# ANNUAL REPORT 2020-21

Indian Institute of Technology Mandi

## INDIAN INSTITUTE OF TECHNOLOGY MANDI

Kamand– 175075, Himachal Pradesh, India

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## 2020-21


**INDIAN INSTITUTE OF TECHNOLOGY MANDI**
**Kamand – 175075, Himachal Pradesh, India**

# 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 individually 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 eco-system 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.

# CONTENTS

# From the Director's Desk

IIT Mandi has rapidly progressed since 2009 when it began its journey. Presently, about 1850 students in various disciplines of Engineering, Sciences, Humanities, and Social Sciences are studying at IIT Mandi. The Institute is working untiringly to carry out globally recognized research and impart quality education that keeps pace with the latest advancements.

The year 2020 saw an unprecedented situation due to the Covid-19 pandemic. However, the Institute continued its academic activities and achieved its targets. The teaching activities were conducted online and the students were graduated in time. Our faculty won several research projects, including Covid related research projects, and published several papers and patents this year. Our researchers also won several awards, including the Vasvik Award for Mechanical and Structural Science & Technology, membership of the Indian National Young Academy of Sciences, Fulbright-Nehru Doctoral Research Fellowship, Young Scientist Award, Fellowships, and several best paper awards in international conferences.

During 2020-21, the Institute has seen a rapid expansion with many new buildings being completed, including classrooms, hostels, faculty/staff housing and sports facilities. Presently, both the campuses (North and South) are fully functional. During the course of the year, our students planted 500 saplings on the campus.

In the last ten years, IIT Mandi has forged a strong partnership with the TU9 in Germany. This involved significant mobility of faculty and students and joint research activities. There was a significant increase in our outreach activities this year. This included sponsored projects by the HP Government and IIT Mandi, benefiting the people of Himachal Pradesh.

In February 2021, IIT Mandi hosted an International Workshop on Design and Manufacturing of Composites for Engineering Applications, in online mode. More than 120 participants attended the workshop, which included participants from universities abroad and industry personnel from ISRO, TATA Steel, LM Wind Power, etc. Speakers from IIT Kanpur, IIT Roorkee, IIT Mandi, University of Salerno, PSI Switzerland, IIT Bombay, KMUTNB Thailand, Institute of Research Hydro Québec Canada delivered talks. In November 2020, IIT Mandi hosted an International Workshop on Capacity Building Workshop on Vulnerability Assessment in India Using a Common Framework. Keynotes lectures were delivered by eminent scientists and faculty members from India and abroad.

On 24$^{th}$ February 2021, IIT Mandi celebrated its 12$^{th}$ Foundation Day. Hon'ble Chief Minister of Himachal Pradesh Shri. Jai Ram Thakur graced the occasion as the Chief Guest in the esteemed presence of Late Shri. Ram Swaroop Sharma, Member of Lok Sabha, as the Guest of Honor. On 12$^{th}$ December 2020, the 8$^{th}$ Convocation of IIT Mandi was held in online mode. The graduands were inspired by the speeches of Dr. Raghunath Anant Mashelkar, National Research Professor, former Director-General of Council of Scientific and Industrial Research as the Chief Guest and Prof. Prem Vrat, Chairperson, Board of Governors, IIT Mandi.

The faculty, students, and staff of IIT Mandi continued to work hard throughout the year to make IIT Mandi a preferred destination for high-quality learning, research, and innovation. I am sure their new initiatives during the year will bear rich fruits in the years to come.

**Prof. Ajit K. Chaturvedi**
Director

# 1. Academic Structure

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 inter-disciplinary 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 Engineering (SE)**

Faculty members from other areas of Engineering, including Mechanical Engineering and Civil Engineering, Materials Science, are part of this School.

**School of Basic Sciences (SBS)**

Faculty members from all areas of Basic Sciences, including Physics, Mathematics, Chemistry, and Biology, are part of this School.

