhD from Indian Institute of Technology Dhanbad (2009) Home Town: Dhanbad, Jharkhand Phone: 01905-267109; E-mail: nitu@iitmandi.ac.in	
4.	**Dr. Sarita Azad,** Associate Professor Specialization: Statistical Time Series Analysis PhD from Delhi University and Indian Institute of Science (2008) Home Town: New Delhi E-mail: sarita@iitmandi.ac.in	
5.	**Dr. Rajendra K. Ray,** Professor Specialisation: Numerical Methods, Computational Fluid Dynamics, Mathematical Image Processing PhD from Indian Institute of Technology Guwahati (2009) Home Town: Sainthia, West Bengal Phone: 01905- 267041; E-mail: rajendra@iitmandi.ac.in	
6.	**Dr. Manoj Thakur**, Professor Specialisation: Optimization, Soft Computing, Machine Learning & its Application to Computational Finance PhD from Indian Institute of Technology Roorkee (2007) Home Town: Roorkee, Uttarakhand Phone: 01905-267913; E-mail: manoj@iitmandi.ac.in	

7.	**Dr. Qaiser Jahan,** Assistant Professor Specialisation: Harmonic and Wavelet Analysis PhD from ISI Kolkata (2014) Home Town: Allahabad E-mail: qaiser@iitmandi.ac.in	
8.	**Dr. Samir Shukla,** Assistant Professor Specialisation: Applied Topology and Combinatorics PhD from Indian Institute of Technology Kanpur (2017) Home Town: Allahabad Phone: 01905-267922; E-mail: samir@iitmandi.ac.in	
9.	**Dr. Sampat Kumar Sharma**, Assistant Professor Specialisation: Classical K. Theory, Commutative Algebra PhD from Tata Institute of Fundamental Research Mumbai, India (2019) Home Town: Sikar (Rajasthan) Phone: 01905-267717; E-mail: sampat@iitmandi.ac.in	
10.	**Dr. Saswata Adhikari,** Assistant Professor Specialisation: Harmonic Analysis PhD from Indian Institute of Technology Madras, India (2017) Home Town: Jalchak, West Bengal Phone: 01905-72201; E-mail: saswata@iitmandi.ac.in	
11.	**Dr. Preeti,** Assistant Professor Specialisation: Operations Research PhD from Indian Institute of Technology (ISM) Dhanbad India (2021) Home Town: Delhi E-mail: preeti@iitmandi.ac.in	

3.8.1 Publication

1. Books Published: None
2. Book Chapters Published: None
3. Papers Published in Reputed National Journals: None
4. Papers Accepted in Reputed National Journals: None
5. (a). Papers Published in Reputed International Journals: 76

1. Dr. Muslim Malik

(i) Impact of Hunting Cooperation and Feedback Control For A Nonlinear Hybrid Leslie–Gower Predator-Prey System On Nonuniform Time Domain

A Kumar, M Malik

Rocky Mountain Journal of Mathematics 53 (2), 485-515, 2023

(ii) An analysis of approximate controllability for Hilfer fractional delay differential equations of Sobolev type without uniqueness

M Johnson, K Kavitha, D Chalishajar, M Malik, V Vijayakumar, A Shukla

Nonlinear Analysis: Modelling and Control 28, 1-23, 202

(iii) Controllability analysis of nonlinear switched singular system on time scales
B Kumar, M Malik
Asian Journal of Control 25 (3), 2345-2359, 2023

(iv) Results on the Approximate Controllability of Hilfer Type fractional Semilinear Control Systems
V Vijayakumar, M Malik, A Shukla
Qualitative Theory of Dynamical Systems 22 (2), 58, 2023

(v) Inverse problem for an abstract neutral differential equation of Sobolev-type
M Malik, S Ruhil
Results in Control and Optimization 11, 100235, 2023

(vi) Approximation of solutions to abstract neutral differential equations with non-instantaneous impulses
S Ansari, M Malik
The Journal of Analysis, 1-24, 2023

(vii) Controllability of discrete-time semilinear Riemann–Liouville-like fractional equations
M Malik, V Vijayakumar, A Shukla
Chaos, Solitons & Fractals 175, 113959, 2023

(viii) An investigation of an inverse problem for second-order abstract differential equation
M Malik, S Ruhil, R Dhayal
Indian Journal of Pure and Applied Mathematics, 1-14, 2023

(ix) Trajectory controllability of Clarke subdifferential type Hilfer fractional stochastic differential inclusion with non instantaneous impulsive effects and deviated argument
N Durga, M Malik
Results in Control and Optimization, 100317, 2023

(x) Existence, controllability and Hyers–Ulam stability of a hybrid neutral switched system with impulsive effects
B Kumar, M Malik
International Journal of Systems Science, 1-18, 2023

(xi) Inverse problem for abstract delay differential equation with impulsive effects
S Ruhil, M Malik
Evolution Equations and Control Theory, 0-0, 2024

(xii) Projective synchronization of fractional order quaternion valued uncertain competitive neural networks
MSH Ansari, M Malik
Chinese Journal of Physics, 2024

(xiii) Existence and controllability results of semilinear Sobolev type difference equation
B Verma, M Malik
Mathematical Foundations of Computing, 0-0, 2024

(xiv) Finite dimensional approximation to fractional stochastic integro-differential equations with non-instantaneous impulses
S Ansari, M Malik
Stochastics, 1-27, 2024

2. Prof. Rajendra Kumar Ray

(i) Effect of arc-shaped vertical control plate on heat and mass transfer in uniform flow past an isothermally heated circular cylinder

RK Ray, A Haty

Heat Transfer 52 (3), 2462-2489, 2023

(ii) Natural convection of MoS2-water nanofluid inside a square cavity with corrugated bottom

M Samadder, RK Ray, D Sanpui

Indian Journal of Physics 97 (6), 1811-1832, 2023

(iii) A computational study of forced convection from rotating circular cylinder heated with time-periodic pulsating temperature

A Haty, RK Ray, A Kumar

AIP Conference Proceedings 2584 (1), 2023

(iv) Higher order accurate numerical simulation of shear flow past a circular cylinder with an attached arc-shaped control plate

A Punia, RK Ray

International Journal of Advances in Engineering Sciences and Applied, 2023

(v) Natural convective heat transfer and fluid flow in a porous medium filled corrugated enclosure: Effect of discrete heat sources

P Choudhary, RK Ray

Heat Transfer 52 (7), 4547-4577, 2023

(vi) Effect of discrete heating on the key parameters and entropy generation in a corrugated enclosure filled with hybrid nanofluid

M Samadder, RK Ray

Numerical Heat Transfer, Part A: Applications, 1-22, 2023

(vii) On the existence and uniqueness of weak solutions of a coupled diffusion system related to image restoration

SK Jain, S Majee, RK Ray Inverse Problems and Imaging 18 (1), 165-182, 2024

(viii) MHD natural convection flow in a porous medium-filled corrugated enclosure: Effect of heat sources with different heights

P Choudhary, RK Ray

International Journal of Thermal Sciences 196, 108673, 2024

(ix) New higher-order accurate super-compact scheme for three-dimensional natural convection and entropy generation

A Punia, RK Ray

Physics of Fluids 36 (3), 2024

3. Prof. Syed Abbas

(i) Analysis of diffusive size-structured population model and optimal birth control

M Kumar, S Abbas, R Sakthivel

Evolution Equations and Control Theory 12 (2), 423-445, 2023

(ii) Bernstein super fractal interpolation function for countable data systems

S Chandra, S Abbas, S Verma

Numerical Algorithm 92, 2457-2481, 2023

(iii) Modelling and prevention of crime using age-structure and law enforcement

M Kumar, S Abbas

Journal of Mathematical Analysis and Applications 519 (2), 126849, 2023

(iv) Existence of solutions for the fractional hybrid differential equation via measure of noncompactness

A Das, B Hazarika, S Abbas, NH Kumar, A Deep

Rocky Mountain Journal of Mathematics, 2023

(v) Stability results on non-instantaneous impulsive fractional integro-differential equations with multipoint boundary conditions

P Karthikeyan, K Venkatachalam, S Abbas

Filomat 37 (19), 6603-6615, 2023

(vi) Nonlinear Second Order Delay Dynamic Equations on Time Scales: New Oscillatory Criteria

SR Grace, GN Chhatria, S Abbas

Qualitative Theory of Dynamical Systems 22, 2023

(vii) Optimal control of the treatment and the vaccination in an epidemic switched system using polynomial approach

S Salwahan, S Abbas, A Tridane, MA Hajji

Alexandria Engineering Journal 74 (1), 187-193, 2023

(viii) General theory for significance of culling in two-way disease transmission between humans and animals

S Bugalia, JP Tripathi, S Abbas, H Wang

Journal of Biological Systems 31 (3), 791-832, 2023

(ix) Optimal control and stability analysis of an age-structured SEIRV model with imperfect vaccination

M Kumar, S Abbas, A Tridane

Mathematical Biosciences and Engineering 20 (8), 14438-14463, 2023

(x) Stability and optimal control of age-structured cell-free and cell-to-cell transmission model of HIV

M Kumar, S Abbas

Mathematical Methods in the Applied Sciences 46 (17), 18336-18353, 2023

(xi) Weighted Pseudo Almost Automorphic Solution for Abstract Dynamic Equations under Translation and Non-Translation Time Scales with Shift Operators and Unbounded Graininess

S Dhama, S Abbas, M Pinto, S Castillo, S Tomar

Advances in Operator Theory, 2023

(xii) Stability analysis of an age-structured SIR model with nonlocal diffusion and indirect contacts

N Chanauria, S Abbas

Discrete & Continuous Dynamical Systems-B, 2023

(xiii) Diffusive size-structured population model with time-varying diffusion rate

M Kumar, S Abbas

Discrete and Continuous Dynamical Systems-B 28 (2), 1414-1435, 2023

(xiv) Parameter Identification for Vector Dynamic Equations on Arbitrary Time Scales

GA Satpute, S Abbas

Acta Applicandae Mathematicae 183 (1), 6, 2023

(xv) Role of alternative food and different competition coefficients in controlling chaos in an eco-epidemiological model with disease in prey

KP Das, S Abbas, K Agnihotri, H Kaur

Nonlinear Studies 30 (2), 529-549, 2023

(xvi) On the box dimension of Weyl–Marchaud fractional derivative and linearity effect

S Chandra, S Abbas, Y Liang

Fractals, 2350058, 2023

(xvii) Study of Oscillation Criteria of Odd-Order Differential Equations with Mixed Neutral Terms

SR Grace, S Abbas, SS Negi

Mathematica Slovaca 73 (5), 1231-1242, 2023

(xviii) On fractal dimension of the graph of non stationary fractal interpolation function

S Chandra, S Abbas

Contemporary Mathematics (CONM) series of the American Mathematical Society, 2024

(xix) A Note on Fractal Dimension of Riemann-Liouville Fractional Integral

S Chandra, S Abbas, Y Liang

Fractals 32 (2), 14, 2024

(xx) Existence and Roughness of Nonuniform Exponential Dichotomies on Time Scales

S Dhama, S Castillo, S Abbas, M Pinto

Qualitative Theory of Dynamical Systems 23, 36, 2024

(xxi) Periodicity, stability, and synchronization of solutions of hybrid coupled dynamic equations with multiple delays

D Agrawal, S Dhama, M Kostic, S Abbas

Mathematical Methods in the Applied Sciences 47 (9), 7616—7636, 2024

(xxii) P-mean (mu1,mu2)-pseudo almost periodic processes and application to integro-differential stochastic evolution equations

M Ayachi, S Abbas

Electronic Journal of Differential Equations 2024 (24), 1-26, 2024

(xxiii) Containing an epidemic in the case of running out of treatment: A switched system approach

S Salwahan, S Abbas, A Tridane

Nonlinear Analysis Modelling and Control, 2024

(xxiv) Existence of Periodic Solutions for a Class of Dynamic Equations with Multiple Time Varying Delays on Time Scales

D Agrawal, S Abbas

Qualitative Theory of Dynamical Systems 23 (1), 32, 2024

4. Prof. Manoj Thakur

(i) Higher-order moments in portfolio selection problems: A comprehensive literature review

PK Mandal, M Thakur

Expert Systems with Applications, 121625, 2023

(ii) A hybrid multicategory framework for generating automated trading systems

D Kumar, K Sahoo, M Thakur

Concurrency and Computation: Practice and Experience 35 (22), e7746, 2023

(iii) Unbiased estimation of inner product via higher order count sketch

BD Verma, R Pratap, M Thakur

Information Processing Letters 183, 106407, 2024

(iv) A nuclear norm-induced robust and lightweight relation network for few-shots classification of hyperspectral images

UP Singh, KP Singh, M Thakur

Multimedia Tools and Applications 83 (3), 9279-9306, 2024

(v) Credibilistic portfolio optimization with higher-order moments using coherent triangular fuzzy numbers

PK Mandal, M Thakur, G Mittal

Applied Soft Computing 151, 111155, 2024

(vi) Hyper spectral band selection using a decomposition based multi objective wrapper approach

K Deep, M Thakur

Infrared Physics & Technology 136, 105053, 2024

5. Dr. Nitu Kumari

(i) Role of Pollution in the Recent Zika Outbreak in Colombia: A Mathematical Study, Journal of Applied Nonlinear Dynamics.

Sumit Kumar, S. Sharma, A. Kashyap and Nitu Kumari (2024)

ESCI, 13, no. 3 : 491-505. (MCQ = 0.07)s.

(ii) Assessment of Parameters for Phase Synchronization of A Chaotic Food Chain System with Allee and Refugia Effects under Seasonal Fluctuations,

* Shubhangi Dwivedi and Nitu Kumari (2023)-

Chaos, American Institute of Physics (Accepted) (IF = 3.74, MCQ = 0.35)

(iii) Application of Dynamic Mode Decomposition and Compatible Window-Wise Dynamic Mode Decomposition in deciphering COVID-19 dynamics of India, Computational and Mathematical Biophysics,

Kanav Singh Rana and Nitu Kumari (2023).

De Gruyter, (Accepted). (MCQ = 0.68)

(iv) Impact of Cross border reverse migration in Delhi-UP region of India during COVID-19 Lockdown, Computational and Mathematical Biophysics,

Shubhangi Dwivedi, S.Keerthana Perumal, Sumit Kumar, Samit Bhattacharyya and Nitu Kumari (2023)-

De Gruyter, 11, no. 1: 20220151peru (MCQ = 0.68).

(v) Modelling the effect of environmental population on Zika outbreak: A case study of Brazil, Discrete and Continuous Dynamical Systems.

Sumit Kumar, S. Sharma, A. Kashyap, Nitu Kumari and Ravi P. Agarwal (2023)

Series S, AIMS. (Accepted) (IF = 1.86, MCQ = 0.73).

(vi) Basic Reproduction Number Estimation and Forecasting of COVID-19: A Case Study of India, Brazil and Peru, Communications on Pure and Applied Analysis (AIMS),.

Nitu Kumari, Sumit Kumar, Sandeep Sharma, Fateh Singh and Rana Parshad (2023)

22. No. 2 doi: 10.3934/cpaa.2021170. (IF = 1.916, MCQ = 0.94)

6. Dr. Sarita Azad

(i) Regional selection of satellite estimates over the Northwest Himalayan region using the merged ranking methods

S Garg, P Jena, S Azad

Theoretical and Applied Climatology 151 (1), 515-533, 2023

(ii) Rainfall Wet Spells Variability Across Temperature Mean Change Years in the Northwestern Himalayan Region

A Suri, P Jena, S Azad

Earth and Space Science 10 (2), e2022EA002568, 2023

(iii) An optimal vaccination strategy for pandemic management and its impact on economic recovery

V Kodesia, A Suri, S Azad

Current Science, 319-326, 2023

(iv) Performance evaluation of high-resolution IMDAA and IMERG for detecting cloudburst events over the Northwest Himalayas

S Garg, P Jena, U Devi, S Azad

International Journal of Climatology 43 (8), 3730-3748, 2023

(v) A New Statistical Distribution Derived from a Clayton Copula for Modeling Bivariate Processes

N Poonia, S Azad

Journal of Hydrometeorology 24 (10), 1659-1678, 2023

(vi) The bivariate exponentiated additive Weibull distribution and its multivariate extension with applications

N Poonia, D Prajapati, S Azad

Computers & Industrial Engineering 188, 109886, 2023

(vii) Evaluation of the WRF model for a heavy rainfall event over the complex mountainous topography of Mandi, India

S Garg, G Tiwari, S Azad

Natural Hazards 120 (3), 2661-2681, 2024

(viii) Revealing hidden patterns in Indian migration using network analytics

S Kaur, S Azad, A Gupta

International Journal of Information Technology, 1-12, 2024

(ix) Optimal placement of rain gauge networks in complex terrains for monitoring extreme rainfall events: a review

A Suri, S Azad

Theoretical and Applied Climatology, 1-11, 2024

(x) Investigating a novel feature of multi-phase rotated empirical orthogonal function to capture spatiotemporal temperature variations

K Mishra, S Azad

Theoretical and Applied Climatology, 1-12, 2024

7. Dr. Samir Shukla

(i) Vertex cut of a graph and connectivity of its neighbourhood complex

R Santhanam, S Shukla

Discrete Mathematics 346 (8), 113432, 2023

(ii) On Vietoris–Rips complexes (with scale 3) of hypercube graphs

S Shukla

SIAM Journal on Discrete Mathematics 37 (3), 1472-1495, 2023

8. Dr. Qaiser Jahan

(i) Dilation operators in Besov spaces over local fields

S Ashraf, Q Jahan

Advances in Operator Theory 8 (2), 27, 2023

(ii) Singular Integral Operators with Rough Kernel on Function Spaces Over Local Fields

S Ashraf, Q Jahan

Complex Analysis and Operator Theory 17 (7), 108, 2023

9. Dr. Sampat Kumar Sharma

(i) A sufficient criterion about group homomorphism of the first-row map

Sharma, S. Proc Math Sci 133, 20 (2023)

(ii) Generalised homotopy and commutativity principle

R.A. Rao, S. Sharma

Journal of pure and applied algebra, Volume 227, Issue 6, June 2023, 107309., 2023

(iii) Applications of Swan's Bertini theorem to unimodular rows

M.K. Keshari, S. Sharma

Journal of Pure and Applied Algebra, Volume 228, 2024, 107487, 2023

3.8.2. 5.(b) Paper accepted in reputed international journals: None

(c) National conferences attended and papers presented in the format: 06

1. Dr. Muslim Malik

(i) Resource Person in the Computational and Applied Mathematics workshop at IIT Tirupati, 15-16 April 2023.

2. Dr. Syed Abbas

(i) Invited talk in "National Conference on the Recent Developments in Mathematical Sciences-2024" NCRDMS, 12-14 February, 2024 at University of Hyderabad.

(ii) Attended "Iinventive-24" at IIT Hyderabad, 18-20 January 2024.

(iii) Invited talk in "Conference on Functional Analysis and Fractals" CFAF-2024, IIIT Allahabad, 16-18 Feb 2024.

3. Dr. Saswata Adhikari (conference attended only)

(i) Attended 18th Discussion Meeting in Harmonic Analysis at IIT Guwahati during December 18-21, 2023.

4. Dr. Samir Shukla

(i) Delivered a lecture with title "On the Vietoris-Rips complexes", in the ATM School `` Cohen Macaulay simplicial complexes in graph theory" at CMI Chennai.

Organizers: Priyavart Deshpande and Anurag Singh.

5. International conferences attended and papers presented in the format: - 11

1. Dr. Muslim Malik

(i) Invited speaker in ICMC 2023, BITS Pilani Goa Campus.

(ii) Invited speaker at the 29th International Conference on Finite or Infinite Dimensional Complex Analysis and Applications (The 29th ICFIDCAA2023), Pondicherry University, 2023.

(iii) Program Chair and Keynote Speaker at International Conference on Advancements in Mathematics (ICAM 2023), Thapar Institute of Engineering and Technology, Patiala, 28-30, September 2023.

(iv) Symposia Convener and Invited Speaker, Controllability and Differential Equations, IMS-2023, BITS Pilani, Hyderabad, India.

(v) Invited Speaker at the 5th International Conference on Mathematical Techniques and Applications (ICMTA-2024), SRM-IST, Chennai, Tamil Nadu, India.

vi) Organizing Member, Workshop cum International Symposium on Complete Flux Scheme for Convection Diffusion Reaction Models, Fluid Flow, and Allied Topics, 18–21 January 2024, Indian Institute of Technology Kanpur, Uttar Pradesh, India.

(vii) Organizing Member and Invited Speaker Workshop on Multi-Scale Analysis cum Conference on Differential Equations (MSADE-24), February 26–March 2, 2024, Indian Institute of Technology Ropar, Punjab, India.

(viii) Invited Speaker, International Conference on Analysis and its Applications (ICAA 24), January 19–21, 2024, Jamia Millia Islamia University, New Delhi, India.

2. Dr. Syed Abbas

(i) Invited talk in "5th annual International Conference on Mathematical Techniques and Applications (ICMTA2024)" at SRM-University, Chennai, January 2-4, 2024.

3. Dr. Nitu Kumari

(i) 2023 Invited talk “Role of Group Defense on Pattern Formation Analysis” 8th China-India-Japan-Korea (CIJK) Conference on Mathematical and Theoretical Biology, Jeju Island, 27 June, 2023 – 1st July, 2023.

(ii) 2023 Invited talk “Application of Dynamic Mode Decomposition and Compatible Window wise Dynamic Mode Decomposition in deciphering COVID 19 Dynamics in India” 8th China-India-Japan-Korea (CIJK) Conference on Mathematical and Theoretical Biology, Jeju Island, 27 June, 2023 – 1st July, 2023.

3.8.3 Invited Lecturers/Continuing education programs: 02

***(i)* Prof. Rajendra Kumar Ray**

(i) Invited Speaker, Joint Conference of APCATS, AJSAE & AAME 2023, October 11 to 14, 2023, JEJU Boo-Young Hotel & Resort, Jeju Island, Republic of Korea.

Dr. Samir Shukla

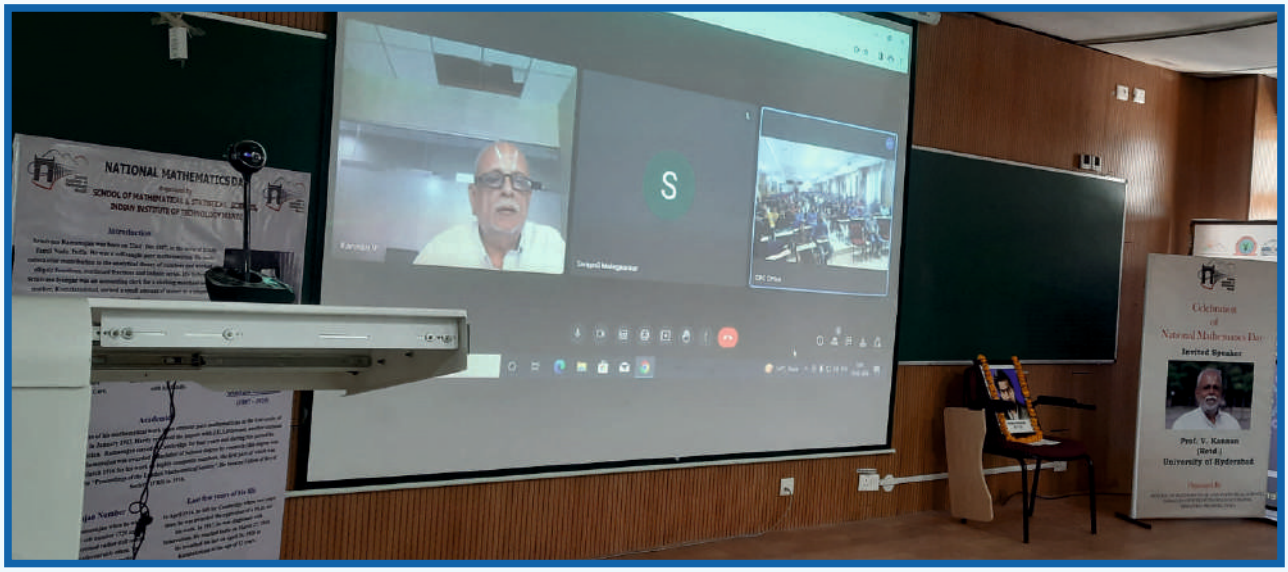
1. Delivered an invited lecture on "Vietoris-Rips complexes of hypercube graphs", in the Applied Algebraic Topology Research Network (AATRN) Seminar Series.

   Organizers: Henry Adams, Hana Dal Poz Kouřimská, Teresa Heiss, Sara Kališnik, Bastian Rieck

6. Workshop / Conference organized with high resolution soft copies of photographs: 06

(i) National Mathematics Day- 2023 organized by School of Mathematical & Statistical Sciences, IIT Mandi on 10th Feb-2024.

Invited Speaker: Prof. V. Kannan, SRM University Hyderabad India.



1. Dr. Muslim Malik

(i) Seminar arranged by SMSS on 26th Feb. 2024, speaker invited Dr. Ravi Prakash, University of Concepción, Concepción, Chile.

(ii) The School of Mathematical & Statistical Sciences, Indian Institute of Technology Mandi, Himachal Pradesh, India organized the International Conference on Differential Equations and Control Problems (ICDECP23) during June 15-17, 2023.

(iii) Mathematics Training and Talent Search Programme 2023
Organizer of Mini-Mathematics Training and Talent search Programme (MTTS), 29 May – 24 June at IIT Mandi.

2. Dr. Nitu Kumari

Two International Minisymposia Organized in International Conference in Korea:

i) International Mini-Symposium "Emerging Trends in Epidemiology and Disease Modelling: Insights from cancer, Hansen's Disease and COVID-19" organized in 8th China-India-Japan-Korea (CIJK) Conference on Mathematical and Theoretical Biology, Jeju Island, 27 June, 2023 – 1st July, 2023.

(ii) International Mini-Symposium "Recent Advances in Mathematical Models of Ecology and Epidemiology" organized in 8th China-India-Japan-Korea (CIJK) Conference on Mathematical and Theoretical Biology, Jeju Island, 27 June, 2023 – 1st July, 2023.

3.8.4 Patents filed/ awarded and Professional achievements, Honors and Awards: 01

(i) Prof. Rajendra Kumar Ray

Vice-President, Indian Society of Theoretical and Applied Mechanics (ISTAM).

3.8.5 Membership of Professional Societies: 04

1. Prof. Rajendra Kumar Ray

(i) Member, Society for Industrial and Applied Mathematics (SIAM)

(ii) Member, Calcutta Mathematical Society, Kolkata, India

(iii) Member, Indian Society of Theoretical and Applied Mechanics (ISTAM)

(iv) Member, Indian Mathematical Society (IMS)

3.8.6 Outreach Activities: 01

Prof. Syed Abbas

IST - Ordinary Differential Equations and Dynamical Systems (2023), IIT, Mandi, Dates: 26 Jun 2023 to 8 Jul 2023.

3.9 School of Biosciences & Bioengineering

School of Biosciences and Bioengineering (SBB), IIT Mandi since 2016 is focused on teaching and cutting-edge research in the broad areas of Biotechnology and Bioengineering. The current academic programs being offered are

- B.Tech. in Bioengineering
- B.Tech.-M.Tech. in Bioengineering (Dual degree)
- M.Tech. in Biotechnology
- M.Tech. (Research) in Biotechnology
- Ph.D. in Biosciences and Bioengineering

Within a few years of establishment, SBB has grown substantially in terms of academic activities, diverse research areas and infrastructure. SBB thrives for excellence with different academic programs at the level of PhD, post graduate, and undergraduate to create an academic niche, where state-of-the-art Bioscience meets cutting-edge Bioengineering technologies at IIT Mandi. Currently, SBB is the home to a vibrant group of 12 core faculties, 1 visiting faculty, several research scholars, and students. More than 130 undergraduate and 70 postgraduate scholars and about 85 PhD scholars are currently benefitting from the programs. We have an alumni strength of about 175 PhD, BTech and MTech scholars contributing to research, academic and industry across the globe.

The strength of SBB is its incredibly talented and committed faculty along with the infrastructure built over the years. Faculty carry independent research, teach, design academic curriculum, develop laboratories and impart hands-on project-based learning to scholars that is contributing to the vision. SBB faculty achieved Early Career Research Awards, carried projects of high impact in fundamental and translational research areas, widely published and filed patents. Few faculty also achieved INSA Young Scientists Award, Innovative Young Biotechnologist Award, SERB-STAR Award and Welcome Trust-DBT India Alliance Intermediate Fellowship. SBB faculty serve as Associate editors, editorial board members and founding members of various scientific journals and academic societies. Our faculty contributed to projects of national and international relevance such as Indo-UK, Indo-US, Indo-German, Indo-Russia, Indo-Danish, IMPRINT Health and Energy, Farmer Zone etc. As a reflection of our high-quality research, since last 3 years we are rated by Nature index among the top 15 institutes and among the top 5 IITs in India (in Lifesciences category).

The high-quality research training and education to the next generation of scholars is successfully catering to the needs of the industries and academia eventually contributing to the Nation Building. Our Alumni started contributing in academia and industries nationally and internationally.

Research Focus: Health, Environment and Agriculture

		Principal Investigators
Metabolic diseases	• Obesity, Diabetes, Fatty liver, Cardiac fibrosis, Disease Markers	Dr Trayambak Basak, Dr Prosenjit Mondal, Dr Amit Prasad, Dr Rajanish Giri
Infectious diseases	• Neurocysticercosis, Neglected Tropical diseases, Immunology, Molecular Virology, Viral diseases	
Nanobiotechnology	• Nanomaterials, Photothermal Therapy, Biosensing, Antimicrobial Biomaterials	Dr Amit Jaiswal
Systems Biology and Multiomics	• NGS, Gut microbiota for Health, Disease Biomarkers, Genome to Phenome	Prof Tulika Srivastava, Dr Kharerin Hungyo, Dr Shyam Kumar Masakapalli
Drug discovery from Himalayan flora	• Natural products against disease targets (MDR Mtb, Anti-viral, Anti-ageing)	
Neurosciences and Ageing	• Neurodegeneration, Ageing and age related diseases, Protein Quality control	Dr Baskar Bakthavachalu, Dr Kasturi Prasad
Tissue Engineering and 3D Bioprinting	• Orthopaedic, Invitro disease models, Novel biomaterial for 3D Bioprinting	Dr Sumit Murab, Dr Ekta Makhija

Research Focus: Health, Environment and Agriculture

Major Research Themes
Disease Biology – Metabolic, Infectious
Nanobiotechnology, Biomaterials, Tissue Engineering and 3-D Bioprinting
Systems Biology and Multiomics for Bioenergy, Health, Phytochemistry and Smart Agriculture
Neurosciences and Aging
Bioengineering areas

Existing Infrastructure

Model Organism labs
[Worm, Mouse, Animal cell lines, Plant, Microbial, Fly (upcoming)]

Sophisticated platforms
- Sequencing platforms (NGS)
- Analytical and Spectroscopy platforms (GC-MS, FPLC, Stop-Flow, Flow cytometer)
- Imaging platforms (Fluorescence microscopy)
- Basic and Industrial Microbiology (Bioreactors, incubators, centrifuges, culture hoods etc)

Others:
High performance computing
Common facilities

New Infrastructure

- **Confocal Microscopy** – live cell imaging
- **3D- Bioprinting** – Biomaterial Scaffolds, Organ cultures, Bioink, Lab-on-a-chip
- **Ultrasound imaging system** Live tissue imaging
- **HPLC Semi-Prep** – Screening and separation natural bioactive molecules
- **Multimode reader** - assays
- **Ultracentrifuge** - separations
- **Other heavily used basic equipments:** Lyophiliser, Speed Vac

8

Faculty Members

Dr. Shyam Kumar Masakapalli
Chairperson SBB and Associate Professor
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Professor
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Associate Professor
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Dr. Prosenjit Mondal
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Dr. Trayambak Basak
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Dr. Sumit Murab
Assistant Professor
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Dr. Rajanish Giri
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Prof. Shailja Gupta
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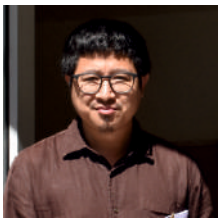

Dr. Ekta Makhija
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3.9.1 SBB facilities

SBB facilities includes instruments (high-end and basic) that are supporting high quality research and teaching. Every year the facilities support more than 200 scholars from SBB and other schools. Almost 35-40 crore has been already invested to build the research infrastructure to address the undefined problems in several Bio-domain.

The broad vision of the SBB and its facilities (SBB-BioX Centre and Animal House) at IIT Mandi is to perform cutting-edge research in Health care, Agriculture, and Environment by bridging the gap between life sciences, physical sciences, and engineering. Some of the important missions of the SBB-BioX Centre include:

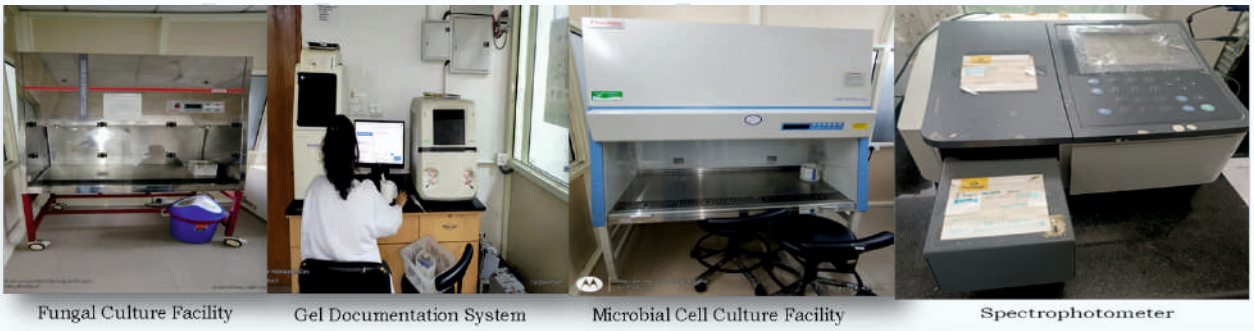
- To tackle major health-related and agri-based challenges and perform cutting-edge research.
- To encourage multi-institutional and inter-disciplinary collaborations to attract extramural funding.
- To develop industry-academic partnerships.
- To facilitate interaction between engineers, computational scientists, and physical and life science researchers.
- To pursue excellence in research, innovation, and discovery with a focus on life sciences and technology development.

A. High-end facilities

NGS facility, Flow cytometry (FACS), Fluorescence Spectroscope, Stopped Flow Spectrometry, UV/VIS/NIR Spectrometry, Bioreactor facility, Gas Chromatography-Mass spectrometry, Protein purification unit etc.

B. Basic facilities

Gel doc system, Culture facilities (Animal, Plant, Bacterial, Fungal), PCRs, Centrifuges etc.



Fungal Culture Facility | Gel Documentation System | Microbial Cell Culture Facility | Spectrophotometer

Animal Cell Culture Facility | PCR Facility

C. The Small Animal Research facility (SARF- https://sbb.iitmandi.ac.in/sarf) is a state-of-the-art facility developed at IIT-Mandi which is supporting animal studies.

Small Animal House Facility

D. FIST-SBB Lab

FIST-SBB Lab is being established with funding support of DST-FIST and IIT Mandi

- Ultracentrifuge* - for separations [Received and installed]
- 3D- Bioprinting* – for biomaterial Scaffolds, Organ cultures, Lab-on-a-chip [Received and installed]
- Confocal Microscopy* – live cell imaging [Ordered]
- Ultrasound imaging system* Live tissue imaging [Ordered]
- HPLC Semi-Prep – Screening and separation natural bioactive molecules [Upcoming]
- Multimode reader – assays [Upcoming]
- Other heavily used basic equipments: Lyophiliser, Speed Vac [Upcoming]

3-D Bioprinter

Ultracentrifuge

E. M.Tech. Biotechnology teaching lab

All SBB facilities support the M.Tech. teaching labs - Bioprocess Technology, Cell Biology and Physiology lab, Bioinstrumentation, Molecular Biotechnology etc.

F. B.Tech. Bioengineering teaching Lab

B.Tech. Bioengineering Lab is well established and more facilities are being created. The lab classes associated with courses such as Cell Biology, Biochemistry, Microbiology, Molecular Biology, Enzymology, Bioprocessing, Biomanufacturing; Biomaterials and Bioengineering courses are regularly conducted here.

B.Tech Bioengineering Lab

G. Research Theme Labs

Our SBB faculty established several common and research theme-based facilities and labs to cater to >100 research scholars at any given time.

- System-Biology Lab
- Nano bio–Fabrication Lab
- Cardiometabolic Lab
- Worm Lab
- Disease Biology Labs
- Plant Metabolic System Biology Lab
- Synthetic consortia Engineering Lab
- Translational Tissue Engineering Lab
- Molecular neuroscience Lab
- Others upcoming..like Mechanobiology, Molecular simulations etc.

Worm Lab | Molecular Biology lab | Translational Tissue Engineering Lab | Cardiometabolic lab

Molecular neuroscience Lab | Nano-bio-fabrication Lab | Plant Metabolic System Biology lab | System Biology lab

3.9.2 Books/Book Chapters published

Book published:

- **Murab, Sumit.** Drug Delivery Systems for Musculoskeletal Tissues. Springer Nature

Book chapters published:

- Shagun, **Masakapalli SK*.** Phytochemical Databases and their Relevance to Phytotherapy. Bioactive Phytochemicals from Himalayas: A Phytotherapeutic Approach (Book Chapter). 2023, 128-156 (29) DOI:10.2174/978981512328912301013
- Shagun, **Masakapalli SK*.** Tools and Techniques to Tap the Potential of Himalayan Bioactive Molecules. Bioactive Phytochemicals from Himalayas: A Phytotherapeutic Approach (Book Chapter). 2023, 157-175 (19) DOI:10.2174/978981512328912301014
- Negi, A., Sharma, P., Mishra, V., & **Murab, S** (2024). Introduction to Musculoskeletal Tissues and Drug Delivery Systems. In Drug Delivery Systems for Musculoskeletal Tissues (pp. 1-46). Cham: Springer International Publishing.
- Negi, A., **Murab, S**. and Whitlock, P.W., 2024. Challenges in Clinical Translation of Musculoskeletal Drug Delivery Systems. In Drug Delivery Systems for Musculoskeletal Tissues (pp. 209-217). Cham: Springer International Publishing.
- Rashmi Ira, Shweta Deswal, **Tulika Prakash**. "Role of the Microbial Community in Energy Recovery via Wastewater Treatment". Springer Nature (2024). Book Chapter *(Accepted)*

3.9.2.1 Paper published and accepted in reputed International Journals

- Pant Y & Lingwan M & Masakapalli SK* (2023). Metabolic, Biochemical, Mineral and Fatty acid profiles of edible Brassicaceae microgreens establish them as promising functional food. Food Chemistry Advances DOI: 10.1016/j.focha.2023.100461.
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- Upadhyay, A.; Kovalev, A.A.; Zhuravleva, E.A.; Kovalev, D.A.; Litti, Y.V.; Masakapalli, S.K.; Pareek, N.; Vivekanand, V. (2023) A Review of Basic Bioinformatic Techniques for Microbial Community Analysis in an Anaerobic Digester. Fermentation. DOI: https://doi.org/10.3390/fermentation9010062.
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- Prasad A, Sreedharan S, Bakthavachalu B#, Laxman S# (2023). Eggs of the mosquito Aedes aegypti survive desiccation by rewiring their polyamine and lipid metabolism. PLoS Biol., 21(10): e3002342. https://doi.org/10.1371/journal. pbio.3002342. (#Corresponding authors).

- ColPTMScape: An Open Access Knowledge Base for Tissue-Specific Collagen PTM Maps. Joshi A*, Nigam A*, Mudgal LN, Mondal B*, Basak T*. Matrix Biology Plus 2024. https://doi.org/10.1016/j.mbplus.2024.100144.
- Panda P, Sarohi V, Basak T, Kasturi P. Elucidation of Site-Specific Ubiquitination on Chaperones in Response to Mutant Huntingtin. Cell Mol Neurobiol. Volume 44, 3, 2023.
- Rawat, S. S., Singh, G., & Prasad, A. (2024). Investigating the Taenia solium Fatty Acid Binding Protein Superfamily for Their Immunological Outlook and Prospect for Therapeutic Targets. ACS omega, 9(21), 22557–22572. https://doi.org/10.1021/acsomega.3c09253.
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- Anand Kumar Keshri, Swati Sharma, Suraj Singh Rawat, Anubha Chaudhry, Parul Mehra, Naina Arora, Amit Prasad, Chapter 3 - An overview on helminthic infections of central nervous system in humans, A Review on Diverse Neurological Disorders, Academic Press, 2024, 43-72, ISBN 9780323957359, https://doi.org/10.1016/B978-0-323-95735-9.00048-6.
- Kumar P, Kinger S, Dubey AR, Jagtap YA, Choudhary A, Prasad A, Jha HC, Dhiman R, Gutti RK, Mishra A. Trehalose Promotes Clearance of Proteotoxic Aggregation of Neurodegenerative Disease-Associated Aberrant Proteins. Mol Neurobiol. 2023 Dec 7. doi: 10.1007/s12035-023-03824-8. Epub ahead of print. PMID: 38057642.
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- Keshri AK, Kaur R, Rawat SS, Arora N, Pandey RK, Kumbhar BV, Mishra A, Tripathi S, Prasad A. Designing and development of multi-epitope chimeric vaccine against Helicobacter pylori by exploring its entire immunogenic.
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epitopes: an immunoinformatic approach. BMC Bioinformatics. 2023 Sep 22;24(1):358. doi: 10.1186/s12859-023-05454-2. PMID: 37740175.

- Arora N, Chaudhary A and **Prasad A*** Advances in methods and application of molecular diagnostics: a current perspective. Editorial: Methods and applications in molecular diagnostics. *Front. Mol. Biosci.* 2023; 10:1239005. doi: 10.3389/fmolb.2023.1239005 (**Invited editorial**).
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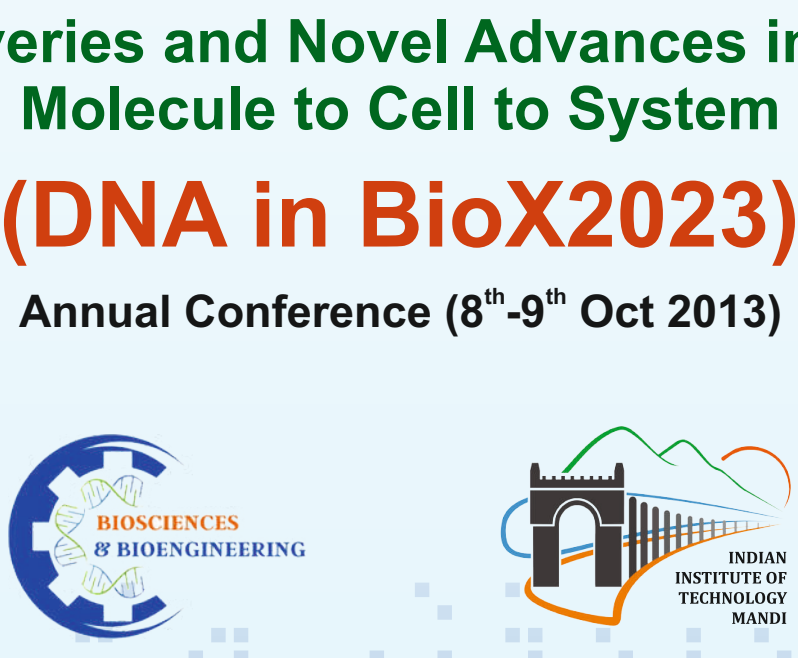
3.9.2.2 Invited Talks in conferences (National/International) and colleges

- Dr. Shyam K Masakapalli was an Invited speaker at IPAFNH-PSI 2023 Conference- 15th Annual Meeting of Proteomics Society, India (PSI)" and the International Conference on "Integrated Proteomics: He presented on "Defining metabolic phenotypes of microbial and plant systems with metabolomics and fluxomics - Strategies and challenges".
- Dr. Shyam K Masakapalli was an Invited key note speaker "1st National Workshop on Plant Metabolomics: from Sample Preparation to Data Analysis (26th February - 2nd March, 2024) organised by RTGR, University of Hyderabad, India.
- Dr. Shyam K Masakapalli was an Invited speaker at a workshop on "Development of Aroma Farming and Essential Oil Industry of Western Himalayan Region" organised by EOAIssential oil association of India at IHBT Palampur, 23rd April 2023. He presented on "Multi-analytical platforms for Himalayan essential oil phytochemical profiling: Vision and progress".
- Dr. Shyam Kumar Masakapalli was an invited keynote speaker in HistCON 2023 - Himalayan Science and Technology (HiSTCon) 2023 held at Shoolini University, 20-21 May 2023, Himachal Pradesh and has given a talk on "Smart Biosystems and Smart Agriculture with focus on Himalayas".