**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.

## 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.-M.Tech. Integrated Dual Degree in Bio-Engineering
2. M.S. (by Research) in the following engineering disciplines:
   a) Computer Science and Engineering
   b) Mechanical Engineering
   c) Electrical Engineering
   d) Civil Engineering

3. Ph.D. in Engineering, Basic Sciences, and Humanities & Social Sciences
4. M.Sc. in Chemistry
5. M.Sc. in Applied Mathematics
6. M.Sc. in Physics
7. M.Tech. in Mechanical Engineering with Specialization in Energy Systems
8. M.Tech. in Energy Engineering with Specialization in Materials
9. M.Tech. in Structural Engineering
10. M.Tech. in VLSI
11. M.Tech. in Power Electronics and Drives
12. M.Tech. in Communications and Signal Processing
13. M.Tech. in Biotechnology
14. I-Ph.D. (Physics)
15. Master of Arts in Development Studies

## 1.3 Statistics of the Currently Enrolled Students Based on the Year of Enrollment, Batch, Gender, and Category.

| Gender wise data | | |
|---|---|---|
| **Year** | **Male** | **Female** |
| **2012** | 1 | 0 |
| **2013** | 2 | 0 |
| **2014** | 5 | 6 |
| **2015** | 23 | 16 |
| **2016** | 51 | 22 |
| **2017** | 175 | 41 |
| **2018** | 216 | 60 |
| **2019** | 469 | 147 |
| **2020** | 473 | 147 |
| **Total** | **1415** | **439** |

| | 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** |
| **2014** | 0 | 0 | 0 | 0 | 0 | **0** | -- | -- | -- | -- | -- | **--** | -- | -- | -- | -- | -- | **--** |
| **2015** | 0 | 0 | 2 | 0 | 0 | **2** | -- | -- | -- | -- | -- | **--** | -- | -- | -- | -- | -- | **--** |
| **2016** | 0 | 1 | 0 | 0 | -- | **1** | -- | -- | -- | -- | -- | **--** | -- | -- | -- | -- | -- | **--** |
| **2017** | 73 | 39 | 23 | 11 | -- | **146** | 0 | 1 | 0 | 0 | 0 | **1** | 0 | 1 | 0 | 0 | 0 | **1** |
| **2018** | 94 | 53 | 29 | 15 | -- | **191** | 0 | 0 | 1 | 1 | 0 | **2** | 1 | 0 | 0 | 0 | 0 | **1** |
| **2019** | 126 | 72 | 41 | 17 | 6 | **262** | 46 | 28 | 16 | 6 | 4 | **100** | 80 | 37 | 17 | 3 | 9 | **146** |
| **2020** | 124 | 87 | 45 | 22 | 32 | **310** | 31 | 35 | 17 | 8 | 15 | **106** | 43 | 29 | 12 | 3 | 4 | **91** |
| **GRAND TOTAL** | | | | | | **912** | | | | | | **209** | | | | | | **239** |

| | M.A. | | | | | | I-Ph.D. | | | | | | M.S. (by Research) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Year** | **Gen** | **OBC** | **SC** | **ST** | **EWS** | **Total** | **Gen** | **OBC** | **SC** | **ST** | **EWS** | **Total** | **Gen** | **OBC** | **SC** | **ST** | **EWS** | **Total** |
| **2015** | -- | -- | -- | -- | -- | **--** | 4 | 1 | 0 | 0 | 0 | **5** | 1 | 0 | 0 | 0 | 0 | **1** |
| **2016** | -- | -- | -- | -- | -- | **--** | 4 | 0 | 0 | 0 | 0 | **4** | 1 | 0 | 0 | 0 | 0 | **1** |
| **2017** | -- | -- | -- | -- | -- | **--** | 4 | 2 | 0 | 0 | 0 | **6** | 4 | 0 | 0 | 0 | 0 | **4** |
| **2018** | -- | -- | -- | -- | -- | **--** | 0 | 0 | 0 | 0 | 0 | **0** | 18 | 2 | 0 | 0 | 0 | **20** |
| **2019** | 5 | 2 | 2 | 0 | 2 | **11** | 2 | 1 | 0 | 0 | 0 | **3** | 21 | 4 | 0 | 0 | 0 | **25** |
| **2020** | 6 | 4 | 2 | 1 | 0 | **13** | 2 | 1 | 0 | 0 | 1 | **4** | 10 | 4 | 0 | 0 | 4 | **18** |
| **GRAND TOTAL** | | | | | | **24** | | | | | | **22** | | | | | | **69** |