- Dr. Shyam Kumar Masakapalli was an invited speaker in MIPAM 2024 - Molecular Intricacies of Plant Associated Microorganisms (MIPAM)-2024, 18 – 20th March, 2024. Jointly organized by Central Tribal University of Andhra.
- Pradesh, Vizianagaram, and Centurion University, Vizianagaram. He delivered a talk on "Deciphering the plant-microbial metabolic crosstalk – progress and challenges".
- Dr. Baskar Bakathavachlu was an invited speaker at Cellular and Molecular Mechanisms of Development and Regeneration meeting (2024) at Shiv Nadar Institution of Eminence, Delhi NCR: Aedes mosquito embryos use rewired polyamine and lipid metabolism to survive extreme desiccation.
- Dr. Baskar Bakathavachlu was an invited speaker at Institute for Neuroscience, Trinity College, Dublin (2023): How structured and disordered domains in the SCA-2 and ALS associated protein Ataxin-2 control ribonucleoprotein granule condensation.
- Dr. Baskar Bakathavachlu was an invited speaker at InDRC at IISER Trivandrum (2023): How structured and disordered domains in the SCA-2 and ALS associated protein Ataxin-2 control ribonucleo protein granule condensation.
- Dr. Baskar Bakathavachlu was an invited speaker at Ignite Life Science Foundation meeting (2023): The neurodegeneration meeting- Perspective to Prospective.
- Dr. Baskar Bakathavachlu was an invited speaker at Gordon Research Conference (2023): CAG Triplet Repeat Disorders.
- Dr. Baskar Bakathavachlu was an invited speaker at Neurodegeneration and Neurogenetics conference, Bangalore (2023): Can we find a cure for SCA12? The path forward.
- Dr. Sumit Murab was an invited speaker in the Asian Polymer Association Annual Conference 2023, Goa India.
- Dr. Prasad Kasturi presented a poster at the EMBO Protein quality control: From molecular mechanisms to therapeutic intervention May 2023, Srebreno-Dubrovnik, Croatia.
- Dr. Trayambak Basak Delivered a lecture at the Society for Biological Chemists (SBS) 2023 at BITS-Pilani, Goa.

3.9.2.3 Workshop/Conference organized

- SBB organised its Annual Conference on the Theme: Discoveries and Novel Advances in BioX: Molecules to Cells to Systems (DNA in BioX) - 8th - 9th Oct 2023.
  Coordinating Team: Dr Prosenjit Mondal, Dr Kharerin Hungyo & Dr Shyam K Masakapalli.











- The faculty colleagues from IIT Mandi who supported SBB vision were thanked and felicitated for their contributions of high quality.
- Several SBB scholars were awarded "Best oral talks" and "Best Posters" for their scientific work of high merit.

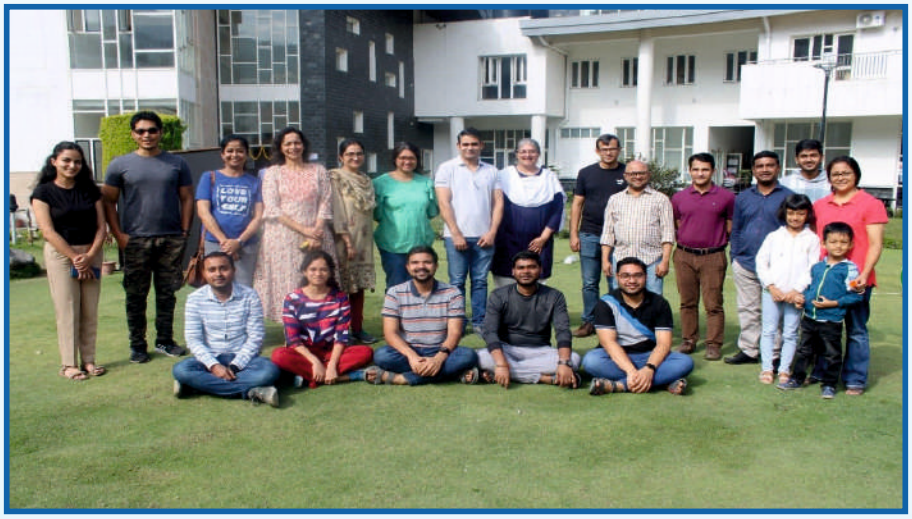
- **SBB family in a single frame.**

- **Dr. Shyam Kumar Masakapalli** along with MSBL, Medicinal plant lab, and EWOK collaboratively organized **"Industry-Academia-NGO-FPOs Stakeholders meet on Medicinal Plants of Himalayas"** on 24th-25th May 2023 at IIT Mandi.

- **Dr. Shyam Kumar Masakapalli** has organised "**Indo-Danish 2nd workshop towards efficient delivery of crop irrigation advisories**" on 16-17th February 2024 along with IT University Copenhagen and DHI Denmark at IIT Mandi.

- International Workshop on **"Astrobiology and Analogue Sites for the Indian Space Programmed" (30th Oct-5th Nov 2023):** Coordinated by **Prof. Tulika Srivastava**. The workshop had 24 participants. Funded by DST Karyashala and SBB School fund.

- National Workshop on **"Indian *C.elegans* PI's meeting"** (28-30th Sept 2023): Coordinated by **Dr. Prasad Kasturi.** The workshop had 35 participants. Funded by DBT-Ramalingaswami Fellowship and SBB.



- SBB Organised **One week Capacity Building Program in Science for TGT** (Physics, Chemistry, Biology) Coordinated by Dr. Shyam Kumar Masakapalli (SBB), Dr. Moupriya Das and Dr. Nirmalya Kajuri (SPS) from 25 to 30 October, 2023.The Program had 40 participants. Funded by SCERT, New Delhi.

3.9.2.4 Patents filed/ awarded

- Herbal Extract of *Rhododendron arboreum* for treatment Of Sars-Cov-2 Virus And Other Coronaviruses/covid Variants. Inventors: **Dr. Shyam Kumar Masakapalli,** Dr Maneesh Lingwan, Shagun Shagun, Dr Ranjan Kumar Nanda, Dr Sujatha Sunil; Patent application no. 202211012925. Patent awarded No. 525944.

3.9.2.5 Professional achievements, Honours, Award, Membership of Professional Societies

1. **Dr. Shyam K Masakapalli**

- Board of Editors in ASM Journal mSystems (2023-2026)
- Invited for DD Himachal TV live interview - Waste to Value 2023
- Coordinated the efforts for SBB FIST grant worth 4.6 crores received from DST
- Established Farmer-Academia-Industry-NGO model network that benefitted ~100 farmer families and scaling up further at IIT Mandi
- Awarded "Chaiti Award for contribution to Science and Technology", Rayagada District 2023
- Conferred Honarary fellowship -Fellow of Himalayan Forum for Science and Technology Communication, Shoolini University
- Founding member - Biological Engineering Society, India
- Contributing Member - American Society for Microbiology

2. **Dr. Baskar Bakathavachlu**

- American Society for Cell Biology Member
- Asian Pacific Society for Neurochemistry

3. **Dr. Trayambak Basak**

- Member of ASBMB, PSI (EC), ISHR-India Section (EC)

4. **Dr. Amit Prasad**

- American Society of Chemical Biology
- American Society of Microbiology
- American Society of Parasitology
- International Society of extracellular vesicles,
- Indian Society of clinical microbiologist
- Indian Tropical Parasitology Society

5. **Dr. Amit Jaiswal**

- Member, American Chemical Society (ACS), USA
- Member, Chemical Research Society of India
- Member, Materials Research Society of India

6. **Dr. Prasad Kasturi**

- Member of American Society for Biochemistry and Molecular Biology
- Member of Genetics Society of America

3.9.3 Outreach Activities

- Dr. Prasad Kasturi, Dr. Shyam K Masakapalli, Dr Baskar Bakthavatchalu, Dr Trayambak Basak and Prof. Tulika Srivatsava provided SCERT Teacher Training in Biosciences, 27th-30th October 2023, IIT Mandi. Trained hands-on biological experiments to about 80 teachers from Delhi schools (Ref: IITM/TP-SCERT/Science/167).
- SBB hosted the visits of students and faculty of other institutes - Sardar Patel University Mandi, Sundernagar College etc.
- SBB hosted **several eminent scientists, academicians and industry experts**
  - **Prof. CS Pramesh** (Director Tata Memorial Hospital) who shared experiences on National Cancer Grid (https://tmc.gov.in/ncg).
  - **Dr. Madhulika Dixit, IIT Madras** interacted with all SBB PhD scholars and also delivered talk on "Insulin and impaired glucose metabolism: the atypical determinants of lymphocyte adherence"- 26-06-2023.
  - **Dr. Sandhya Koushika, Tata Institute of Fundamental Research (TIFR),** Mumbai, 2 Sep 2023.
  - **Dr. Srinivas V Kaveri, Director of Research at INSERM, Paris,** Director of CNRS office in India (French National Centre for Scientific Research) delivered talk on "Immunotherapy: Going Beyond Monoclonals" ON 6 Nov 2023.
  - **Prof. Subhra Chakraborty, Director, NIPGR,** delivered talk on "Nutritional Genomics, Plant Immunity & Stress Genomics, and delayed fruit softening" 8-10-2023.
  - **Prof. Debjani Paul, BSBE, IIT Bombay** delivered talk on "Microfluidic devices for healthcare applications", 8-10-2023.
  - **Prof. Amitabha Bandyopadhyay, Head, BSBE, IIT Kanpur** delivered talk on "A developmental biologist's perspective of osteoarthritis", 8-10-2023.
  - **Mr. Ambar Srivastava, Managing Director, Wrig Nanosystems,** Title: Future of Preventive Healthcare, Biosensors, Digital Therapeutics, and AI, 8-10-2023.
  - **Prof. Niranjan Chakraborty, Professor of Eminence, NIPGR**, delivered a talk on "Mitochondrial proteome dynamics and defense response: turning knowledge into application", 8-10-2023.
  - **Prof. Sanjeev Khosla, Director, CSIR-IMTECH** delivered a talk on "Epigenetic inheritance"
  - **Dr. Tan Phat Huynh, Åbo Akademi University, Turku, Finland**, delivered a talk on "Polymer-based functional materials", 22 February 2024 .
  - **Prof. Utpal Nath, Indian Institute of Science, Bangalore** delivered a talk on "How genes regulate organ growth and geometry".
  - **Prof. Annapoorni Rangarajan, Indian Institute of Science, Bangalore** delivered a talk on "Stem Cells and Cancer: Lessons from each other".
  - **Prof. Sanyog Jain**, Centre for Pharmaceutical Nanotechnology, Department of Pharmaceutics National Institute of Pharmaceutical Education and Research (NIPER), Mohali, Dual drug delivery for safer synergistic cancer chemotherapy, 28th March 2024.

3.9.4 SBB- Students Achievements

Ph.D Scholars graduated in 2023-24

- **Dr. Ankita Sarkar** completed Thesis on "Cationic polymer and metal nanorattle-based nanocomposites for cancer therapy"
- **Dr. Pushpendra Mani Mishra** Thesis Excess:-Unravelling Albumin Protein-Epigallocatechin gallate conjugate as model drug for programmed cell death and discovery of novel drug against SARS-CoV-2
- **Dr. Shounak:** AY-2023 - Thesis 2D MoS2-Polysaccharide based nanocomposites: Applications in antibacterial therapy, wound healing and flexible bioelectronics
- **Dr. Keshav:-**AY-2023-Thesis Title Nano plasmonic SERS Substrate Design for Trace analysis and detection.
- **Dr. Prateek Kumar:** AY-2024 -Thesis Title:- Molecular Characterization of C-terminal regions of SARS-CoV-2 proteins and targeted inhibitor discovery Molecular Characterization of C-terminal regions of SARS-CoV-2 proteins and targeted inhibitor discovery
- **Dr. Taniya Bharadwaj:** AY-2024 -Thesis Title:- Amyloidogenic nature of proteins of enveloped RNA viruses: An unexplored aspect of viral pathogenesis

- **Dr. Shivani Krishna Kapuganti:-** AY-2024-Thesis Title:- Investigating the structure of ZIKV and DENV NS1 β-roll domain and targeting ZIKV NS1 for inhibitor discovery
- **Dr. Praveen Kumar:-**AY-2024-Thesis Title 2D MoS2 Nanosheets based Antimicrobial Fabric and Oleophilic Aerogel

3.9.5 Posters presented in National/International scientific events

- Shagun Shagun, Shyam Kumar Masakapalli. Phytochemistry from the Himalayan diversity – from molecular discovery and metabolic analysis to Health applications. 6th Plants and People "Exploring Plant(s)"-2023 held on 6th-7th Sept 2023 at Max Planck Institute of Molecular Plant Physiology, Potsdam, Germany.
- Navya kapoor and Dr. Shyam Kumar Masakapalli "Understanding polyamine polyamine metabolism in different biological systems. Anusandhan, 2023 25th June, IIT Mandi.
- Yogesh Pant and Shyam Kumar Masakapalli. Fatty acid profiles of edible oils. HistCON 2023 at Shoolini University, Himachal Pradesh, 20th-21st May 2023.
- Jyotika Thakur and Shyam Kumar Masakapalli. Development of *Thermobifida fusca* into cell factory and synthetic consortia (SynCONS) partner for cellulose to valuables. BioX Annual Conference (13.05.2023-14.05.2023) Indian Institute of Technology Mandi Kamand, H.P. India.
- Portia D Singh, Sanjeev Kumar, and Shyam K Masakapalli. "Deciphering the metabolome of potato leaves infected with *Phytophthora infestans.*" HISTCON 2023, Shoolini University, Solan. 19th-20th May 2023.
- Prem Chand, Vishali Dhiman, Shagun Shagun, Portia D Singh, Jyotika Thakur, Yogesh Pant and Shyam K Masakapalli. "Science and Technology for Sustainable Agriculture of Himalayan Apples" Anusandhan 1.0 organized by Research Society IIT Mandi, 23rd – 25th June 2023.
- Prem Chand, Vishali Dhiman, Shagun Shagun, Portia D Singh, Jyotika Thakur, Yogesh Pant and Shyam K Masakapalli. "Science and Technology for Sustainable Agriculture of Himalayan Apples" Emerging Issues of Biodiversity and Environment for Sustainable Development organized by VGC Mandi, 14th – 15th February 2024.
- Akalya Sendrayakannan, Ashutosh Sahoo, Chandrakant Joshi, and Shyam Kumar Masakapalli. Comparative transcriptome analysis of amino acid transporters in various cancer cell line. 43rd Annual convention of the Indian Association for Cancer research organised by IISER Pune, from 19th to 22nd January 2024.
- Ashutosh Sahoo, Amit K. Mohapatra, Haripriya Priyadarsini, Shyam K. Masakapalli, Ranjan K. Nanda. Can we predict the multidrug resistance ability of clinical Mtb isolates from their whole genome sequences?. Antimicrobial Resistance (AMR) and the Human Microbiome International conference 2023 organized by THSTI, Faridabad, NCR-Delhi, from November 15th–16th, 2023.
- Ashutosh Sahoo, Amit K. Mohapatra,Haripriya Priyadarsini, Shyam K. Masakapalli, Ranjan K. Nanda. Can we predict the multidrug resistance ability of clinical Mtb isolates from their whole genome sequences?.15thAnnual meeting of Proteomics Society, India International Conference on Integrated Proteomics: Application in food, Nutrition & Health. Organized by NIPGR, New Delhi from 20th to 22th November 2023.
- Ramnath Nayak, Yogesh Pant and Dr. Shyam Kumar Masakapalli. Exploring the physiological and metabolic responses of Pea under drought stress and exogenous GABA application. EMBO-ISPP SATELLITE MEETING 2024. Organized by IISER Bhopal and NISER Bhubaneswar from 15th - 16th January 2024.
- Prajnadipta Panda and Prasad Kasturi. Identification of neuronal specific modifiers of protein aggregation in Caenorhabditis elegans. EMBO Protein quality control: From molecular mechanisms to therapeutic intervention May 2023, Srebreno-Dubrovnik, Croatia.
- Prajnadipta Panda and Prasad Kasturi. Identification of neuronal specific modifiers of protein aggregation in Caenorhabditis elegans. 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi.
- Pritam Mukherjee and Prasad Kasturi. Distinct mechanisms of protective protein aggregation during aging in C.elegans. 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi.
- Prasun Kumar Bhunia, Vishwajeet Raj and Prasad Kasturi. Roles for secreted proteins in inter-tissue communication proteotoxicity. 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi.

- Rushali Kamath and Prasad Kasturi. Roles For Small Heat-Shock Proteins in Protective Protein Aggregation. FCS conference from 9 to 14 December 2023, IISER Mohali.
- Anand Kumar Keshri, Shweta Tripathi, Amit Prasad* LL-37 protects gastric epithelial cells against Helicobacter pylori infection through apoptosis and pathogen clearance; Microcon 2023, KGMU Lucknow.
- Suraj Singh Rawat, Amit Prasad. Expanding *Taenia solium* Fatty Acid Binding Protein Family". The 19th Asia Pacific Congress of Clinical Microbiology and Infection 2023. COEX, 513 Gangnam-gu, Seoul, South Korea. 6th 8th July 2023.
- Shagun Shagun and Shyam Kumar Masakapalli. Phytochemistry from the Himalayan diversity – from molecular discovery and metabolic analysis to Health applications. 6th Plants and People "Exploring Plant(s)"-2023 held on 6th-7th Sept 2023 at Max Planck Institute of Molecular Plant Physiology, Potsdam, Germany.
- Navya kapoor and Shyam Kumar Masakapalli "Understanding polyamine polyamine metabolism in different biological systems. Anusandhan, 2023 25th June, IIT Mandi
- Yogesh Pant and Shyam Kumar Masakapalli. Fatty acid profiles of edible oils. HistCON 2023 at Shoolini University, Himachal Pradesh, 20th-21st May 2023
- Jyotika Thakur and Shyam Kumar Masakapalli. Development of *Thermobifida fusca* into cell factory and synthetic consortia (SynCONS) partner for cellulose to valuables. SBB-BioX Annual Conference (8-9 Oct 2023) Indian Institute of Technology Mandi Kamand, H.P. India.
- Portia D Singh, Sanjeev Kumar, and Shyam K Masakapalli. "Deciphering the metabolome of potato leaves infected with *Phytophthora infestans.*" HISTCON 2023, Shoolini University, Solan. 19th-20th May 2023.
- Prem Chand, Vishali Dhiman, Shagun Shagun, Portia D Singh, Jyotika Thakur, Yogesh Pant and Shyam K Masakapalli. "Science and Technology for Sustainable Agriculture of Himalayan Apples" Anusandhan 1.0 organized by Research Society IIT Mandi, 23rd – 25th June 2023.
- Prem Chand, Vishali Dhiman, Shagun Shagun, Portia D Singh, Jyotika Thakur, Yogesh Pant and Shyam K Masakapalli. "Science and Technology for Sustainable Agriculture of Himalayan Apples" Emerging Issues of Biodiversity and Environment for Sustainable Development organized by VGC Mandi, 14th – 15th February 2024.
- Akalya Sendrayakannan, Ashutosh Sahoo, Chandrakant Joshi, and Shyam Kumar Masakapalli. Comparative transcriptome analysis of amino acid transporters in various cancer cell line. 43rd Annual convention of the Indian Association for Cancer research organised by IISER Pune, from 19th-22nd Jan 2024.
- Ashutosh Sahoo, Amit K. Mohapatra,Haripriya Priyadarsini, Shyam K. Masakapalli, Ranjan K. Nanda. Can we predict the multidrug resistance ability of clinical Mtb isolates from their whole genome sequences?. Antimicrobial Resistance (AMR) and the Human Microbiome International conference 2023 organized by THSTI, Faridabad, NCR-Delhi, from November 15th–16th, 2023.
- Ashutosh Sahoo, Amit K. Mohapatra,Haripriya Priyadarsini, Shyam K. Masakapalli, Ranjan K. Nanda. Can we predict the multidrug resistance ability of clinical Mtb isolates from their whole genome sequences?.15thAnnual meeting of Proteomics Society, India International Conference on Integrated Proteomics: Application in food, Nutrition & Health. Organized by NIPGR, New Delhi from 20th-22nd Nov 2023.
- Ramnath Nayak, Yogesh Pant and Dr. Shyam Kumar Masakapalli. Exploring the physiological and metabolic responses of Pea under drought stress and exogenous GABA application. EMBO-ISPP SATELLITE MEETING 2024. Organized by IISER Bhopal and NISER Bhubaneswar from 15th - 16th January 2024.
- Prajnadipta Panda and Prasad Kasturi. Identification of neuronal specific modifiers of protein aggregation in Caenorhabditis elegans. EMBO Protein quality control: From molecular mechanisms to therapeutic intervention May 2023, Srebreno-Dubrovnik, Croatia.
- Prajnadipta Panda and Prasad Kasturi. Identification of neuronal specific modifiers of protein aggregation in Caenorhabditis elegans. 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi.
- Pritam Mukherjee and Prasad Kasturi. Distinct mechanisms of protective protein aggregation during aging in C.elegans. 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi.

- Prasun Kumar Bhunia, Vishwajeet Raj and Prasad Kasturi. Roles for secreted proteins in inter-tissue communication proteotoxicity. 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi.
- Rushali Kamath and Prasad Kasturi. Roles For Small Heat-Shock Proteins in Protective Protein Aggregation. FCS XIV conference from 9 to 14 December 2023, IISER Mohali.
- Anjum F Presented Poster in "EMBO-EMBL Symposium: Seeing is Believing 2023 at EMBL, Heidelberg, Germany. October 2023
- Priya Rawat and Prosenjit Mondal, Diet-induced induction of hepatic Serine/Threonine Kinase STK38 triggers proinflammation and hepatic lipid accumulation.DZD Diabetes Research School in Hamburg (Germany) from September 30 - October 2, 2023.
- Preeti Rathi, Sumanta Chowdhury, and Prem F. Siril. "Pore-interface Engineering Improves Anticancer Drug-loading to Triazine Based Covalent Organic Framework." 3rd International Conference on Nanomaterials in Biology held at IIT Gandhinagar, Gujrat from November 19-24, 2023.
- Preeti Rathi, Sumanta Chowdhury, and Prem F. Siril. "Pore-interface Engineering Improves Anticancer Drug-loading to Triazine Based Covalent Organic Framework." International Conference on "Integrating Novel Approaches for Non-Communicable Disease Target Exploration", INNOVATE 2024 held at BITS Pilani, Rajasthan from March 7-9, 2024.
- Ashutosh Joshi, Bhaskar Mondal, Trayambak Basak. "Deciphering the Role of 4-hydroxylation of Proline at Yaa in Gly-Xaa-Yaa Triplet in Collagen Stability." International Conference on Integrated Proteomics: Application in food, Nutrition & Health. NIPGR, New Delhi, November 20-22, 2023.
- Ashutosh Joshi, Bhaskar Mondal, Trayambak Basak. "Deciphering the Role of 4-hydroxylation of Proline at Yaa in Gly-Xaa-Yaa Triplet in Collagen Stability." 6th Symposium on Advancs in Bioinorganic Chemistry (SABIC) 2024 at Kolkata, January 7-11, 2024.
- Saksham Handa, Navin Kumar, and Sumit Murab. "Multifunctional 3D-printed Poly-Lactic acid (PLA) Scaffolds: Integrating MnO_2 nanoparticles, and Salicylic acid for advanced Osteoarthritis therapy". Asia-Pacific Conclave on Engineering Healthcare 2024, IISc Bangalore from January 29-31, 2024.
- Himanshi Diwan and Sumit Murab. "Himalayan sheep wool keratin and hydroxyapatite blended polycaprolactone (PCL) composite scaffolds for bone regeneration". Asia-Pacific Conclave on Engineering Healthcare 2024, IISc Bangalore from January 29-31, 2024.
- Swati Sharma, Naina Arora, Amit Prasad. Investigating Macrophage Responses to Taenia solium metacestode ESP antigen through Metabolomics. Conducted by Indian Association of Tropical Parasitology (IATP)- TROPACON-2023 at AIIMS Jodhpur, India on 26-29 October 2023
- Shilpa Thakur, Khyati Girdhar ,Prosenjit Mondal. Design, synthesis, and biological evaluation of a small molecule oral agonist of the glucagon-like-peptide-1 receptorBioX conference organised by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- Shilpa Thakur, Khyati Girdhar ,Prosenjit Mondal ,Design, synthesis, and biological evaluation of a small molecule oral agonist of the glucagon-like-peptide-1 receptor at Anusandhan organised by IIT Mandi,2023.
- Abhi Dutta, Sanchari Chakraborty, Antara Roy, Comparative electrocardiography profile of acute and chronic dosage of Isoproterenol in live mice. BioX conference organised by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- Abhi Dutta, Sanchari Chakraborty, Shubham Saha, Antara Roy, Ashutosh Joshi, Trayambak Basak, Perturbed collagen I and collagen IV post-translational modification network during chronic myocardial fibrosis. International Society for Heart Research (ISHR) 2024 at AIIMS Jodhpur, Jodhpur, Rajasthan, India (February 16-18, 2024
- Khushal Singh, Prem Singh, Shounak Roy, Ankita Sarkar and Amit Jaiswal. "Palladium Nanocapsules: A Promising Photothermal Agent in the NIR-II Biological Window for Cancer Therapy" BioX conference organised by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023
- Khushal Singh, Keshav Bhardwaj, Amit Jaiswal. "Engineering Plasmonic Gold Dogbone Nanorattles for Trace Analysis" 3rd International Conference on Nanomaterials in Biology held at IIT Gandhinagar, Gujrat from November 19-24, 2023.

- Rashmi Ira, Vikas Sharma, Shrawan Kumar, Tulika Prakash. "Anaerobic Co-digestion of Food Waste, Cow Dung, and Sewage Wastewater using E(C2)Tx Synthetic Consortia". International Conference on Biodiversity and Geochemistry of Deep and Extreme Earth Systems" organized by IIT Kharagpur, in association with IISER Kolkata, and NIT Durgapur at Indian Institute of Technology Kharagpur, India from 1st to 3rd February 2024.
- Rashmi Ira, Vikas Sharma, Shrawan Kumar, Tulika Prakash. "Designing Synthetic Microbial Consortia for Biohythane Production Using "Cow Dung" As A Substrate and Evaluating Microbial Dynamics by Metagenomic Profiling." The 31st European Biomass Conference and Exhibition 2023 (EUBCE2023)" organized by ETA-Florence Renewable Energies, in "Bologna, Italy (5 June – 9 June 2023).
- Pratyusha Patidar and Tulika Prakash. Deciphering the role of molecular mimicry in the etiopathogenesis of Autoimmune Hemolytic Anemia. SBB-BioX Annual Conference (8-9 Oct 2023) at the Indian Institute of Technology Mandi Kamand, H.P. India.
- Sanchari Chakraborty, Abhi Dutta, Shubham Saha, Anatra Roy and Trayambak Basak. "The Paradox of Collagen Deposition Mediated Extracellular Matrix Remodelling During Post-Myocardial Infarction Heart Failure". International Society for Heart Research (ISHR) 2024 at AIIMS Jodhpur, Jodhpur, Rajasthan, India (February 16-18, 2024
- Pankaj Sharma, Sumit Murab, 3D-Printed Piezoelectric and Anti-bacterial Nanocomposite Scaffold for Dental Regeneration. SBB Symposium 2023, Indian Institute of Technology Mandi, Himachal Pradesh, India (8th- 9th Oct. 2023)
- Pankaj Sharma, Sumit Murab, 3D-Printed Piezoelectric and Anti-bacterial Nanocomposite Scaffold for Dental Regeneration. Society of Biological Chemists (India), 92nd Annual Meeting, Goa, India (18th- 20th Dec. 2023)
- Pankaj Sharma, Sumit Murab, 3D-Printed Piezoelectric and Anti-bacterial Nanocomposite Scaffold for Dental Regeneration. Anusandhan 2.0 Research Fair , IIT Mandi (18th- 19th June 2024)
- Vivek Sarohi, Ceylan Onursal, Natalia Cabeza-Boeddinghaus, Elisabeth Hennen, Juliane Merl-Pham, Hans Peter Bächinger, Stefanie Hauck, Roberto Vanacore, Trayambak Basak, Claudia A. Staab-Weijnitz. Prolyl 3-hydroxylase 1 deficiency unhinges collagen post-translational modification patterns far beyond the lack of specific 3-hydroxyproline sites. BSPR-EuPA 2023 conference at Newcastle, United Kingdom (from 17th to 20th July 2023).
- Shubham Saha, Praveen Singh, Anurag Raj, Mamta Rathore, Deepika Jindal, Hiteshi Vaidya, Prakash Chand Negi, Santanu Sengupta, Sandeep Seth , Trayambak Basak. High-resolution-Mass-Spectrometry based proteomic and lipidomic analyses of blood plasma samples of dilated cardiomyopathy (DCM) patients in India. ISHR 2024, AIIMS Jodhpur, Rajasthan, India (February 16-18, 2024)
- Shubham Saha, Praveen Singh, Anurag Raj, Mamta Rathore, Deepika Jindal, Hiteshi Vaidya, Prakash Chand Negi, Santanu Sengupta, Sandeep Seth , Trayambak Basak. High-resolution-Mass-Spectrometry based proteomic and lipidomic analyses of blood plasma samples of dilated cardiomyopathy (DCM) patients in India. International Conference on Integrated Proteomics: Application in food, Nutrition & Health. NIPGR, New Delhi, November 20-22, 2023.
- Shubham Saha, Praveen Singh, Anurag Raj, Mamta Rathore, Deepika Jindal, Hiteshi Vaidya, Prakash Chand Negi, Santanu Sengupta, Sandeep Seth, Trayambak Basak. High-resolution-Mass-Spectrometry based lipidomic analyses of blood plasma samples of dilated cardiomyopathy (DCM) patients in India. SPARCS-ACMR 2023, PGIMER Chandigarh, India. (February 16-18, 2023).
- Shubham Saha, Praveen Singh, Anurag Raj, Mamta Rathore, Deepika Jindal, Hiteshi Vaidya, Prakash Chand Negi, Santanu Sengupta, Sandeep Seth, Trayambak Basak. High-resolution-Mass-Spectrometry based lipidomic analyses of blood plasma samples of dilated cardiomyopathy (DCM) patients in India. SBB Symposium 2023, Indian Institute of Technology Mandi, Himachal Pradesh, India (8th- 9th Oct. 2023).

3.9.6 Oral talks by scholars

- Yogesh Pant and Shyam Kumar Masakapalli. Metabolic Insights into lipid metabolism during oilseed germination. 10th European Symposium on Plant Lipids held at Conference center, Hotel Casa, Amsterdam, Netherlands. 9th-12th July 2023.

- Jyotika Thakur and Shyam Kumar Masakapalli. Genomic and metabolic insights into *Thermobifida fusca*. 16th International Congress Thermophiles 2023, (29th Sept-2nd Oct 2023) Bangor University, Bangor, North Wales, UK.
- Shagun Shagun, Shyam Kumar Masakapalli. Small Molecules from Nature: drug discovery and their effects on cellular metabolic phenotypes. BioX conference organised by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- Pritam Mukherjee and Prasad Kasturi. Distinct mechanisms of protective protein aggregation during aging in C.elegans. BioX conference organised by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- Anand Kumar Keshri, Shweta Tripathi, Amit Prasad* Comprehensive immunoinformatics approach for designing a multi-epitope chimeric vaccine against Helicobacter pylori; SBB symposium 2023, IIT Mandi Himachal Pradesh
- Suraj Singh Rawat, Amit Prasad. "Thioredoxin 1 from Taenia solium suppresses ROS production in neutrophils and regulates pTEN activity" at Tropacon 2022 organized by Indian Academy of Tropical Parasitology, Calcutta Medical College & Hospital. West Bengal, India. 10-11 September 2022.
- Pritam Mukherjee and Prasad Kasturi. Distinct mechanisms of protective protein aggregation during aging in *C.elegans*. BioX conference organised by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- Ashutosh Joshi, Bhaskar Mondal, and Trayambak Basak. "Deciphering the Role of 4-hydroxylation of Proline at Yaa in Gly-Xaa-Yaa Triplet in Collagen Stability." Discoveries and Novel Advances in BioX: Molecules to Cells to Systems. Annual Conference. School of Biosciences and Bioengineering, IIT Mandi. October 8-9, 2023.
- Priya Rawat and Prosenjit Mondal. Diet-induced induction of hepatic Serine/Threonine Kinase STK38 triggers proinflammation and hepatic lipid accumulation. BioX conference organized by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- Abhi Dutta and Trayambak Basak, Exploring the Collagen network in Extracellular-Matrix Remodeling in a chronic myocardial fibrosis model: Insights into Mechanisms and Implications. The 13th annual Cardiovascular Research Convergence Meet on 29.10.2023 (Sunday) at CSIR-IGIB, New Delhi.
- Manju Lata, Amit Prasad. A Perspective on Therapeutic Potential of Medicinal Plants for Neurodegenerative Diseases: Herbal Hopes from Himalayas. National seminar on exploring the history of traditional medicines in the Himalayas.10-11 May 2024 Shoolini University Solan, Himachal Pradesh.

3.9.7 Workshops/conferences attended

- **Ashutosh Sahoo** attended a workshop on "Multicolour flow cytometry & single cell sorting with CytoFLEX SRT" held on 25th to 27th July, 2023 at International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi.
- **Yogesh Pandey** attended EMSL Summer School: Demystifying Multiomics with Data Science. July 24-28, 2023.
- **Prajnadipta Panda** attended the EMBO Protein quality control: From molecular mechanisms to therapeutic intervention 21-26 May 2023, Srebreno-Dubrovnik, Croatia.
- **Prajnadipta Panda** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Pritam Mukherjee** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Pritam Mukherjee** attended the Post-Conference Workshop (15th Annual meeting of Proteomics Society) on Biomedical Proteomics and Data Analysis at RCB THSTI, Faridabad, 23 November 2023.
- **Prasun Kumar Bhunia** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Rushali Kamath** attended the 14th National Workshop on Fluorescence and Raman Spectroscopy organized jointly by the IISER Mohali and Institute of Nanoscience and Technology (INST) from December 9 to 14 December, 2023.

- **Anubha Chaudhary** attended a 'Hands-On Training Course in Metabolomics', Organized by Centre for Cellular and Molecular Platforms (C-CAMP) (A Dept. of Biotechnology, Govt. of India Initiative), Bangalore, India. (05-03-2024 to 07-03 2024).
- **Anubha Chaudhary** attended a 'Hands-on workshop on High- Dimensional Flow Cytometry Panel Design and Data Analysis', Organized by Translational Health Science and Technology Institute, Faridabad, India (THSTI). (15/03/23-17-03-23).
- **Ashutosh Sahoo** attended a workshop on "Multicolour flow cytometry & single cell sorting with CytoFLEX SRT" held on 25th to 27th July, 2023 at International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi.
- **Yogesh Pandey** attended EMSL Summer School: Demystifying Multiomics with Data Science. July 24-28, 2023.
- **Prajnadipta Panda** attended the EMBO Protein quality control: From molecular mechanisms to therapeutic intervention 21-26 May 2023, Srebreno-Dubrovnik, Croatia.
- **Prajnadipta Panda** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Pritam Mukherjee** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
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- **Prasun Kumar Bhunia** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Rushali Kamath** attended the 14th National Workshop on Fluorescence and Raman Spectroscopy organized jointly by the IISER Mohali and Institute of Nanoscience and Technology (INST) from December 9 to 14 December, 2023.
- **Rija Kalita** attended the International Conference and pre-conference workshop "PGI-HEM-ONC FEST" at PGIMER, Chandigarh, from September 21st to 24th, 2023.
- **Rija Kalita** attended the DST funded Accelerate Vigyan High-End Workshop "KARYASHALA-Astrobiology and Analogue sites for the Indian Space programmes" organized by Indian Institute of Technology,Mandi in association with Physical Research Laboratory (PRL),Gujarat, from 31st October- 4th November,2023.
- **Ashutosh Joshi** attended the "DFT-Crystal in-person workshop with hands-on training" at INST Mohali, 13-16 February, 2023.
- **Ashutosh Joshi** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Ashutosh Joshi** attended 6th Symposium on Advances in Bioinorganic Chemistry (SABIC) 2024 at Kolkata, January 7-11, 2024.
- **Preeti Rathi** attended the 3rd International Conference on Nanomaterials in Biology held at IIT Gandhinagar, Gujarat from November 19-24, 2023 and International Conference on "Integrating Novel Approaches for Non-Communicable Disease Target Exploration", INNOVATE 2024 held at BITS Pilani, Rajasthan from March 7-9, 2024.
- **Preeti Rathi** attended the Microscopy and Image Analysis Training Course organised by IISER Pune from May 20-24, 2024.
- **Priya Rawat** attended DZD Diabetes Research School in Hamburg (Germany) from September 30 - October 2, 2023.
- **Abhi Dutta** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Abhi Dutta** attended the The 13th annual Cardiovascular Research Convergence (CRC) Meet on 29.10.2023 (Sunday) at CSIR-IGIB, New Delhi.
- **Abhi Dutta** attended the Joint Annual Meeting of International Society for Heart Research (Indian Section) & International Academy of Cardiovascular Sciences (India Section), ISHR 2024: Cardiovascular Sciences – From Molecule to Clinical to be held on 16th-18th February 2024 at AIIMS, Jodhpur, Rajasthan, India.

- **Antara Roy** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Antara Roy** attended the The 13th annual Cardiovascular Research Convergence (CRC) Meet on 29.10.2023 (Sunday) at CSIR-IGIB, New Delhi.
- **Antara Roy** attended the Joint Annual Meeting of International Society for Heart Research (Indian Section) & International Academy of Cardiovascular Sciences (India Section), ISHR 2024: Cardiovascular Sciences – From Molecule to Clinical to be held on 16th-18th February 2024 at AIIMS, Jodhpur, Rajasthan, India.
- **Rashmi Ira** conducted a hands-on session: on Microbial culturing and Metagenomic data analysis in DST funded Accelerate Vigyan High-End Workshop "KARYASHALA" under the theme "Astrobiology and Analogue sites for the Indian Space programmes" organized by the Indian Institute of Technology Mandi with association of Physical Research Laboratory (PRL) Ahmedabad, Gujrat, India (31st October – 4th November 2023).
- **Rashmi Ira** attended and conducted a hands-on session: on Metagenomic data analysis in "Deep Bioinformatics Boot Camp 2023" organized by the Himalayan Centre for High-throughput Computational Biology (HiCHiCoB), a BIC of DBT, Govt. of India CSIR-Institute of Himalayan Bioresource Technology (CSIR-IHBT), Palampur, H.P, India (28th August – 30th August 2023).
- **Manju Lata** attended "2nd National Conference on Natural Products / Ayush System of Medicine" on 19th-21th April,2024 organized by Department of Pharmacology, PGIMER, Chandigarh in collaboration with RCFC (NR-1) of National Medicinal Plant Board Ministry of Ayush, Govt. of India.
- **Pratyusha Patidar** attended the DST funded high-end workshop "Astrobiology Karyashala" jointly organised by the Physical Research Laboratory (PRL), Ahmedabad and IIT Mandi (30th Oct-4th Nov 2023).
- **Pratyusha Patidar** attended a DBT-funded hands-on workshop "Deep Bioinformatics Boot Camp 2023" at CSIR-IHBT, Palampur (28th-30th Aug 2023).
- **Sanchari Chakraborty** attended the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Sanchari Chakraborty** attended the Joint Annual Meeting of International Society for Heart Research (Indian Section) & International Academy of Cardiovascular Sciences (India Section), ISHR 2024: Cardiovascular Sciences – From Molecule to Clinical to be held on 16th-18th February 2024 at AIIMS, Jodhpur, Rajasthan, India.
- **Pankaj Sharma** attended the 92nd Annual Meet of the Society of Biological Chemists at BITS Pilani, Goa, India. (18th-20th Dec. 2023).
- **Shubham Saha** attended the Post-Conference Workshop (15th Annual meeting of Proteomics Society) on Biomedical Proteomics and Data Analysis at RCB THSTI, Faridabad, 23 November 2023.
- **Shubham Saha** attended the Post-Conference Workshop (ISHR 2024) on Echocardiography at AIIMS, Jodhpur, Rajasthan, India. 18th February 2024.
- **Shubham Saha** attended the Pre-Conference Workshop (SPARCS-ACMR 2023) on Confocal Microscopy and Image Analysis at PGIMER Chandigarh, India. 16th February, 2023.

3.9.7.1 Other Achievements of scholar (international conference visits, conference pics, awards, poster/oral prizes)

- **Swetha R** awarded Khorana fellowship 2023. Carried project in Dr. Srivatsan Raman's Laboratory at University of Wisconsin-Madison, WI, USA on "Bacterial gene complementation in T7 phage genome" June-August 2023.
- **Naziya Faizy** awarded Khorana fellowship 2023.
- **Jyotika Thakur** received SERB Travel award for attending Thermophiles 2023: International Travel Grant (ITS)-SERB.
- Vanshika Saxena Received Prime Minister's Research Fellowship Award.

- **Akash Kumaran** Received Prime Minister's Research Fellowship Award. Also Teaching Bio-informatics and Enzymology at Sardar Patel University, mandi (May-June 2023).
- **Yogesh Pan**t received Best Poster award in HistCON 2023 at Shoolini University, Himachal Pradesh.
- **Farhan Anjum** received DST Travel Grant 2023, DBT travel grant 2023, CSIR travel grant 2023 to present her research in "EMBO-EMBL Symposium: Seeing is Believing 2023 at EMBL, Heidelberg, Germany. October 2023.
- **Suraj Singh Rawat** received DST Travel Grant 2023, The 19th Asia Pacific Congress of Clinical Microbiology and Infection 2023. COEX, 513 Gangnam-gu, Seoul, South Korea. 6th 8th July 2023.
- **Swetha R** awarded Khorana fellowship 2023. Carried project in Dr. Srivatsan Raman's Laboratory at University of Wisconsin-Madison, WI, USA on "Bacterial gene complementation in T7 phage genome" June-August 2023.
- **Naziya Faizy** awarded Khorana fellowship 2023.
- **Jyotika Thakur** received SERB Travel award for attending Thermophiles 2023: International Travel Grant (ITS)-SERB.
- **Swati received Best Poster award** in IATP-TROPACON 2023 at AIIMS Jodhpur.
- **Anand Kumar Keshri, Poster award** at Microcon 2023, KGMU Lucknow.
- **Anand Kumar Keshri, Best oral presentation** award at SBB symposium 2023, IIT Mandi Himachal Pradesh. BioX conference organized by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- **Priya rawat. Best oral presentation** award at SBB symposium 2023, IIT Mandi Himachal Pradesh. BioX conference organized by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- **Shagun Shagun**. Best oral presentation award at SBB symposium 2023, IIT Mandi Himachal Pradesh. BioX conference organized by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- **Vivek Sarohi** received DST Travel Grant 2023 to present his research in "BSPR-EuPA 2023 conference" at Newcastle, United Kingdom. July 2023.
- **Pritam Mukherjee**, Best oral presentation award at SBB symposium 2023, IIT Mandi Himachal Pradesh. BioX conference organized by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.
- **Pritam Mukherjee** Best poster presentation at the 15th Annual meeting of Proteomics Society, India (PSI) and International Conference on "Integrated Proteomics: Applications in Food, Nutrition and Health" at NIPGR, New Delhi, 20-22 November 2023.
- **Prasun Kumar Bhunia**, Best poster presentation award at SBB symposium 2023, IIT Mandi Himachal Pradesh. BioX conference organized by School of Biosciences and Bioengineering, IIT Mandi. 8th-9th Oct 2023.

4. International Relation

International Bachelor's, Master's and Ph.D. students can spend up to a year at IIT Mandi under student exchange. Also, international students can pursue graduate degree programs at the Institute. Students coming for student exchange or degree programs can get credit for courses they take at IIT Mandi. International students can work with the Institute's faculty on collaborative research topics involving institutional, regional, and national interests. IIT Mandi also provides possibilities for faculty members at international universities/institutes to spend time for the purposes of teaching and research. The fields in which IIT Mandi is currently involved at the Bachelor's, Master's, and Ph.D. levels include: Computer & Electrical Engineering, Civil & Environmental Engineering, Chemical Sciences, Physical Sciences, Mathematical & Statistical Sciences, Biosciences & Bio Engineering, Mechanical & Materials Engineering, Management and Humanities and Social Sciences. The exchange visits are being performed as per the terms and conditions of the MoU/agreements.