| | Ph.D. | | | | | | Part-Time/ERP (M.S./Ph.D.) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Gen | OBC | SC | ST | EWS | Total | Gen | OBC | SC | ST | EWS | Total |
| **2012** | 0 | 1 | 0 | 0 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | **0** |
| **2013** | 0 | 0 | 0 | 0 | 0 | **0** | 2 | 0 | 0 | 0 | 0 | **2** |
| **2014** | 3 | 1 | 0 | 0 | 0 | **4** | 5 | 2 | 0 | 0 | 0 | **7** |
| **2015** | 18 | 6 | 2 | 0 | 0 | **26** | 4 | 1 | 0 | 0 | 0 | **5** |
| **2016** | 47 | 11 | 7 | 0 | 0 | **65** | 1 | 1 | 0 | 0 | 0 | **2** |
| **2017** | 40 | 11 | 4 | 0 | 0 | **55** | 2 | 0 | 1 | 0 | 0 | **3** |
| **2018** | 49 | 5 | 4 | 0 | 0 | **58** | 3 | 1 | 0 | 0 | 0 | **4** |
| **2019** | 43 | 15 | 2 | 2 | 0 | **62** | 7 | 0 | 0 | 0 | 0 | **7** |
| **2020** | 37 | 20 | 3 | 2 | 8 | **70** | 5 | 2 | 1 | 0 | 0 | **8** |
| **GRAND TOTAL** | | | | | | **341** | | | | | | **38** |

# 2. Project Oriented B.Tech. Curriculum

Historically, the IITs had a B.Tech. Curriculum that was aimed at training experts in each specific branch for a career in research or engineering in the branch. The curriculum had a large and strong core covering all sub-areas of the branch in depth. There was also a substantial component in basic sciences and engineering fundamentals. The courses were carefully sequenced, assuming that all students would take them in lock-step. With changes in society and technology, IIT Mandi has taken a fresh look at the B.Tech. Curriculum. As an Indian Institute of Technology, we must train leaders for the growth of India with a strong technology focus. The necessary and desirable characteristics of our B.Tech. Graduates are:

- Self-motivated with a passion to do something useful.
- The ability to learn quickly and devise innovative solutions.
- The ability to work hard, in a focused and disciplined manner.
- A solid foundation in basic principles and substantial practical hands-on experience.
- Sufficient specific knowledge to be immediately productive.
- The ability to communicate effectively and work with others.
- With these characteristics, our graduates can be expected to make their mark, enhance IIT's reputation and recompense the nation for its investment in their education.

The foundations of all B.Techs. are: Facility in design and innovation; strong understanding of common scientific and engineering principles and methods; and breadth of knowledge outside science and engineering i.e. in the Humanities, Social Sciences and Management.

Next is the core of knowledge in the student's chosen branch. This is kept to the bare minimum, with principles and techniques being learned in theory courses, in labs, or in practicums. Finally, we have a large number of specialist baskets. Many of these are interdisciplinary. The boundaries in the curriculum diagram have deliberately been drawn in a vague and overlapping manner. This is to emphasize the flexibility and the inherently interdisciplinary nature of tomorrow's B.Tech. Graduate.