Under an existing MoU with Worcester Polytechnic Institute (WPI), USA, IIT Mandi hosted a team of 19 undergraduate students and two faculty mentors from WPI at the Institute for two-months between mid-March and early-May, and these students worked with similar number of IIT Mandi undergraduate students in solving a number of socioeconomic issues concerning the local communities in Mandi and Kamand.

International Students at IIT Mandi

18 International students are enrolled for Undergraduate, Masters, PhD programs and for semester Exchange programs at IIT Mandi. Of these, 05 students are from Bangladesh, 05 students are from Nepal, 03 students are from Ethiopia, 01 student from Korea, 01 student from Pakistan, 01 student from Canada, 01 student is from USA and 01 student from Germany.
19 students from Worcester Polytechnic Institute visited IIT Mandi from 13th March to 2nd May 2024 under ISTP Project.

Events with International Participation

There were a number of workshops/Talks conducted online at IIT Mandi involving visitors from universities abroad between April, 2023 and March, 2024. The details of these workshops/talks/awards are given below.

- Ms. Muskan Dhandhi, has been awarded the prestigious Charles Wallace India Trust Research Grant for 2023-24. Muskan is 'Translating Haryanvi Folklore' for her Ph.D. thesis. This grant will allow her to access archives at King's College London and British Museums to 'Translate Haryanvi Material Culture including Haryanvi clothing and jewelry'. This comes soon upon the receipt of the Shastri Indo-Canadian MITACS Globalink Research Award.
- One of IIT Mandi's M.Tech by Research student Ms. Aditi Rana from School of Civil and Environmental Engineering has secured a fully funded PhD position within the School of the Environment, Geography and Geosciences at University of Portsmouth, United Kingdom. She will be working on industry-academia project "The effects of climate change on the performance of geo-infrastructure under cyclic loading" under the supervisory team of Dr Arash Azizi, Dr Nick Koor, Dr. Philip Benson from University of Portsmouth and Professor David Toll from the Durham University.
- Mr. Armanul Hoda, a talented M.Tech student in Structural Engineering, has achieved a significant milestone in his academic career. He has been offered fully funded PhD positions from both the University of New Hampshire and the University of Nevada. Mr. Hoda will be joining the prestigious lab of Professor Eftekher Azam, as a Graduate Assistant within Department of Civil and Environmental Engineering at the University of New Hampshire in Durham, NH, USA.
- The School of Mathematical & Statistical Sciences, Indian Institute of Technology Mandi, Himachal Pradesh, India has successfully organized the International Conference on Differential Equations and Control Problems (ICDECP23) during 15th to 17th June, 2023. The inauguration ceremony was graced by the chief guest Prof. Anuj Mubayi from Illinois State University, USA, The inaugural ceremony was attended by around 210 great minds of India and abroad.
- In collaboration with the Secretary/Joint Secretary/Alumni, Japan Alumni Chapter, the DORA office IIT Mandi successfully organized the in-person Japan Chapter Alumni Meet on 21.09.2023 at Tokyo, Japan. It was a highly successful meeting that brought together a diverse group of IIT Mandi graduates living and working in Japan. Prof. Laxmidhar Behera, Director, IIT Mandi, along with Dr. C. S. Yadav graced the event with their presence. This event served as a testament to the enduring spirit of the Institute's alumni community.
- Indian Institute of Technology Mandi (IIT Mandi) has been honored with the Prestigious Green University Award in COP 28 UAE. This prestigious accolade was conferred by Green Mentors, a non-governmental organization holding special consultative status with the United Nations Economic and Social Council (ECOSOC) in the United States. The recognition was given to the Institute in acknowledgment of its comprehensive commitment to sustainable practices and its holistic approach towards environmental initiatives.

IIT Mandi students visiting Institutions abroad

A number of IIT Mandi graduate and undergraduate students visited several EU institutions under academic exchange in the year 2023. The undergraduate visits included: 08-students to RWTH Aachen, 10-students to Technical University of Munich, 04 students to Technical University of Darmstadt, 04 students to Technical University of Dresden, 04 students to Technical University of Braunschweig, 02 student to Norwegian University of Science, 04 students to Kyushu University Japan, 01-student of M. Tech. to Germany under DAAD (KOSPIE) program and 01 student for research internship CNRS Biologie du Institut de Biologie Paris, France.

4.1 IIT Mandi faculty visiting Institutions abroad

- Prof. Laxmidhar Behera (Director, IIT Mandi) and Dr. C S Yadav (Assoc. Professor) visited Japan in October'23 in various organizations to pursue collaborations with international universities to establish and strengthen the academic bonds to benefit the Student and Faculty communities of both sides.

- Several IIT Mandi faculty members visited institutions in Singapore, Sweden, France, Germany, UK, Italy, Japan, USA, Greece, Belgium, Austria, Bangladesh, UAE, Ireland, Turkey, Korea, Indonesia, Kazakhstan, Canada, Greece, Spain, Australia, and Sauth Africa in 2023-24 for participating in conferences and furthering industry and academic collaborations. The visits included three faculty members from the School of Humanities and Social Sciences; eleven faculty members from the School of Computing and Electrical Engineering; two faculty member from the School of Chemical Sciences; seven faculty members from the School of Physical Sciences; two faculty members from the School of Mathematical & Statistical Sciences; seven faculty members from the School of Civil & Environmental Engineering; six faculty members from Biosciences & Bio Engineering; Seven faculty members from the School of Mechanical & Materials Engineering; one faculty member from School of Management.

4.2 International Visitors at IIT Mandi

- Prof. Dittrich Yvonne Gisela, IT University of Copenhagan under a project in April 2023.
- Dr. Risto Pietari , Post-doc fellow, IT University of Copenhagan under project in April 2023.
- Dr. Adriana Aguilera Gonzalez, Lahonce France, under INSA-JRD TATA Fellowship programme in June 2023.
- Dr. Y J Park, Director Science and Technology, embassy of the Republic of Korea in June 2023.
- Mr. Raj G Asava, Philanthropist from USA in July 2023 to deliver lecture.
- Ms. Aradhana Asava, Philanthropist from USA in July 2023 to deliver lecture.
- Prof. AKM Samsur Rahman, from USA in July 2023 for Research (International Summer Internship).
- Caleb Ian Watson Beckwith, Sahil Krishnani, Roger Enhan li, Shrihit Saxena, Kayalyn Andersen from USA in July 2023 for Research (International Summer Internship).
- Arnaud Charles F Deraemaeker from Belgium in July 2023 as collaborator.
- Nikhil Gupta from USA in July 2023 as collaborator.
- Surbhi Mittal from USA in July 2023 as collaborator.
- Prof. Masamichi Kohno from Japan in September 2023 for meetings with faculty members of the School of Mechanical & Materials Engineering in September 2023.
- Mr. Hidehiko Saegusa from Japan in October 2023 to teach an approved course "Selected topics in Indian Knowledge System and Consciousness Studies IK592_6.
- Akke Schotten from Rwth Aachen, for semester exchange program in August to December 2023.
- Dr. Y J Park, Director Science and Technology, embassy of the Republic of Korea for attending the G20 event in June 2023.
- Ms. Hinaho Kishi, language teacher in School of Humanities from Japan in January to June 2024.
- Dr. Juan Luis Toribio Vazquez, visiting faculty in School of Humanities from Spain in March2024.
- Dr. Jefferson Alex Sphar, from WPI, USA for ISTP project in March 2024.
- Dr. Uma T Kumar , from WPI, USA for ISTP project in March 2024.

4.3 MOUs

- Technical University of Munich in May 2023 (renewed).
- National Yang Ming Chiao Tung University (NYCU), Taiwan in June 2023.
- DAAD and IIT Mandi: Faculty Exchange Programme, Germany in October 2023 .
- Agreement on the International Cooperative Graduate Program with National Institute for Material Science, Japan in February 2024.
- ABO Akademi University, Finland in February 2024.

The School of Mathematical & Statistical Sciences, Indian Institute of Technology Mandi, Himachal Pradesh, India has successfully organized the International Conference on Differential Equations and Control Problems (ICDECP23) during 15th to 17th June, 2023.

In collaboration with the Secretary / Joint Secretary / Alumni, Japan Alumni Chapter, the DORA office IIT Mandi successfully organized the in-person Japan Chapter Alumni Meet on 21.09.2023 at Tokyo, Japan.

IIT Mandi Receives 'Green University' Award at COP28 UAE.

WPI team from Worcester Polytechnic Institute, USA visited IIT Mandi in March to May 2023 under Interactive Socio-Technical Practicum (ISTP) project.

5. Thrust Area Research Centres

5.1 Advanced Materials Research Centre (AMRC)

Dr. Aditi Halder
AMRC Coordinator
Email: chairamrc@iitmandi.ac.in

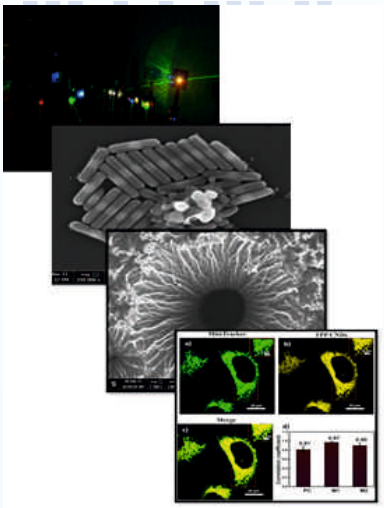
From Coordinator's Desk

The Advanced Material Research Centre's (AMRC) Annual report April 2023 –March 2024 reflects about the centre, its activities and facilities. AMRC is a centralized user facility which is housed with around 65 state of art instruments which can be categorised in spectroscopic instruments, microscopic instruments, surface analysing instruments, physical property measurement instruments, Chromatographic instruments and other characterisation instruments. In the last financial year we have extended our instrumental facility by procuring four new instruments viz. portable Raman Spectrometer, Table top Atomic Force Microscope, Lyophilizer and glove box from HEFA fund. With the expansion of cutting age research facility, AMRC is fostering the research work of internal researchers of IIT Mandi as well as the researchers of academic institutes and industries throughout the country. In the year 2023-24, AMRC organised a few workshops on Transmission Electron Microscopy in collaboration with Thermo Fisher Scientific and on Hyphenated electrochemical Raman Spectrometer in collaboration with Methrohm, where many internal research scholars took part and learn the instrument in detail. AMRC also organised some outreach programme for the students, where students from technical institute of Himachal Pradesh participated and gained knowledge about the instruments, their uses and application.

About AMRC

Vision

- To promote excellence in advanced materials science research and technology.



Mission

- To create a state of art research facility by up kipping and upgrading the facility.
- Facilitating and promoting good research culture in nearby institutions by providing facility.
- To develop expert technician by organizing training and workshops on scientific instrument.
- Support to interdisciplinary research.

Facilities at AMRC

5.1.1 New Facilities (2023-24)

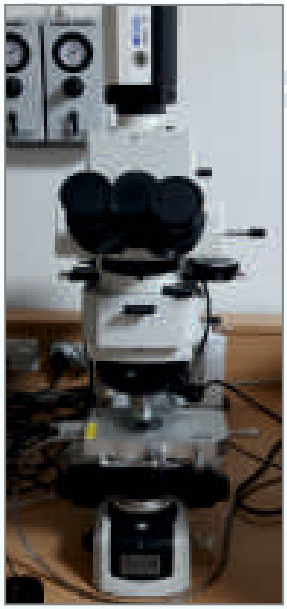
As the mission of the centre is to create state of art research facility by upgrading the current facilities, the centre is focusing on upgrading and expanding the state of art research facility continuously. In the year 2023-24, AMRC has procured 4 new instruments mentioned below from HEFA grant.

Instruments from HEFA grant
In the year 2023-24 four new instruments have been procured from the HEFA grant viz.

1. Portable Atomic Force Microscope
2. Portable Raman Spectrometer
3. Lyophilizer
4. Glove box

Current Facilities (2023-24)

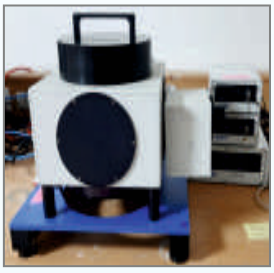
Circular dichroism



Fluorescence Spectrometer

UV-VIS-NIR Spectrometer

Optical Cum Polarizing Microscope



Fluorescence lifetime measurement system

Thermogravimetric Analysis

Atomic Absorption Analysis

Fourier Transformed Infrared Spectroscopy

Fluorescence Spectropohotometer

Rheometer

5.1.2 Research Output

Some Selected Publications in 2023-24

- Site-specific optical encryption via nanoscale integration of carbon on monolayer WS2, D Thakur, P Kumar, A Barwal, D Jariwala, E Stach, V Balakrishnan. Carbon Oct, 2023. https://doi.org/10.1016/j.carbon.2023.118339. (Impact Factor: 10.9)
- Substrate Versatile Roller Ball Pen Writing of Nanoporous MoS2 for Energy Storage Devices N Arya, Y Chandran, A Singh, R Sharma, A Halder, V Balakrishnan. ACS Applied Materials & Interfaces Aug, 2023. https://doi.org/10.1021/acsami.3c05536. (Impact Factor: 9.6)
- Ultrafast carrier dynamics in vanadium-doped MoS2 alloys. Bhuvan Upadhyay, Rahul Sharma, Dipak Maity, Tharangattu N. Narayan and Suman Kalyan Pal. Nanoscale.(Sep 2023) https://doi.org/10.1039/D3NR03337F Impact factor: 6.7
- Stable Perovskite Solar Cells Based on Direct Surface Passivation Employing 2D Perovskites Milon Kundar, Prasun Kumar, Satinder Kumar Sharma, Ranbir Singh, Suman Kalyan Pal, Solar RRL(Sep2023), https://doi.org/10.1002/solr.202300572. Impact factor: 9.173
- Chiral anomaly and positive longitudinal magnetoresistance in the type-II Dirac semimetals AxPdTe2 (A=Cu, Ag), Sonika, Sunil Gangwar, Nikhlesh Singh Mehta, G. Sharma and C. S. Yadav. Physical Review B (2023). https://doi.org/10.1103/PhysRevB.108.245141

- Chemically Transformed Ag_2Te Nanowires on Polyvinylidene Fluoride Membrane For Flexible Thermoelectric Application. Ankit Kashyap, Divya Rawat, Debattam Sarkar, Niraj Kumar Singh, Kanishka Biswas, and Ajay Soni. Angewandte Chemie (Jan 2024) https://doi.org/10.1002/anie.202401234.

- Extended Antibonding States and Phonon Localization Induce Ultralow Thermal Conductivity in Low Dimensional Metal Halide. Paribesh Acharyya, Koushik Pal, Abdul Ahad, Debattam Sarkar, Kewal Singh Rana, Moinak Dutta, Ajay Soni, Umesh V. Waghmare, and Kanishka Biswas. Advanced Functional Materials. (June 2023) https://doi.org/10.1002/adfm.202304607

- Design and investigation of photoelectrochemical water treatment using self-standing $Fe_3O_4/NiCo_2O_4$ photoanode: In-situ H_2O_2 generation and fenton-like activation. Ravinder Kaushik, Kajal Sharma, Prem Felix Siril, Aditi Halder. Chemical Engineering Journal, Elsevier. (Jan 2024) https://doi.org/10.1016/j.cej.2023.147575. Impact factor- 15.1

- Surface engineering of 2D layered MnO_2 with co-doping of Ni and Fe for rechargeable zinc-air battery. Ankita Mathur, Sonu Kumari, Arkaj Singh, Rahul Mitra, Ravinder Sharma, Krishanu Biswas, Aditi Halder. Journal of Energy Storage, Elsevier. (Dec 2023) https://doi.org/10.1016/j.est.2023.109350. Impact Factor- 9.4

- Unveiling the Long-Lived Emission of Copper Nanoclusters Embedded in Protein Scaffold. Sharma, S.; Das, S..; Kaushik K.; Yadav, A.; Patra A.; Nandi, C. J. Phys. Chem. Lett. 2023, 14 (40), 8979-8987. https://doi.org/10.1021/acs.jpclett.3c01877 Impact factor: 5.7

- Tracking Super Resolved Structure of Mitochondria using Red emissive Carbon Nanodots as Fluorescent Biomarker. Garg, R.; Anjum, F.; Salam, A.; Kaushik, K.; Sharma, S.; Sahrawat, U.; Yadav, A.; Nandi, C. K. Chem. Commun.(2023), 59 (90), 13454-13457. https://doi.org/10.1002/adbi.202300399 Impact factor: 6.2

- Boosting photocatalytic nitrogen fixation via nanoarchitectonics using oxygen vacancy regulation in W-doped Bi_2MoO_6 nanosheets. M. Sharma, A. Kumar, D. Gill, S. Jaiswal, A. Patra, S. Bhattacharya and **V. Krishnan**. *ACS Appl. Mater. Interfaces* **2023**, 15, 55765–55778 (DOI: 10.1021/acsami.3c12563). (https://doi.org/10.1021/acsami.3c12563)

- Nanoarchitectonics of sulfonated boron nitride for catalytic synthesis of aromatic nitriles under mild conditions. P. Choudhary, S. S. Chauhan, D. Sharma, S. Kumar and **V. Krishnan** *Chem. Eng. J.* **2023**, 475, 146055 (13 pages) (DOI: 10.1016/j.cej.2023.146055). https://doi.org/10.1016/j.cej.2023.146055

- Self-Sulfuration and Carbonization of a Mixed-Metal Aryl Sulfonium Polyoxometalate Hybrid: A Path to Electrocatalytically Active Ternary Composit. Aranya Kar, Rajesha Kumar Swain, Aditi Halder, Chullikkattil P. Pradeep. ACS Applied Energy Materials. DOI no. - doi.org/10.1021/acsaem.3c02849. Published Impact Factor- 6.4.

- Multifunctional Aryl Sulfonium Decavanadates: Tuning the Photochromic and Heterogeneous Oxidative Desulfurization Catalytic Properties Using Salicylaldehyde-type Functional Moieties on Counterions Kousik Routh, Chullikkattil P. Pradeep. ACS, Inorganic Chemistry.(2023) doi.org/10.1021/acs.inorgchem.3c01470. Impact Factor- 4.6.

- NIR-I Emissive Cyanine Derived Molecular Probe for Selective Monitoring of Hepatic Albumin Levels During Hyperglycemia. Bidisha Biswas, Surbhi Dogra, Aniket Sen, Arul N. Murugan, Pooja Dhingra, Kajal Jaswal, Prosenjit Mondal, Subrata Ghosh. J. Mater. Chem. B (2024) IF: 7.571

- Computational Evaluation with Experimental Validation: Arylamine-Based Functional Hole-Transport Materials for Energy-Efficient Solution-Processed OLEDs. Krishan Kumar, Kiran Kishore Kesavan, Sunil Kumar, Feng-Rong Chen, Anirban Karmakar, Jayachandran Jayakumar, Rishabh Goswami, Subrata Banik, Jwo-Huei Jou Subrata Ghosh. J. Phys. Chem. C.(2023)

- Ankita Dhiman, Piyush Thaper, Dimpy Bhardwaj, and Garima Agrawal. Biodegradable Dextrin-based Microgels for Slow Release of Dual Fertilizers for Sustainable Agriculture. *ACS Applied Materials & Interfaces,* 2024,16, 11860–11871. (https://doi.org/10.1021/acsami.3c16670) Impact factor: 9.5

- Aastha Gupta, Ritu Singhmar, Ankur Sood, Dimpy Bhardwaj, S. Senthil Kumaran, Shubhra Chaturvedi, and Garima Agrawal. Gd/Hafnium Oxide@ Gold@ Chitosan Core-Shell Nanoparticles as a Platform for Multimodal Theranostics in Oncology Research. *Chemical Communications,* 2023, 59, 11819-11822. (https://doi.org/10.1039/D3CC02971A) Impact factor: 4.9
- Continuous flow synthesis of visible light-active conjugated porous polymer for pollutant degradation and plastic waste photo-reforming. Astha Singh, Rituporn Gogoi, Kajal Sharma, Swadhin Kumar Jena, Najla Fourati, Chouki Zerrouki, Samy Remita, and Prem Felix Siril. Journal of Cleaner Production. (2023) https://doi.org/10.1016/j.jclepro.2023.139476. Impact factor: 11.1
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- Reverse Regioselective Cp*Co (III)-Catalyzed [4+2] C−H Annulation of *N*-Chloroamides with Vinylsilanes: Synthesis of 4-Silylated Isoquinolones and Their Synthetic Utilities. Arijit Ghosh^, Tamanna Rana^, Nilanjan Bhaduri, and Amit B. Pawar* (^Contributed equally) *Org. Lett.* 2023. https://doi.org/10.1021/acs.orglett.3c03115 (Impact Factor = 5.2
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- Mass spectrometry and Nuclear magnetic resonance spectroscopy profiles of red and pink Rhododendron flower petals establish them as rich sources of bioactive secondary metabolites. Shagun Shagun, Maneesh Lingwan, Shyam Kumar Masakapalli. Separation Science Plus. (2024). http://dx.doi.org/10.1002/sscp.202400007

- Zn –MOF as a single catalyst with Dual Lewis acidic and basic reaction sites for CO2 fixation. A Eskemech, H Chand, A Karmakar, V Krishnan, RR Koner. Inorganic Chemistry(Feb 2024) https://doi.org/10.1021/acs.inorgchem.3c03901 IF:5.4

- Amino Acid Based Molecular Molecular and Membrenous chiral tool for enantiomeric recognition. D Gambhir, K Kumar, P Murugesan, A Yadav, S Sinha Ray, RR Koner. Langmuir. (Jan 2024) https://doi.org/10.1021/acs.langmuir.3c03396 IF:4.3

- Electrochemical evaluation of hybrid La_2CoCrO_6/Co_3O_4/rGO composite for enhanced supercapacitor performance. D Nagpal, A Singh, A Vasishth, R Singh, A Kumar. Carbon Trends https://doi.org/10.1016/j.cartre.2024.100358

- Electro-Optically Tunable Passivated Double-Cation Perovskite-Based ReRAM for Low-Power Memory Applications. Manvendra Chauhan, Ranbir Singh, Satinder K Sharma ACS Applied Electronic Materials (March 2024) https://doi.org/10.1021/acsaelm.4c00257

5.1.3 Patent

- Patent granted on: Carbogenic Fluorescent Nanodot As New Probe For Super Resolution Microscopy And Method Of Application Thereof. Patent Grant No. is: 507194. Granted on 5th February 2024
- Nanoarchitectonics of sulfonated boron nitride for catalytic synthesis of aromatic nitriles under mild conditions, P. Choudhary, S. S. Chauhan, D. Sharma, S. Kumar and V. Krishnan. **Patent No. 529546**
- Surface nanoarchitectonics of boron nitride nanosheets for highly efficient and sustainable ipso-hydroxylation of arylboronic acids, P. Choudhary, K. Kumari, D. Sharma, S. Kumar and **V. Krishnan Patent no. 535848**
- A NEW CLASS OF NON-CHEMICALLY AMPLIFIED MOLECULAR PHOTORESISTS FOR NEXT GENERATION INTEGRATED CIRCUITS (ICS) TECHNOLOGY. Chullikkattil P. Pradeep, Kenneth E. Gonsalves, Midathala,Yogesh, Neha Thakur, Pulikanti Guruprasad Reddy, Santu Nandi, Satinder K. Sharma, Subrata Ghosh. Filed on 24/12/2016 (Application No. 201611044190). Grant No. 452719. Date of Grant: 19.09.2023
- NEGATIVE TONE RESIST COMPOSITIONS FOR LITHOGRAPHY. Santu Nandi, Lalit Khillare, Mohamad G. Moinuddin, Sunil Kumar, Manvendra Chauhan, Satinder K. Sharma, Kenneth E. Gonsalves, Subrata Ghosh. Filed on 08/11/2021 (Application No. 202111050981). Grant No. 460129. Date of Grant: 18.10.2023
  AMRC Faculty
- Patent granted on: Carbogenic Fluorescent Nanodot As New Probe For Super Resolution Microscopy And Method Of Application Thereof. Patent Grant No. is: 507194. Granted on 5th February 2024. Navneet C Verma, Aditya Yadav, Chethana Rao

5.1.4 AMRC Faculty

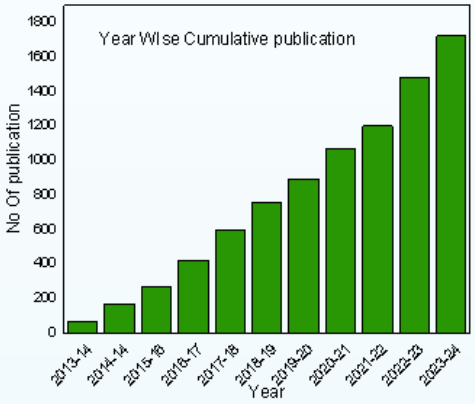
1. Dr. Garima Agrawal featured as Chem Comm 2023 Emerging Investigator
2. Dr. Garima Agrawal selected as an Editorial Board Member of Carbohydrate Polymers Technologies and Applications (Elsevier).

5.1.5 AMRC Students

- Richa got the prestigious Prime M **Internal Users of the facility** on 26th October 2023

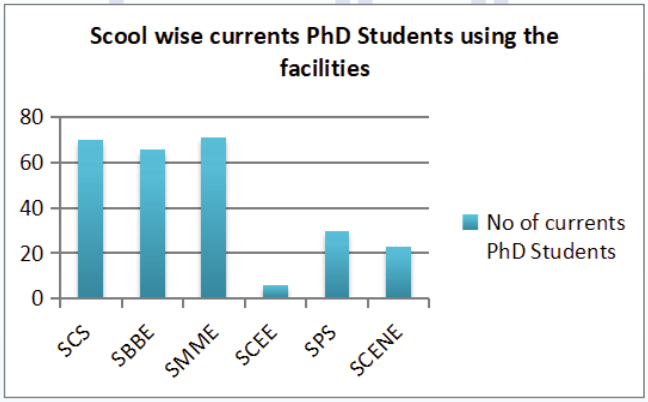
5.1.6 Research Quality output

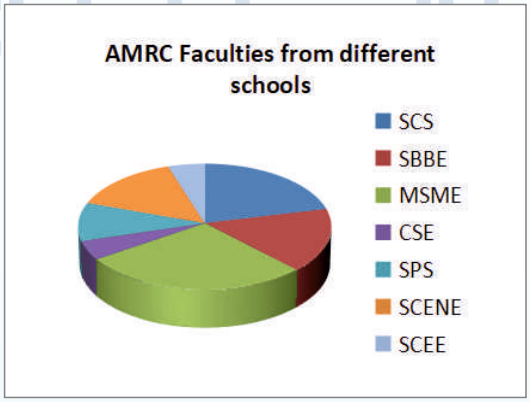
The internal students, who are the key users of the AMRC facility, have published more than 237 research articles in the high-quality international journals this year. The number of research publications from the users has shown the consistent growth, with the cumulative number reaching to more than 1650 in the short span of 10 years



Some reputed Journals where AMRC internal scholars' data published in 2023-24

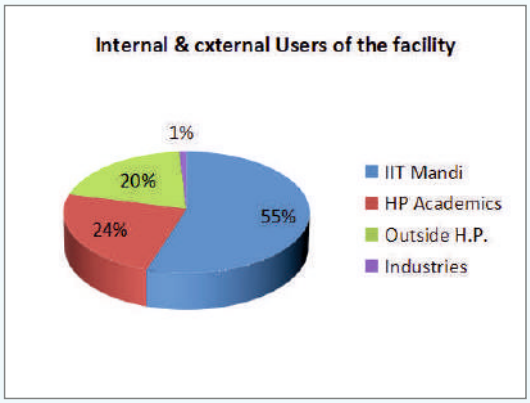
5.1.6.1 Internal Users of the facility





5.1.6.2 Users statistics (internal and external)

A otal No. of 300 students of IIT Mandi from 5 different schools SCS, SPS,SBBE, SMME,SCENE and SCEE are using this facilities, total 800 students of 22 academic institutes of Himachal Pradesh and students of 50 external academic institute (other than Himachal Pradesh) also using the AMRC facilities on regular basis. Beside these few industries are using the AMRC facilities. In this way AMRC is supporting large groups of vibrant research communities of the country.



5.1.6.3 List of External Users

Name of the Institutes in Himachal Pradesh

1. NIT Hamirpur.
2. CSIR-IHBT Palampur.
3. HPU Shimla, HP.
4. Shoolini University.
5. Sri Sai University, Palampur.
6. Jaypee University.
7. Carrier Point University.
8. Arni University, Kangra.
9. Maharaja Agrasen University.
10. Laureate Institute of Pharmacy.
11. M Pharmacy Institute.
12. Indus International University.
13. A.P. Goyal Shimla University.
14. Baddi University, Baddi.
15. Eternal University, Baru Sahi.
16. School of Pharmacy & Immerging Science.
17. YS Parmar University, Solan.
18. Central University of Himachal.
19. JNG Engineering College, Sundar Nagar.
20. Govt. College Bilaspur.
21. Sardar Patel University, Mandi.
22. IEC Baddi.

5.1.6.4 Name of the Institutes in Himachal Pradesh

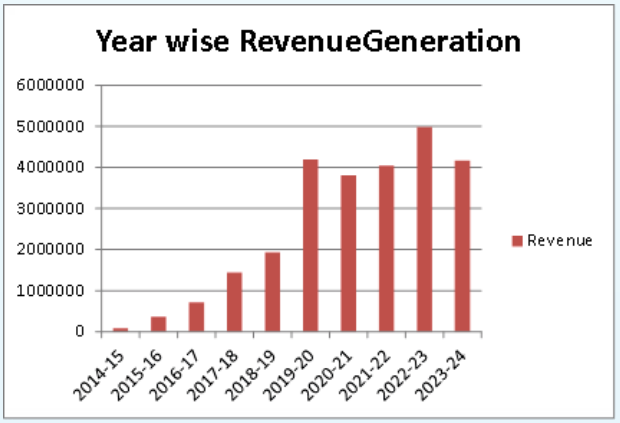
1. NIT Manipur.
2. NIT Delhi, New Delhi.
3. NIT Durgapur, W. B.
4. NIT Karnataka.
5. NIT Trichy, Tamil Nadu.
6. IIT Gandhinagar.
7. IIT Guwahati, Assam.
8. IIT Patna, Bihar.
9. IIT Ropar, Punjab.
10. IIT Madras, Tamil Nadu.
11. Punjab University, Patiala.
12. Manipur University.
13. Shiv Nadar University, New Delhi.
14. HNBG University, Uttarakhand.
15. CSIR-IMMT, Bhubaneswar.
16. IIT Kharagpur.
17. IIT Delhi.
18. JNU New Delhi.
19. CSIR NPL New Delhi.
20. IISC Bangalore, Karnataka.
21. INST Mohali, Chandigarh.
22. Jamia Millia Islamia University, New Delhi.
23. Doon University, Uttarakhand.
24. Kurukshetra University.
25. Agra University, Agra.
26. Indian Institute of Petroleum, Dehradun.
27. Jamia Millia Islamia University, New Delhi.
28. Central Univerity, Bhatinda.
29. Punjab University.
30. Mata Vaishno Devi University, Jammu.
31. NIT Srinagar.
32. Jammu University
33. Kashmir University.
34. BSBA University, Lukhnow.
35. IIT ISM Dhanbad.
36. Amity University.
37. IISER Berhampur, Odisha.
38. NIT Rourkella.
39. SOA University, Bhubaneswar.
40. University BBSR Odisha.
41. IISER Mohali, Chandigarh.
42. Gurucharan College Silchar, Assam.
43. Visva Bharati University, W.B.
44. UPUS dehradoon University, U.K.
45. IIT Indore.
46. ISR Pune.
47. VIT Vellor, Tamil Nadu.
48. SRM institute, Tamil Nadu.
49. Pondicherry University.
50. Guru Jamdeswar University of Science & Technology.

5.1.6.5 Name of the Industries

1.Crystal Morfix Technology
2.Chemtel Co. New Delhi
3.Hindustan Organic Chemical Ltd. Kerala

5.1.7 Revenue Generation of the Centre

AMRC is catering the instrumental facilities to around 1100 internal and external users. We are providing the service to industries as well. It is worth mentioning that AMRC has generated a revenue of Rs.41,64,584/- in the financial year 2023-24 from the instrumental facilities. The objective of opening the facilities to the external is to promote the research activities of the state of Himachal Pradesh and other institute who has lack of the research facility. The facility needs to be functional maximum time to cater to a large group. Therefore a continuous maintenance of the instruments is required. The total expenditure for the financial year 2023-24 for repairing and upgrading of the instruments was Rs.55,39,606/- . Four new instruments were procured this financial year. Viz. Portable Atomic Force Microscope, Portable Raman Spectrometer, Lyophilizer and Glove Box to upgrade the current facility. The total cost of these instruments is Rs. 2,43,48,441/-.



5.1.8 Outreach Activity & Training Programme

AMRC encourage students for technical and research oriented studies for the development of the country. Therefore we arrange workshop, instrumental facility tour and internship on the several instruments to the school students, graduate students and post graduate students of Himachal Pradesh and nearby states. This year we have arranged workshop on instruments, training programme, & tour for the various school students.

Educational Visit by MLMS College Sundar Nagar

Workshop on TEM, SCXRD & XPS for HPTU students

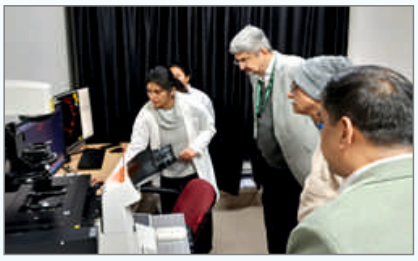
ITI Padhar Students visit

5.1.9 Centre Visit by Eminent personalities and Scientists

Governor of Himachal Pradesh with Director IIT Mandi

Chairman DRDO Prof. Samir V. Kamat & Director DRDL Heyderabad Dr. GA Srinivasa Murthy

Prof. Anil Sahashra Budhe Chairman AICTE



Prof. Samir V. Kamat Chairman DRDO

Governor of Himachal Pradesh

Dr. Piyush Goyel with Director IIT Mandi

Dr. Hemant From Aditya Birla

Dr. Arun Saint Gobin

Dr. Kaushik Ghosh INST Mohali

5.1.10 Visit Details

1. Rajesh Andania Journalist DST Science monitor Gyan Vigyan (15.5.2023)
2. Mr. Hemant Aditya Birla Mumbai (20.6.2023)
3. Dr. Ajay Sankha, Director Bhaktivedanta Hospital (23.6.2023)
4. Dr. Rama Jaya Sundar, Prof. AIMS Delhi (23.6.2023)
5. Dr. Pramod K Satyawali Director DGRE (27.6.2023)
6. Sri Siv Pratap Sukla, Governor of Himachal Pradesh (30.6.2023)
7. Prof. G Rangarao, IIT Madras (25.9.2023)
8. Prof. Phillip Tinefeld Dean Faculty of LUM Germany
9. Prof. GA Srinivasamurthy, Director DRDL, Heyderabad (8.11.2023)
10. Dr. Arun Saintgobin (8.11.2023)
11. Dr. Kaushik Ghosh Head of Quantum Materials & Device Unit (INST Mohali)
12. Bharat Electronics Limited team
13. Prof. Samir V Kamat, Chairman DRDO (27.2.2024)
14. Prof. Bharad Amrutar, Chairman Robert Bosch Centre for Cybre Physical System IISC Bangalore (29.2.2024)
15. Prof. B Ravi, Director NIT Suratkal (26.3.2024)
16. Prof. Lalit Kumar Awasthi, Director Sardar Ballav Bhai Patel University (26.3.2024)

Farewell of Dr. C.S. Yadav (previous Coordinator)

Welcome of Dr. Aditi Halder (Current Coordinator)

In this financial year four staff joined viz. one Technical Officer, two junior technical Superintendents and one Junior Laboratory attendant.

5.1.11 AMRC Team

AMRC Coordinator: Dr. Aditi Halder
Technical Officer: Ms. Ishita Mahanty Nandi
Junior Technical Superintendent: Mr. Puneet Sood
Junior Lab Assistant: Mr. Navin Kumar
Junior Technical Superintendent: Arjun Barwal
Project Engineer: Mr. Sunil Kumar
Lab Attendant: Mr. Karm Singh

5.1.12 Contact us

Email: amrcoffice@iitmandi.ac.in
Web page: www.iitmandi.ac.in/research/amrc/index.php
Phone: 01905-267027

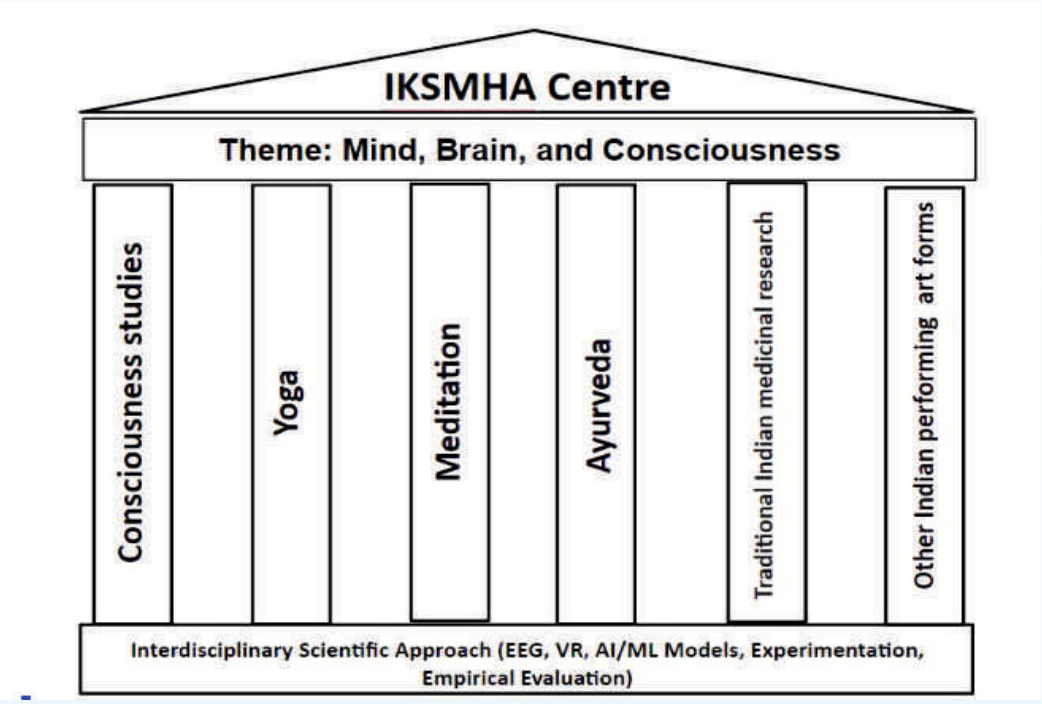
5.1.13 Future Plan

1. Certification of the training
2. Workshop on different instrument
3. Collaboration with different academic institutes
4. Establishment of new HEFA facility

5.2 Indian Knowledge System And Mental Health Applications (IKSMHA) Centre

According to a study by Charlson et al. (2016), it is estimated in 2025, 38.1 million years of healthy life will be lost to mental illness in India. This statistic is a 23% increase. Also, the same study estimated that the mental ill-health burden would become even heavier in India, projected to increase by 25% by 2025. To address the sharp increase in mental health problems, the Indian Institute of Technology Mandi (IIT Mandi) conducted a Workshop on the Indian Knowledge System and Mental Health (IKSMH) between 25th and 27th March 2022. The workshop was widely attended by renowned researchers in the Indian Knowledge System (IKS) and Mental Health (MH) from India and abroad. Also, 20+ faculty and staff from IIT Mandi participated in this Workshop. As a part of the deliberations that took place in the Workshop, the following IKS topics emerged: Mind, brain, and consciousness with applications from consciousness studies, yoga, meditation, Ayurveda, traditional Indian medicine research, and other Indian performing arts (like dance, music, and Indian languages, etc.).

Consequently, as per the deliberations of the workshop, the Indian Knowledge System and Mental Health Applications (IKSMHA) Centre was set up on 6th July, 2022 at IIT Mandi after approval from the Board of Governors of IIT Mandi. The IKSMHA Centre focuses on research concerning IKS, which has several benefits for the human body, mental health, and well-being. In fact, IKS has deep roots grounded in Indian history, philosophy, society, arts, languages, science and technology, and life sciences. Thus, the IKSMHA Centre is incorporating the study of mind, brain, and consciousness and includes applications from several areas like consciousness studies, yoga, meditation, Ayurveda, traditional Indian medicine research, and other Indian performing arts.



Vision and Uniqueness

The conceptualization of the IKSMHA Centre is grounded in mind, brain, and consciousness via applications from consciousness studies, yoga, meditation, Ayurveda, traditional Indian medicinal research, and Indian performing arts (music, dance, traditional Indian languages, etc.).

5.2.1 The Vision Behind IKSMHA Centre

To be a world leader and serve India via research, skill development, translation, and collaborative activities in areas concerning the Indian knowledge system and mental health.

Uniqueness

- First of its kind in India to integrate IKS and mental health
- A socio-technical wellness facility for outreach
- Truly interdisciplinary research and collaboration

Program	Year	Total No. of students
Post Doctoral Fellow	2023-24	2
M. Tech. by Research	2023-24	5
Ph.D.	2023-24	33
M.Tech_R+Ph.D (Dual Degree)	2023-24	3
Staff	2023-24	2

There were 19 Journal Papers, and 33 Conference Papers, 2/11 book/book chapters and 1 patents filed in 2022-24

For more information Website: https://iksmha.iitmandi.ac.in/fstaff.php

Faculty Members			
1.	**Prof. Laxmidhar Behera** Mentor, IKSMHA https://faculty.iitmandi.ac.in/director/	Robotics and Artificial Intelligence Intelligent Systems and Control, Cognitive Robotics, Nano-robotics, Vision based Control, Soft Computing, and Information Retrieval in music and language, Semantic Information Processing, Physics of Complex Systems, Cyber Physical Systems. Formation Control of UAVs, Brain-Computer Interface (BCI), Sanskrit Computational Linguistics.	
2.	**Dr. Arnav Bhavsar Vinayak** Chairperson, IKSMHA http://faculty.iitmandi.ac.in/~arnav/	Computer Vision, Medical Image Analysis, Machine Learning, Deep Learning.	
3.	**Dr. Varun Dutt** http://faculty.iitmandi.ac.in/~varun/	Artificial Intelligence, Human-Computer Interaction, Cognitive Science, Judgment and Decision Making.	
4.	**Dr. Ramajayam Govindaraji**	Skills and Expertise Yoga/Meditation Neuroscience and Mental Health Consciousness Indian Knowledge System Positive psychology and psychiatry.	
5.	**Prof. Aniruddha Chakraborty** https://www.achakraborty.org/	Theoretical Chemistry	

6.	**Dr. Shubhajit Roy Chowdhury** http://faculty.iitmandi.ac.in/~src/	Biomedical Embedded Systems, Non-invasive diagnostic systems, Near Infrared Spectroscopy, VLSI Architectures.	
7.	**Prof. Chayan K. Nandi** http://faculty.iitmandi.ac.in/~chayan/	Physical Chemistry	
8.	**Dr. Amit Prasad** http://faculty.iitmandi.ac.in/~amitprasad/	Immunology, Neuro inflammation, Neuro infection, Parasitology, Microbiology, Yogic-immunology.	
9.	**Dr. Nitu Kumari** http://faculty.iitmandi.ac.in/~nitu/	Specialisation: Mathematical Modelling, Nonlinear Dynamics, Differential Equations.	
10.	**Dr. Amit Shukla** https://www.amitshuklaiitk.com/	Control Systems, Robotics, Mechatronics, Machine Vision and Artificial Intelligence PhD from Imperial College, London in 2012.	
11.	**Dr. Rohit Saluja** https://rohitsaluja22.github.io/	Optical Character Recognition, Road Safety, Computer Vision Applications related to Environment and Agriculture.	
12.	**Dr. Pratim Kundu** http://faculty.iitmandi.ac.in/~pratim/	Development of techniques for enhancing the reliability of power system operations using wide area measurements to avoid cascading failures. The research focuses on developing computational algorithms to improve smart grid operations.	
13.	**Dr. K.V. Uday** https://scene.iitmandi.ac.in/pages/faculty_details/MTM=	Specialization: Geotechnical Engineering Landslide Monitoring, Landslide mitigation, Innovations in Disaster management, Environmental Geotech	
14.	**Dr. Ashish Bollimbala** https://som.iitmandi.ac.in/people/faculty/ashish-bollimbala	Specialization: Marketing Management Research Interests: Consumer Behavior; Creativity Management; Advertising; Neural-marketing.	
15.	**Dr. Sumit Murab**	Specialization: Tissue Engineering, Biomaterials, 3D printing/ bio-printing, Disease models, Intellectual property rights.	
16.	**Dr. Milan Behl**	Ayurveda	

17.	**Dr. Akhaya Kumar Nayak** https://som.iitmandi.ac.in/people/faculty/akhaya-kumar-nayak	Business Ethics (Organizational Ethics), Corporate Social Responsibility, Sustainability, Social Movements.	
18.	**Dr. Ekta Makhija**	Mechanobiology of cells and tissues	
19.	**Prof. Venkata Krishnan** https://scs.iitmandi.ac.in/venkata-krishnan	Materials Chemistry, X-ray Science	
20.	**Dr. Garima Agrawal** https://scs.iitmandi.ac.in/garima-agrawal	Specialization: Polymer Science and Technology, Materials Chemistry, Nanomaterials, Smart Materials, Biodegradable Polymers, Biomaterials.	
21.	**Dr. Abhimanew Dhir** https://scs.iitmandi.ac.in/abhimanew	Specialization: Supramolecular Chemistry, Fluorescent Materials and Crystal Engineering.	
22.	**Prof. Arti Kashyap** http://www.faculty.iitmandi.ac.in/~arti/	Specialization: Magnetism and magnetic materials.	
23.	**Dr. Bindu Radhamany** https://iitmandi.ac.in/CMP/files/ bindu.pdf	Specialization: X-ray spectroscopy	
24.	**Dr. Shyam Kumar Masakapalli** https://faculty.iitmandi.ac.in/~ shyam/	Specialization: Metabolic Systems Biology, Fluxomics, Metabolomics, Biochemistry, Cellular Bioprocessing Technology, Smart Agriculture.	

25.	**Prof. Tulika P. Srivastava** https://faculty.iitmandi.ac.in/~tulika/	Specialization: Systems Biology and Multi-OMICS Applications for Health and Environment, Next Generation Sequencing Applications, Computational Biology, Microbiology.	
26.	**Dr. Rajanish Giri** https://faculty.iitmandi.ac.in/~rajanishgiri/	Specialization: Biophysics and protein folding, Intrinsically Disordered Proteins, T Cell Engineering, Protein Engineering Molecular Virology, Intrinsically Disordered Proteins, Drug Discovery.	
27.	**Dr. Atul Dhar** https://faculty.iitmandi.ac.in/~add/	Specialization: IC Engines, Alternative Fuels, Emission Control.	
28.	**Dr. Thirthankar Chakraborty** https://faculty.iitmandi.ac.in/~thirthankar/	Comparative and World Literature, Modernism, Samuel Beckett, & Indian Literature.	

List of Other Faculty Members			
1.	**Prof. Stuart R. Hameroff**, Distinguished Professor	Intelligent behaviour of microtubules, protein lattices which organize activities within living cells.	
2.	**Dr. Vadim Tuneev**, Adjunct Professor	Molecular biology	
3.	**Mr. Hidehiko Saegusa**, Professor of Practice	Indian Knowledge System	

5.2.2 Innovative Research at IKSMHA

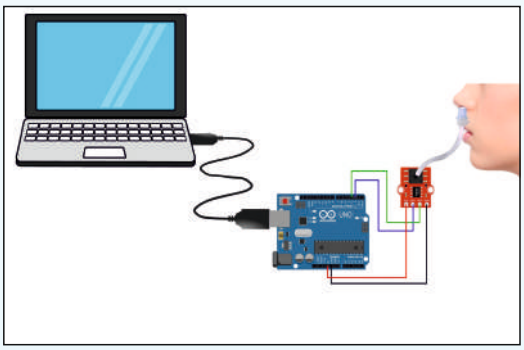
Some of the existing research themes at the IKSMHA Centre include:

- Impact of Indian classical raga on human cognitive function: A neuropsychological study using EEG.
- Biomarkers of Prana and its application for Overall Wellbeing.
- Studying efficacy of longitudinal Maha-mantra chanting-based intervention on brain networks.
- Nadi Pariksha based on heart rate variability from ECG.
- Prakriti assessment via machine learning.
- Semantic Space and Samkhya-inspired Mind-Body Simulation.
- Development of a multisensor low-cost digital nose to detect abnormally high BGLs and heart disease.
- Understanding the different levels of consciousness in plants.

VR Raga intervention (ACM PETRA 2023)

Odissi Dance intervention (ACM PETRA 2023)

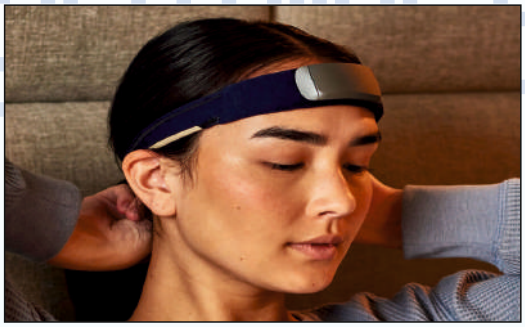
Maha-mantra chanting-based intervention on brain networks (ACM PETRA 2023)



Biomarkers of Uninostril Breathings in the context of Svara Yoga

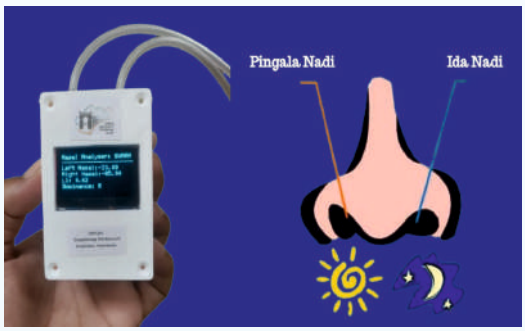
Non-invasive Glucometer for Diabetes Prediction (Journal of Clinical Medicine)

Experienced vs novice meditators (AICTE sponsored)

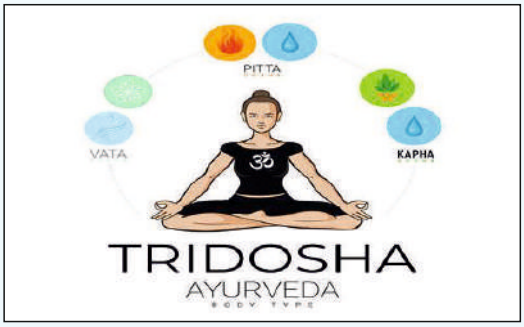


Infertility project with RARI Mandi

Mathematical modelling of mind wandering during meditation

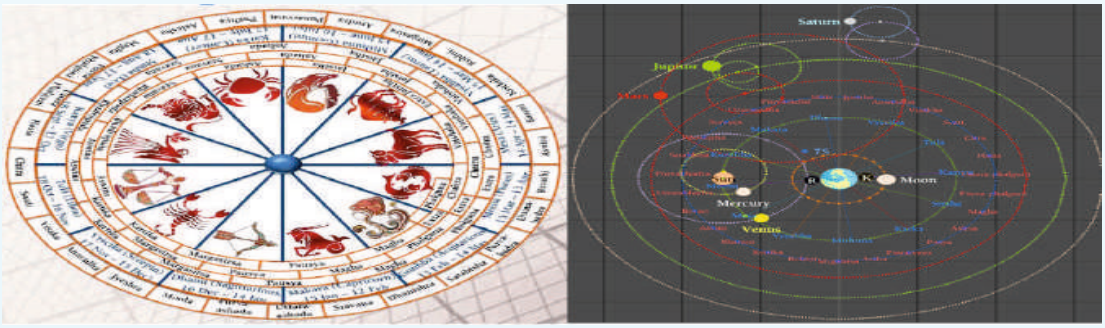


Nasal Dominance and Breath patterns analysis in the context of Svara Yoga

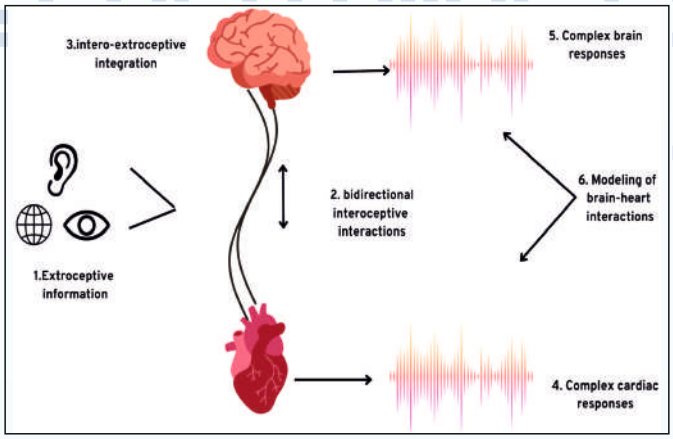


Prakriti assessment via machine learning

Studying the different levels of conciousness in plants

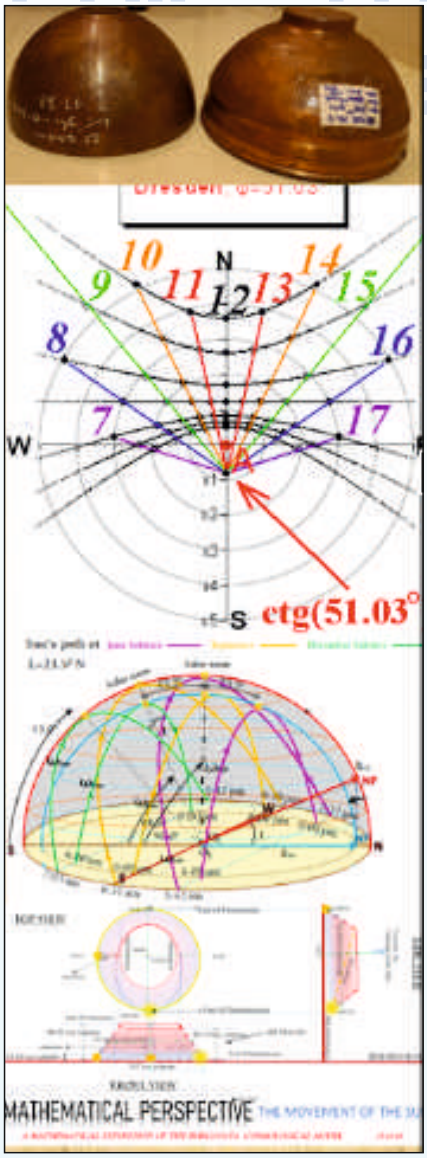


Application: Traditionally the Time and Planetary Motion calculations based on Sūrya-Siddhānta are used in making the Traditional Indian Calendar – Pañcāṅga, which accurately predicts the seasons, eclipses and is the very basis of Astrology.



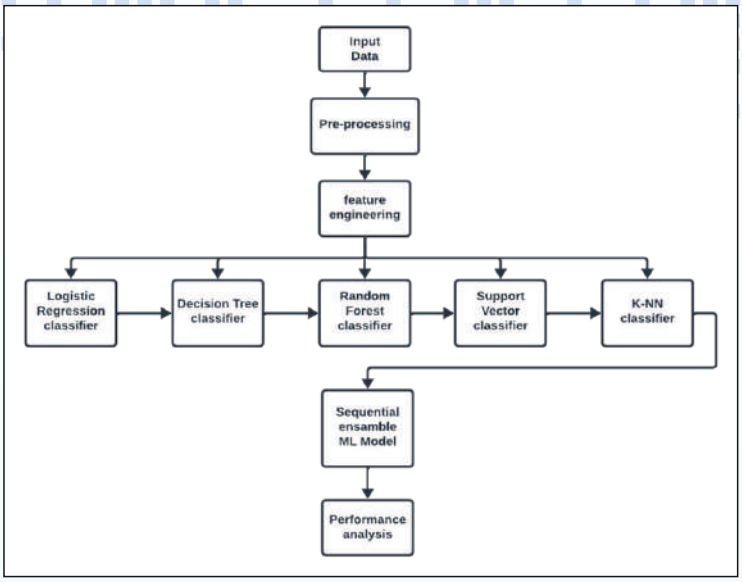
Studying the biomarkers of cognition with IKS Interventions

Yogic Mudras on cortical excitability, cerebral hemodynamics and heart rate variability

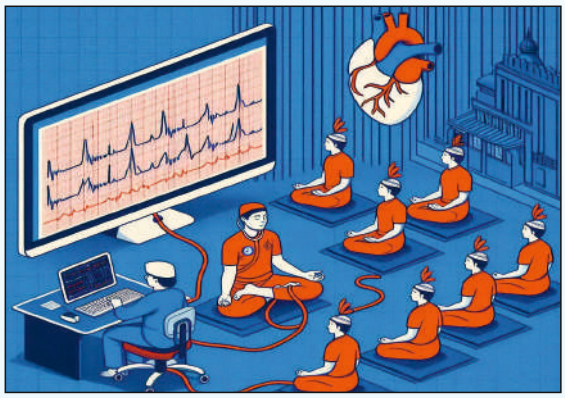


A MATHEMATICAL EXPOSITION OF THE *BHĀGAVATA* COSMOLOGICAL MODEL

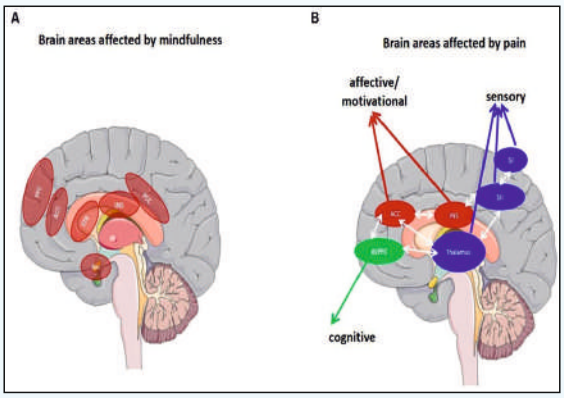
Comparing the moral retention and physiological responses across different storytelling mediums



Proposed Sequential Ensemble (SE) personality prediction model



Effect of yoga based breathing and rhythmic Skeletal muscle tension & relaxation on brain oscillations and HRV



Investigating the Impact of Meditation Timing on Brain Oscillations : A Chronobiological Approach

Facilities and New Initiatives at IKSMHA Centre

Plant Consciousness Lab

Yoga Classroom

Sleep Research Lab

IKSMHA Centre

Human Data Collection Lab (Main equipments: Quest 3, EEG - 16 channels, HRV, PPG, Driving Sim Flying Sim, Nadi Tarangini, 4-channel Muse device)

5.2.3 Courses offered at IKSMHA Centre

The course teaching at IKSMHA Centre includes courses at undergraduate and graduate levels. The following courses are offered at the IKSMHA Centre for students:

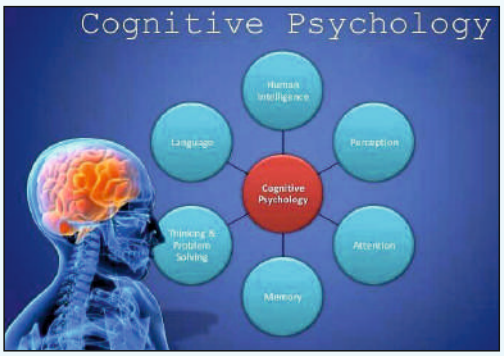
S.No.	Course Code: Course Title	Credits
1.	IK 593_1: Selected topics in Indian Astronomy and Mathematics	3-0-0-3
2.	IK 593_2: Selected topics in Odissi dance	3-0-0-3
3.	IK 591_3: Selected topics in Odissi dance	1-0-0-1
4.	IK 591_4: Selected topics on Vedic Thoughts and Cultural Behaviour	1-0-0-1
5.	IK 592_5: Selected topics in Music and Musopathy	2-0-0-2
6.	IK 592_6: Selected topics in Indian Knowledge System and Consciousness Studies	2-0-0-2
7.	IK 593_7: Contemplative Psychology/Contemplative Studies	2-0-0-2
8.	IK 501: Yogasutra	2-0-2-3
9.	IK 502: Introduction to Biosignals	3-0-0-3
10.	IK 503: Cognitine psychology and the Indian thought system	3-0-0-3

11.	IK 504: Bhagavad Gita Comprehensive	3-0-0-3
12.	IC 181: Introduction to Consciousness and Holistic Wellbeing	2-0-2-3
13.	IK 505: Bhagavat Samkhya	3-0-0-3
14.	IK 506 Research methods and statistics for contemplative science	2-1-0-3
15.	IK 507 Neuroscience and mental health	3-0-0-3
16.	IK 593_5 Selected topics on Paninian Grammar	2-1-0-3
17.	IK-592_1 Selected topics in the scientific basis of Mantra Chikitsa	1-0-2-2
18.	IK 593_6 Selected Topics in Ayurvedic Biology	3-0-0-3
19.	IK 592_3 Selected topics in Ayurveda and cognitive sciences	2-0-0-2

Introduction to Consciousness and Holistic Wellbeing (42 hours)

Introduction to Yogasutra (42 hours)

Introduction to Bio-signals (42 hours)



Cognitive Psychology and the Indian Thought System (42 hours)

Bhagavad Gita - Comprehensive (42 hours)

Neuroscience and mental health (42 hours)

Total Expenditure and Revenue Generation from User Charges

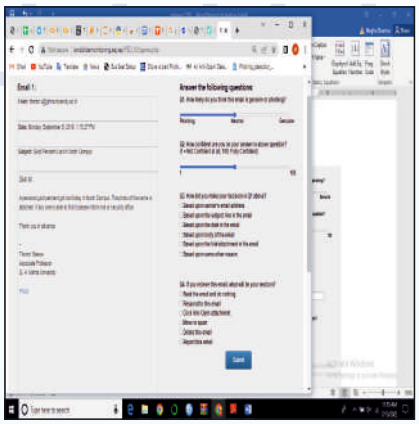
The total expenditure and revenue generation for the IKSMHA Centre is presented in Table 1 below.

Table 1: The expenditure and revenue generation at IKSMHA Centre

S.No.	Performance Parameters	2023-24 (Current)	Target for 2024-25
1	OH-31	24,00,000	30 Approx
2	OH-35	11,00,000	30 Approx

Applied Cognitive Science Laboratory Projects, Awards, and Achievements

Commercialized via Intiot Services Pvt. Ltd. Funded From NDMA, DGRE, HP, and Uttrakhand Governments

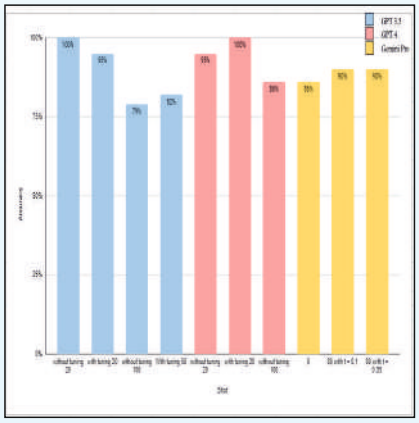


Phishing attacks and human decisions (DST; Collaborations with CMU, USA)

Human decision-making with partner robots in simulated Environments (CAIR, DRDO)

Human decision making and IVD, VR and AR in defence (INMAS, LSRB, DRDO)

Behavioral Game Theory and Cybersecurity (DST, MeiTY; Collaboration with UTEP, USA)



Clinical Trial Patients Eligibility Prediction via GPT and Gemini (Syneos Health, USA)

Outdoor Activities and Training

Some of the outdoor and training activities organized by the IKSMHA Centre are given below in Table 3:

Table 3: Some of the outdoor and training activities organized by the IKSMHA Centre

Yoga and Meditation Lab Environments

Hiking and Practice of Yoga in Nature

Ayurvedic Cooking Sessions

Mantra Meditation

North Region Seminar on ONOHS

Workshop on IKSMHA Centre

5.2.4 Publications

Patents/Books/Book Chapters/ Papers National and International Journals/Conferences

5.2.4.1 Patents

- Dutt, V. Aggarwal, P., Katakwar, H., Uttrani, S., and Sharma, M. Subnet Deception Tool – A testbed for understanding adversarial decision-making in the presence of subnetworks in realistic cyber deception scenarios (India Patent No. 202211005795). Indian Patent Office (2022).

5.2.4.2 Journal Papers

- Priyanka, P., Kumar, P., Panda, S., Uday, K. V.,, & Dutt, V. (In press) Can Machine Learning Models Predict Soil Moisture Evaporation Rates? An investigation via novel feature selection techniques and model comparisons. Frontiers in Earth Science, 12, 1344690.
- Choudhary G. and Dutt V. (In press). Analyzing Single-Action Bias in Dynamic Climate Change Environments: Insights from Feedback and Probability. Nature Humanities and Social Sciences Communications.
- Chand, K., Chandra, S., & Dutt, V. (In press). A comprehensive evaluation of linear and non-linear HRV parameters between Paced Breathing and Stressful Mental State. Heliyon. Elsevier.
- Kumar, P., Priyanka, P., Uday, K. V., & Dutt, V. (In press). Addressing Class Imbalance in Soil Movement Predictions. Natural Hazards and Earth System Sciences.
- Kapur, R., Kumar, Y., Sharma, R., Singh, E., Rohilla, D., Kanwar, V., ... & Dutt, V. (In press). GlucoBreath: An IoT, ML, and breath-based non-invasive glucose meter. IEEE Access.
- Kapur, R., Kumar, Y., Sharma, S., Rastogi, V., Sharma, S., Kanwar, V., ... & Dutt, V. (2023). DiabeticSense: A Non-Invasive, Multi-Sensor, IoT-Based Pre-Diagnostic System for Diabetes Detection Using Breath. Journal of Clinical Medicine, 12(20), 6439.
- Kumar, P., Priyanka, P., Dhanya, J., Uday, K. V., & Dutt, V. (2023). Analyzing the Performance of Univariate and Multivariate Machine Learning Models in Soil Movement Prediction: A Comparative Study. IEEE Access.
- Dutt, V., & Chandra, S. (2023). Human decision-making in combat situations involving traditional and immersive visual technologies. Frontiers in Psychology, 14, 1166115.
- Uttrani, S., Aggarwal, P., & Dutt, V. (2023). Does subnetting and port hardening influence human adversarial decisions? An investigation via a HackIT tool. Frontiers in Big Data, 6, 988007.
- Choudhary, G., Rao, A. K., & Dutt, V. (2023). Does correlation heuristic dependence reduce due to classroom teaching? A case study from India. Frontiers in Psychology, 14, 1040538.
- Dutt, V., & Chandra S. (2023). Editorial on the Research Topic Human Decision-Making in Combat Situations Involving Traditional and Immersive Visual Technologies. Frontiers in Psychology (Cognitive Science), 14 - 2023, doi: 10.3389/fpsyg.2023.1166115
- Dhanda, M., Pant, P., Dogra, S., Gupta, A., Dutt, V. (2022). Sensitivity Analysis of Contact Type Vibration Measuring Sensors. Sound & Vibration, 56(3), 235–243.
- Rao, A. K., Chandra, S., & Dutt, V. (2022). Learning from feedback: Evaluation of dynamic decision-making in virtual reality under various repetitive training frameworks. Frontiers in Psychology (Cognitive Science), 13: 872061.doi: 10.3389/fpsyg.2022.872061
- Uttrani, S., Sharma, N., & Dutt, V. (2022). Life and Death Decisions and COVID-19: Investigating and Modeling the Effect of Framing, Experience, and Context on Preference Reversals in the Asian Disease Problem. Topics in Cognitive Science, 14(4), 800-824. doi: 10.1111/tops.12607
- Aggarwal, P., Moisan, F., Gonzalez, C., & Dutt, V. (2022). Learning about the effects of alert uncertainty in attack and defend decisions via cognitive modeling. Human Factors, 64(2), 343-358.
- Pathania, A., Kumar, P., Priyanka, Maurya, A., Kumar, M., Chaturvedi, P., ... & Dutt, V. (2022). Predictions of soil movements using persistence, auto-regression, and neural network models: a case-study in Mandi, India. International Journal of Swarm Intelligence, 7(1), 94-109.

- Katakwar, H., Aggarwal, P., Maqbool, Z., Dutt, V. (2022). Influence of Probing Action Costs on Adversarial Decision-Making in a Deception Game. Lecture Notes in Networks and Systems, 314, pp 649–658.
- Beuria, Jyotiranjan. "Persistent homology of collider observations: When (w) hole matters." *Physics Letters B* 846 (2023): 138188.
- Gupta, Kurusetti Vinay, Jyotiranjan Beuria, and Laxmidhar Behera. "Characterizing EEG signals of meditative states using persistent homology and Hodge spectral entropy." Biomedical Signal Processing and Control 89 (2024): 105779. (Online Publication on 30 November 2023).

5.2.4.3 Book Publications

- Mukherjee, S., Dutt, V., & Srinivasan, N. (2023). Applied Cognitive Science and Technology: Implications of interaction between human cognition and technology. Springer-Nature, Singapore.
- Dutt, V., Chandra, S., & Cassenti, D. (2023). Human decision-making in combat situations involving traditional and immersive visual technologies. Frontiers Media SA. Lausanne, Switzerland.

5.2.4.5 Conference papers

- Rao, A. K., Bhat, R., Bhavsar, A., Negi, R., & Dutt, V. (2024). Does augmenting Virtual Reality-based training with transcranial direct current stimulation improve visual search performance? A neurobehavioral evaluation. In the HFES Annual Meeting and Exhibition, Phoenix, Arizona.
- Chauhan, S., Choudhary, G., Bhavsar, A., & Dutt, V. (In press). Retention from ancient Indian scriptures: Evaluating VR-based storytelling against the traditional methods. PETRA 2024.
- Kappor, S., Uttrani, S., Paul, G., Dutt, V. (In press). Does human-robot collaboration yield better search performance? An investigation via Proximal Policy Optimization in complex search tasks. PETRA 2024.
- Tripathi, K., Swaroop, S., Arya, A., Pandey, D., Bhavsar, A., & Dutt, V. (In press). Exploring the Effects of Yoga on Self-Esteem and Emotional Well-Being in Stressed College Students: A Randomized Controlled Trial. PETRA 2024.
- Ghosh, S., Kamand, H. P., Garg, A., Singh, D., Prasad, A., Bhavsar, A., & Dutt, V. (In press). Predicting Stress among Students via Psychometric Assessments and Machine Learning. PETRA 2024.
- Kapur, R., Sharma, R., Kanwar, V., Bhavsar, A., & Dutt, V. (In press). SugarControl: An Integrative Mobile App for Type 2 Diabetes Management through Yoga, Meditation, and Lifestyle Interventions. PETRA 2024. In press
- Devi, A., Uttrani, S., Dasgupta, N., & Dutt, V. (In press). Automating Clinical Trial Eligibility Screening: Quantitative Analysis of GPT Models versus Human Expertise. PETRA 2024.
- Rao, A. K., Uttrani, S., Menon, V. K., Shah, D., Bhavsar, A., Chowdhury, S. R., & Dutt, V. (In press). Prediction of multitasking performance post-longitudinal tDCS via EEG-based functional connectivity and machine learning methods. PETRA 2024.
- Rao, A. K., Trivedi, G. Y., Trivedi, R. G., Bajpai, A., Chauhan, G. S., Menon, V. K., ... & Dutt, V. (2024). Predicting suicidal behavior among Indian adults using childhood trauma, mental health questionnaires and machine learning cascade ensembles. arXiv preprint arXiv:2401.17705.
- Rao, A., Menon, V., Bhavsar, A., Chowdhury, S. R., Negi, R., & Dutt, V. (2024). Classification of attention performance post-longitudinal tDCS via functional connectivity and machine learning methods. In 2024 IEEE 9th International Conference for Convergence in Technology (I2CT). eCF Paper Id: I2CT2024-894.
- Devi, A., Uttrani, S., Dasgupta, N., & Dutt, V. (2024). Quantitative Analysis of GPT-4 model: Optimizing Patient Eligibility Classification for Clinical Trials and Reducing Expert Judgment Dependency. ICMHI 2024.
- Rao, A. K., Bhavsar, A., Chowdhury, S. R., Chandra, S., Negi, R. S., Duraisamy, P., & Dutt, V. (2024). Evaluating the efficacy of a haptic feedback, 360° treadmill-integrated Virtual Reality framework and longitudinal training on decision-making performance in a complex search-and-shoot simulation. In Proceedings of the SPIE International SPIE Defense + Commercial Sensing Conference (accepted).
- Rao, A. K., Menon, V. K., Uttrani, S., Dixit, A., Verma, D., & Dutt, V. (2023, December). Classification of executive functioning performance post-longitudinal tDCS using functional connectivity and machine learning methods. In 2023 IEEE 20th India Council International Conference (INDICON) (pp. 1199-1204). IEEE.

- Uttrani, Shashank & Sharma, Shakshi & Dabas, Mahavir & Kanekar, Bhavik & Dutt, V. (2022). Modeling human performance in complex search and retrieve environment using supervised and unsupervised machine learning techniques. In New In ML at NeurIPS 2022
- Durgesh Ameta, Ankita Garg, Parveen Kumar, Laxmidhar Behera, and Varun Dutt. 2023. Evaluating the Effectiveness of Mantra Meditation in a 360 Virtual Reality Environment. In Proceedings of the 16th International Conference on PErvasive Technologies Related to Assistive Environments (PETRA '23). Association for Computing Machinery, New York, NY, USA, 766–772.
- D. Ameta, V. Gupta, R. P. Sathian, L. Behera and T. Sandhan, "Statistical and Deep Convolutional Feature Fusion for Emotion Detection from Audio Signal," 2023 International Conference on Bio Signals, Images, and Instrumentation (ICBSII), Chennai, India, 2023, pp. 1-7, doi: 10.1109/ICBSII58188.2023.10181060. keywords: {Support vector machines;Training;Measurement;Emotion recognition;Time-frequency analysis;Sentiment analysis;Feature extraction;Audio Emotion Classification (AEP);MultiLayer Perceptron (MLP);Mel Frequency Cepstral Coefficient (MFCC);Visual Geometry Group19 (VGG19);Convolutional Neural Network(CNN)},
- V. Gupta, R. Mittal, D. Ameta, L. Behera and T. Sandhan, "Active Feedback using Riemannian Features for Motor Imagery Classification," 2023 International Conference on Bio Signals, Images, and Instrumentation (ICBSII), Chennai, India, 2023, pp. 1-6, doi: 10.1109/ICBSII58188.2023.10181030. keywords: {Training;Support vector machines;Correlation;Pattern classification;Machine learning;Electroencephalography;Classification algorithms;Electroencephalogram (EEG);Brain-Computer Interfaces (BCI);Motor Imagery (MI);user feedback;Riemannian manifold}

5.2.4.6 Book Chapter Publications

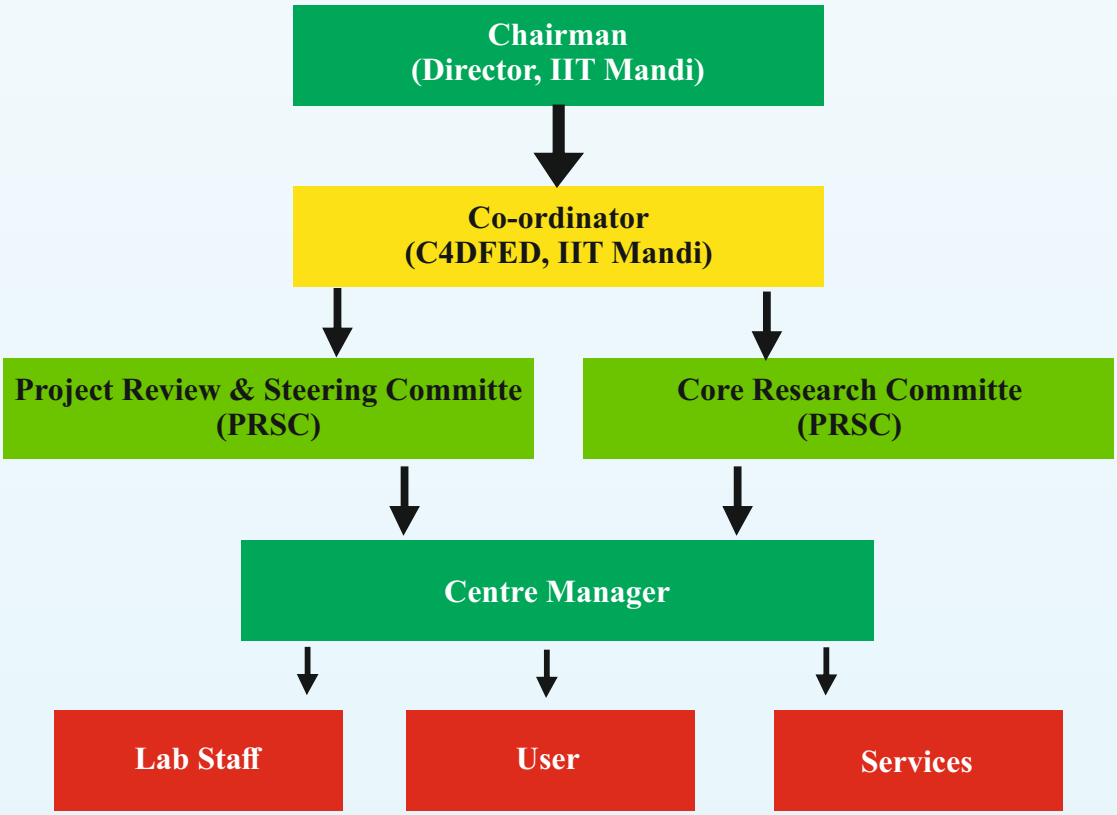
- Uttrani, S., Rao, A. K., Kanekar, B., Vohra, I., & Dutt, V. (2023). Assessment of Various Deep Reinforcement Learning Techniques in Complex Virtual Search-and-Retrieve Environments Compared to Human Performance. In Applied Cognitive Science and Technology: Implications of Interactions Between Human Cognition and Technology (pp. 139-155). Singapore: Springer Nature Singapore.
- Maqbool, Z., Pammi, V. C., & Dutt, V. (2023). Behavioral Game Theory in Cyber Security: The Influence of Interdependent Information's Availability on Cyber-Strike and Patching Processes. In Applied Cognitive Science and Technology: Implications of Interactions Between Human Cognition and Technology (pp. 91-107). Singapore: Springer Nature Singapore.
- Kumar P., Priyanka P., Uday K.V., and Dutt, V. (2022). DR-A-LSTM: A Recurrent Neural Network with a Dimension Reduction Autoencoder a Deep Learning Approach for Landslide Movements Prediction. In: 12th International Advanced Computing Conference (IACC), Hyderabad, India. (in press)
- Priyanka P., Kumar P., Chaturvedi P., Uday K.V., and Dutt, V. (2022). Data-driven Approach for Predicting Surface Subsidence Velocity from Geotechnical Parameters. In: 12th International Advanced Computing Conference (IACC), Hyderabad, India. (in press)
- Priyanka P., Kumar P., Devi A., Kumar A., Gaurav G., Uday K.V., and Dutt, V. (2022). Univariate, Multivariate, and Ensemble of Multilayer Perceptron Models for Landslide Movement Prediction: A Case Study of Mandi. In: 12th International Advanced Computing Conference (IACC), Hyderabad, India. (in press)
- Katakwar, H., Uttrani, S., Aggarwal, P., & Dutt, V. (2022). Modeling the effects of network size in a deception game involving honeypots. In Cybersecurity and cognitive science (pp. 339-355). Academic Press.
- Uttrani, S., Nanta, B., Sharma, N., & Dutt, V. (2022). Modeling the impact of the COVID-19 pandemic and socioeconomic factors on global mobility and its effects on mental health. In Artificial Intelligence, Machine Learning, and Mental Health in Pandemics (pp. 189-208). Academic Press.
- Rao, A. K., Daniel, R. V., Pandey, V., Chandra, S., & Dutt, V. (2022). Impact of different field-of-views on visuospatial memory and cognitive workload in a complex virtual environment. In Advances in Augmented Reality and Virtual Reality (pp. 11-28). Springer, Singapore.

- Uttrani, S., Nanta, B., Sharma, N., & Dutt, V. (2022). Modeling the impact of the COVID-19 pandemic and socioeconomic factors on global mobility and its effects on mental health. In Artificial Intelligence, Machine Learning, and Mental Health in Pandemics: A Computational Approach (pp. 189-208). Elsevier.
- Maqbool. Z., Pammi, V. S. C., & Dutt, V. (2022). Computational Modeling of Decisions in Cyber-Security Games in the Presence or Absence of Interdependence Information. In Cybersecurity and Cognitive Science (pp. 357-370). Elsevier.
- Saini, T., Tomar, G., Rana D.C., Attri S., Chaturvedi, P., & Dutt, V. (2022). CloudIoT for pollution monitoring: A multivariate weighted ensemble forecasting approach for prediction of suspended particulate matter. In Verma K.J., Saxena, D., Gonzalez-Prida, D.V., and Shendryk, V., (1st Eds.), CloudIoT: Concepts, Paradigms and Applications. CRC Press.

5.3 Centre for Design & Fabrication of Electronic Devices (C*4*DFED)

Co-ordinator: Prof. Satinder Kumar Sharma

Organizational Structure C*4*DFED Facility



"Project Review & Steering Committee (PRSC)"	
Prof. Satinder Kumar Sharma (SCEE, IIT Mandi)	Coordinator
Prof. Laxmidhar Behera	Chairman, Director IIT Mandi
Prof. Timothy A. Gonsalves (SCEE, Emeritus Prof.)	Founder Director/ Member
Prof. Kenneth Gonsalves (SBS, IIT Mandi)	Distinguish Prof./ Member
Prof. Subrata Ghosh (SCS, IIT Mandi)	Member
Dr. Hitesh Shrimali (SCEE, IIT Mandi)	Member
Dr. Viswanath Balakrishnan (SMME, IIT Mandi)	Member
Dr. Ajay Soni (SPS, IIT Mandi)	Member
Dr. Ranbir Singh (SMME, IIT Mandi)	Member
Dr. Robin Khosla (SCEE, IIT Mandi)	Member

"Core Research Committee (CRC)"			
S. No.	**Name**	**School**	**E-mail id:**
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18	Dr. Venkata Krishnan	SCS, IIT Mandi	vkn@iitmandi.ac.in
19	Dr. Viswanath Balakrishnan	SMME, IIT Mandi	viswa@iitmandi.ac.in
20	Dr. Ranbir Singh	SMME. IIT Mandi	ranbir@iitmandi.ac.in
21	Dr. Robin Khosla	SCEE, IIT Mandi	robin@iitmandi.ac.in

5.3.1 Executive Summary

This documents serves as the **Centre for Design & Fabrication of Electronic Devices (C*4*DFED)'s** official annual report for FY 23-24 ending March 31, 2024. C*4*DFED facility at IIT Mandi is a unique facility for multidisciplinary research on device design and fabrication at IIT Mandi where many state of the art facilities and utilities are housed inside class 100, class 1000 and class 10000 clean laboratories. This high end state of the art facility was inaugurated by **Shri R. Subrahmanyam, Secretary (HE),** Ministry of Human Resource Development (MHRD), and Government of India on 31st October, 2018.

The ultimate goal of this Centre is to cater the different need of IIT Mandi research and scientific community for various ongoing projects and futuristic and also train the students to provide skilled professionals and researchers to serve India and semiconductor industries/society in the long run. The C*4*DFED facility at IIT Mandi is fully operational from **last two years** and is now capable of handling research projects like Development and Application of Nano electronics, Development of Extreme Ultraviolet Lithography (EUL) resists materials for the next generation technology node, IC design and fabrication and Nano-Micro (NEMS & MEMS) systems and designs etc. A good number of researchers, students from the institute and neighboring institutes are benefited from this infrastructure available at IIT Mandi and this is also a source of revenue generation for the self-sustainability of facility. The user charges collected in two past quarter are around 4 Lakhs. Along with that, many government institute like ISRO, DRDO, DST, MeitY etc. or industrial funded projects have been successfully completed or still going on. In the present projects, center manager, two project staff and instrument operators are hired for the proper day to day operations of center facilities. Whereas, two technical staff members are taking care of the complete clean room & plant room operations, which are equipped with AHUs, MAUs, Chillers, UPS and BMS.

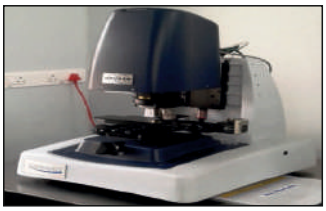
To make C*4*DFED facilities self-reliance and self-sustainable, a cumulative effort has been started. In this regard, an expert committee from different institutes/organizations from India (IIT Mandi, IIT Delhi, IISc, IIT Ropar, ISRO, DRDO and company etc.) and abroad have visited in person/Skype IIT Mandi C*4*DFED facility, on 11th Dec 2019 and as per their suggestions center is going to organizing more training programs, workshops and conference like previous year.