## 2.1 Design Practicum

IIT Mandi has been running its unique flagship UG course named “Design Practicum (DP)” for several years. The course is offered to second-year UG students towards nurturing and developing their creative, innovative, and managerial skills in developing products useful for society. This course targets connecting the technological knowledge to societal applications, like pollution (air, water & noise), sanitation, climate change, public security & safety, health, agriculture etc. The course is also designed to create a time and resource-constrained scenario under which the students need to perform. Accordingly, interdisciplinary teams of randomly selected five to six students are nurtured by a two mentors group in their journey of discussing socially relevant problems, identifying probable solutions, and ultimately coming up with a product to implement the best solution. The expected learning outcomes of this program are the ability to work in interdisciplinary teams, coordination, delegation, leadership, technical learning, planning and integrity, learning by mistakes, and teamwork. The products successfully built and demonstrated in the previous years include a wall-climbing robot, fire-fighting robot, gesture-controlled 3-D hologram, automated ration vending machine etc. Such products have huge potential to be used in public safety, security, and defense to save valuable human life.

Due to the COVID-related constraints, DP couldn't be organized within the campus this year. However, the students are working with the idea and making as much progress as possible before fabricating the final products. The coordinators are planning for an in-person open house where the students can showcase their products once they return to the campus and fabricate their products.

## 2.2 Interactive Socio-Technical Practicum (ISTP)

IIT Mandi offers this unique interdisciplinary course curriculum to accommodate better the needs of a changing world where societal challenges require technological solutions more than before, and technology can no longer be seen as something above or outside of society. This approach focuses on building an academic culture of encouragement towards design and innovation to address today's critical socio-economic challenges through technical pathways. A crucial course under the design and innovation stream is the Interactive Socio-Technical Practicum (ISTP), offered to 3rd year B.Tech. Students. IIT Mandi students and their counterparts from institutes abroad work for two months on joint technology-oriented projects with social relevance. Student teams assess specific real-world problems through extensive fieldwork and literature review. After checking the different dimensions of the problem, they propose technological solutions for the same.

Due to the COVID-19 pandemic and restrictions on the movement of people across countries, in 2020-21, 22 projects were executed successfully by 81 IIT Mandi students only under the mentorship of 20 IIT Mandi faculty members and NGO partners.

Detailed information about the modalities of the course and all project reports are available here: http://www.iitmandi.ac.in/ISTP/