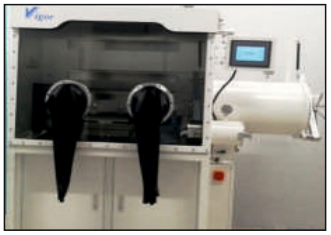
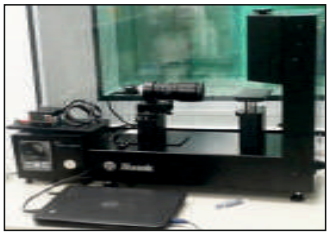
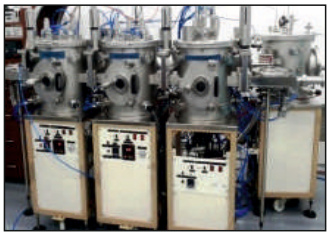
5.3.1.1 Highlights of C*4*DFED

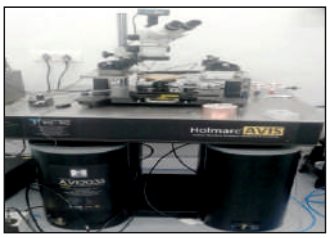
1	Users	• All IIT Mandi faculties who have similar research interest. • Masters and PhD students of IIT Mandi. • Academic, Research & Industrial institutes & other institutes.
2	Total Cost of the project	Rs.10 Crores + Rs.40 Crores Equipment
3	Electrical Power	600 KVA
4	Class 100 area	1200 Sq Ft
5	Class 1000 area	450Sq Ft
6	Class 10000 area	350 Sq Ft
7	Class 100000 area	2000 Sq Ft

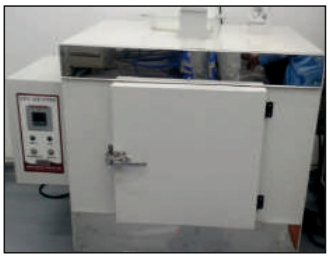
5.3.1.2 List of Facilities/Equipment's at C*4*DFED

Sr. No.	Equipment	Model	Make	Category	Images
1.	Atomic Force Microscope (AFM)	Dimension ICON PT	BRUKER	Sophisticated Equipment	

2.	Optical Profilometer	CONTOURGT-K Automated System	BRUKER	Sophisticated Equipment	
3.	Ellipsometery	EP4	Accurion	Sophisticated Equipment	
4.	Field Emission Scanning Electron Microscope (FESEM)	GeminiSEM 500	Carl Ziess Microscopy	Sophisticated Equipment	
5.	Helium Ion Beam Lithography (HIBL)	ORION Nano Fab	Carl Ziess Microscopy	Sophisticated Equipment	
6.	Maskless Lithography	SF - 100 Xpress Maskless Exposure	Intelligent Micro Patterning	Sophisticated Equipment	
7.	Electron Beam Lithography (EBL)	eLINE Plus	RAITH	Sophisticated Equipment	
8.	Mask Aligner	EVG610	EV Group	Sophisticated Equipment	

9.	Atomic Layer Deposition (ALD)	S100 G2	Savannah	Sophisticated Equipment	
10.	Glove Box	SGI 200/750TS	SciLab - Vigro Gas Purification tech.	General Characterisation Instrument	
11.	Optical Microscope	BX 51	Olympus	Sophisticated Equipment	
12.	Contact Angle	SEO Phoenix 300	SEO (Surface electro Optics) Phoenix 300	Sophisticated Equipment	
13.	Electro Chemical Analyzer	CH Instruments	CH Instruments	General Characterisation Instrument	
14.	Spin Coater	WS-650MZ-23NPP	Laurell	Sophisticated Equipment	
15.	Sputtering System	Self-Assembled	Advance Process Technology	Sophisticated Equipment	

16.	Reactive Ion Etching (RIE)	PlanarRIE-6S	PLANAR Tech.	Sophisticated Equipment	
17.	Thermal Evaporator	BC-300	Hind High Vacuum	Sophisticated Equipment	
18.	Electrical Characterization System	Keitheley 4200 SCS	Tektronics (Keithley)	Sophisticated Equipment	
19.	Nanofiber Unit (E-SPIN)	Super-ES2	E-Spin nanotech	Sophisticated Equipment	
20.	3 Zone Furnace	Lindberg Blue M	Thermofisher scientific	General laboratory equipment	
21.	Vacuum Oven		Nanosemi Technology	General laboratory equipment	

22.	Hot Air Oven	MAC	MACRO Scientific Works —	General laboratory equipment	
23.	Centrifuge	Spinwin MC 03	Tarsons	General laboratory equipment	
24.	Probe Sonicator	Frontline FS-750 Sonicator		General laboratory equipment	
25.	Ultra Sonicator		Riviera Glass	General laboratory equipment	
26.	3D Printer		XYZ Printing Pro	General laboratory equipment	
27.	Weighing Machine	ME-204	Mateller Toledo	General laboratory equipment	

28.	Hot Plate	M10102003	Axiva Sichem Biotech	General laboratory equipment	
29.	Vacuum Filter		Axiva Sichem Biotech	General laboratory equipment	
30.	Wafer Dicing	P/N-SYJ-400	Precision CNC Dicing	Sophisticated Equipment	
31.	Metal Wire Bonder	53XX BDA	F & S Bondtec	Sophisticated Equipment	
32.	UV Ozone Cleaner	HO-TH-UVT350	HOLMARC	General laboratory equipment	

5.3.2 Number of Students/Researchers Benefited from C*4*DFED facility at IIT Mandi so far

i) Academic year (2023-2024): **50**

User List of C*4*DFED facility (Internal & External)

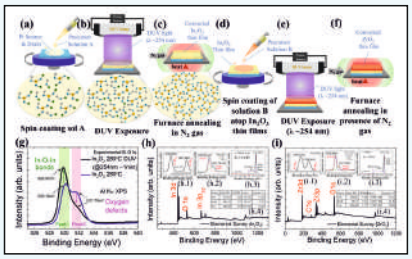
Academic Year: 2023-2024				
S. No.	Type of User	Name User/User ID	Name Supervisor/ Program/ Institute/ Organization	Number of utilization days
1	Internal	Koushik Gayen	Prof. Suman Kalyan Pal	3
2	Internal	Bhavika Chouhan	Dr. Swati Sharma	9
3	Internal	Pankaj Kumar	Dr. Sumit Murab	5
4	Internal	Rajat Sharma	Dr. Jaspreet Kaur Randhawa	8
5	Internal	B Raju Naik	Dr. Viswanath Balakrishnan	7
6	Internal	Manvendra	Prof. Satinder Sharma	90
7	Internal	Yadu Chandran	Dr. Viswanath Balakrishnan	2
8	Internal	Khushal Singh	Dr. Amit Jaiswal	7
9	Internal	Ganesh Phulmogare	Dr. Amit Jaiswal	40
10	Internal	Manish Yadav	Dr. Jaspreet Kaur Randhawa	13
11	Internal	Bhumit Luhar	Dr. Viswanath Balakrishnan	6
12	Internal	Sachin	Prof. Satinder Sharma	25
13	Internal	Rahul Kumar Rai	Dr. Bukke Ravindra Naik	1
14	Internal	Prasun Kumar	Dr. Ranbir Singh	60
15	Internal	Richa	Prof. Chayan Kanti Nandi	2
16	Internal	Jyoti Shikhar	Dr. Swati Sharma	20
17	Internal	Aksa Thomas	Dr. Ajay Soni	2

18	Internal	MD Sadallua	Dr. Kunal Ghosh	5
19	Internal	Sumit Choudhary	Prof. Satinder Sharma	3
20	Internal	Kajal Goswami	Dr. Sumit Murab	6
21	Internal	Anjali Sharma	Dr. Viswanath Balakrishnan	4
22	Internal	Pankaj Kumar	Prof. Satinder Sharma	30
23	Internal	Mohd Shadab Ansari	Dr. Sunny Zafar	2
24	Internal	Saira Bano	Dr. Ranbir Singh	10
25	Internal	Sudhir Kumar Chaudhary	Dr. Sunny Zafar	6
26	Internal	Ankita Negi	Dr. Sumit Murab	6
27	Internal	Dipanjan	Prof. Satinder Sharma	25
28	Internal	Atul Gangaram Chakkar	Dr. Pradeep Kumar	6
29	Internal	Syed Mohd Hussain	Dr. Kunal Ghosh	15
30	Internal	Ashish Jaiswal	Dr. Swati Sharma	15
31	Internal	Mamta Devi	Dr. Swati Sharma	20
32	Internal	Aditya Narayan Khokhar	Dr. Sumit Murab	5
33	Internal	Prachi Gupta	Prof. Satinder Sharma	20
34	Internal	EE611P Course	Prof. Satinder Sharma	28
35	Internal	Rahul Tiwari	Dr. Ranbir Singh	30
36	Internal	Paras Sahu	Dr. Kunal Ghosh	2
37	Internal	Nandini Samudre	Dr. Sumit Murab	2
38	Internal	Harikrishna	Dr. Robin Khosla	10
39	Internal	Gaurav Kumar	Dr. Sumit Murab	3
40	Internal	Aanidhya	Prof. Satinder Sharma	15

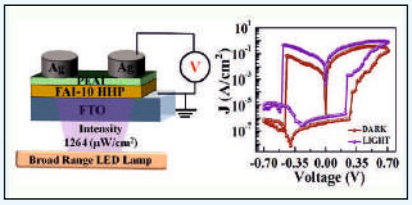
41	Internal	Dr. Sougata	Prof. Subrata Ghosh	5
42	Internal	Nitika	Dr. Rik Rani Koner	2
43	Internal	Neeraj Yadav	Dr. Viswanath Balakrishnan	2
44	Internal	Pankaj Kumar Singh	Dr. Aditi Halder	8
45	Internal	Rubi Bhakhar	Dr. Rik Rani Koner	5
46	Internal	Ankita Dhiman	Dr. Garima Agrawal	10
47	Internal	Soujatya Sarkar	Prof. Rohit Saluja	3
48	Internal	Rajat Verma	Prof. Rohit Saluja	2
49	Internal	Abul Hansat	Prof. Prem Felix Siril	3
50	Internal	Shiwani Chaubey	Dr. Ajay Soni	3

5.3.4 List of publication and patents from C4DFED

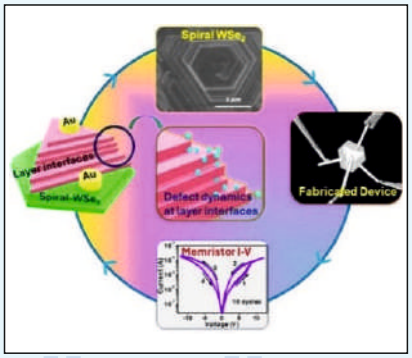
A total of 07 publications have been generated from the C4DFED facility for FY. 2023-24. The list is as follows:



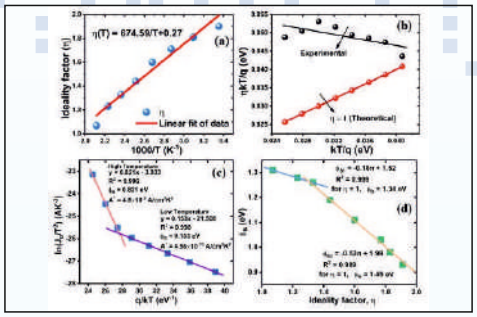
1. Facile DUV Irradiated Solution-Processed ZrO_2/In_2O_3 for Low Voltages FET Applications; Prachi Gupta and Satinder K. Sharma; IEEE Transactions on Electron Devices, 1-9, (2024), : DoI: 10.1109/TED.2024.3395422.



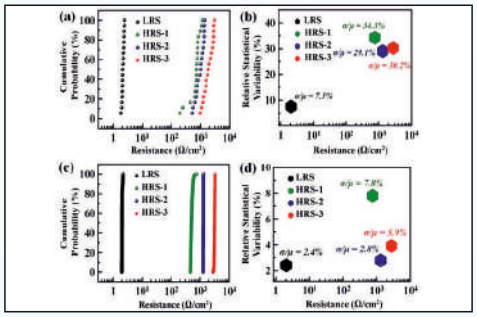
2 Electro-Optically Tunable Passivated Double-Cation Perovskite-Based ReRAM for Low-Power Memory Applications, Manvendra Chauhan, Ranbir Singh, and Satinder K. Sharma, ACS Applied Electronic Materials (2024): https://doi.org/10.1021/acsaelm.4c00257.



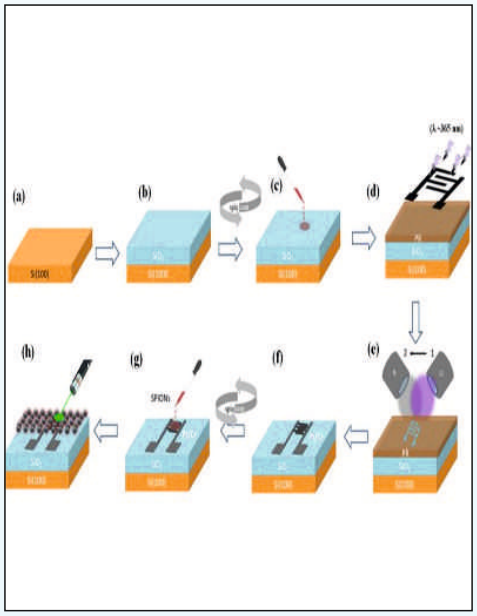
3. Spiral WSe2 with Interlayer Twist for Memristive and Neuromorphic Device Applications B. Raju Naik, Sumit Choudhary, Satinder K. Sharma, Viswanath Balakrishnan. *ACS Appl. Electron. Mater. (2024)* DOI: doi.org/10.1021/acsaelm.3c01810.



4. Unveiling Thermal Effects on Sn-Doped -GaO Schottky Barrier Diodes on Sapphire for High-Temperature Power Electronics Manoj K. Yadav, Arnab Mondal, Satinder K. Sharma, and Ankush Bag. *IEEE Transactions on Electron Devices, Volume 71, Issue 3, Page(s): 1529-1534 (2024).*



5. Reliable Memristive Switching Empowered by Ag/NiO/W ReRAM Configuration for Multi-Level Non-Volatile Memory Applications Manvendra Chauhan, Sumit Choudhary, Satinder K. Sharma. *Advanced Electronic Materials, (2024) DOI: 10.1002/aelm.202300724.*



6. Multifunctional fluorescent SPIONs display exceptional optical/ magnetic contrast and enhanced photoconductivity in interdigitated electrode based photoresponsive devices Ashish Tiwari, Ayan Debnath, Mohamad G. Moinuddin, Aamir Mushtaq, Anup Singh, and Satinder K. Sharma Jaspreet K. Randhawa. *Journal of materials Chemistry A, (2024)* DOI: 10.1039/d3ta06147g.

7. Selective and Reversible Carbon Mono Oxide Gas Detection using Silver Doped Octahedral Molecular Sieves (OMS-2) Nanorods; Amit Kumar Gupta, Priyanshu Singh, Monical Jaiswal, Jagjiwan Mittal, Sivanandam Aravindan, Sumit Chaudhry, Satinder Kumar Sharma, Robin Kumar; IOP Advances in Natural Sciences: Nanoscience and Nanotechnology (2024).

List of Patent Granted

1. Negative Tone Resist Compositions for Lithography
Inventors: Santu Nandi, Lalit Khilare, Mohamad G. Moinuddin, Sunil Kumar, Manvendra Chauhan, Satinder K. Sharma, Subrata Ghosh, Kenneth E. Gonsalves. *(Application number: 202111050981)* .

2. A process for i-line resist dissolution modulation using hydroxy-styrene based ter- polymer Inventors: Santu Nandi, M.Yogesh, S.Dolai, Pradeep Parameswaran, Satinder K. Sharma, A. Bogavelly, D.N.Tiwary, P. Jain, Subrata Ghosh, Kenneth Gonsalves. (Application number: 202141007495).

3. Metal-organic Clusters (MOCs) Resist for Sub 10 nm Semiconductor Technology Node Patterning by Helium Ion Beam (He + BL), and Electron Beam Lithography (EBL) Inventors: Rudra Kumar, Manvendra Chauhan, M. G. Moinuddin, Satinder K. Sharma, Kenneth E. Gonsalves; (Application number: 202011003482).

4. A New Class of Non-Chemically Amplified Molecular Photoresists for Next Generation Integrated Circuits (ICs) Technology
Inventors: Kenneth E Gonsalves; Subrata Ghosh; P. Parameswaran; Satinder K. Sharma; Neha Thakur; Pulikanti Guru Prasad Reddy; Santu Nandi; M. Yogesh; (Application number: 201611044190).

5. Highly Sensitive MAPDSM-MAPDST based Resists Technology for Next Generation Lithography
Inventors: Kenneth E. Gonsalves, Satinder K. Sharma, Subrata Ghosh, Chullikkattil P. Pradeep, Pulikanti Guruprasad Reddy, Satyendra P. Pal, Pawan Kumar (Application number: 201611022219A).

6. Metal-Organic Clusters (MOCs) Resist Formulation Compatible to Next Generation Lithography Application
Inventors: Manvendra Chauhan, Kumar Palit Sharma, Sumit Choudhary, Diksha Thakur, Subrata Ghosh, Satinder K. Sharma, Kenneth E. Gonsalves. (Application Number: - 202311033883).

7. A Novel Bifacial Perovskite Photovoltaic Architecture for Harvesting Energy form Artificial Indoor LED Light Sources
Inventors: Ranbir Singh, Satinder K. Sharma
(Application Number: - 202211063783).

5.3.5 Ongoing Projects and funding at the Centre

I. Center for Promotion of Additive Manufacturing (CPAM): Renewable Energy & Distributed Manufacturing using Customized 4D & 3D Technologies (CPAM: RE & DM)", Funded by Ministry of Electronics and Information Technology (MeitY). Govt. of India: 3435.48 Lakh (Feb, 2024 – Feb, 2029) SKS/470

II. Development of artificial skin integrated with multipurpose sensors and creating perceptual explanations through artificial skin", Funded by iHUB and HCI Foundation, Department of Science & Technology (DST), Govt. of India: 2 CR. (July, 2023 – July, 2025) GSR/431

III. Development of bifacial indoor photovoltaics prototype for self-powering smart internet of things (IoTs)", Funded by Department of Science & Technology (DST), Govt. of India: 50 Lakhs (March, 2023 – March, 2026). RS/410

IV. Design and Optimization of Room Temperature, Heater - less, Cost effective CO (Carbon Mono Oxide) Gas Sensor using Metal Doped OMS2 Nano fibers, Funded by SERB, Govt. of India: 10 Lakhs (Dec, 2021 – Dec-2024) RKU/362

V. Fund for Improvement of S&T Infrastructure (FIST) program 2020, "Engineering Sciences-FIST 2020". Funded by Department of Science & Technology (DST), Govt. of India:~92 Lakhs (Dec, 2021 –Dec, 2026) SKS/352

VI. C4DFED (Clean Room) Facility Project (IITM/INT/C4DFED-CO/27) funded by IIT Mandi

5.3.5.1 National and International distinguished visitor at the Center

- Dr. Mukul Sarkar, IIT Delhi, Prof. Santosh Vishwakarama, IIT Indore and Dr. Sunny Sharma, IIT-Allahabad, visited the center on 28.03.2024.
- Prof. M.K Verma, Vice Chancellor, CSVTU, Bhilai (C.G), & Registrar, IIT-Mandi visited the center on 26.03.2024.
- Prof. Dr.-Ing. Michael Sinapius, Professor, Technische Universität Braunschweig, visited the center on 17.03.2024.
- Dr. Gurpreet Singh, (Sci/Eng-SF), SCL, Mohali (Punjab), visited the center on 13.03.2024.





- **Dr. Bharadwaj Amrutur, Professor, IISC, visited the center on 29.02.2024.**

- **Dr. S. V. Kamat, Chairman, DRDO & Dr. G.A Srinivas Murthy, Director, DRDL visited the center on 27.02.2024.**

- **Dr. Manoj Jain, Director (R&D), Bharat Electronics Limited (BEL), visited the center on 27.02.2024.**

- **Dr. S.P. Singh, Principal Scientist, CSIR-IICT, Hyderabad, visited the center on 20.01.2024.**
- **Dr. Kaushik Ghosh, Scientist-F(Professor), INST, Mohali, visited the center on 28.12.2023.**

- **Dr. Sunil Kumar, Human Space Flight Centre, ISRO, visited the center on 30.10.2023.**
- **Dr. Gargi Khanna, Associate Professor, E&CED, NIT Hamirpur, visited the center on 18.10.2023.**
- **Dr. Sapna Yadav, SCERT Delhi, visited the center on 12.10.2023.**
- **Mr. Gokul Butail, Principal Adviser to Hon'ble Chief Minster, Govt. of H.P visited the center on 30.09.2023.**

- **Dr. Jayant K. Singh, IIT Kanpur, visited the center on 26/09/2023.**
- **Dr. Piyoosh Goyal, visited the center on 5/08/2023.**

Organizing the Design Practicum Courses in Fabrication @ C4DFED Centre, IIT Mandi

Conducting Hands-On Training for new Equipment @ C*4*DFED Centre, IIT Mandi

5.3.6 Appendix

Rate Structure for C4DFED Facility Users

C*4*DFED based facilities are available to internal and external users on nominal charges. Below is the rate structure of the C*4*DFED facility, which is also available online.

Sr. No.	Equipment	Make/Model	Academic Subsidized Charges for Internal Users	Charges for External Academic users	Charges for Industry users
1	FESEM	Zeiss	750	1875	3750
2	HE Ion Microscope	Orion, Zeiss		5000	10000
3	AFM	Bruker	500	1250	2500
4	Raith EBL (exposure only)	Raith	1000	2500	5000

5	Ellipsometer (Data Acquisition)	Accurion	500	1250	2500
6	Ellipsometer (Modeling & Analysis)	Accurion	2500	6250	12500
7	MaskLess Lithography (Exposure only)	Intelligent Micro Patterning	200	500	1000
8	Optical Lithography	EV Group	250	625	1250
9	Stylis Profiler	AEP Technology	100	250	500
10	Optical Profiler	Bruker	150	375	750
11	RIE	Planer Tech.	300	750	1500
12	E-Spin	E-Spin nanotech	100	250	500
13	Sputtering	Advance Process Technology	400	1000	2000
14	Optical Microscope	Olympus	100	250	500
15	Keithley System with Probe Station	Keithley	100	250	500
16	Glove Box	SciLab SG1200/750TS	150	375	750
17	Thermal Evaporation	Hind High vacuum	300 (per run)	750 (per run)	1500 (per run)
18	ALD		950	2375	4750
19	Spin Coater (Controlled atmosphere)	Laurell	75 (per sample)	200 (per sample)	600 (per sample)
20	Spin Coating (In air)	Spectro Spin	50 (per sample)	125 (per sample)	250 (per sample)
21	Contact Angle	SEO Phoenix 300 Touch Contact Angle	50 (per sample)	125 (per sample)	400 (per sample)

22	3D printer	XYZ Printing Pro	100	250	500
23	Electro Chemical Analyzer	CH Instruments	100	250	500
24	Three Zone Furnace 1000 °C	Thermofisher scientific	100	250	500
25	Vacuum Oven	Nanosemi Technology	100 per day	250 per day	500 per day
26	DI Water	Millipore	50 per liter	125 per liter	250 per liter
27	Clean Lab Space (5'x5')	-	2000 per day	5000 per day	10000 per day

5.4 Center for Quantum Science and Technologies

Introduction

Welcome to the inaugural annual report of the Center for Quantum Science and Technologies (CQST) at IIT Mandi, India. This report outlines our progress and future goals in advancing quantum computing and training the next generation of Indian quantum computing scientists. Our primary focus is on developing a reliable and scalable optical vortex-based quantum computing platform, which can solve specific problems without traditional algorithms. By exploring how multiple quantum phenomena can work together, we aim to instantly deliver deeper insights into unknown data. We are establishing a national laboratory with state-of-the-art facilities to test various aspects of optical quantum computing, including a quantum supremacy testing unit. Additionally, we are building a prototype facility for creating quantum computers and cryptographic devices. Our work includes developing and optimizing nanowire self-assembly techniques, which are crucial for encoding quantum algorithms in our optical vortex-based quantum computer. This report provides an overview of our activities and progress over the past year, reflecting our commitment to advancing quantum science and technology.

5.4.1 Faculty Members

1. Laxmidhar Behera (Director, IIT Mandi)
2. R. P. Singh (Adjunct Prof, IIT Mandi, PRL Ahmedabad)
3. Anirban Bandyopadhyay (Adjunct Professor Neuromorphic Computing, NIMS Japan)
4. C. S. Yadav (Chairperson, CQST, IIT Mandi)
5. Suman Kalyan Pal (Professor Exciton Spectroscopy, Light-Matter Interaction, IIT Mandi)

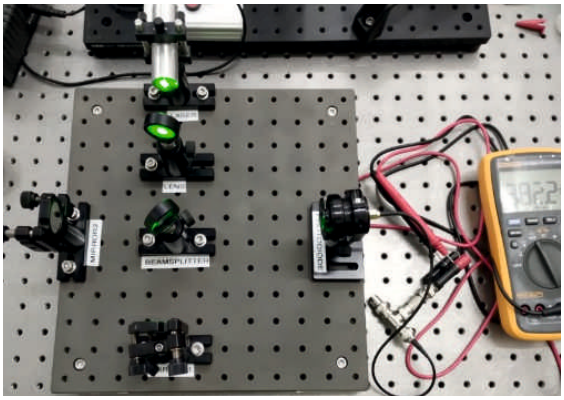
5.4.2 Students/Scholars Admitted to the Centre during the Year 2023-24

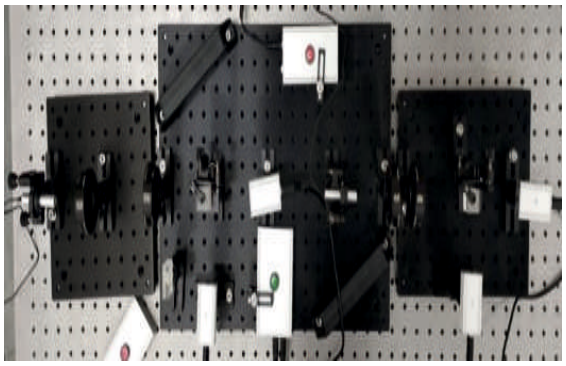
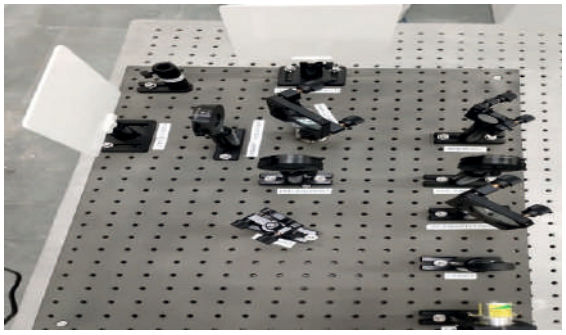
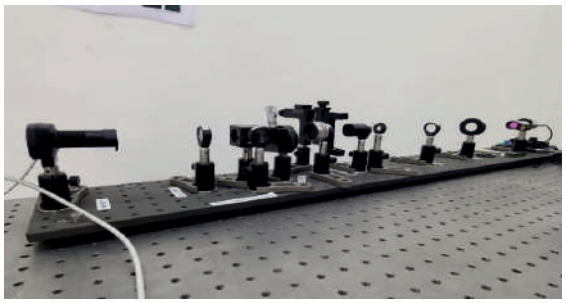
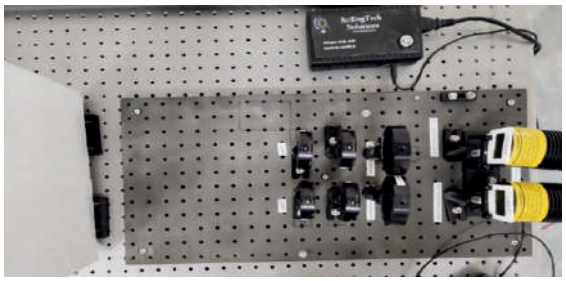
Post –Doctoral Fellows: 1

Ph.D. students: 4

5.4.3 Setting up a teaching lab to train the UG/PG/PhD students in handling of optics for quantum phenomena

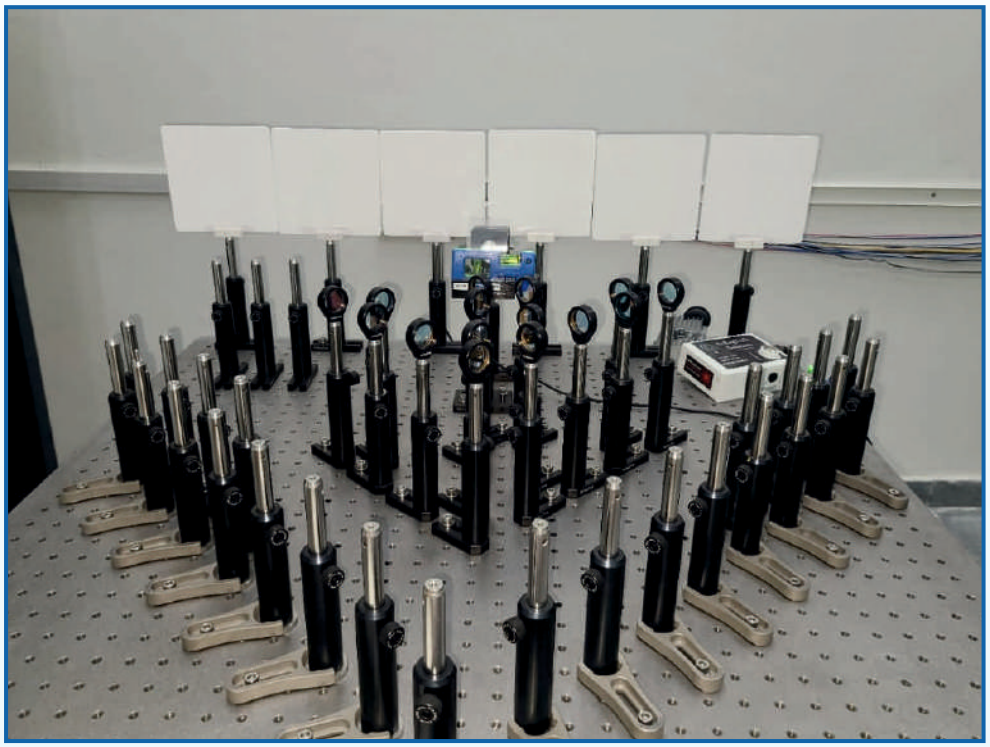
1. A Few Major Instruments Installed in Labs

Sr. No.	Experiments	Images
1.	Bomb Tester (Experiment on Interaction –free Quantum measurements: Testing the Bombs in Michelson Interferometer.)	

2.	Quantum Cryptography: (Demonstration of BB84 Quantum Cryptography Protocol and detection of eavesdropper on Encrypted data.)	
3.	Quantum Eraser: (To demonstrate the sensitivity of the path information on the measurement process.)	
4.	Fourier Transform: (To demonstrate the Fourier-Transform of sample images.)	
5.	Polarized 3D Cinema: (Create a 3D Projection using circularly polarized light based on RealD Cinema Technology.)	
6.	Portable Optical Tweezer: Demonstrate micro-scale particle manipulation dynamics through laser induced forces using.	

Custom-Developed Setup: Optical Vortex setup for 16 channels.

Optical vortex is topological structure of light which have helical wave front. Light is said to acquire quantized orbital angular momentum. Topological structure of light has many applications. We aim to create logic gates using optical vortices which would be instrumental in our Room Temperature Quantum computation application. We are developing a custom vortex setup for demonstration purpose. The setup consists of 15 beam splitters being used to split a single pair of optical vortices, generated from a hologram, into 16 different pairs. A 632nm Laser beam passes through a hologram resulting in a pair of vortices. The pair passes through a network of 15 beam splitters that result in output of 16 optical vortex pairs.



Developing and coming up infrastructure

New Initiatives / New Research Facilities Created / Laboratory Established

5.4.4 International Geoscience Program and Collaborative Research Agreement with NIMS Japan

IIT Mandi is collaborating with NIMS Japan, to develop the optical vortex-based Quantum Computer. The goal is to build a reliable and scalable optical vortex-based quantum computing platform that demonstrates quantum supremacy by performing computations beyond classical computers. To achieve this, we will begin by using a neuromorphic computer developed in Japan's NIMS and progress towards the portable Quantum Computer capable of predicting future events and detecting threats. We have already started processing Collaborative Research Agreement, CRA with NIMS, once done we would be replicating and scaling of an identical prototype of neuromorphic computer.

Current Research

- **Single Photon Source Generation**: In the realm of quantum technologies, the development of an efficient and reliable single photon source is crucial for quantum computing and secure communication. The Single Photon Source, capable of emitting individual particles of light, is an essential building block in Quantum Technologies due to its unique properties. This research aims to contribute to this area by developing an innovative method for generating single photons consistently and efficiently. By combining principles from quantum optics and materials science, we seek to design a novel platform that overcomes existing limitations in photon generation. Through experimentation and optimization, the goal is to not only improve the performance of the single photon source but also to unlock new possibilities for applications in quantum information processing and beyond.

- **Quantum Memory-Processor integration**: Unlike classical computers, where processing and memory units are distinct entities, quantum systems often face challenges in establishing and maintaining coherence between qubits (quantum bits) used for computation and those employed for memory storage. Integrating these components within a unified architecture is essential for minimizing latency, maximizing throughput, and enabling coherent information transfer between processing and storage units. Furthermore, the fragile nature of quantum information makes it susceptible to errors induced by decoherence, environmental noise, and imperfect control mechanisms. As such, the development of robust error correction techniques tailored to the unique characteristics of quantum processors and memory is imperative. This research will be oriented towards integrating quantum memory and quantum processor, and developing quantum error correction codes that can be used in such a system to prevent loss of quantum information due to decoherence and other factors.

- **Developing generalized Quantum Fourier Transform for Optical Quantum Computer**: Time crystals represent a novel state of matter realized under specific conditions, characterized by their unique temporal order and spontaneous time translation symmetry breaking. Theoretical approaches to realize time crystals involve designing quantum systems with discrete time translation symmetry breaking, while experimental approaches include using trapped ions, superconducting circuits, and spin systems under carefully controlled conditions to achieve time crystal behaviour. Once realized, time crystals could revolutionize quantum computing, offering stable qubits, advanced quantum memory, and novel methods for quantum information processing. While a few “No-Go” theorems rule out the possibility of realizing a time crystal in the ground state of a closed system, researchers have been able to circumvent that hurdle by considering open quantum systems. Although pumping the system with a periodic signal in order to capture a periodic subharmonic response reveals an apparent Discrete Time Crystal behaviour, the credibility of such an approach is still subject to scepticism. This research will aim to study discrete and continuous time crystal behaviour subject to fundamentals of symmetry breaking and many body localizations, exploring the time crystal behaviour that is insensitive to the properties of the input signal. Furthermore, the research will aim to explore the application of time crystals in the field of quantum information, focusing on quantum circuits and quantum memory.

- **Utilizing Time Crystals for generating Quantum Circuits:** Quantum Fourier Transform is core of many algorithms like Shor's Algorithm, Grover's search Algorithm. It is essential in quantum computing for things like quantum walks (a quantum version of random walks), boson sampling (a method for simulating quantum systems), and quantum metrology (the science of measurement at the quantum level). However, existing circuits for QFT are incomplete, and their correctness hasn't been fully proven. Additionally, applying QFT to practical fields of information processing, such as image and video processing, has been challenging. This research will aim to develop a generalised Quantum Fourier Transform which will eventually help in practical field of Quantum computing like Quantum Image Processing.

5.5 Centre for Artificial Intelligence and Robotics (CAIR)

UAV

AGV

5.5.1 ABOUT US

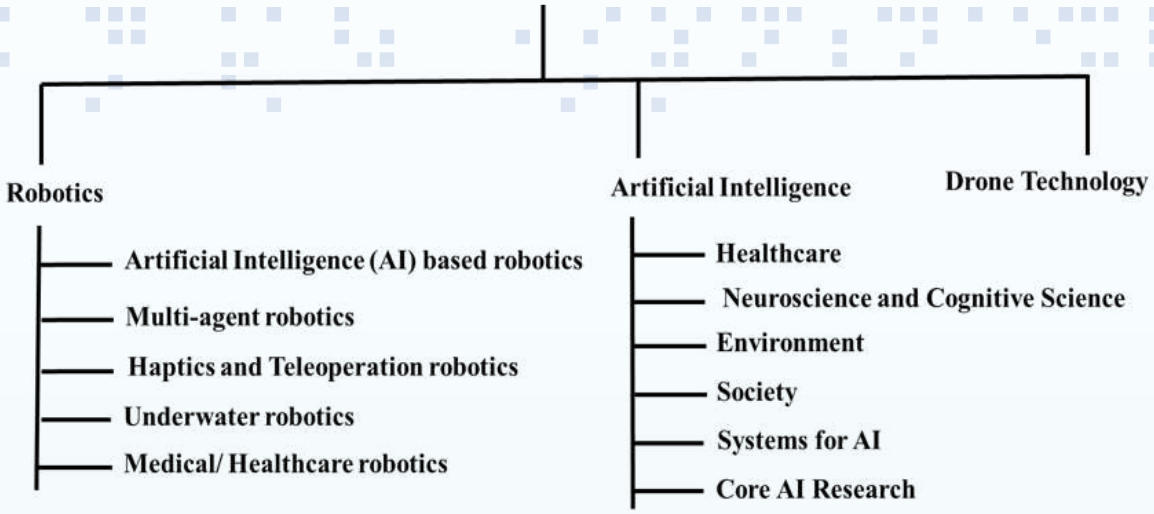
For several decades, the development of intelligent machines that help humans in various tasks are growing at a very fast pace. A myriad of applications ranging from healthcare to autonomous vehicles are powered by recent developments in artificial intelligence, robotics and drone technology.

To address the technological advancements and their potential, IIT Mandi conducted a Workshop on Healthcare Robotics and Drone Applications (WHRDA) between 27th and 29th May, 2022. As a part of the deliberations in the Workshop, several topics emerged under three main themes: a) Robotics, b) Artificial Intelligence, and c) Drone Technology. Consequent to the WHRDA Workshop, it is proposed to establish a Centre for Artificial Intelligence and Robotics (referred to as CAIR) at IIT Mandi.

The CAIR will focus on research on topics concerning Robotics, AI, and Drone technology.

- Developing systems that complement and augment human capabilities,
- Understanding and addressing the ethical, legal, and societal implications of this research,
- Creating robust and trustworthy robotics and AI systems,
- Supporting the development of related technical standards and tools,
- Better understand the national R&D workforce needs, and enable long-term investments in these research areas.

Centre for Artificial Intelligence and Robotics



5.5.2 VISION & MISSION

Our vision is to create a sustainable and futuristic ecosystem of self-reliant innovation and entrepreneurship, enabled by cutting-edge research, education, and technology development in AI & Robotics, fostering responsible and ethical use of the technology.

Our mission is to establish CAIR as a leading center of excellence in AI research, providing top-notch education and training to the next generation of AI & Robotics researchers and professionals, and fostering innovation and entrepreneurship in AI through collaborations with academia, industry, and government agencies. We aim to advance the state-of-the-art in AI & Robotics and promote responsible and ethical use of the technology to address real-world challenges.

Faculty Members		
1.	**Dr. Amit Shukla** Assistant Professor Specialization: Robotics Control Systems, Mechatronics, Artificial Intelligence, Electric Vehicle PhD from Imperial College, London in 2012 Phone: 01905-267222 E-mail: amitshukla@iitandi.ac.in	
2.	**Dr. Jagadeesh Kadiyam** Assistant Professor Specialization: Marine robotics, Bioinspired robots, Ocean observations and underwater intervention applications, Hydrodynamics, Dynamics and control. PhD from IIT Indore, 2021 Phone: 01905-267736 E-mail: jagadeesh@iitmandi.ac.in	

3.	**Dr. Radhe Shyam Sharma** Assistant Professor Specialization: Visual Servoing, Robot Learning, Autonomous Navigation & Multi-Robot Systems PhD from IIT Kanpur, 2021 Phone: 01905- 267273 E-mail: radheshyam@iitmandi.ac.in	
4.	**Dr. Narendra Kumar Dhar** Assistant Professor Specialization: Cyber-Physical System, Robotics and its Intelligent Control, Dynamical Systems PhD from IIT Kanpur, 2021 E-mail: narendra@iitmandi.ac.in	

Affiliated Faculties

1.	**Dr. Parimala Kancharla** Assistant Professor Specialization: Computer Vision, Machine Learning and Deep Learning, Generative Adversarial Networks, Understanding Visual Cortex, Video Quality Assessment, Learned Video Compression & Machine Learning for Robotics PhD from IIT Hyderabad, 2022 Phone: 01905-267224 E-mail: parimala@iitmandi.ac.in	
2.	**Dr. Mrityunjay Doddamani** Associate Professor Specialization: Additive Manufacturing, Syntactic Foams Phone: 01905- 267264 E-mail: mrityunjay@iitmandi.ac.in	
3.	**Dr. Aditya Nigam** Associate Professor Specialization: Applications of deep learning in Biometric PhD from IIT Kanpur, 2014 Phone: 01905- 267273 E-mail: aditya@iitmandi.ac.in	

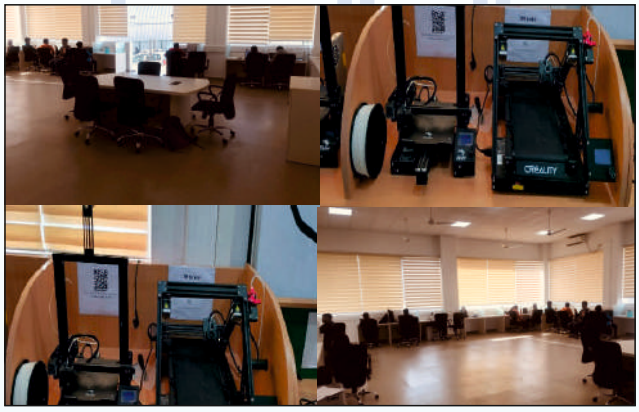
4.	**Dr. Padmanabhan Rajan** Assistant Professor Specialization: Speech and audio processing, Analysis of music, Bioacoustics (analysis of natural sounds - bird calls, animal vocalisations) PhD from IIT Madras, 2012 Phone: 01905- 267118 E-mail: padman@iitmandi.ac.in	
5.	**Dr. Varun Dutt** Associate Professor Specialization: Artificial Intelligence, Human-Computer Interaction, Judgment and Decision Making, Environmental Decision Makin PhD from Carnegie Mellon University, USA E-mail: varun@iitmandi.ac.in	

- **Degree Programs in Robotics**
  - MTech by Research
  - PhD Regular
  - Dual Degree (MTech PhD) Part time Masters
  - Part-time PhD
- **Capacity Building**
  - Boot Camp on Drone Technology
  - Faculty Development Program on Robotics
  - Short Term Course on Robotics

Foundation of Design Practicum Lab

Robotics Lab

Robotics Competition Lab



Drone Lab

5.5.3 Research Areas

- Drone Technology Aerial Manipulation
- Autonomous Navigation and Control Drone Analytics
- Energy management of Drone Swarm Drones
- Multi-robot Systems Visual Servoing Robot Learning
- Swarm Robotics & Formation Control Collision Avoidance
- Autonomous Navigation Grasping and Manipulation Collaborative Manipulation Teleoperation
- Legged Robotics Marine Robotics
- Cyber-physical systems (CPS)
- Connected Autonomous Vehicles (CAVs) Driverless Cars
- Cloud-facilitated Control of CAVs Optimal Control of CAVs Intelligent control in CPS

5.5.4 Recent Activities

Akhil Bhartiya Shiksha Samagam 3rd Anniversary on National Education Policy-2023

Drone Exhibition on Agricultural Drones 2023

5.5.4.1 Academic & Technical Staff

i. Abhay Pratap Singh (Junior Technical Superintendent)

ii. Atul Kumar Saini (Junior Assistant)

iii. Shiv Kamal (Office Attendant)

5.5.4.2 Development of New Courses/ Laboratories/ Equipment

- **COURSES OFFERED**
  - Foundation of Design Practicum
  - Robot Kinematics, Dynamics, and Control Robot Programming, Modeling and Simulation
  - Mechatronics Probabilistic Robotics Marine Robotics
  - Deep Learning for Robotics Linear Dynamical System Advanced Design Practicum Digital Image Processing
  - Vision and Learning-based Control

- **LABORATORIES**
  - Foundation Of Design Practicum Lab
  - Drone Lab
  - Robotics lab
  - Robotics Competition Lab

- **Equipment**
  - Ground Vehicle.
  - Kinova Arm.
  - Kinova arm (Lite).
  - Haptic Device.
  - Agriculture Drones with 15kg Payload.
  - Mini CNC Lath Machine.
  - Mini CNC Milling Machine.
  - 3D Printers.
  - Mini Drones.
  - Inhouse Fabricated Wheel Robotos.
  - Omni-directional wheel Robot.
  - Heavy computing GPU Server.

5.5.5 Academic Activities Organized By The Department

Name of the conf./seminar/symp./ workshop	Name of the Chairman Coordinator	Sponsored by	Duration
Boot Camp on Drone Technology Bootcamp Workshop Training Target - 240 Students. Bootcamp Workshop Training Target Achieved - 319 Students.	Dr. Radhe Shyam Sharma	MEITY	6 DAYS
Faculty Development Course On Robotics	Dr. Radhe Shyam Sharma	DTE, Sundar Nagar	6 DAYS
Short Term Course On Robotics	Dr. Radhe Shyam Sharma	HPKVN	30 DAYS

5.5.6 Research Publication

1. Dr. Narendra Kumar Dhar Research Papers

1. Dynamic Updates in Stochastic Control for Networked System with Uncertainties - Ninth Indian Control Conference (ICC-9), 2023.
2. Coupled evolutionary behavioral and disease dynamics under reinfection risk - IEEE Transactions on Control of Network Systems, 2023.
3. Near-optimal sliding mode control for multi-robot consensus under dynamic events - Advanced Robotics, 2023.
4. Epidemic propagation under evolutionary behavioral dynamics: Stability and bifurcation analysis - 2022 American Control Conference (ACC), 2022.
5. Dynamically triggered control for system connected to network with permissible imperfections - IEEE Systems Journal, 2022.

2. Dr. Amit Shukla Research Papers

1. "Vision-Based Autonomous Inspection of the Vertical Structure Using Unmanned Aerial Vehicle (UAV)" Proceeding of ASME2022 International Mechanical Engineering Congress \& Exposition IMECE 2022 October 30-Nobember, 3, 2022, Columbus, OH. (Published)
2. "Vision-Based Autonomous Inspection of Horizontal Structures Using Unmanned Aerial Vehicle" Proceeding of ASME2022 International Mechanical Engineering Congress \& Exposition IMECE 2022 October 30-Nobember, 3, 2022, Columbus, OH. (Published)
3. "Trajectory Tracking in the Image Frame for Autonomous UAV Navigation in UAV - AGV Multi-Agent System" Proceeding of ASME2022 International Mechanical Engineering Congress \& Exposition IMECE 2022 October 30-Nobember, 3, 2022, Columbus, OH. (Published)
4. "Kinematic modes of vision-based heterogeneous UAV-AGV system", Array, Volume 17, 2023, 100269, ISSN 2590-0056, https://doi.org/10.1016/j.array.2022.100269. (Published)
5. "3-D Trajectory Tracking in the Image Frame for Autonomous Navigation of UAV in UAV-AGV Multi-Agent System," 2023 9th International Conference on Automation, Robotics and Applications (ICARA), Abu Dhabi, United Arab Emirates, 2023, pp. 234-238, doi: 10.1109/ICARA56516.2023.10125818.
6. Surya Prakash S.K, Amit Shukla, Naisarg Pandya, Shirish Shekhar Jha, "Automated Vision-based Bolt Sorting by Manipulator for Industrial Applications," 2024 IEEE 20th International Conference on Automation Science and Engineering (CASE), Bari, Italy, 2024.
7. Naisarg Pandya, Amit Shukla, Pushkar Kumar, Ankit Mehra, "Autonomous Sensor-based Control of Aerial Manipulator for Horizontal Pipe Structure Tracking with Continuous Contact" 2024 IEEE 8th "International conference on robotics and automation" (ICRAS) Japan, Tokyo.
8. Ashok Kumar Sivarathri, Amit Shukla, Pushkar Kumar, "Autonomous Vision-based Tracking of UAV by a Flexible AGV," 2024 20th IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA), Genoa, Italy, 2024.
9. Ashok Kumar Sivarathri, Amit Shukla, "Autonomous Navigation of AGV by Tracking the Motion of UAV," 2024 20th IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA), Genoa, Italy, 2024.
10. Ashok Kumar Sivarathri, Amit Shukla, Ayush Gupta, "Waypoint Navigation in the Image Plane for Autonomous Navigation of UAV in Vision-based UAV-AGV System," 2024 20th IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA), Genoa, Italy, 2024.
11. Ayush Gupta, Amit Shukla, Ashok Kumar shivrathri, Naisarg Pandya, "Vision-based autonomous Tracking of High-rise vertical structure using quadcopter", 2024 IEEE 16th International Conference on computer and Automation Engineering (ICCAE), Melbourne, Australia 2024.
12. Mohit Vohra, Ayush Gupta, Mian muhammad Umair, Amit Shukla, jayakumar karunamurthy Aditi Gupta, "Automated underground mapping of Buried Utilities: A review of robotics Solution and Sensor Technologies", 2024 9th International conference on control and Robotics engineering (ICCRE 2024), Osaka, Japan.
13. Ayush Gupta, Amit Shukla, Ashok kumar Sivarathri, Naisarg Pandya "Vision-based Tracking of High-Rise Vertical Structure Using Quadcopter", IEEE/ASME MESA 2024 – 20th International Conference on Mechatronic, Embedded Systems and Applications, University of Genova, Genova (Italy), 2-4 September 2024.

14. Ankit Mehra, Amit Shukla, Darshankumar Prajapati, Pushkar Kumar, Ashish Rana and Tushar Patil " Vision-based Control of UAV for Autonomous Firefighting" , International Conference on Computer and Automation Engineering (ICCAE 2024), Melbourne, Australia.
15. Sudhanshu Maurya, Shreyas Kasture, Amit Shukla, "Quantum Cryptography for Secure Communications in Industrial Mechatronics and Embedded Systems", IEEE/ASME MESA 2024 – 20th International Conference on Mechatronic, Embedded Systems and Applications, University of Genova, Genova (Italy), 2-4 September 2024.
16. Shreyas Kasture, Sudhanshu Maurya, Rohan Verma, Ajay Kumar Yadav and Amit Shukla, "Interpreting Deep Convolutional Neural Networks for Medical Diagnosis Using Perceptual Encoding and Retrieval", 15th INTERNATIONAL IEEE CONFERENCE ON COMPUTING, COMMUNICATION AND NETWORKING TECHNOLOGIES (ICCCNT), June 24 - 28, 2024, IIT Mandi, Himachal Pradesh, India.

3. Dr. Jagadeesh Kadiyam Research Papers

1. Arun Krishnan K S, Kadiyam Jagadeesh, and Santhakumar Mohan. Robust motion control of fully/over-actuated underwater vehicle using sliding surfaces. Journal of Intelligent & Robotic Systems, volume 108, page 60. Springer, 2023.
2. Arun Krishnan KS, Kadiyam, Jagadeesh, and Santhakumar Mohan. Comparative performance investigations of the intervention-class underwater vehicle with different possible thruster configurations using eight identical thrusters. Ocean Engineering, volume 288, page 116147. Elsevier, 2023.

5.5.7 Workshop/ Training programme /Conference organized

- One month's winter internship program for 10 B.Tech. Students run by CAIR Faculty Members.
- Two and Three-month Summer Internship Program for 150 B.Tech. Students run By CAIR Faculty members.

5.5.8 No. of Research student list

Dr. Amit Shukla Students list

S.No.	Course Name	Student
01	Ph.D.	13
02	Dual degree	03
03	M.Tech. (Research)	17
04	Ph.D. (Part-time)	08
05	M.Tech. (R) Part time	01

Dr. Narendra K Dhar students List

S.No.	Course Name	Student
01	Ph.D.	04
02	Dual degree	0
03	M.Tech. (Research)	01
04	Ph.D. (Part time)	0
05	M.Tech. (R) Part time	0

Dr. Radhe Shyam Sharma students list

S.No.	Course Name	Student
01	Ph.D.	01
02	Dual degree	01
03	M.Tech. (Research)	03
04	Ph.D. (Part time)	0
05	M.Tech. (R) Part time	0

5.6 Centre for Continuing Education (CCE)

Overview

This report outlines the various initiatives, programs, and achievements undertaken by IIT Mandi's Centre for Continuing Education (CCE) from March 2023 to March 2024. The details provided are based on the submitted proposals and the collaborative efforts with various organizations to enhance skill development and educational outreach.

Key Initiatives and Programs Conducted (April 2023 - March 2024)

5.6.1 Faculty Development Programs (FDP)

- The Level-O Training Program on "Mathematics Training and Talent Search Programme" (MTTS-2023), coordinated by Dr. Muslim Malik, was organized from May 22, 2023, to June 17, 2023.
- The "Faculty Development Program on Robotics," coordinated by Dr. Radhe Shyam Sharma (CAIR), took place from September 28, 2023, to October 2, 2023, and was fully financially supported by the Directorate of Technical Education Vocational and Industrial Training, Himachal Pradesh (DTE).
- A "Capacity Building Training Program for Mathematics Teachers" was conducted from September 17, 2023, to September 22, 2023, under the coordination of Professor Manoj Thakur from the School of Mathematics and Statistical Sciences (SMSS).
- One week Faculty Development Program on "Entrepreneurship, Ideation and Innovation" Coordinated by Dr. Puran Singh, Associate Professor (SoM) from 09-10-2023 to 13-10-2023. The Program has 50 participants and received funding from SCERT, New Delhi.
- One week Capacity Building Program in Science for TGT (Physics, Chemistry, Biology) Coordinated by Dr. Shyam Kumar Masakapalli, Associate Professor (SBB), Dr. Moupriya Das, Assistant Professor (SCS) and Dr. Nirmalya Kajuri, Assistant Professor (SPS) from 25 to 30 October, 2023.The Program had 40 participants and received funding from SCERT, New Delhi.
- One week Faculty Development Program on "Entrepreneurship, Ideation and Innovation" Coordinated by Dr. Puran Singh, Associate Professor (SoM) from 20 to 24 November, 2023.The Program has 40 participants and received funding from SCERT, New Delhi.
- One week Faculty Development Program in "Physics for PG Teachers" Coordinated by Dr. Nirmalya Kajuri, Assistant Professor (School of Physical Sciences) and Dr. Hari Varma, Associate Professor (School of Physical Sciences) from 21 to 25 November, 2023.The Program has 40 participants and received funding from SCERT, New Delhi.
- One week Faculty Development Program on "Entrepreneurship, Ideation and Innovation" Coordinated by Dr. Puran Singh, Associate Professor (SoM) from December 04, 2023, to December 08, 2023.The Program has 40 participants and received funding from SCERT, New Delhi.
- A 6-day workshop on "General Management/Leadership Program" was conducted at IIT Mandi. Professor N. Ravichandran, visiting professor (SOM), worked as the coordinator for this program. The workshop took place from March 11, 2024, to March 16, 2024, and was fully financially supported by Gujarat Energy Training & Research Institute (GETRI).

5.6.2 Short Term Course

- A certification program on “Data Science and Machine Learning,” coordinated by Prof. Manoj Thakur and co-coordinated by Dr. Tushar Jain, was organized from December 2022 to June 2023.

- IIT Mandi in collaboration with Uttar Pradesh Skill Development Mission (UPSDM) has conducted a one month School Camp on Robotics and AI (PRAYAS 2.0) for UP school students & teachers. The course was started on 5th June, 2023 to 4th July, 2023. More than 250 school students and teachers from UP have participated in this course.

- The short-term course on "Machine Learning," coordinated by Prof. Manoj Thakur (SMSS/SoM), took place from July 24, 2023, to August 23, 2023. The course received full financial support from Himachal Pradesh Kaushal Vikas Nigam (HPKVN).

- A short-term course titled "Robotics," coordinated by Dr. Radhe Shyam Sharma (CAIR), took place from September 11, 2023, to September 16, 2023. The course received full financial support from the Directorate of Technical Education Vocational and Industrial Training, Himachal Pradesh (DTE).

- The Short Term Course on "Internet of Things (IoT)," coordinated by Dr. Kaushik Halder, Assistant Prof. (SCEE), took place from October 30, 2023, to November 29, 2023. The course received full financial support from Himachal Pradesh Kaushal Vikas Nigam (HPKVN).

- The Short Term Course on "Robotic," coordinated by Dr. Radhe Shayam Sharma, Assistant Prof. (SCEE), took place from October 30, 2023, to November 29, 2023. The course received full financial support from Himachal Pradesh Kaushal Vikas Nigam (HPKVN).

- The Short Term Course for "Engineers and Personnel involved in the implementation of PMGSY at the PIU and SRRDA level," coordinated by Dr. Ashutosh Kumar, Assistant Prof. (SCENE), took place from December 4, 2023, to December 8, 2023.

- Short-term course on Machine Learning Coordinated by Prof. Manoj Thakur from January 29, 2024, to February 28, 2024. The course had 54 participants and received funding from HPKVN, Shimla

- Short-term course on “Technologies for 5G and Beyond” coordinated by Dr. Adarsh Patel, Assistant Professor (SCEE) from March 9, 2024, to March 15, 2024.

- On March 27, 2024, a State Level Skill Competition was held at IIT Mandi, fully sponsored by HPKVN Shimla. Coordinated by Dr. Tushar Jain (Head CCE), the event saw a total of 15 participants from across the state of Himachal Pradesh.

5.6.3 Workshop

- A workshop, “Student Talk on Trending Topics 2023,” coordinated by Dr. Nirmalya Kajuri, Assistant Professor (SPS), took place from July 4, 2023, to July 15, 2023.
- A workshop on “Residential Yusuf Hamied Chemistry Camp by RSC, UK,” coordinated by Dr. Bhaskar Mondal, Assistant Professor (SCS), and Dr. Amit B. Pawar, Assistant Professor (SCS), took place from July 5, 2023, to July 7, 2023.

- A conference on "Catalysis for Energy, Environment and Sustainability (CEES-2023)," coordinated by Dr. Aditi Halder, Associate Professor (SCS), Prof. Venkata Krishnan (SCS), and Dr. Rik Rani Koner, Associate Professor (SMME), took place from October 4, 2023, to October 6, 2023.
- Online International Workshop on "5th Winter School on Cognitive Modeling - 2023" from 13 to 15 October, 2023.The workshop had 80 participants and funding for the was provided by DST-SERB and IIT Mandi iHub - HCI Foundation. Dignitaries at the conference included Dr. Percy Mistry, Senior Scientist at the School of Neuroscience, Stanford University, and Prof. Terrence C. Stewart, NRC Associate Research Officer at the University of Waterloo.
- In-person International Workshop on "Astrobiology and Analogue Sites for the Indian Space Programs" Coordinated by Dr. Tulika Srivastava, Professor (SBB) from 30 October to 05 November, 2023.
- An "Online Workshop on Writing Book Review & Field Report" was held on 18-11-2023 under the guidance of Dr. Shyamasree Dasgupta, Assoc. Prof. (SHSS).
- A workshop on "Observable Algebra in Field Theory and Gravity," coordinated by Dr. Nirmalya Kajuri, Assistant Professor (SPS), was held from February 16, 2024, to February 17, 2024.
- Dr. Shyam Kumar Masakapali, Associate Professor (SBB), successfully organized a workshop titled "Efficient Delivery of Crop Irrigation Advisories – Second Stakeholders Workshop" held from February 16, 2024, to February 17, 2024. Dr. Shyam Kumar Masakapali served as the coordinator for the event.
- The workshop on "Writer in Residence Programme," coordinated by Dr. Thirthankar Chakraborty, Assistant Professor (SHSS), with Dr. Neethi V. Alexander, Assistant Professor (SHSS), serving as the Co-coordinator, is scheduled to take place from February 25, 2024, to February 26, 2024.
- A workshop on "Observable Algebra in Field Theory and Gravity" was held from February 16, 2024, to February 17, 2024, with Dr. Nirmalya Kajuri, Assistant Professor (SPS), serving as the coordinator.
- A "Workshop for Graduate Students," coordinated by Dr. Tushar Jain, Associate Professor (SCEE), was held from March 15, 2024, to March 16, 2024.

5.6.4 Conferences

- The International Conference on "Differential Equations and Control Problems (ICDECP23)," coordinated by Dr. Muslim Malik was organized from June 15, 2023, to June 17, 2023.

- The conference on "DNA in Biox 2023, SBB Annual Conference," coordinated by Dr. Kharerin Hungyo, Assistant Prof. (SBB), took place from October 8, 2023, to October 9, 2023.

- The conference on the "3rd Young Graduate Meet 2023," coordinated by Dr. Saumya Malviya, Assistant Prof. (SHSS), took place from October 10, 2023, to October 12, 2023.

- The International Conference on "Mind, Brain and Consciousness: Perspectives From the Indian Knowledge System," coordinated by Dr. Varun Dutt, Prof. Chayan K. Nandi, Dr. Arnav Bhavsar, Dr. Shubhajit Roy Chowdhury, Dr. Aniruddha Chakraborty, Dr. Amit Prasad, Dr. Nitu Kumari, and Dr. Tulika Srivastava, took place from December 14, 2023, to December 16, 2023.

- An international conference on "Engineering for Sustainable and Resilient Development," coordinated by Dr. Deepak Swami, Associate Professor (SCENE), was held from January 18, 2024, to January 20, 2024.

5.6.4.1 Symposium

- A symposium titled "Himalayan Business Summit" was held from November 18, 2023, to November 19, 2023, with Dr. Ashish Bollimbala, Assistant Professor (SoM), and Dr. Anjan Kumar Swain, Professor (SoM), serving as the coordinators.

- A symposium titled "AiXCELRATE" was held from September 22, 2023, to September 24, 2023, with Dr. Ashish Bollimbala, Assistant Professor (SoM), serving as the coordinator.

5.6.4.2 Glimpse of Programs:

Img: Short Term Course on IoT

Img 1: Short Term course on Machine Learning

Img 2: Short Term Course on Machine Learning - 2

Img 1: Six Days General Management leadership program

Img 2: Six Days General Management leadership program

Img 1: Faculty Development Program on Entrepreneurship, Ideation and Innovation for SCERT

Img 2: Faculty Development Program on Entrepreneurship, Ideation and Innovation for SCERT

Img 3: Faculty Development Program on Entrepreneurship, Ideation and Innovation for SCERT

6. Central Library

Central Library plays a vital role in furthering the academic and research mission of IIT Mandi and facilitates creation and dissemination of knowledge. Library provides essential support by offering current library services which are integrated with teaching, learning and research activities. Central library is rapidly developing its collection of books, reference books, reports, periodicals, and electronic resources. The Text Book Collection in the Library provides vital supports for on-going undergraduate teaching programs.

It provides access to the various e-journals databases. This includes access to hundreds of journal titles on different subjects. Central Library is completely automated by using open source library management software ***KOHA***. All documents are RFID technology enabled. Transaction of books is also automated. Library has introduced various innovative services including CAS/SDI, On-line status of ILL, On-line reservation of books, Remote access of resources etc. By using Web OPAC, users can check their borrowing details online. Two workstations have been set up for users to access library holdings.

Locations

At present three different units of library are operational at two different campuses i.e. South Campus and North Campus. Detail of these libraries are given below:

1. Central Library @ North Campus (A16 Building)

Maximum collection pertaining to the print books are available within this unit. Almost all collection related to the different course subjects except Physics, Chemistry and Biotechnology are available within this building for circulation purpose. A16 is a big building having three floors having 192 seating capacity. It also has one conference room, one meeting room, one low discussion hall and two discussion rooms facility.

2. Satellite Library cum Archive Section @ North Campus (A9 Building – IIIrd Floor)

Satellite Library has facility of reading room with 150 seating capacity, One meeting room and collection pertaining to the general reading books.

3. Library @ South Campus (A5 Building – First Floor)

Book Circulation facility alongwith the Reading room with almost 75 seats are available within this section. Collection pertaining to the different courses (Physics, Chemistry and Biotechnology) is available for circulation alongwith the Xerox and scanning facility are also available in this unit.

Software Used in Library

(i) KOHA: For automation purpose.

(ii) DSpace: For digitization purpose.

(iii) Linux: For operating system.

(iv) Piwigo: For photographs repository

6.1 Collection Development and Management

Collection building is one of the important functions of the library that supports academic and research work of the students, faculty, staff, and other users. Library collection comprises of books, journals, reports, pamphlets and other reading material in science, engineering, technology, humanities and social sciences.

6.1.1 Print Documents added during the year 2023-24

During the period of 2023-24, Central Library acquired 826 books. It also added few periodicals/magazines, besides reprints, technical reports and annual reports of other universities/institutions.

A list of new additions of books is released every month and can be accessed on the library home page. This list also circulated by e-mail. An email alert is also sent to the requesting faculty members(s) about the arrival of publications requested by them.

6.1.2 Electronic resources subscribed during the year 2023-24

Central Library provides web-based access to the following e-resources:

6.1.2.1 Full-text e-journals: Access to 8000 + full-text journals from the following databases:

1. AIP, ACM Digital Library, ACS, APS, ASME, IOP, Elsevier's Science Direct, IEEE Electronic Library, JSTOR, SIAM, Springer Link, Taylor & Francis (S&T and SHSS complete Collections), Annual Reviews, CMIE, EBSCO e-books and BSU, HBSP etc.

6.1.2.2 Bibliographic e-databases: MathSciNet & Web of Science.

6.1.2.3 Thesis & Dissertations: Institute's Thesis Database, etc.

6.1.2.4 Archives: Institutional Archives, Sabin Americana

6.1.2.5 E-Books: Central Library provides access to a collection of more than 27438 e-Book titles pertaining to various disciplines. The e-book collection contains the titles which are a rigorous recommendation by the subject experts of the institute and cater to the needs of the users. The publishers of e-books collection include Science-Direct (Elsevier), McGraw Hill, Pearson, T&F, IEEE, IEEE-MIT press, IEEE-Wiley, Morgan Claypool, CUP, ASME, World Scientific and John Wiley. The e-books collection also includes the Lecture Notes Series on Mathematics (LNM), Physics (LNP) & Computer Science (LNCS) of Springer publisher.

The process of e-book collection development for this year has already been started. The efforts are being made to include the book collection of other renowned publishing houses. During the period of 2023-24, Central Library acquired 5906 new titles.

6.2 Circulation

Circulation activities are now automated. Library users can check their borrowing details by using WebOPAC. We serve the users consisting of the faculty, research scholars, students and staff. Circulation desk is kept open for 60 hours a week. On an average, the monthly circulation transactions are about 835.

6.3 Digital Library

Central Library has its own homepage (http://library.iitmandi.ac.in/), which provides web-based access to its resources, procures over 50000 electronic resources, 27438 electronic books and databases.

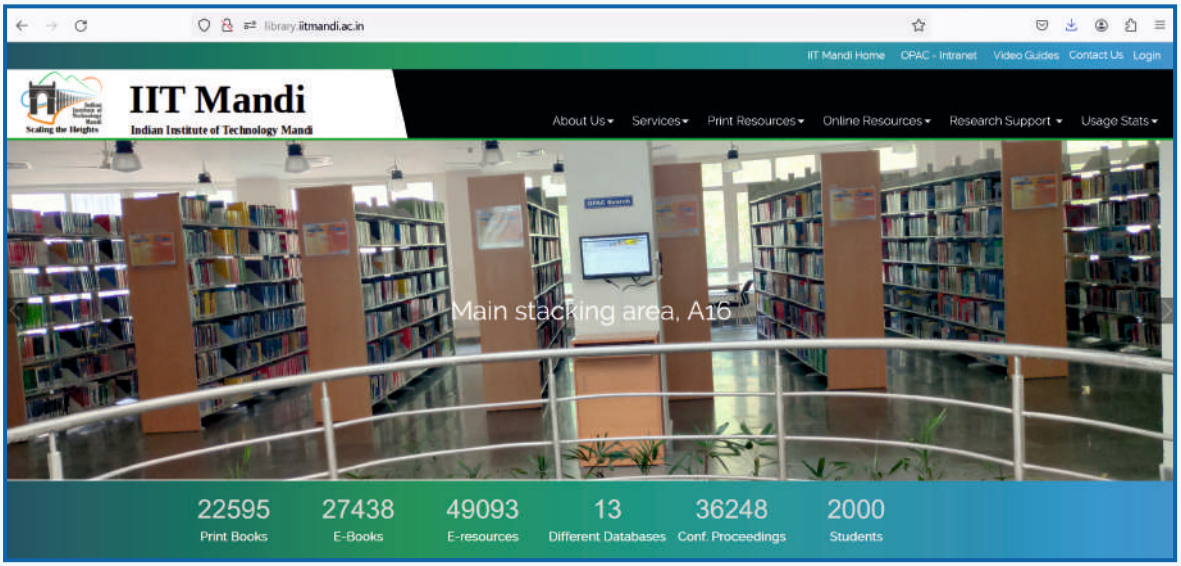
6.4 OPAC (On-line Public Access Catalogue)

The OPAC is one of the most heavily used databases of the library and is accessible 24*7 via library web page (http//www.webopac.iitmandi.ac.in/). Besides listing all the documents available in the library, it allows on-line renewal and reservation, circulation and tells the current status of each & every book. OPAC is searchable by author, title, accession number, subject and several other fields.

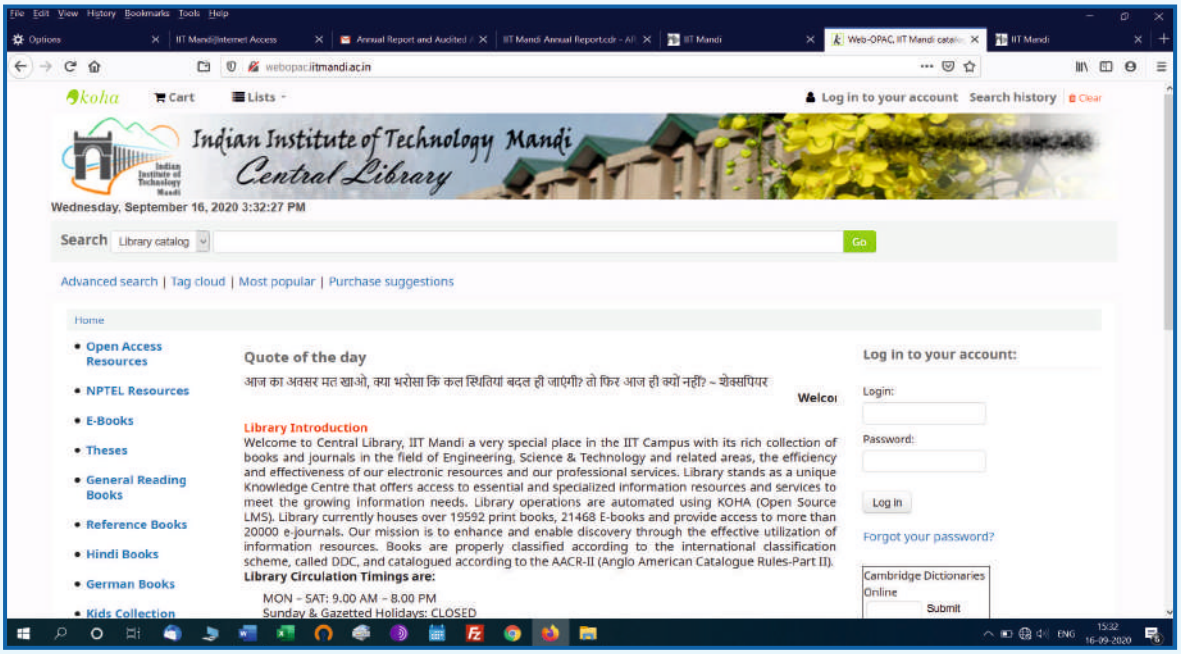
6.5 Services Offered

- Fully automated Circulation facility
- Online book reservation, Information search, Patron's library book loan status check
- Web OPAC (Web based Online Public Access catalogue)
- Reserve collection development for student's in-house reading
- New Arrival Book Section
- Reference Service
- Inter-Library Loan
- Document Delivery Service

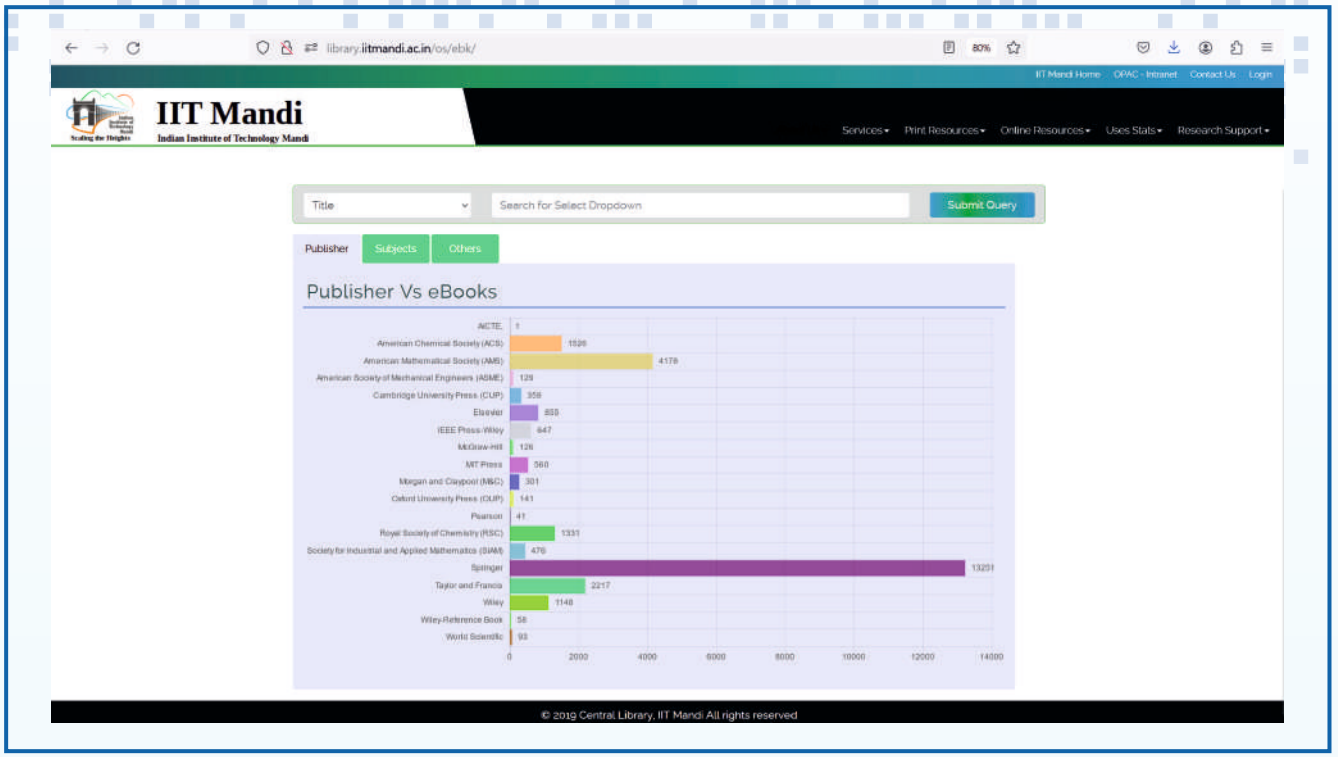
- Information Alert Services
- E-Journals/Databases
- Digital library services
- User education program
- Mobile App Services
- Research Support Service
- Remote Access Service
- RFID
- Subject Guides
- Faculty Research Data
- Institutional Repository
- Institutional Archives



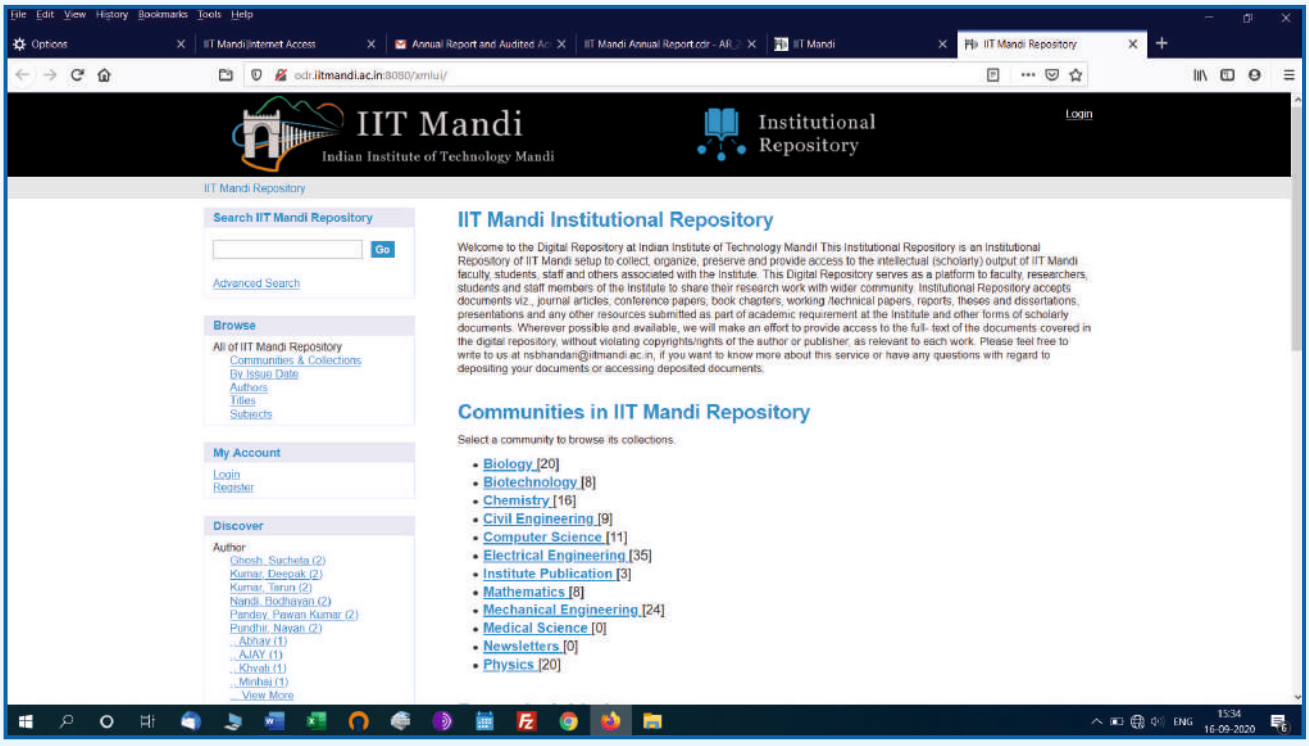
Library Home Page



WEB OPAC



E-Book Portal



Institutional Repository Portal

7. Eleventh Convocation

As part of this Convocation 244 B.Tech. students, 112 M.Tech., 124 M.Sc. (Chemistry, Mathematics, Physics), 15 M.A. in Development Studies, 10 M.S. (by Research) and 56 Ph.D, 01 I.Ph.D, 01 Dual Degree(M.Tech+Ph.D). Scholars graduated from the Institute.

Sl.No.	Roll No.	Name	Medal/Prize
1	B19003	Aditya Sarkar	President of India Gold Medal
2	B19001	Aarushi Gajri	Institute Silver Medal: B.Tech. Bio Engineering
3	B19026	Amit Kumar Singh	Institute Silver Medal: B.Tech. Civil Engineering
4	B19025	Aditya Singh Chauhan	Institute Silver Medal: B.Tech. Computer Science & Engineering
5	B19124	Aaron Thomas Joseph	Institute Silver Medal: B.Tech. Data Science & Engineering
6	B19127	Anshika Bajpai	
7	B19003	Aditya Sarkar	Institute Silver Medal: B.Tech. Electrical Engineering
8	B19048	Nilaksh Pundir	Institute Silver Medal: B.Tech. Engineering Physics
9	B19261	Rishav Raj	Institute Silver Medal: B.Tech. Mechanical Engineering
10	B19187	Pritish Chugh	Director's Gold Medal
11	B19169	Kratika Gupta	Rani Gonsalves Memorial Medal
12	B19224	Tandel Jainan Nareshkumar	Balasundaram Endowment Prize in German
13	T21202	Sudhanshu Gangawar	Institute Gold Medal: Among PG Programmes: M.Tech. Mechanical Engineering with Specialization in Energy Systems
14	V21051	Mohit Singh Karki	Institute Silver Medal: M.Sc. (Applied Mathematics)
15	V21027	Shubhangi Goyal	Institute Silver Medal: M.Sc. (Chemistry)

16	V21104	Neha Bhatia	Institute Silver Medal: M.Sc. (Physics)
17	A21014	Shelja	Outstanding Academic Achievement Award: M.A. in Development Studies
18	T21167	Deepa Mehta	Outstanding Academic Achievement Award: M.Tech. in Biotechnology
19	T21005	Anamika Kumari	Outstanding Academic Achievement Award: M.Tech. Communication and Signal Processing
20	T21045	Anmol Agrawal	Outstanding Academic Achievement Award: M.Tech. Computer Science and Engineering
21	T21202	Sudhanshu Gangwar	Outstanding Academic Achievement Award: M.Tech Mechanical Engineering with Specialization in Energy Systems
22	T21244	Vivek Kumar Singh	Outstanding Academic Achievement Award: M.Tech. Materials and Energy Engineering
23	T21290	Md Armanul Hoda	Outstanding Academic Achievement Award: M.Tech. Structural Engineering
24	T21126	Shakti Singh	Outstanding Academic Achievement Award: M.Tech. in VLSI
25	S19024	Anuj Kumar Rao	Ms. Kiran Bala Arora Memorial Award

8. Students' Amenities and Activities

At IIT Mandi, student amenities and activities are expertly managed, with students playing a key role in their execution. Guided by the Dean of Students, the efforts aim for excellence. In the academic year 2023-24, various initiatives enhanced student life, focusing on career development, placement facilitation, and a supportive environment for academic and professional growth. Student-led initiatives foster a dynamic community, addressing holistic well-being and mental health. The institution's commitment to academic excellence and personal growth ensures a rich tapestry of experiences for all students.

8.1 Career and Placement Cell

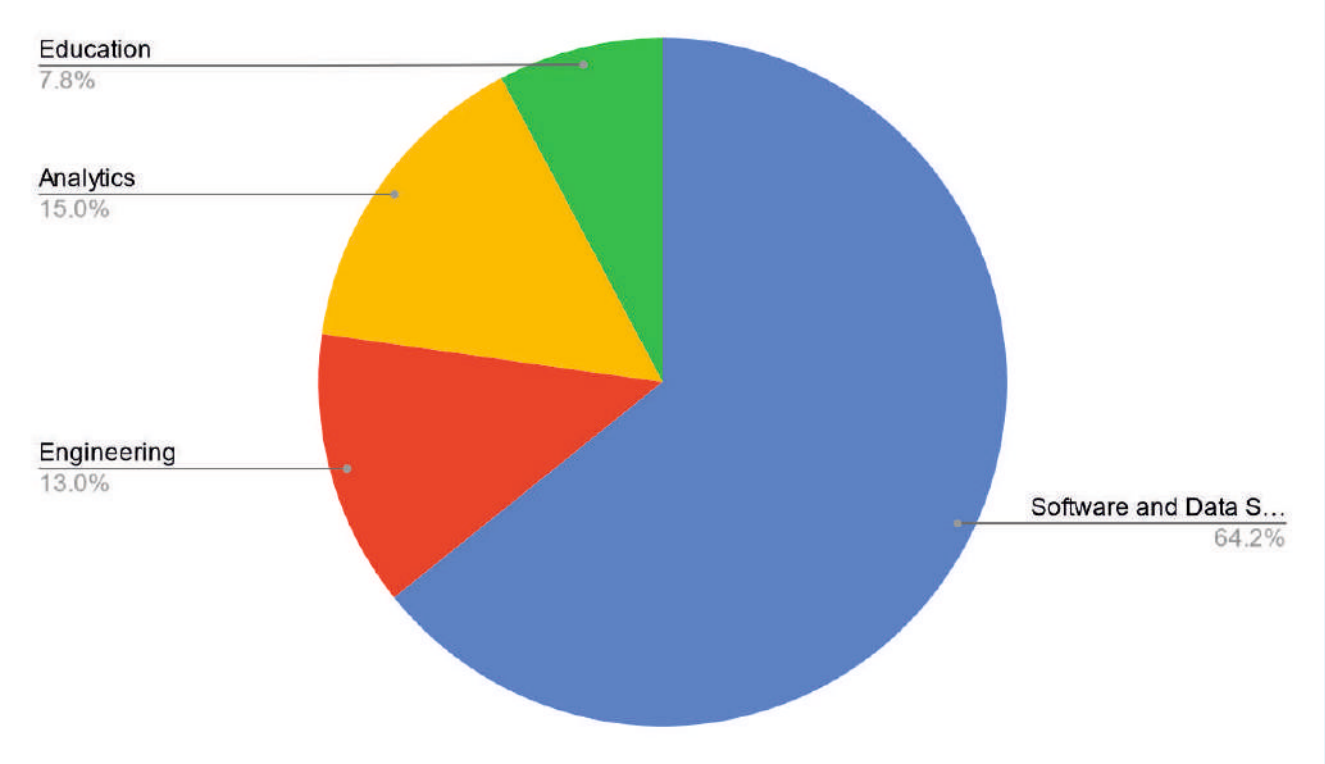
The Career and Placement Cell (CnPC) assists students in finding suitable careers by organizing a variety of career guidance sessions. Additionally, the CnPC conducts campus internship and placement drives, attracting companies from various domains to recruit interns and employees from IIT Mandi.
The Career and Placement Cell organized the following career sessions during the academic year from April 2023 to March 2024:

1. A comprehensive understanding of the AI/ML career landscape, an overview of TLP (curriculum, career outcomes, and scholarships), and a brief of career paths in technology leadership on 12 May 2023.
   Speakers: Vineet Gupta, Founder & Trustee, Plaksha University, Dr. Saumya Jetley, Associate Dean, Academics, Plaksha TLP, Career Advancement Team, and Alumni Speakers.
2. Career Guidance session for Electrical Branch on 24th June 2023:
   Speakers: Tanmay Mahendrakar, B.Tech in Electrical Engineering (2019 - 2023) Working at ARM, and Shrinivas Khatavkar, B.Tech in Electrical Engineering (2018 - 2022) Working at Ceremorphic.
3. Career Guidance Session for Engineering Physics Branch on 25th June 2023:
   Speakers: Yuvraj Misra, B.Tech in Engineering Physics (2019 - 2023), Upcoming MS at the University of Illinois Urbana Champaign(ECE).
4. Career Guidance Session for Bioengineering Branch on 30th June 2023:
   Speakers: Shivangi Kataria, B.Tech in Electrical Engineering (2013 - 2017), MS in Biostatistics from Boston University School of Public Health (2018-2019), currently Working at Syneos Health.
5. Career Guidance Session for Non-Core on 1st July 2023:
   Speaker: Sahas Goyal, B.Tech in Mechanical Engineering (2019 - 2023), Currently Officer Engineer At Hindustan Petroleum Corporation Limited.
6. Career Guidance Session for Civil Engineering Branch on 5th July 2023:
   Speaker: Ankit Gupta, B.Tech in Civil Engineering (2018 - 2022), Currently working at Amazon as Operations Manager.
7. Career Guidance Session for Computer Science Engineering branch on 8th July 2023:
   Speakers: Abhishek Sharma, B.Tech in Computer Science Engineering (2015 -2019), Software Development Engineer (SDE2) at AWS Security, Abhigyan Khaund, B.Tech in Computer Science Engineering (2016 - 2020), Software Engineer at Palantir Technologies, Piyush Goyal, B.Tech in Computer Science Engineering(2018 - 2022), Software Engineer at Google London.
8. Career Guidance Session for Mechanical Engineering on 9th July 2023:
   Speakers: Kunal Gour, B.Tech in Mechanical Engineering (2014-2018), Growth Product Manager at Bolt.Earth, Chaman Kumar, B.Tech in Mechanical Engineering (2014-2018), Senior Product Manager at Addverb, Nikhil Kaushik, B.Tech in Mechanical Engineering (2014-2018), Scientific Officer at Nuclear Power Corporation of India Limited, Saurabh Agarwal, B.Tech in Mechanical Engineering (2014-2018) Graduate Analyst at Barclays.
9. Career guidance session for IAS aspirants on 7th October 2023:
   Speakers: Navneed Chhabra (Academic Coach, Next IAS) and Pulkit Singh (IAS, Air-26, CSE 2020).
10. Career guidance session for GRE and TOEFL on 18th November 2023.
    Speakers: Navneen Kumar and Munish Modi
11. Foreign Research Internship and MS Guidance Session for Mechanical Field on 30th April 2024.
    Speaker: Gaurav Bhutani (Assistant Professor, School of Mechanical and Materials Engineering, IIT Mandi)
12. Foreign Research Internship and MS Guidance Session For Electrical Field on 1st May 2024.
    Speaker: Dr. Srikanth Sugavanam (Assistant Professor, School of Computing and Electrical Engineering, IIT Mandi)
13. Foreign Research Internship and MS Guidance Session for Civil Field on 2nd May 2024.
    Speakers: Dr. K V Uday (Associate Professor, School of Civil and Environmental Engineering, IIT Mandi), Dr. Ashutosh Kumar (Assistant professor, School of Civil and Environmental Engineering, IIT Mandi), Dr. Maheshreddy Gade(Associate Professor, School of Civil and Environmental Engineering, IIT Mandi).

Few Employers of Our Students

amazon, Texas Instruments, Google, Qualcomm, Larsen & Toubro, Microsoft, D E Shaw & Co, NVIDIA, ORACLE, Bharat Petroleum, AMD, HP, DELL, Bharat Electronics, Adobe, sprinklr, AIFUL Corporation, mindtickle, Uber, C-DOT, TATA, TATA ELECTRONICS, Walmart, intel, HDFC BANK, zomato, hilabs, Jaguar, Land Rover

Sector wise Placement of 2023-24



Placement drive 2023-24 till March 31st 2024

Total Number of FTE offers	303
No of internship offers	234
No.of international offers	16
No. of PPOs	78
No. of companies hosted	192

All IITs' Placement Committee (AIPC)

AIPC is a national body of all the IITs looking after smooth conduct of the Placements drives at IITs and maintaining smooth relations between the Companies and the IITs in the benefit of the students. Recently, the 40th meeting of the AIPC was held on 24th of February, 2024, at IIT Mandi.

MoUs/MoAs

- IIT Mandi has signed MoU with the Willings, Inc., Japan to get various opportunities for Internship and Placements for our students.
- IIT Mandi has signed MoA with Internshala.

8.2 Guiding and Counselling Services

Apart from the routine psychological assessment, therapy sessions, and the facilitation of counselling for students and staff who are in need, the Guidance and Counseling Service (GCS) conducts various student outreach, wellness, and motivation activities throughout the year. The details of the activities carried out by the GCS in the year 2023–24 is as follows:

1. Orientation programs for PG and PhD students: For PG and PhD students, Online Orientation programs were organized. The program includes sessions on academic and professional skills. These included sessions on Professional ethics and etiquette, Study hacks: reading, listening and note taking, presentation skills and public speaking, work-life balance, handling stress and managing failure, creating a professional and gender sensitive work environment, introduction to international opportunities, campus facilities like library, high performance computing facility and session by teaching and learning committee regarding TA responsibilities etc.

2. *"SAHYOG"* Inter IIT Wellness Meet: A wellness meet was organized by the IIT Roorkee on 13th and 14th of Feb. 2024, the two-day Sahyog Conference, which focused on addressing the challenges related to student wellness in all IITs. IIT Mandi participated and gives its presentation of best practices, challenges and future planning. All IIT's Counsellors and DOSA, Associate Deans, Assistant Registrar (student) were invited.

Besides, following are other activities under GCS

- Wellness and Mental health and Awareness Campaign.
- Workshop on "Goal Setting": conducted on 7th April 2024, Speaker- Mr. Rizwan Uddin.
- Workshop on "Unlock your happiness": conducted on 27th April 2024.

Workshop-cum-training programme on suicide prevention: A workshop entitled "Words That Matter: Skills to Support the Ones in Distress" was Organized for NSS Volunteers, GCS Volunteers, Care taker and hostel staff on 3rd May 2024, Speaker- Ms. Sanjana Roy (From Yourdost).