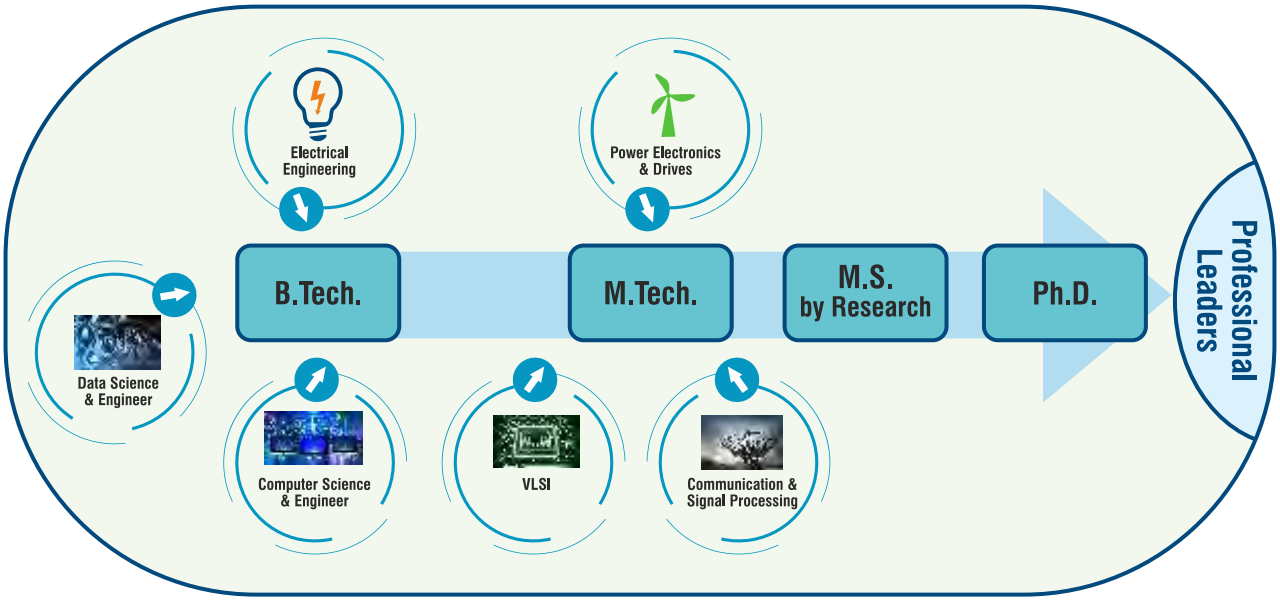
# 3. Academic Schools

## 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 35 Regular Faculty members, 6 other Faculty members, 8 Staff Members and around 77 Ph.D Students, 137 Masters Students and 597 B.Tech. Students. It has five broad areas, namely Power Electronics & Drives, Controls & Sensors, VLSI, Signal Processing and Communications, Computer Science & Engineering.

The School offers four UG degrees, namely B.Tech. in Computer Science & Engineering, Electrical Engineering, Data Science & Engineering, and a dual degree program in Bioengineering jointly with the School of Basic Science. The School has three M.Tech. Programs, namely in Power Electronics and Drives, Signal Processing & Communications, and VLSI and regular Ph.D. and M.S. by Research programs.




### Degree programs offered by SCEE, IIT Mandi

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

| Program | Year of start | Intake Capacity |
|---|---|---|
| **B. Tech. (Computer Science & Engineering)** | 2009 | 70 |
| **B. Tech. (Electrical Engineering)** | 2009 | 68 |
| **B. Tech. Data Science and Engineering** | 2019 | 28 |
| **B. Tech. (Bio Engineering) Dual Degree** | 2019 | 28 |
| **M. Tech. (VLSI)** | 2016 | 36 |
| **M. Tech. (Communication & Signal Processing)** | 2017 | 35 |
| **M. Tech. (Power Electronics & Drives)** | 2017 | 36 |
| **M.S. by Research** | 2010 | As per the |
| **Ph.D.** | 2010 | requirements |

The research areas 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 etc.

At the undergraduate level, we emphasize a hands-on learning approach by providing students with a firm foundation of both theory and practice of Computer Science and Electrical Engineering. We also have joint faculty positions with the School of Basic Sciences and School of Humanities to expose students to the social, ethical, and inclusive dimensions of their chosen area of study, enabling them to contribute significantly to society.

The first batch of B.Tech. Students completed their graduation on 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 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.

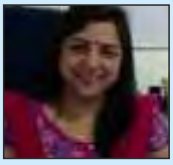
***There were around 66 Journal Papers, and 32 Peer-Reviewed Conference Papers, 6 book/book chapters and 5 patents filed in 2020-21***

***For more information:***

***Website:http://iitmandi.ac.in/Schools/SCEE/index.php***

## Faculty

| S. No | Name | Specialization & Research Interest | Photograph |
|---|---|---|---|
| 1 | **Dr. Samar Agnihotri**<br>**Associate Professor & Chairperson**<br><br>http://faculty.iitmandi.ac.in/~samar/ | Relay networks, Secure Communication and Computation, Distributed compression and computation |  |
| 2 | **Dr. Ankush Bag**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~ankushbag/ | Semiconductor Devices, Epitaxy and Compound Semiconductors |  |
| 3 | **Dr. Adarsh Patel**<br>**Assistant Professor**<br><br>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. |  |
| 4 | **Dr. Aditya Nigam**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~aditya/ | Deep Learning, Biometrics, Computer Vision, Image Processing, Computer Vision and Machine Learning |  |