Guest Lectures

- Knowing your self-worth, guest lecture by Mr. Kevin Simon in March 2023.
- 7-day induction programme (7 DIP) with emphasis on holistic development through the Indian knowledge system. Respective field experts delivered their lectures as well as various activities during the induction programme.
- Lecture on "Anti-ranging" by Dr. Sandhya Prakash, Oct. 2023.
- Lecture on 'Anti-ragging and drug abuse" by Mr. J. P. Singh, IGP Shimla in Nov. 2023.
- Lecture on how to "Gain and sustain a successful career" by Mr. J. P. Singh, IGP Shimla, Nov. 2023.
- Conducted *Open House* with emphasis on course curriculum, campus life, and opportunities.

Group sessions

- What is mental health? Understanding and embracing individual differences, Feb. 2023.
- Understanding mental health warning signs and management, April 2023.
- Understanding academic and career stressors, June 2023.
- Mindfulness and relaxation session, July 2023.
- Communication skills module: assertive communication, language barriers, non-verbal vs verbal communication, digital communication, October 2023.
- Expressive arts- self-awareness, emotional intelligence, Sep. 2023.
- Mastering interviewing skills, Nov. 2023.

8.3 Students Gymkhana Report (2023-24)

Students Gymkhana under Dean Students Office is a unit which facilitates and coordinates with students in organizing activities and events. The unit is comprised of 08 different societies which are further divided into various clubs. The eight (08) societies of Gymkhana are:

- Cultural Society
- Technical Society
- Literary Society
- Sports Society
- Research Affairs Council
- Hostel Affairs Council
- Academic Affairs Council (UG)
- Academic Affairs Council (PG)

Besides, above 8 societies, NSS unit of the IIT Mandi also works as an important element of Gymkhana.

Gymkhana held many activities and events during the year 2023-24. These activities were held in coordination with all departments/ sections of the institute. All societies under Gymkhana played different roles in organizing events and activities. Society Secretaries and Club Coordinators were in strong support in all the activities of the institute. Following are the major and important events organised by the Student Gymkhana under Dean Students Office.

Yuva Sangam 2.0: In May 2023, the Dean of Students Office at IIT Mandi organized Yuva Sangam 2.0 under the Government of India's "Ek Bharat Shreshtha Bharat" initiative, which promotes cultural exchange and unity among different states. From May 18th to 22nd, IIT Mandi hosted 45 young individuals aged 18 to 30, offering them a chance to explore Himachal Pradesh.

SPICMACAY: During the year 2023-24, Dean students office hosted and organized various cultural events under the flag of SPICMACAY. These events include following:

i. Santoor Vaadan by Padma Shri Pandit Satish Vyas.
ii. Himachali Folk Songs/Dance by AASRA Association and Chureshwar Group.
iii. Sitar Vaadan by Pandit Shubhendra Rao.

Virasat: From November 16-18, 2023, SPICMACAY organized Virasat, a three-day celebration of art, heritage, and education at IIT Mandi. This event highlighted the institute's commitment to promoting cultural diversity and exploring rich artistic traditions. Madhubani artist Mr. Manoj Kumar Chaudhary conducted a workshop on Madhubani painting. The first night featured a captivating Kathak performance by Sahitya Academy winner Pandit Rajendra Gangani Ji. The second evening showcased Rajasthani folk songs by celebrated vocalist Sh. Anwar Khan Langa and his team. On the final day, Ms. Sudha Raghuraman mesmerized the audience with her soulful Carnatic singing.

La-Faguli Fiesta: La-Faguli Fiesta is the annual prize distribution function of Dean Students Office. The prizes were given in different categories to society and club representatives, faculty advisors and staff. This year best representatives and volunteers were given Emerald and Sapphire awards who worked for the smooth functioning of societies and clubs. The other awards included best FA award, best employee under Gymkhana and Hostels, best caretaker, best Rakshak etc. Other than awards, service certificates were also given to all those who worked under Dean students office during the year 2022-23.

Azadi ka Amrit Mahotsav: "आज़ादी क़ा अमृत महोत्सव" was an initiative of the Government of India to celebrate and commemorate 75 years of independence of India and the glorious history of its people, culture, and achievements. At IIT Mandi, Dean students office actively organized various activities, commensurate with the idea of Azadi Ka Amrit Mahotsav. To celebrate, following activities were organized to make this campaign a great success:

i. Aatmanirbhar Bharat Abhiyan - Sale Counters for Local Products
ii. Health and Wellness-Groups Discussion on Millets
iii. Women & Child Welfare: Painting Competition among school students
iv. Lifestyle for Environment (LiFE)-Plantation Drive
v. Tribal Empowerment- A Bike Ride to Lahaul & Spiti valley

International Day of Yoga: On the auspicious occasion of the International Day of Yoga (IDY) on June 21, 2023, IIT Mandi was transformed into heaven of tranquillity and well-being as students, faculty, and staff came together to celebrate the ancient practice of yoga. The festivities extended across both campuses of the institute, fostering a sense of unity and wellness.

International Year of Millet 2023: Thanks to the efforts of the Government of India, the United Nations declared 2023 as the International Year of Millets (IYoM 2023). In November 2023, the Dean of Students Office at IIT Mandi organized a week-long series of events dedicated to IYoM activities. These events aimed to raise awareness about the nutritional and health benefits of millets and promote their use. Activities and competitions were held to emphasize the importance of millets in our daily diet and their suitability for cultivation under adverse and changing climatic conditions. The list of activities conducted during the week includes:

- Rangoli Making Competition
- Quiz Competition
- Poster Making Competition
- Slogan Writing Competition
- Introducing Millet based Kheer in Student Mess Menu

National Unity Day: On October 31, 2023, the Institute celebrated the *National Unity Day* or *Rashtriya Ekta Diwas* to commemorate the birth anniversary of Sardar Vallabhbhai Patel, the Iron Man of India. As a remembrance to Sardar Patel, the Sports Unit of Dean students office organized *Unity Run* with an active participation of students, faculty and staff. Besides, more than 100 students participated in the National Unity Day Pledge taking ceremony, which was organized by NSS unit of Dean Students office.

Khadi Mahotsav: To promote Khadi among new generation, Dean students office organized Essay writing and Elocution competitions. To celebrate the legacy and relevance of khadi, an essay competition on the topic of importance of khadi was held. The students were asked to write an essay highlighting the various aspects of Khadi such as its history, philosophy, aesthetics, sustainability and contemporary appeal. Also, an Elocution competition on the topic of importance of khadi was conducted. All the winners of competitions were presented different gift items purchased from diverse range of products available at the portal of Khadi India.

Fit India Week: During the second half of November and the first half of December 2023, IIT Mandi actively participated in the nationwide 'Fit India Week' campaign, aligning with the Government of India's initiative to promote a healthier and fitter nation. The Sports Unit, under the Dean of Students Office, spearheaded the campaign to motivate and engage the IIT Mandi community. The highlight of Fit India Week was the organization of various indigenous games, fostering cultural pride and encouraging participation in physical activities beyond conventional sports. Traditional games like rope jumping and Kho-Kho transformed the campus grounds into lively arenas for friendly contests and fitness challenges. Additionally, yoga sessions aimed at promoting holistic well-being were organized, along with a diverse range of sports events including Table Tennis, Badminton, Volleyball, and Cricket.

Jan Jatiya Gaurav Diwas Mahotsav: At IIT Mandi, the Dean of Students Office organized a week-long celebration to honor Bhagwan Birsa Munda's birthday, a revolutionary leader from Bihar (now Jharkhand). On November 16th, Birsa Munda's birthday, a floral tribute was held where faculty, staff, and students offered flowers. The event included a three-day tribal painting workshop led by Mr. Manoj Kumar Choudhary, who taught the basics of Madhubani painting. A one-day tour to a nearby tribal village was organized for faculty and staff. The celebration culminated with an event that explored various aspects of tribal culture, music, and community life. Eminent speakers from North-East states, including Assam, Tripura, and Manipur, shared insights into their tribal heritage.

A Series of Guest Lectures from *Vedic and Scientific Research Foundation:* During the 7 Days Induction Program, for freshers of UG batch, Dean students office held a series of lectures on Ancient Indian Knowledge and Vedic sutras. Five distinguished speakers affiliated with the *Vedic & Scientific Research Foundation, Chennai*, were present at the institute to impart their knowledge to students through a series of lectures. The purpose of this lecture series was to give the students of IIT Mandi a deep sense of belongingness towards our rich culture and scientific knowledge which is embodied in our ancient books. Before indulging into the modern aspects of this scientific knowledge, students must know the roots of the knowledge which is now encapsulated in their text and course books.

Other Activities and Events: In addition to the above-mentioned activities, following events were also organized under Dean Students office:

i. Single Use Plastic Campaign: A campus wide campaign in which the IIT Mandi community has been sensitized and motivated to avoid the usage of single use plastic.

ii. World Environment Day-Cleanliness drive: A cleanliness drive was organised along side the stream of Uhl river, North and South campus.

iii. Pariksha Pe Charcha: A live webcast of Pariksha Pe Charcha was arranged for the students of IIT Mandi, under the auspices of the Dean students office.

iv. Landing of Chandrayaan-3 on Moon: On 23 August 2023 a live webcast of the landing of Chandrayaan-3 on the moon was arranged for the IIT Mandi community, in the auditorium.

v. Workshop on Anti-Ragging: In an effort to promote a safe and respectful institute environment, Dean students office organized a comprehensive workshop on anti-ragging titled, *"Workshop on Anti-Ragging: Where Do You Draw the Line"*. The event took place at the auditorium of the institute and featured a thought leader Mrs. Sandhya Prakash.

vi. A Workshop on Anti-Ragging & Drug Abuse: Dean students office organized a workshop on the topic of Anti Ragging and Drug Abuse. The guest speaker for the program was Mr. J.P. Singh, the IGP of Himachal Pradesh Police and an IPS officer of 2000 Batch.

vii. A Talk on How to Gain and Sustain a Successful Career: Dean students office organized an awareness program on the topic of *'How to Gain and Sustain a Successful Career*', as part of the career guidance and counselling initiative for the students. The guest speaker for the program was Mr. J.P. Singh, the IGP of Himachal Police.

Students Events: Students Gymkhana is the unit which gives full support for the events of the students of the institute. The legacy of IIT Mandi students has been of conducting various vibrant and joyful events in the institute. These events are conducted on the intra and inter-institute level. Students organized following 3 major events during the year 2023-24:

Xpecto: Science & Technology Club (SnTC) hosted the first-ever technical fest of IIT Mandi, Xpecto. The event received 7000 plus registrations from different colleges, institutions and universities. More than 1000 colleges participated in various events, webinars, workshops conducted during the fest. A total of 1139 teams competed against each other showcasing their technical skills and expertise in their respective domains. School students from JNV Mandi and DAV Ner-Chowk also witnessed this extravaganza. As a reward for excellence, a prize-giving event was held to honor the best of the bests.

Exodia: The Cultural and Literary Fest of IIT Mandi - Exodia was organised after a gap of 3 years. The event witnessed 30 + events along with pronites and talks by famous artists. The participants from different colleges participated in various events and competitions such as robotics, coding, gaming, quiz, debate, fashion show, etc. More than 16 colleges participated in the fest. The Fest was organized by the Cultural and Literary Society collaboratively under Students Gymkhana.

Anusandhan 2.0: The annual research fair of the institute, Anusandhan, organized by the Research Council in association with the Society for Collaborative Research and Innovation (SCRI), focused on the approach to engaging with experts and distinguished agencies from other institutes across the world. *Anusandhan* is primarily dedicated to celebrating the research atmosphere and scholastic engagements. The researchers from diverse backgrounds viz. Fundamental Sciences, Humanities and Social Sciences, Engineering, and Management engaged with their thought-provoking ideas, and research-based works to collaborate with other fields of knowledge and engage with interdisciplinary approaches.

National Service Scheme (NSS): NSS is a voluntary group of students working for the betterment of the community around them. They are the social workers of the institute striving for an improved society around them. The motto of NSS is "NOT ME BUT YOU".. In the institute, following activities have been conducted during the reporting period from April 2023 to March 2024:

- NSS Orientation and NSS Write up
- Plantation Drive at North campus
- Painting Competition on "Population Day"
- Cleanliness Drive at North Campus
- Plantation Drive at South Campus
- Painting Competition on theme *"Beti Bachao Beti Padhao"*
- Movie Screening under *"Aazadi Ka Amrit Mahotsav"*
- Outreach Activity "To Promote Sanskrit Language"
- Competitions on HIV Awareness at GSSS Kamand
- Talk on HIV Awareness
- Awareness Session on HIV/AIDS at GSSS Triyambali

- Donation Collection
- Awareness Session on HIV/AIDS at GSSS Katoula
- A Visit to DMJ Anathalaya Dehar
- A Visit to Special Kids Home Gutkar during Diwali
- National Unity Day Celebration
- Blood Donation Camp
- Youth Day Celebration
- NSS Special Camp-2023
- Running/Meditation/Yoga
- Cleanliness Drive
- Plantation
- Village Visit
- Talk/Interaction Session on Benefits of Donating Blood
- Movie Screening
- Women Day Celebration
- Talk on Oral Health and Dental Check-up Camp

Students Achievements

- Two different teams from IIT Mandi grabbed 1st and 3rd Positions in PAN IIT Gen-AI Hackathon 2024 organized at IIT Kharagpur. Teams have secured their positions among 153 teams from all IITs.
- IIT Mandi won Bronze Medal in Mphasis Foundation - Quantum Computing Challenge of PAN IIT Technical Meet 2023 IIT Madras.
- Among 1000 teams, 'Team IIT Mandi' secured the position of Runner's up in Students Innovation Festival (SIF) - Space Hackathon 2023 organized by Hack2Skill, under the auspices of the Indian International Science Festival and mentored by the Indian Space Research Organization (ISRO).
- Mr. Keshav Verma has contributed to developing a Neonatal Incubator, which is now a part of the startup, which has recently been selected for the prestigious Stanford Biodesign Innovators Garage Program.
- Literary and Cultural clubs won one Silver and two Bronze medals in Literary and Culinary Arts respectively in Inter-IIT Cultural Meet 6.0, Kharagpur. Also, IIT Mandi grabbed overall 3rd position in Culinary Art.
- Student members from MTB Club, Sports Society has successfully finished bicycle expedition to Ladakh in June 2023.
- IIT Mandi won 2 Gold and 1 Silver medals in District Table-Tennis Championship in Mandi district.
- Mr. Nippun Sharma led Akatsuki team grabbed third position in the Smartathon Challenge (Smart Cities Challenge) at Global AI Summit held in Riyadh, Saudi Arabia in Sept 2023. The team has been awarded a winning amount for Rs. 12.14 Lakh.

9. Resource Generation & Alumni Relations

Dr. Varun Dutt has taken over the charge of the Dean Resource Generation and Alumni Relations (DORA) from Prof. Chayan K. Nandi (see Figure 1) who led the section from April 6th, 2022 to April 8th, 2024.

Figure 1. Transfer of the charge of DORA

About DORA

The office works extensively towards arranging financial resources to meet the growing needs of IIT Mandi through corporate connections, philanthropists, and alumni. The office actively conducts several activities including campaigns involving fundraising to support research and excellence at the Institute, creating centers in emerging areas of science and technology, endowments for faculty chairs, honoring and awarding alumni, providing scholarships/fellowships to students, and promoting infrastructure growth of the Institute. The DORA office engages in creating multiple events and global outreach programs with our alumni, corporates, and philanthropic organizations. The DORA office works hard to stay connected with its alumni and other stakeholders to ensure mutual growth and success. The Institute is grateful for generous and philanthropic contributions from different alumni and stakeholders.

AIM of DORA

The DORA aims to establish sustainable relationships with alumni, corporates, and other stakeholders, for resource generation. The office works extensively to arrange financial resources to meet the growing needs of IIT Mandi through corporate connections, philanthropy, and alumni. The office actively conducts several activities including campaigns involving fundraising to support research and excellence at the Institute, creating centers in emerging areas of science and technology, endowments for faculty chairs, honoring and awarding alumni, providing scholarships/fellowships to students, and promoting infrastructure growth of the Institute. The DORA office engages in creating multiple events and global outreach programs with our alumni, corporates, and philanthropic organizations. It also organizes the Reunion and recognizes the achievements of the Institute's alumni by nominating them for the "Young Achiever Award (YAA)". Table 1 displays the name and designation of the team DORA.

Activities of DORA

1. Resource Generation

Building relations with

- Philanthropists
- Foundations
- CSR Heads of the companies
- PSU
- NRIs
- Embassy & their corporate associations
- Alumni

Purpose for Resource Generation

- To support students in terms of scholarship/ travel support/ tuition fees

- Student/Faculty exchange program
- Faculty Chair Professor
- Institute Infrastructure building
- Creating a Center of Excellence
- Lab Establishment
- Endowment
- Support for organizing the Cultural/ Technical Fests and other events of the Institute

More than 150 Organizations/Philanthropists have been approached for funding support.

MoUs signed

- With TCS for Research Scholarship Program
- With Willings, Japan for placements, summer internship and joint research activities

Scholarships and beneficiaries details

- Sri Badrika Ashram (SBA) Scholarship - 14 UG students
- TCS Research Scholar Program - 01 PG student
- PanIIT scholarship scheme titled “Vidyalakshmi Scholarship Scheme” - 07 UG Students
- Dhawan's Family Scholarship - 03 UG/PG (Himachali Girls Students)
- Foundation For Excellence (FFE) Scholarship - 11 UG Students
- Reliance Foundation Scholarships Program for UG - 01 Student
- Kotak Kanya Scholarship - 01 UG Student

Other Scholarships under follow-up

- Swami Dayanand Education Foundation's "merit-cum-means scholarships"
- Panasonic Ratti Chhatr Scholarship
- Amazon Future Engineer Scholarship (AFE) (from Foundation For Excellence (FFE))
- Reliance Foundation Scholarships Program for UG and PG students
- SPDC Scheme (Scholarship Programme For Diaspora Children)
- National Scholarship for Higher Education of ST students
- Scholarship for PG/PhD/Postdoctoral Studies Abroad JN
- Tata Endowment Loan Scholarship
- Your Space Scholarship
- State Bank of India Foundation (SBIF) Scholarship

Meetings with the CSR Head of the companies for collaborations and funding support

We have organized several meetings with Eicher Group, Arista Network, Col-Pal, Willings, Otsuka, Tonichi, etc, and presented the proposals in line with their CSR focus areas. Discussions with these companies are in the next stage and follow-up meetings are being planned which hopefully will lead to generating some funds in the near future.

2. Building relationships with the Alumni

The IIT Mandi Alumni Association is an incredibly valuable resource for the community. It proudly serves as the official association for alumni around the world, providing them with unwavering support and unparalleled opportunities. The association's network of alumni and friends is dedicated to promote the Institute, providing graduates with job opportunities, and offering guidance and inspiration for academic/research work. With its vast array of networking opportunities, professional resources, and Institute-led trips, the association ensures that its members have access to the best connections and experiences available. Through its unwavering commitment to fostering relationships with accomplished and knowledgeable alumni and friends, the association continues to lead the way in supporting the success of its members. Our goal is to keep our Alumni connected with each other and with IIT Mandi.

Alumni Portal

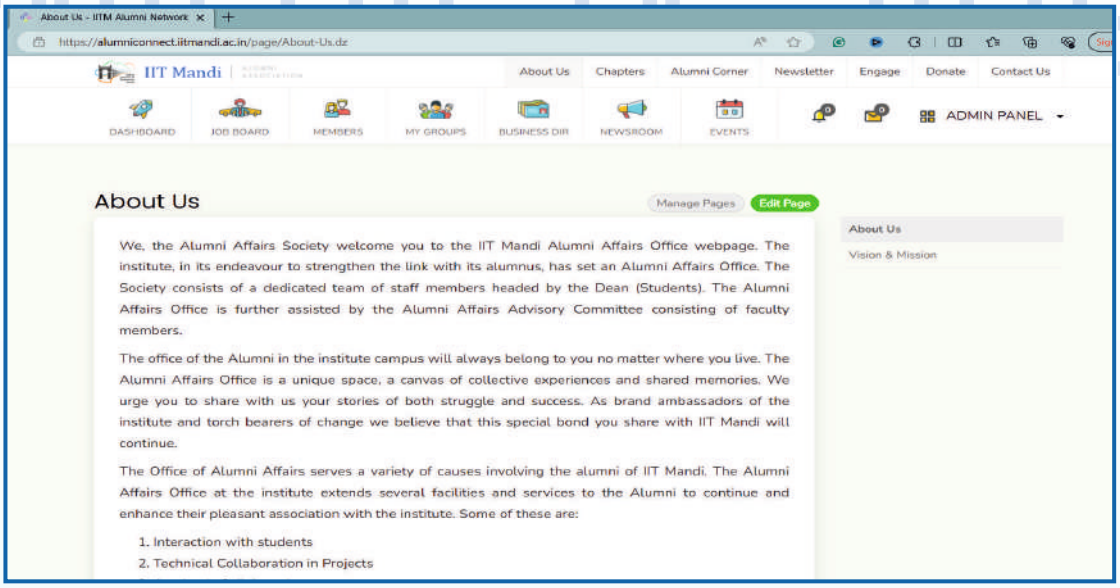


Figure 2. Alumni Connect Portal

To Connect with **The Official Alumni Network of Alumni Association IIT Mandi,** please follow the link https://alumniconnect.iitmandi.ac.in (Figure 2 shows the alumni connect portal).

Total number of Alumni

- 2997 (till last Convocation)

Membership Benefits

- Stay connected with batchmates and friends
- Can take part in networking opportunities organized by IIT Mandi
- Enjoy various on- and off-campus alumni events
- Become influential ambassadors of your alma mater in the corporate world

Alumni Chapters

Total No. of Alumni Chapters (International): 03

- USA Chapter
- Japan Chapter
- Europe Chapter

Total No. of Alumni Chapters (National): 05

- NCR Chapter
- Bombay Chapter
- Pune Chapter
- Hyderabad Chapter
- Bangalore Chapter

Table 2 consists of the names and other details of the Alumni Chapter Secretaries/Joint Secretaries.

Activities carried out for the Alumni

- Alumni get-togethers and Reunions every year

- Young Achiever Award
- Alumni Chapters Meetings
- Webinar by the Alumni on various topics for current students
- Lectures/ Conferences /Workshops on various topics
- Motivation/sensitization to Alumni for donations at small intervals
- Processing of all the paper formalities for release of caution money
- Career Guidance by the Alumni
- Provided a platform to extend support to the Alumni, as and when required
- Registration of graduands
- Issuance of NOC/Alumni I-cards
- Generation of data for Higher Studies
- Organizing donation drives

Meetings

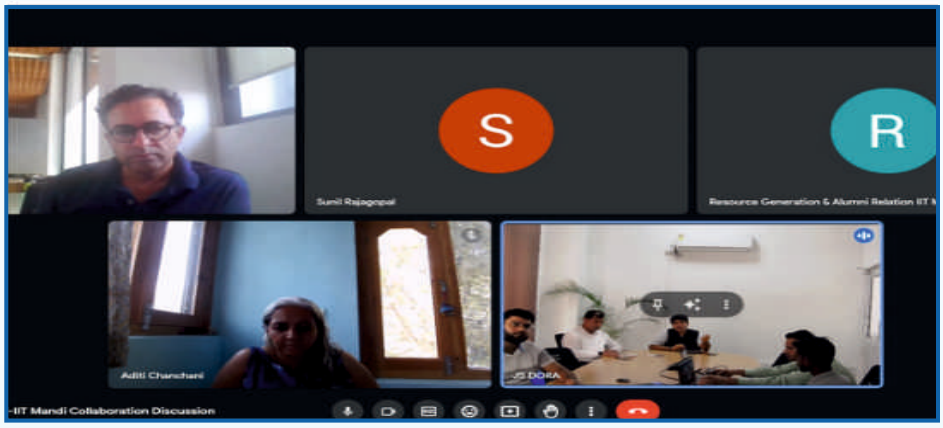


Figure 3. A virtual meeting with the delegates of the EICHER Group Foundation

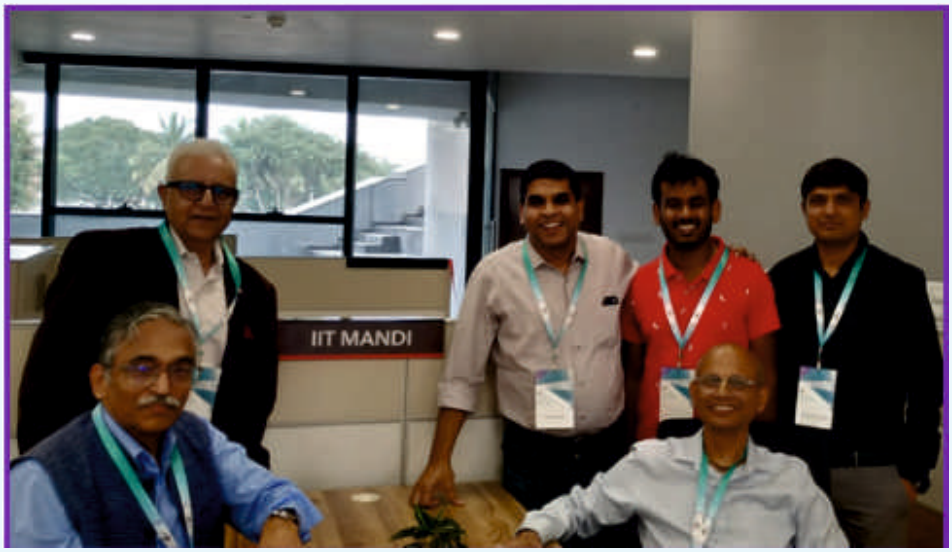


Figure 4. Inauguration of Institute's Office at IIT Alumni Centre Bengaluru (IITACB)

A virtual meeting with the delegates of the EICHER Group Foundation was held on September 4th, 2023 (see Figure 3) to discuss the possibility of collaboration. In line with the discussion held during the meeting, the DORA Office submitted three white paper summaries to the Eicher Group Team. We are following up with them and a response is awaited.

Figure 5. Visit of Japanese delegation to IIT Mandi

IIT Mandi welcomed a Japanese delegation from Tonichi, Otsuka Corp., and Willings Inc. on February 12-13th, 2024, to discover collaboration opportunities (see Figure 5). The visit consisted of a campus tour, discussions on collaboration, and networking sessions for students to explore internships in Japanese industries. The visit was highly successful, leading to various collaborative endeavors such as signing an MoU with Willings for academics, research, and long-term internships.

Alumni Chapters Meetings

Figure 6. Bangalore Chapter Alumni Meet 2023

IIT Mandi Bangalore Alumni Chapter Meet 2023 was a significant gathering on September 9th, 2023 (see Figure 6), hosted by the DORA Office/Institute at the Defense Research Officers Mess, DRDO Township, Bangalore, the event aimed to strengthen connections, and align alumni with the Institute's mission, and inspire contributions. The Director IIT Mandi, DORA and AD SRIC graced the event, shared the Institute updates with the Alumni, and sensitized them to support their Alma Mater.

Figure 7. First-ever Japan Chapter Alumni meet at Tokyo, Japan on July 29, 2023

Figure 7 shows the pictures of the first-ever IIT Mandi Japan Chapter meeting held on 29th July 2023, bringing all the alumni together in Japan. During the get-together, they discussed how they can support their alma mater, what they can donate and also had fun with games and fireworks. Mr. Gopal Krishan Aggarwal and Mr. Chandan Purbia Secretary/Joint Secretary IIT Mandi Japan Alumni Chapter took the lead to make it happen. It was quite a successful meet in which 13 alumni from the different batches participated. Many participants met each other for the first time. The Dean of Resource Generation and Alumni Relations (DORA) graced the occasion with their online presence and shared with everyone a few words about DORA and the Institute in general.

Figure 8. Japan Chapter Alumni meet in Tokyo, Japan, on September 21, 2023

In collaboration with the Secretary, Joint Secretary, and alumni of the Japan Alumni Chapter, the DORA office successfully hosted the second Japan Chapter Alumni Meet in Tokyo, Japan on September 21st, 2023 (see Figure 8). The meeting was a great success, bringing together a diverse group of IIT Mandi graduates residing and working in Japan. Prof. Laxmidhar Behera, Director of IIT Mandi, and Dr. C. S. Yadav, Associate Professor at IIT Mandi, graced the event with their kind presence. This gathering highlighted the enduring spirit of the Institute's alumni community in Japan.

Figure 9. Bombay & Pune Chapter Alumni Meet 2023

Figure 9 shows the Alumni Meet of the Bombay and Pune Chapters on October 27 & 28, 2023. It was a resounding success and fostered connections among alumni. The event featured a warm welcome & inaugural address by Prof. Chaytan K. Nandi (DORA) and Dr. Shubhajit Roy Chowdhury. The networking dinner provided a delightful conclusion, encouraging alumni to reminisce and build new connections. The event strengthened the bond between the Alumni and its alma mater and ensured a memorable reunion.

Figure 10. Hyderabad Chapter Alumni Meet 2023

The Hyderabad Alumni Chapter meet was held on November 26th, 2023, at Flechazo Gachibowli with remarkable success (see Figure 10). The event aimed to strengthen connections and inspire alumni to contribute to their alma mater. It provided a platform for the alumni to interact with each other and enhance their interpersonal relationships. The DORA and the Alumni Advisor graced the event with their presence.

Figure 11. Delhi-NCR Chapter Alumni Meet 2023

The IIT Mandi Delhi-NCR Alumni Chapter Meet was held on November 25th, 2023, at Ambience Mall, Vasant Kunj, with a resounding success (see Figure 11). About 30 alumni attended the event. The event aimed to foster stronger connections, align alumni with the Institute's mission and inspire contributions to their alma mater. With a warm welcome by Dr. Varun Dutt (ADORA) along with AR DORA, a few engaging sessions were organized to provide a platform for alumni interaction and to keep them connected.

Figure 12. IIT Mandi Japan Alumni Chapter meet

Figure 12 shows the IIT Mandi Japan Alumni Chapter meeting held on March 30th, 2024 at Yoyogi Park, Tokyo, with a resounding success. Surprisingly, 21 alumni attended, spanning batches from 2017 to 2025. Highlights included a seminar on the Japanese government's NISA scheme, self-introductions, and discussions on chapter expectations. Feedback showed satisfaction with the event's planning, with suggestions for more provisions. Overall, alumni eagerly anticipate future gatherings.

Figure 13. Visit of a distinguished alumna at IIT Mandi.

Dr. Palvi Agarwal, an esteemed alumna of IIT Mandi who graduated in 2018 with a Ph.D. in Computer Science, visited its alma mater on August 3rd, 2023 (see Figure 13). Her visit was momentous and provided an opportunity to reconnect with the Institute. She shared insights from her post-graduation journey and inspired current students. The visit fostered a sense of pride and connection within the IIT Mandi community.

ALUMNI CONTRIBUTION

Figure 14. Alumni Mr. Aman Grover and Mr. Gopal Krishan Aggarwal demonstrated generosity by contributing to the alma mater.

Mr. Aman Grover (Figure 14), a B.Tech CSE-2016 graduate, donated INR 50,000 to the Alma Mater, showcasing loyalty and gratitude. The donation will support projects and enhance the student experience. Mr. Grover emphasized giving back to his alma mater and received praise from faculty, staff, and students. His generosity may inspire others and strengthen the bond between alumni and the Institute, contributing to its progress and legacy. Following the legacy set in by Mr. Grover, Mr. Gopal Krishan Aggarwal (Figure 14), a distinguished alumnus of the B.Tech. CSE-2017 has made a generous contribution of INR 10,000 to the Alma Mater.

Figure 15. Get-together of IIT Mandi alumni at the Institute Campus.

Figure 15 shows the inaugural alumni get-together of IIT Mandi graduates from the 2013 to 2019 batches held on February 10th, 2024 at the Institute Campus. The event aimed to strengthen alumni connections, align them with the Institute's goals, and encourage contributions to their alma mater. The program included a warm welcome, updates about the Institute, a campus tour, and engaging interaction sessions, followed by a group photo session and lunch. Overall, it was a productive and memorable event.

ALUMNI ACHIEVEMENTS

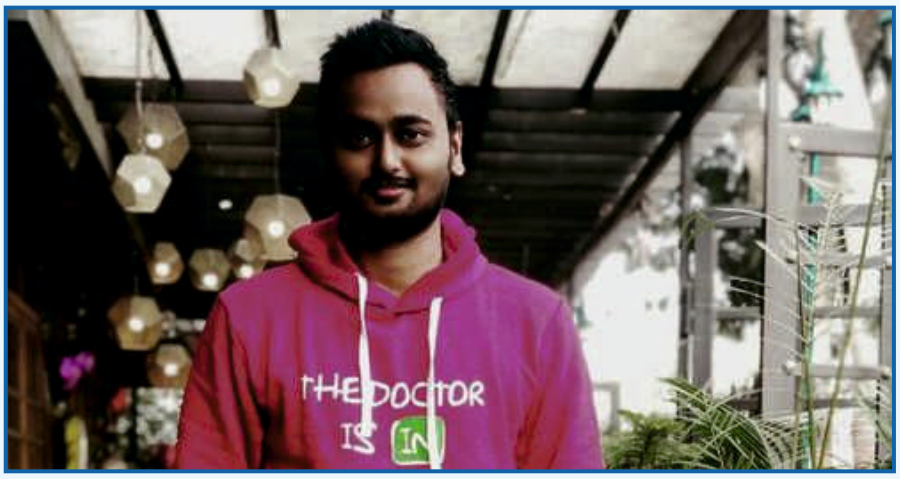


Figure 16. A London-based MNC acquired startup founded by IIT Mandi Alumnus.

Exciting news to share! Nyxion.ai, the innovative AI-powered email marketing startup founded by Mr. Siddhant Mohan (see Figure 16), an alumnus of IIT Mandi from the B.Tech 2014 batch, has achieved a significant milestone. The company has been successfully acquired by a London-based venture capital firm, marking a noteworthy accomplishment for both the founder and the IIT Mandi community.

Figure 17. A proud moment: IIT Mandi alumnus received the "Global 5 Under 35 SFPE Award" in 2023.

Congratulations to our alumnus, Dr. Ankit Sharma (see Figure 17), for receiving the esteemed Global 5 Under 35 SFPE Award, chosen among candidates worldwide in 2023. We are honored to announce that he is the first Indian scientist to receive this award since its establishment and the sole Indian recipient this year across all categories.

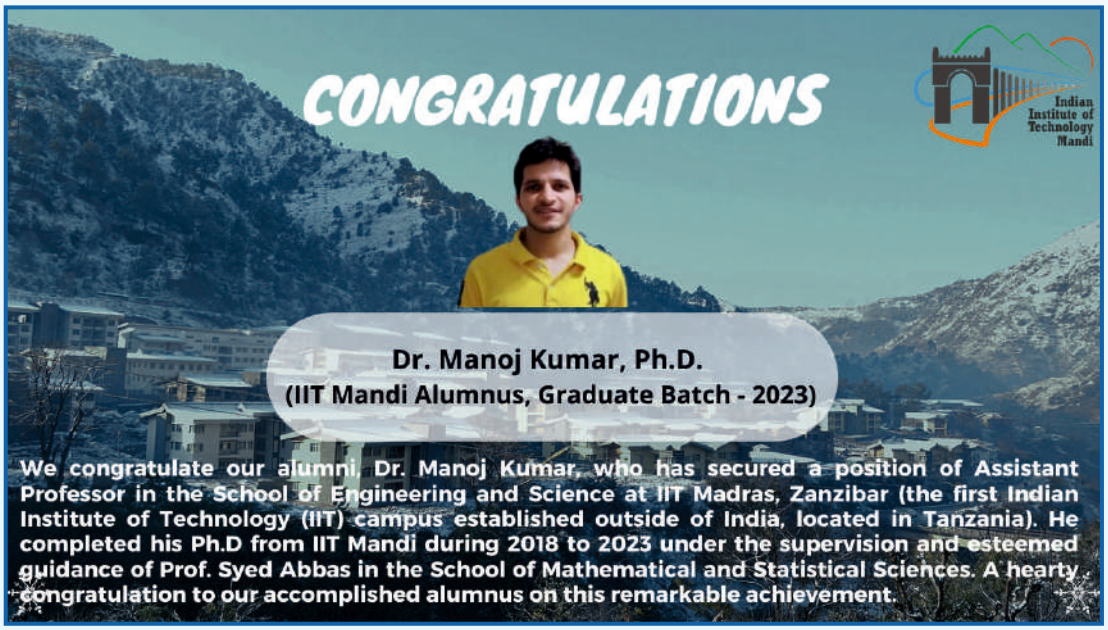


Figure 18. An IIT Mandi alumnus has been appointed as an Assistant Professor at IIT Madras' offshore campus in Zanzibar, Tanzania.

We are thrilled to announce that our esteemed alumnus, Dr. Manoj Kumar (see Figure 18), has been appointed as an Assistant Professor at the offshore campus of IIT Madras at Zanzibar, Tanzania. This is a momentous achievement for him and for us as well, given that IIT Madras, Zanzibar is the first Indian Institute of Technology campus established outside India, located in Tanzania.

Figure 19. Alumni meet of batch Graduated in 2023

Figure 19 shows the Alumni meet of the batch that graduated in 2023, which was a joyous occasion, bringing together former classmates to reminisce and celebrate shared memories. The event facilitated networking opportunities and offered a platform for alumni to reconnect with their alma mater. It showcased the enduring bonds created during their academic journey and fostered a sense of community, reinforcing the strong ties between the Institute and its graduates.

Figure 20. Young Achiever Award - 2024

IIT Mandi awarded distinguished alumni with the “Young Achiever Award 2024” for their accomplishments in Academic Excellence, Professional Achievements, and Entrepreneurship during the institution's 15th Foundation Day celebration (see Figure 20). The alumni serve as inspirational figures embodying values instilled by IIT Mandi. Award Given to Dr. Harivansh Rai Mittal - Academic Excellence, Ms. Harsha Mathur - Professional Excellence, Mr. Siddharth Mohan - Excellence in Entrepreneurship and Management.

Figure 21. A lecture delivered by an alumnus on the IIT Mandi campus

Mr. Neeraj Soni, an esteemed alumnus of IIT Mandi, delivered an insightful lecture on the IIT Mandi campus and shared his valuable expertise (see Figure 21). Mr. Soni engaged the audience with enriching content, drawing from his experiences and achievements. The lecture provided a unique opportunity for students to gain insights into real-world applications and industry trends.

Table 3 displays various scholarships, providing agencies and the beneficiaries

Table 3. Fund raising in terms of Scholarships

Name of agencies providing scholarship	No. of students receiving tuition fee reimbursement			
	UG 4 years	PG 2 years	Ph.D.	
Sri Badrika Ashram (SBA)	14	0	0	Total Beneficiaries till date: 36 Students
Pan IIT Vidyalakshmi scholarship	7	0	0	
Foundation for Excellence	11	0	0	
TCS Research Scholar Program	0	0	1	
Kotak Kanya Scholarship 2023	1	0	0	
Reliance Foundation UG Scholarship	1	0	0	
Dhawan Family Scholarships	0	1	0	

Social Media Links

- Facebook: https://www.facebook.com/groups/IItmandialumniclub
- Instagram: https://www.instagram.com/alumni.iitmandi/
- Twitter: https://twitter.com/AAS_IITMandi
- LinkedIn: https://www.linkedin.com/in/alumni-affairs-cell-2a33ba228/

10. Infrastructure and Services

The Institute Deanery of Infrastructure and Services is responsible for planning, designing and construction of IIT Mandi infrastructure in the campus. An important and tedious responsibility of the infrastructure unit is the Operation, Maintenance and Construction of buildings and furnish services to the campus students, faculty and staff like Sports Complex, Auditorium, Health Centre, Recreation, Guest House, Campus School, Day Care, Water supply, Electric supply, Horticulture, Networking etc.

10.1 Infrastructure:

Presently, North Campus has fully functional Infrastructure of 1,59,370 sq.mt. area. This part of the campus has Academic Blocks, hostels/houses for 1260 students and 255 faculty/staff members. The Sports Complex including swimming pool, Hockey filed, Tennis and Basketball Court, Volleyball court and Health Centre. Dining hall cum Student activity centre is completed in the current year having an area of 4,111 sq. mt.

Aerial view of North and South Campus

North Campus

South Campus

The South Campus has a fully functional infrastructure of about 61,646sqmt. area. This campus presently provides Academic Blocks hostels/houses for 1100 students and 81 faculty/staff members and having full fledge sports facilities like Cricket Ground, Football Ground, Tennis Court, Basketball Court, Volleyball Court and Sports Complex having yoga room, Badminton Hall, T.T. hall etc.

Unification of the North & South Campus has been planned by constructing a road from the Campus School to South Campus which shall also connect land parcel recently (forestland) transferred to IIT Mandi. Efforts to construct a hostel for EWS (634students, another hostel of about 1500 capacity, the academic building of 10000 sqm area and lecture hall complex are in full swing with support from an amount of Rs. 333.72 Cr under HEFA term loan.

The academic space built over the years started yielding fruits –several new schools and centers are being accommodated in the new buildings. Further infrastructure support is being extended.

SERVICES Under Infrastructure & Services

1. Construction Wing
2. Horticulture Structure
3. Housekeeping & Waste Management Services
4. Health Center
5. Guest House
6. Transport Facilities
7. Commercial Establishment & Services
8. Day Care Service
9. Auditorium

1. Construction Wing: CAMPUS DEVELOPMENT (2023-24)

The South Campus has a fully functional infrastructure of about 61,646 sq mt. area. This campus presently provides for 1200 students and faculty/staff members and having sports facilities like Cricket field, Football Field, Lawn Tennis Court, Basketball Court, Volleyball Court and Sports Complex having yoga room, Badminton Hall, T.T. hall etc. On the other hand, North Campus has now fully functional infrastructure of about 1,59,370 sq. mt. area presently. This part of the campus houses around 1260 students and faculty/staff members. The Sports Complex including swimming pool, Hospital and Dining hall cum Student activity centre are fully functional and added sports facilities likes Hockey field, Tennis, Basketball, and Volleyball courts etc.

UG Hostel at South Campus Work for construction of hostel for Under Graduate students having an area of 4926sqmwith capacity of about 270 students, was awarded by Construction Wing of IIT Mandi and the work is in progress and likely to be completed by July, 2024.

1377 bedded boys hostel

Efforts to construct hostel for 634 students (400 seater for girls and 234 seater for boys) under EWS scheme, the academic building of 10,000 sqm area and lecture hall complex are in full swing with support from an amount of Rs. 333.72 Cr under HEFA term loan. CPWD has been engaged by IIT Mandi for the development of new assets. Construction of hostel block for under graduate students has already been initiated by CPWD at LP-2 having an areaof 34,307 sqm with capacity of about 1377 students and likely to be completed by March 2026.

Unification of the North & South Campus is also in progress by constructing a road from the Campus School to South Campus and will also connect land parcels recently (forestland) transferred to IIT Mandi. Excavation work for the road construction is almost near to be completion. Protection work and other protection works are also in progress.

Bridge Work

Road Work

Electrical Power Supply System

The main source of the power supply for IIT Mandi is the Himachal Pradesh State Electricity Board (HPSEB). The institute receives power through a 33 kV high-tension (HT) transmission line from the Nandli Substation, which is located near the campus.

Power Infrastructure

- **Receiving Substation (RSS)**: The North campus houses an in-house 33/11 kV Receiving Substation. This facility plays a crucial role in stepping down the high voltage received from the main transmission line.
- **Total Connected Load**: The total connected load of the IIT Mandi campus is 10.90 MW.
- **Power Transformers**: To cater to this load, the institute has installed two 5 MVA power transformers at the Receiving Substation. These transformers step down the 33 kV supply to 11 kV.
- **Distribution System**: The 11 kV supply is then distributed to various 11/0.415 kV substations located across the campuses. There are four such distribution substations on the North campus and four on the South campus.

This robust electrical infrastructure ensures a reliable and stable power supply to meet the diverse energy needs of the IIT Mandi campus.

Horticulture Department

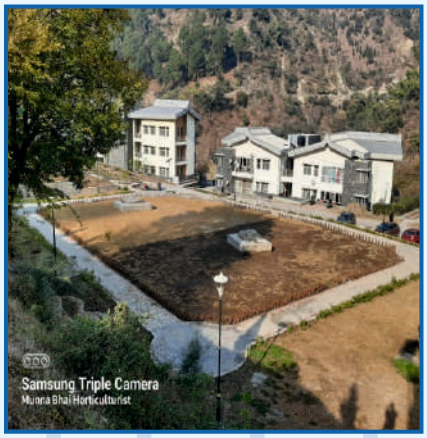
IIT Mandi nestled in the picturesque Kamand Valley, oversees a diverse range of plant species that thrive in this lush, aromatic environment. The department focuses on temperate fruit plants, which require cold winters to break bud dormancy and are typically grown in higher elevations. Examples include apples, pears, plums, apricots, peaches, strawberries, kiwis, and walnuts. Additionally, the department emphasizes the significance of medicinal and aromatic plants in rural India. These plants, such as rosemary, magnolia, and gardenia, play a crucial role in traditional medicine and the pharmaceutical and cosmetic industries.

IIT Mandi actively engages in plantation drives to raise awareness about the environmental benefits of plants among students and faculty. In the 2023-24 period, the institute planted over 5,000 trees, including aromatic plants, forest trees, and fruit trees, across its North and South Campuses. This initiative includes species like apple, kiwi, persimmon, apricot, peach, pear, plum, strawberry, walnut, and many others, contributing to the ecological balance and beauty of the campus.

Ornamental plants include a variety of types, each serving different purposes in landscaping. Creeper plants such as Ficus pumila, Yellow Jessamine, Honeysuckle, and Rose add a climbing, trailing beauty to spaces. Bulb plants like Rain Lilies, Daylilies, and Spider Lilies offer seasonal blooms. Hedge plants, including Hibiscus, Duranta, Buxus, Euonymus, and Enermy, are perfect for creating natural borders. For edging, plants like Kufiya and Alternanthera are ideal. Grasses, such as Mexican, Nilgiri, and Selection No. 1, provide lush ground cover. Trees like Salix alba and Silver Oak add height and structure to landscapes.





In both our North and South campuses, we have installed HDPE Vermi Beds made from premium materials, ensuring durability and sustainability in organic farming. These beds facilitate efficient vermi-composting, converting organic waste into nutrient-rich compost essential for healthy plants. We also produce leaf mold compost, made from decomposed fallen leaves and chopped grass, further enhancing our composting practices.

Housekeeping & Waste Management Services:

We are using best practices for good housekeeping and our objective is to keep the pollutants away from contacting rain and to avoid dumping waste anywhere on the campus. The door-to-door waste collection system is in place to avoid aforesaid issues. There is a complete ban on using any kind of toxic cleaning chemicals on campus. The manpower is being trained to follow up on the processes and their safety aspects too. We are having an effective waste management plan, below are a few benefits of a robust waste management plan:

- Protecting the environment
- Preserving human health
- Minimizing unsightly waste
- Reducing natural resource consumption

Housekeeping & Waste Management Services at North campus of IIT Mandi

There are total 146 housekeeping staff deployed through outsource agency for **HOUSEKEEPING & WASTE MANAGEMENT** services at Mandi (South & North campus).

North Campus

- Out of 146 housekeeping staff, 92 workers is deployed here at North campus deployed here at North campus for housekeeping & waste management services.
- Supervisor (At present - Mr. Ajay Singh), which is looking after all the housekeeping related issues in both the South & North campus of IIT Mandi.
- Out of these 88 workers, Three Assistant supervisor (Mr. Kapil Sharma) is looking after the Acdemic area , Mr Krishan(Asst. Supervisor) is looking after the Hostel and Mess area and Mr Bhupender(Asst. Supervisor) is looking after the Medical, Auditorium and Residential area & Waste management related activities at North campus.
- Times to time training sessions are arranged by the service provider agency to improve the housekeeping faculty and to resolve the housekeepers issues related to their services.

South Campus

- In South campus 54 workers is deployed here at South campus for housekeeping & waste management services.
- Out of these 54 workers, One Assistant supervisor i.e. Mr. Mukesh Kumar is looking after the Acdemic area Hostels, Mess area and all Residential area & Waste management related activities at South campus.

Times to time training sessions are arranged by the service provider agency to improve the housekeeping faculty and to resolve the housekeepers issues related to their services.




Training Sessions

DEPLOYED TEAM STRUCTURE IIT MANDI

Sl. No.	Manpower	Total
1.	Supervisor	01
2	Assistant Supervisors	04
3	Housekeeping Staff	137
4	Sewer Man	04

Flow Chart of Cleaning Process

WORK PLAN & METHODOLOGY

PART A: HOUSEKEEPING SERVICES

- **Timely Start of Services**: Ensure the prompt commencement of housekeeping and cleaning services daily, adhering to designated duty hours. Follow all instructions provided by the Officer-in-Charge.
- **Adherence to Technical Schedule**: Strictly follow the detailed technical schedule for mechanized housekeeping services. This includes using specified machines and materials (with designated brands and makes) and maintaining the frequency of various cleaning operations.
- **Mechanized Cleaning**: Perform all sweeping, cleaning, scrubbing, and vacuum cleaning tasks using machines. Manual cleaning is only undertaken in exceptional cases where machine cleaning is not feasible.**L**.
- **Leaf Disposal**: Collect leaves during sweeping from roads, road berms, and open spaces, and dispose of them at designated sites for bio decomposition.eaf Disposal: Collect leaves during sweeping from roads, road berms, and open spaces, and dispose of them at designated sites for bio decomposition.

This structured approach ensures a high standard of cleanliness and hygiene across the campus, utilizing modern equipment and environmentally friendly practices.

South and North Campus - Cleaning Services Through Machines

- **Comprehensive Cleaning**: The inner and surrounding areas of hostels, mess halls, labs, libraries, and academic buildings are cleaned by workers using machines.
- **Daily Maintenance**: In addition to mechanized cleaning, these areas are also maintained on a daily basis by manual labor to ensure a consistently high standard of cleanliness.

This structured approach ensures a high standard of cleanliness and hygiene across both the South and North campuses, utilizing modern equipment and a dedicated workforce.


Vacuum cleaning & Outer Area


Roof cleaning & Grass Cutting


Sewer men Work-

Two (2) sewer men are deployed here at South campus to resolve the sewerage related issues and two (2) sewer men are deployed at North campus.


PART B: WASTE MANAGEMENT SYSTEM

i) Process of Dry Waste Management System

- **Collection of Garbage**:
  - Dry waste is collected from the dustbins placed in specified locations across both the South and North campuses of IIT Mandi.
- **Workforce**:
  - Four workers are assigned to collect the dry waste and load it into the garbage vehicle.
- **Transportation and Disposal**:
  - The collected dry waste is transported to the Dumping Site in Mandi using the garbage vehicle.
  - The waste is then disposed of at the approved municipal site in Mandi, Himachal Pradesh, which is approximately 30 kilometers from the IIT Mandi Kamand campuses.
  - This process is carried out on a daily basis to ensure effective waste management.

    This systematic approach to dry waste management ensures that garbage is collected, transported, and disposed of efficiently, maintaining the cleanliness and hygiene of the campus.

ii) Process of Food Waste Management System

- **Collection of Food Waste**:
  - Food waste is collected from canteens, mess halls, vegetable shops, recreation centers, and food centers located within both campuses of IIT Mandi.
- **Disposal and Treatment**:
  - The collected food waste is disposed of at the approved organic plant provided by IIT Mandi.
  - The bio-gas plant at the institute treats approximately 70 to 110 kg of food waste daily.
  - This operation helps in managing organic waste efficiently while producing biogas as a byproduct.

This comprehensive waste management system ensures that both dry and food waste are handled efficiently, maintaining campus hygiene and promoting sustain ability.

Blue coloured dustbins in IIT Mandi campus are used for collecting materials like Glass bottles, Metal & plastic waste etc.

Green coloured dustbins in IIT Mandi campus are used for collecting food & paper waste etc.

IIT Mandi develops a food waste site, which is approximate from 4 kms. far away from the IIT campus. Housekeeping & Waste Management service provider agency (on outsourced basis) collects wet and dry waste from IIT Mandi community and disposes only wet waste at this food waste dumping site.

IIT Mandi develops a food waste site, which is approximate from 4 kms. far away from the IIT campus. Housekeeping & Waste Management service provider agency (on outsourced basis) collects wet and dry waste from IIT Mandi community and disposes only wet waste at this food waste dumping site.

HEALTH CENTRE

Health Centre, IIT Mandi is situated on the North campus, having one extension unit on the South campus. It is a non-dieted patient care unit that provides routine and emergency medical cover to all faculty, staff and students of Kamand. It also provides first aid and emergency care to Mind Tree school students and workers/casual laborers of the campus, with the scope of referral to higher Centre who require admission and special care as and when required via 24 hr. ambulance service. The Health Centre consists of a team of full-time Medical Officers, Visiting Specialists and Para Medical staff.

Health Centre North & South Campus IIT Mandi

The following facilities are available at Health Centre

- **ROUTINE OPD:** Taken care of by medical officer and visiting consultant.

  PHARMACY: Reliable quality medicines are available to beneficiaries on doctor's prescription during OPD hour's as well as emergency timings without any cost. Routine over-the-counter medicines are provided by Para medical staff themselves/after consultation with the doctor on duty during emergency hours.

- **Clinical pathology lab**: Trained laboratory staff providing their services, which include routine blood tests and urine tests. Some specialized tests through kits include CRP, malaria, scrub typhus, pregnancy test; HIV, VDRL, HBs AG, typhoid, etc are also available.

- **X-RAY Room**: Health Centre has fully equipped Digital radiography (DR) room. Trained X-ray technician staff providing services, which include all routine X-Rays i.e. Chest X-Ray, Abdominal X-Ray, KUB X-Ray, whole Spine X-Ray, Joint X-Ray and Full, body Stitching X-Ray etc.

X-ray with console room

- Dental service & physiotherapy are also fully functional.

Dental Room

Physiotherapy Room

- Further, Dr. Lal'sPathLab staff also visits the health center once in a every week to enhance the services of the Lab on the IIT campus.
- Visiting Consultant of ENT, Medicine, Obs & Gyane, and Orthopaedic.
- The institute also has MOU with super specialty hospitals like **Maxcare** and **Fortis hospital** in Mohali, Chandigarh where critically ill patients are referred via ALS Ambulance.
- **Panchakarma**:- The basic Panchakarma therapy started last year such as Akshi Tarpanam (Eye Therapy), Nasyam (Nasal Therapy), Greeva Vasti (Cervical pain therapy), Kati Vasti (Lower back pain therapy), and Janu Vasti (Knee pain therapy).
- **Emergency Services**: Health centre has 24 X 7Emergency cares with the provision of emergency drugs, and equipped with Multi para monitor, ECG, Nebulization, automated defibrillator, oxygen concentrator, and central oxygen system etc.

Emergency Room

- **Ambulance Services** :- Institute has two ambulances (One Basic Life Support and another ALS ambulance) which is used to referred the patients to higher centre / empanelled hospitals.

Guest House Services at IIT Mandi

C. V. Raman Guest house

IIT Mandi is nestled in the foothills of Shivalik range of Himalayas located 18 Kilometres away from Mandi town. Being an institute of National importance, visitors & renowned dignitaries as well as alumni and parents keep visiting the campus for official & personal reasons. To facilitate the lodging & dining services for the guests arriving at IIT-Mandi campus, guest house services are provided in both the campuses. The main guest house is situated in the North campus is named after the great Indian scientist and Nobel laureate Sir. C. V. Raman. In the South campus Manirang apartment (two accommodations) is available.

Apart from these two guest houses there are few sets of fully furnished apartments available in both the campuses to provide accommodation to eminent Institute guests. Guest house remains a pleasant heaven for the Institute's guests, whether from academia, guests from centre/ state government administration, Institute alumni, or the parents/wards of students.

Services:

Boarding & Lodging: C. V. Raman guest house of North campus is the largest among all the accommodations available for visitors in the campus. Guest House accommodation comprises of well-appointed 87 rooms including Suites, Double Bed & twin bed rooms. South campus has Manirang guest houses with double bed rooms. Each room is well furnished & equipped with the basic amenities required by the guests. Wi-Fi connectivity, cable TV, 24 hrs hot & cold water supply, study table with chair, luggage rack and cupboard.

Suite rooms are provisioned to cater VVIP guests. Other than the basic room amenities suite rooms have living area with Sofa set and a small kitchenette to cater to the guests.

Dining Services:

C. V. Raman guest house at North campus has dining service which provides buffet style food arrangement. This dining area can easily accommodate & provide sit-down meal services up to 50 numbers of guests during breakfast, lunch & dinner. C. V. Raman guest house dining also serves light snacks to the guests other than meal timings on request during the day as per availability. For South campus dining services can be availed from the canteen and mess in the vicinity of guest house.

Lounge Area:

C. V. Raman Guest House has a lounge area at first floor provisioned for small informal meetings & gatherings. It is a suitable place for the persons looking for a place with silence, calmness and uninterrupted environment to carry out their research, discussions and brain storming with a cup of tea or coffee and snacks served at table.

Lounge area also serves buffet lunch and dinner & snacks as and when requested and also provides standing buffet service. It has capacity to cater up to 40 persons at a time during official & personal events.

Conference Room:

C. V. Raman guest house has a state of the art conference room facility. The conference room can accommodate up to 32 persons and has various facilities such as overhead projector, Wi-Fi with audio-visual connectivity for video- conferencing.

Transport Facilities

IIT Mandi provides comprehensive transport facilities to its students, faculty, and staff at very nominal charges, ensuring convenient and reliable transportation across its campuses and to nearby towns. The transport services include regular shuttle buses that operate between the North and South campuses, facilitating easy movement within the institute. Additionally, transport services extend to Mandi Town, providing connectivity to and from the IIT Mandi campus. The service runs daily from 7:00 AM to 10:00 PM, with a fleet comprising seven buses, each with 30 seats, and one van with 12 seats. The institute regularly updates the vehicle schedule on its website, keeping users informed about the latest timings. An advanced online seat-booking system is also available for the IIT Mandi community, streamlining the reservation process. Furthermore, the transport section assists with taxi bookings for guests, faculty, and staff, catering to events, conferences, and other occasions as needed. These transport facilities and logistical support services significantly enhance accessibility and convenience, making daily commutes and special event transportation efficient and hassle-free.

Commercial Establishments

Currently, 18 commercial establishments are operating within the IIT Mandi campus, providing a variety of services to meet the needs of students, faculty, and staff. These establishments include canteens, a provision store, a supermarket, a vegetable and fruit stall, a stationery shop, unisex salons, an Ayurvedic items shop, a technical equipment shop, an apparel shop, a café cum bakery, an ironing/tailoring/dry cleaning shop, and a Yoga Mess. These services are conveniently available on both the South and North campuses, ensuring accessibility for all members of the IIT Mandi community. As the campus infrastructure continues to develop, additional shops and facilities are being introduced. New commercial spaces will be allocated to start providing these new services, further enhancing the amenities available on campus.

Commercial Establishments at North Campus

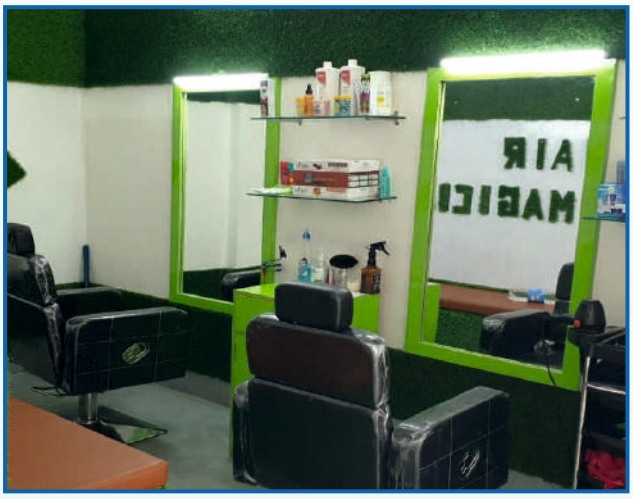
Canteen, North Campus

Canteen, North Campus

Super Market, North Campus

Super Market, North Campus

Vegetable & Fruit Stall, North Campus



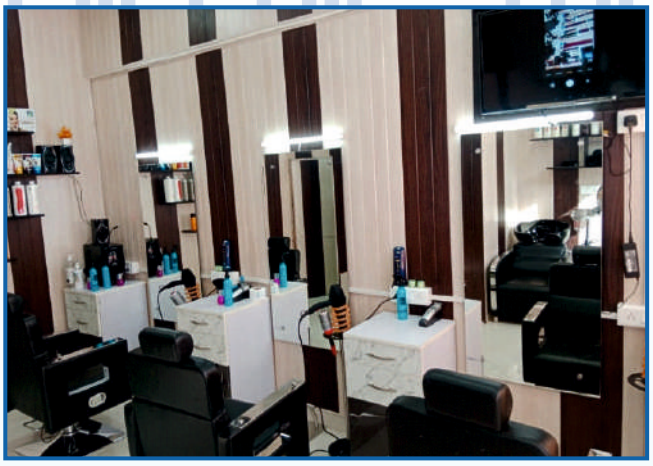
Unisex Saloon, North Campus

Commercial Establishments at South Campus

Griffon Canteen, South Campus

Provision Store, South Campus

Confectionery Shop including Fresh Juice, South Campus



Unisex Saloon, South Campus

Stationery Shop, South Campus

Vegetable & Fruit Stall, South Campus

Daycare

The childcare facilities at IIT Mandi, located on both the North and South campuses, provide safe, nurturing, and educational environments for children of students and employees. Infants and toddlers have dedicated sleeping cribs and high chairs for meals, while pre-scholars and school-aged children receive homework assistance and have comfortable sleeping arrangements. Experienced staff, selected meticulously, cater to the specific needs of children up to 10 years old, engaging them in age-appropriate activities that foster overall development. Flexible part-time and full-time options are available, ensuring parents can balance their professional and academic responsibilities confidently.

11. हिन्दी प्रकोष्ठ

भारतीय प्रौद्योगिकी संस्थान मण्डी में हिन्दी भाषा को बढ़ावा देने के उद्देश्य से हिन्दी में कार्यशालाओं, प्रतियोगिताओं, कवि सम्मेलन, पखवाड़े आदि का आयोजन करवाया जाता है। इस वर्ष भी निम्नलिखित कार्य किए गए:-

इस संस्थान में दिनांक 9 अगस्त, 2023 को "राजभाषा क्रियान्वयन तथा अनुपालन" विषय पर हिन्दी कार्यशाला का आयोजन किया गया। इसका शुभारम्भ संस्थान के प्रभारी कुलसचिव, प्रो. सतिन्द्र कुमार शर्मा के सम्बोधन से हुआ। इसमें हिन्दी प्रकोष्ठ के कनिष्ठ अधीक्षक, श्री नितिन सिंह तोमर ने प्रस्तुति दी।

इलाहाबाद बैंक से वरिष्ठ राजभाषा प्रबन्धक एवम् विभागाध्यक्ष, राजभाषा विभाग के पद से सेवा निवृत्त डॉ. ओम निश्चल द्वारा दिनांक 19 सितम्बर, 2023 को हिन्दी कार्यशाला आयोजित की गई। उन्होंने भारतीय संविधान द्वारा केन्द्रीय सरकार के कार्यालयों में राजभाषा का उपयोग सुनिश्चित करने के लिए निर्धारित प्रावधान की जानकारी हिन्दी सामान्य ज्ञान पर प्रश्नावली के माध्यम से प्रतिभागियों को दी।

इस संस्थान में दिनांक 21 मार्च, 2024 को "राजभाषा हिन्दी में सुगमता से काम कैसे करें" नामक हिन्दी कार्यशाला का आयोजन किया गया। इसमें आमंत्रित वक्ता, डॉ. संजय सिंह, वैज्ञानिक "जी" एवम् प्रमुख पारिस्थितिक पुनर्स्थापन केन्द्र प्रयागराज, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, भारत सरकार थे। इसके दो सत्र रखे गए थे। पहला सत्र हिन्दी भाषी कर्मचारियों के लिए और दूसरा सत्र अहिन्दी भाषी कर्मचारियों के लिए रखा गया था। उन्होंने संस्थान में दैनिक कार्य करते हुए सरल हिन्दी भाषा का उपयोग विनम्रता पूर्वक करने का परामर्श दिया तथा दोनों ही सत्रों का संचालन कुशलतापूर्वक किया।

माह सितम्बर में हिन्दी पखवाड़े का आयोजन किया गया। इसका शुभारम्भ संस्थान के उत्तरी परिसर में दिनांक 18 सितम्बर, 2023 को हिन्दी काव्य संध्या से किया गया, जिसमें विशेष रूप से आमंत्रित सुप्रसिद्ध हास्य कवि पद्मश्री प्रो. अशोक चक्रधर और कवि एवम् गीतकार, डॉ. ओम निश्चल थे। उन्होंने अपनी रसीली कविताओं के माध्यम से सभी श्रोताओं का मनोरंजन किया। इस अवधि में आयोजित हिन्दी की विभिन्न प्रतियोगिताओं में टाइपिंग, टिप्पण एवम् आलेखन, कार्यालयीन अनुवाद, निबन्ध लेखन, पोस्टर मेकिंग, कविता पाठ शामिल थीं। इनमें संस्थान के छात्रों ने भी भाग लिया। इसके समापन समारोह के मुख्य अतिथि, संस्थान के अधिष्ठाता (संकाय) थे। उन्होंने पखवाड़े में भाग लेने वाले सभी प्रतिभागियों, निर्णायक मण्डल और आयोजकों का आभार व्यक्त किया तथा सभी विजेताओं को प्रमाण पत्र और स्मृति चिन्ह देकर पुरस्कृत भी किया।

भारतीय प्रौद्योगिकी संस्थान मण्डी की "उहल" पत्रिका के दूसरे अंक का अनावरण निदेशक, प्रो. लक्ष्मीधर बेहेरा ने किया। उन्होंने संस्थान के हिन्दी प्रकोष्ठ द्वारा किए जा रहे कार्यों की सराहना करते हुए सभी कर्मचारियों को हिन्दी भाषा का उपयोग कार्यालयीन कार्यों में करने के लिए प्रोत्साहित किया।

12. Organisational Structure

12.1 Board of Governors

	**Chairperson** **Prof. Prem Vrat** Retired Professor, IIT Delhi & Founding Director, IIT Roorkee 1240, Sector-A, Pocket-A Vasant Kunj, New Delhi-110070 (till 28-08-2023)
	**Chairperson** **Lt. Gen. Kanwal Jeet Singh Dhillon** PVSM, UYSM, YSM, VSM (Retd.) (From 29-08-2023 to till date)
Prof. Laxmidhar Behera **Director, IIT Mandi (Ex-officio)** Indian Institute of Technology Mandi Mandi – 175 075 (H.P.)	**The Chief Secretary/Secretary (TE)** **(Ex-officio)** Government of Himachal Pradesh Shimla – 171 002
The Additional Secretary (TE)/ **Joint Secretary (Ex-officio)** MoE, Government of India Shastri Bhawan, New Delhi- 110 001	**Shri Kishan Chandra Sharma** **Site Head & Sr. Vice President** Manufacturing, LUPIN Pharma Limited 198 - 202, New Industrial Area No. 2 Mandideep – 642 046, Distt, Raisen (M.P.)
Dr. Pradeep Kumar Agrawal **Scientist, Directorate of Special Projects** D.R.D.O. Hyderabad H.No. 16-142, Green Rich Avenue Badangpet Nagar Panchyat Hyderabad- 500 058	**Shri Hemant Sood** **Managing Director & Promoter** **(Financial Services group)** Findoc Financial Services Group 5th Flr, Kartar Bhawan, Near PAU, Gate No.1 Ferozpur Road, Ludhiana-141 001 (Punjab)
Prof. Manoj Thakur **Professor, School of Mathematical & Statistical Sciences** Indian Institute of Technology Mandi Mandi – 175 075 (H.P.)	**Prof. Satinder Kumar Sharma** **Professor, School of Computing & Electrical Engineering** Indian Institute of Technology Mandi Mandi – 175 075 (H.P.)
Secretary **Prof. Satinder K. Sharma (till 26.09.2023)** **Registrar I/c (Ex-officio)** Indian Institute of Technology Mandi Mandi – 175 075 (H.P.) **Dr. Kumar Sambhav Pandey (w.e.f. 27.09.2023)** **Registrar (Ex-officio)** Indian Institute of Technology Mandi Mandi – 175 075 (H.P.)	

**During this year, meetings of the Board of Governors were held on 29.07.2023, 11.10.2023 and 05.01.2024.*

12.2 Finance Committee

Chairperson **Prof. Prem Vrat** Retired Professor, IIT Delhi & Founding Director, IIT Roorkee 1240, Sector-A, Pocket-A Vasant Kunj, New Delhi-110070 (Till 28-08-2023)	
Chairperson **Lt. Gen. Kanwal Jeet Singh Dhillon** PVSM, UYSM, YSM, VSM (Retd.) (From 29-08-2023 to till date)	
Prof. Laxmidhar Behera **Director, IIT Mandi (Ex-officio)** Indian Institute of Technology Mandi Mandi – 175 075 (H.P.)	**The Addl. Secretary/Bureau Head (T.E.)** **(Ex-officio)** MoE, Government of India Shastri Bhawan, New Delhi-110 001
The Joint Secretary&Finance Advisor **(Ex-officio)** MoE, Government of India Shastri Bhawan, New Delhi – 110 001	**Prof. B. V. Phani** **Professor** Department of Industrial & Management Engineering, IIT Kanpur
Prof. B. K. Mishra **Professor** Mechanical & Industrial Engineering IIT Roorkee	**Dr. Viswanath Balakrishnan** **Dean (F & A) (Ex-officio)** Indian Institute of Technology Mandi Kamand – 175075(H.P.)
Prof. Satinder K. Sharma (till 26.09.2023) **Registrar I/c (Ex-officio)** Indian Institute of Technology Mandi Mandi – 175 075 (H.P.)	**Dr. Kumar Sambhav Pandey (w.e.f. 27.09.2023)** **Registrar (Ex-officio)** Indian Institute of Technology Mandi Mandi – 175 075 (H.P.)

**During this year meetings of the Finance Committee were held on 29.07.2023 and 05.01.2024.*

12.3 Building & Works Committee (B&WC)

Chairman **Prof. Laxmidhar Behera** **Director, IIT Mandi (Ex-officio)** Indian Institute of Technology Mandi Mandi – 175 075 (H.P.)	**Dean (I&S) (Ex-officio)** Indian Institute of Technology Mandi Kamand – 175075, Himachal Pradesh
Prof. B. Bhattacharjee **Professor** Department of Civil Engineering Indian Institute of Technology Delhi Hauz Khas, New Delhi - 110 016	**Er. A.K. Jain** **Senior Consultant** IIT Mandi & Special DG, CPWD (retired) Mandi – 175 075, Himachal Pradesh
Er. K. N. Rai (w.e.f. 01.01.2021) **Former Chief Executive** Civil Works, DRDO (Retired) New Delhi	**Member Secretary** **Er. Sunil Kapoor** (up to 31.01.2023 A/N) **Dr. Deepak Swami**, Superintending Engineer I/c (w.e.f. 01.02.2023) Superintending Engineer (Ex-officio) Indian Institute of Technology Mandi Kamand Campus, VPO Kamand Distt. Mandi – 175 075, (H. P)

**During this year meetings of the Building & Works Committee were held on 25th April, 2022 and 14th October, 2022.*

12.4 SENATE (as on 31.03.2024)

Chairman **Prof. Laxmidhar Behera** **Director, IIT Mandi**
Professors Prof. Subrata Ghosh, Professor, SCS, IIT Mandi Prof. Prem Felix Siril, Professor, SCS, IIT Mandi Prof. Suman Kalyan Pal, Professor, SPS, IIT Mandi Prof. Chayan K. Nandi, Professor, SCS, IIT Mandi Prof. Pradeep C. Parameswaran, Professor, SCS, IIT Mandi Prof. Satinder K. Sharma, Professor, SCEE, IIT Mandi Prof. Arti Kashyap, Professor, SPS, IIT Mandi Prof. Rajeev Kumar, Professor, SMME, IIT Mandi

External Members

Prof. Siddhartha Mukhopadhyay, Dept. of Electrical Engineering, IIT Kharagpur

Prof. Binay Kumar Pattnaik, Dept. of HSS, IIT Kanpur

Prof. Sandeep Verma, Dept. of Chemistry, IIT Kanpur & Secretary (SERB)

Registrar

Dr. Kumar Sambhav Pandey, Registrar, IIT Mandi

Deans

Prof. Aniruddha Chakraborty, Dean (Academics), IIT Mandi

Prof. Rahul Vaish, Dean (Faculty), IIT Mandi

Dr. Viswanath Balakrishnan, Dean (F&A), IIT Mandi

Dr. Hitesh Shrimali, Dean (Students), IIT Mandi

Prof. Rajeev Kumar, Dean (I&S), IIT Mandi

Prof. Syed Abbas, Dean (SRIC & IR), IIT Mandi

Prof. Chayan K. Nandi, Dean (DORA), IIT Mandi

Prof . Arti Kashyap, Dean (DCS), IIT Mandi

Chairpersons

Dr. Aditya Nigam, Chairperson, SCEE, IIT Mandi

Dr. Shyamasree Dasgupta, Chairperson (SHSS), IIT Mandi

Prof. Pradeep C. Parameswaran, Chairperson, SCS, IIT Mandi

Prof. Suman Kalyan Pal, Chairperson, SPS, IIT Mandi

Dr. Muslim Malik, Chairperson, School of Mathematical and Statistical Sciences (SMSS), IIT Mandi

Dr. Shyam Kumar Masakapalli, Chairperson, School of Biosciences & Bioengineering (SBB), IIT Mandi

Dr. Atul Dhar, Chairperson, School of Mechanical & Materials Engineering (SMME), IIT Mandi

Dr. Dericks P. Shukla, Chairperson, School of Civil and Environmental Engineering (SCENE), IIT Mandi

Prof. Manoj Thakur, Chairperson, School of Management (SoM), IIT Mandi

Co-ordinators/Chairpersons - Centres

Dr. C.S. Yadav, Co-ordinator, AMRC, IIT Mandi

Prof. Satinder K. Sharma, Co-ordinator, C4DFED, IIT Mandi

Dr. Varun Dutt, Chairperson, IKSMHA, IIT Mandi

Dr. Amit Shukla, Chairperson, CAIR, IIT Mandi

Dr. C.S. Yadav, Chairperson, CQST, IIT Mandi

Dr. Shubhajit Roy Chowdhury, Chairperson, HCI, IIT Mandi

Nominees from Schools

Dr. Rahul Shrestha, Associate Professor, SCEE, IIT Mandi

Dr. Jinesh Machhar, Assistant Professor, IIT Mandi

Dr. Satyajitsinh A. Thakor, Associate Professor, IIT Mandi

Dr. Bindu Radhamany, Associate Professor, SPS, IIT Mandi

Dr. Deepak Swami, Associate Professor, SCENE, IIT Mandi

Dr. Kala, Venkata Uday, Associate Professor, SCENE, IIT Mandi

Dr. Bhaskar Mondal, Assistant Professor, SCS, IIT Mandi

Dr. Satvasheel Ramesh Powar, Associate Professor, SMME, IIT Mandi

Dr. Amit Prasad, Associate Professor, SBB, IIT Mandi

Dr. Surya Prakash Upadhyay, Associate Professor, SHSS, IIT Mandi

Dr. Nitu Kumari, Associate Professor (SMSS), IIT Mandi

Dr. Puran Singh, Associate Professor (SoM), IIT Mandi

Dr. Arnav Bhavsar Vinayak, Associate Professor, IKSMHA, IIT Mandi

Dr. Narendra Dhar, Assistant Professor, CAIR, IIT Mandi

Nominees from Industries and R&D

Shri. Rajesh Sinha, Chief Scientist & Head - Smart Machines Research Program, TCS

Shri. Hemachandra Bhat, General Manager and Practice Head, Robotics Platforms, Wipro

Invitees

Dr. P. Anil Kishan, Associate Dean (Courses), IIT Mandi

Dr. Amit Jaiswal, Associate Dean (Research), IIT Mandi

Shri. Naresh Singh Bhandari, Deputy Librarian, IIT Mandi

Shri Suresh K. Rohilla, DR (Academics), IIT Mandi

Dr. Tushar Jain, Head CCE, IIT Mandi

Prof. Tulika Srivastava, Professor, SBB, IIT Mandi

Dr. Devika Sethi, Assistant Professor, SHSS, IIT Mandi

Special Invitees

Student Research Affairs Secretary, IIT Mandi. (Special Invitee)

Student General Secretary, IIT Mandi. (Special Invitee)

Student Academic Affairs Secretary, IIT Mandi. (Special Invitee)

PG Academic Affairs Secretary, IIT Mandi. (Special Invitee)

During this year meetings of the Senate were held on 25.04.2023, 17.09.2023, 08.10.2023, and 23.01.2024.

12.5 ACADEMIC OFFICIALS AS ON 31.03.2024

DIRECTOR	
Prof. Laxmidhar Behera	
DEANS	
Prof. Rahul Vaish Dean (Faculty)	Prof. Rajeev Kumar Dean (Infrastructure and Services)
Dr. Hitesh Shrimali Dean (Students)	Dr. Viswanath Balakrishnan Dean (Finance & Accounts)
Prof. Aniruddha Chakraborty Dean (Academics)	Dr. Syed Abbas Dean (SRIC& IR)
Prof. Chayan Kanti Nandi Dean (DORA)	Prof. Arti Kashyap Dean (DCS)
ASSOCIATE DEANS	
Dr. P. Anil Kishan Associate Dean (Courses)	Dr. Tulika Srivastava Associate Dean (International Relations)
Dr. Deepak Swami Associate Dean (Infrastructure)	Dr. Amit Jaiswal Associate Dean (Research)
Dr. Arnav Bhavsar Associate Dean (SRIC)	Dr. Varun Dutt Associate Dean (DORA)
CHAIRPERSONS	
Dr. Aditya Nigam School of Computing and Electrical Engineering (SCEE)	Dr. Atul Dhar School of Mechanical and Materials Engineering (SMME)
Prof. Suman K. Pal School of Physical Sciences (SPS)	Prof. Pradeep C. Parameswaran School of Chemical Sciences (SCS)
Prof. Manoj Thakur School of Management	Dr. Shyamasree Dasgupta School of Humanities and Social Sciences (SHSS)
Dr. Shyam Kumar Masakapalli School of Biosciences & Bioengineering (SBB)	Dr. Dericks P. Shukla School of Civil and Environmental Engineering (SCENE)
Dr. Muslim Malik School of Mathematical and Statistical Sciences (SMSS)	

Centre Co-ordinators/Chairpersons	
Dr. Shubhajit Roy Chowdhuary, Chairperson, Human Computer Interaction (HCI)	**Prof. Satinder K. Sharma, Coordinator, Centre for Design Fabrication of Electronic Devices (C4DFED)**
Dr. C.S. Yadav, Coordinator, Advance Material Research Centre (AMRC)	**Dr. Varun Dutt, Chairperson, Indian Knowledge System and Mental Health Applications (IKSMHA) Centre**
Dr. Amit Shukla, Chairperson, Centre for Artificial Intelligence & Robotics (CAIR)	**Dr. Tushar Jain, Head, Centre for Continuing Education (CCE)**

List of Non-Teaching Staff (Deputation + Permanent + Contract Against Pay Scale)

Sr. No.	Name	Designation
	GROUP 'A' STAFF	
1	Dr. Kumar Sambhav Pandey	Registrar (On Deputation)
2	Mr. Vijay Kumar Sharma	Superintending Engineer
3	Mr. Naresh Singh Bhandari	Deputy Librarian
4	Mr. Suresh Kumar Rohilla	Deputy Registrar (Academics, Store & Purchase)
5	Mr. Vivek Tiwari	Deputy Registrar (Directorate, Staff Administration & Recruitment)
6	Mr. Parminder Jit	Deputy Registrar (Faculty Establishment and Recruitment & Audit & Legal)
7	Ms. Shelika	Assistant Registrar (Dean Students Office)
8	Dr. Chander Singh	Principal Medical Officer
9	Mr. Anuj Kumar Dubey	Assistant Registrar (DORA)
10	Mr. Dushyant Sharma	Assistant Registrar (SRIC & IR)
11	Dr. Hema Pant	Sports Officer (Relieved on 05.07.2023)
12	Ms. Isita Mahanty Nandi	Technical Officer (AMRC)

GROUP 'B' STAFF		
1	Ms. Monika Kashyap	Senior Superintendent
2	Mr. Hardeep Singh	Security Officer (Relieved on 20.07.2023)
3	Ms. Chandan Sharma	Senior Superintendent
4	Mr. Puneet Kumar	Senior Assistant Engineer (Civil) (on Lein)
5	Mr. Siddharth Jamwal	Assistant Engineer (Civil)
6	Mr. Vikas Kumar Chaudhary	Assistant Engineer (Civil)
7	Mr. Neeraj Chauhan	Assistant Engineer (Electrical)
8	Mr. Abhijeet Tiwari	Assistant Library Information Officer
9	Mr. Vinod Kumar	Assistant Library Information Officer
10	Dr. Sonali Malhotra	Senior Library Information Assistant
11	Mr. Jitendra Namdev	Senior Library Information Assistant
12	Mr. Lalit Kumar	Junior Technical Superintendent
13	Mr. Rakesh Kumar	Junior Technical Superintendent
14	Mr. Ramesh Kumar	Junior Superintendent (Accounts)
15	Mr. Kaul Singh	Physical Training Instructor
16	Mr. Pawan Kumar	Junior Superintendent
17	Ms. Lishma Anand	Junior Superintendent
18	Mr. Pavin S. Samuel	Junior Superintendent
19	Ms. Sushma Kumari	Junior Superintendent
20	Mr. Hira Singh Negi	Deputy Security Officer
21	Ms. Bhavneswari Devi	Staff Nurse
22	Mr. Ankush Kapil	Junior Technical Superintendent
23	Mr. Veomesh Rawat	Junior Superintendent
24	Mr. Vishal Parmar	Junior Superintendent
25	Mr. Girish Pal	Junior Superintendent
26	Mr. Rajeev Kumar Sharma	Junior Superintendent
27	Mr. Vineet	Junior Superintendent
28	Mr. Anoop Kumar	Junior Superintendent
29	Mr. Omjeet Thakur	Junior Engineer (Civil)
30	Mr. Gavin Dhiman	Junior Engineer (Civil)

31	Mr. Nitin Singh Tomar	Junior Superintendent (Rajbhasha)
32	Ms. Suchetna Shachi	Junior Superintendent
33	Mr. Sunil	Junior Superintendent
34	Mr. Sushil Kumar Pal	Junior Superintendent
35	Mr. Amit Sharma	Junior Technical Superintendent
36	Mr. Abhay Pratap Singh	Junior Technical Superintendent
37	Ms. Sonia Gupta	Junior Superintendent
38	Mr. Sandeep Kumar	Junior Superintendent
39	Mr. Satharlavadla Harikrishna Chary	Junior Superintendent **(Relieved on 09.10.2023)**
40	Mr. Tilak Raj	Junior Superintendent
41	Mr. Puneet Sood	Junior Technical Superintendent
42	Mr. Arjun Barwal	Junior Technical Superintendent
43	Mr. Desh Raj	Junior Technical Superintendent
44	Mr. Sanjeev Sharma	Junior Technical Superintendent
45	Mr. Shivam	Junior Technical Superintendent
46	Ms. Kamlesh Kumari	Staff Nurse
47	Ms. Arti Devi	Staff Nurse

GROUP 'C' STAFF		
1	Mr. Aditya	Senior Assistant
2	Mr. Prakash Singh Negi	Senior Assistant
3	Mr. Dinesh Thakur	Senior Lab. Assistant
4	Mr. Tarun Verma	Senior Lab. Assistant
5	Mr. Sanjay Kumar	Junior Accountant
6	Mr. Vikram Jeet	Junior Accountant
7	Mr. Gopal	Junior Lab. Assistant (Technical)
8	Mr. Dashmesh Singh	Junior Lab. Assistant (Technical)
9	Mr. Anil Kumar	Junior Assistant
10	Mr. Nishant Kumar	Junior Assistant
11	Mr. Kuldeep	Junior Assistant
12	Mr. Prateek	Junior Assistant
13	Ms. Nalini Singh Gill	Junior Assistant

14	Mr. Sameem Khan	Junior Assistant
15	Mr. Vijay Singh	Junior Assistant
16	Ms. Sruchi Devi	Junior Assistant
17	Mr. Amit Kumar	Junior Assistant **(upto 23.11.2023)** Junior Lab Assistant (Technical) **(w.e.f. 24.11.2023)**
18	Mr. Shiv Kamal	Junior Assistant
19	Mr. Gaurav Katoch	Junior Assistant
20	Mr. Amit Kumar	Junior Assistant
21	Ms. Renu	Junior Assistant
22	Mr. Vivek Kumar Dongre	Junior Assistant
23	Ms. Kavita Enamdar	Junior Assistant **(Relieved on 28.08.2023)**
24	Mr. Balbir Singh	Junior Assistant
25	Mr. Mukesh Kumar	Junior Assistant
26	Ms. Mamta	Junior Assistant
27	Mr. Arvind Thapliyal	Junior Assistant
28	Mr. Saurav Saini	Junior Assistant
29	Ms. Arsheen Gurung	Junior Assistant
30	Mr. Anurag Rawat	Junior Assistant
31	Mr. Anugrah Rawat	Junior Assistant
32	Mr. Ambrish Yadav	Junior Assistant
33	Mr. Kartik	Junior Accountant
34	Ms. Binni Sharma	Junior Accountant
35	Mr. Lucky Sharma	Junior Accountant
36	Mr. Karan Patar	Junior Accountant
37	Ms. Hritika Jain	Junior Accountant
38	Ms. Damini Jain	Junior Accountant
39	Mr. Nanveen Kumar	Junior Lab Assistant (Technical)
40	Mr. Sumeet	Junior Assistant
41	Mr. Sunil Kumar	Junior Assistant
42	Mr. Kahan Singh	Junior Assistant
43	Mr. Arun Kumar	Junior Assistant
44	Mr. Ankush Sharma	Junior Assistant
45	Ms. Stuti Sharma	Junior Assistant
46	Mr. Dushyant Kumar	Junior Assistant
47	Mr. Rakesh Kumar Bhatt	Junior Assistant

48	Mr. Atul Kumar Saini	Junior Assistant
49	Ms. Sakshi Sanchan	Junior Assistant
50	Mr. Manish Kumar	Junior Accountant
51	Ms. Neelam Kumari	Junior Assistant
52	Ms. Srishti Raaj	Junior Assistant
53	Mr. Gulshan Kumar	Junior Assistant **(w.e.f. 27.09.2023)** Junior Lab Assistant (Technical) **(w.e.f. 24.11.2023)**
54	Mr. Vinod	Junior Lab Assistant (Technical)
55	Mr. Rahul Jamwal	Junior Lab Assistant (Technical)
56	Mr. Rakesh Kumar Sharma	Junior Lab Assistant (Technical)
57	Mr. Yuvraj	Junior Lab Assistant - Medical
58	Mr. Vijay Kumar	Pharmacist
59	Mr. Anish Dhiman	Junior Lab Assistant (Technical)
60	Mr. Anand Kumar Dewangan	Junior Lab Assistant (Technical)
61	Mr. Bhavya Sharma	Junior Lab Assistant (Technical)
62	Mr. Teeka Ram	Junior Lab Assistant (Technical)
63	Mr. Ajay Kumar	Junior Lab Assistant (Technical)
64	Mr. Sameem Khan	Junior Assistant
65	Mr. Yoginder Kr. Aggarwal	Junior Lab Assistant - Medical
66	Ms. Shradha Kumari	Junior Library Information Assistant
67	Mr. Shyam Singh	Driver
68	Mr. Manoj Kumar	Attendant (Multi Skilled)
69	Mr. Leela Dhar	Junior Attendant (Multi Skilled)

13. Status of filling up of backlog vacancies during the year

The Ministry of Education, Department of Higher Education has intimated all the IITs to implement Central Educational Institutional (Reservation in Teacher's Cadre) Act 2019. Further, the Ministry vide DO Letter No.33-2/2021-TS-III (Pt.I) dated August 24, 2021 has instructed all IITs regarding filling of backlog vacancies in a mission mode.

The process of recruitment for getting the best candidates from reserved categories is taken up in mission mode through Special Recruitment Drive (SRD) as well as Standing/Specific advertisement mode in which some of the selection process has been completed and few are under process.

The status of Faculty recruitment as on 31.03.2024	
Sanctioned positions (10:1 Students: Faculty ratio)	287
Faculty in positions on Regular pay Scale	164
Vacancy	**123**

Faculty Recruitment conducted during September 2023 to March 2024

Particulars	September 2023 to March 2024
Total No. of offer letter issued	**31**
Out of 31, offer letter issued in Reserved Category	**10**

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CONTACT:

The Registrar,

Indian Institute of Technology Mandi

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