| | | | |
|---|---|---|---|
| 5 | **Dr. Amit Kumar Singha**<br>**Assistant Professor**<br><br>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 |  |
| 6 | **Dr. Anil K. Sao**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~anil/ | Medical Image Processing, Speech Processing, Microscopy Image processing, Sparse representation |  |
| 7 | **Dr. Arnav Bhavsar Vinayak**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~arnav/ | Computer Vision, Medical Image Analysis, Machine Learning, Deep Learning |  |
| 8 | **Dr. Arti Kashyap**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~arti/ | Magnetism and Magnetic Materials,Distributed database application development and Big data Analytics |  |
| 9 | **Dr.Bharat Singh Rajpurohit**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~bsr/ | Renewable Energies, Power Electronics and grid integration of Renewable Energies, Power System Harmonics, Power System (Operation, Control and Analysis), Parameter Estimation of electrical Machines |  |
| 10 | **Dr. Dileep A.D.**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~addileep/ | Pattern Recognition, Kernel Methods for Pattern Analysis, Machine Learning, Speech Technology, Computer Vision |  |
| 11 | **Dr. Gopi Shrikanth Reddy**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~gopishrikanth/ | Antenna and Wave propagation, Microwave passive components, FSS and EBG structures , Electrically Samll Antenna, MIMO/Diversity Antenna, Metamaterials |  |
| 12 | **Dr. Himanshu Misra**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~himanshumisra/ | Electrical Drives, DFIG systems, Electric Vehicle, Renewable Energy, Power Converters |  |
| 13 | **Dr. Hitesh Shrimali**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~hitesh/ | Analog and Mixed signal VLSI design, analog-to-digital converters and design of radiation hard circuits (space application) |  |

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|---|---|---|---|
| 14 | **Dr. Jinesh Machchhar**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~jinesh/ | Geometric modeling, Simulation, Design |  |
| 15 | **Dr. Kunal Ghosh**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~kunal/ | Silicon solar cells, Performance and reliability analysis of photovoltaic modules |  |
| 16 | **Dr. Manas Thakur**<br>**Assistant Professor**<br><br>https://manas.gitlab.io/ | Program analysis, compilers, programming languages |  |
| 17 | **Dr. Moumita Das**<br>**Assistant Professor**<br><br>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 |  |
| 18 | **Dr. Narsa Reddy Tummuru**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~tummuru/ | Hybrid Energy Storage Applications in Future Microgrids, Efficient Power Electronic Interfaces in Renewable Energy Applications and Smartgrid Communication Networks |  |
| 19 | **Dr. Padmanabhan Rajan**<br>**Associate Professor**<br><br>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 |  |
| 20 | **Dr. Pratim Kundu**<br>**Assistant Professor**<br><br>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 |  |
| 21 | **Dr. Rahul Shrestha**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~rahul_shrestha/ | VLSI Design and Circuits & Systems for Signal Processing and Wireless Communication. |  |
| 22 | **Dr. Rameshwar Pratap**<br>**Assistant Professor**<br><br>https://sites.google.com/site/prataprameshwaryadav/home?authuser=0 | Algorithms in Data Science and Machine Learning, Theoretical Computer Science |  |

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|---|---|---|---|
| 23 | **Dr. Renu M. Rameshan**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~renumr/ | Image Processing, Computer vision, Ill-posed problems |  |
| 24 | **Dr.Satinder Kumar Sharma**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~satinder/ | VLSI Technology, CMOS Device Fabrication & Characterization, Advanced Lithography, Nanoelectronics |  |
| 25 | **Dr. Satyajit Thakor**<br>**Assistant Professor**<br><br>https://sites.google.com/site/satyajitthakor/ | Communication Theory, Information Theory, Network Coding |  |
| 26 | **Dr. Shubhajit Roy Chowdhury**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~src/ | Biomedical Embedded Systems,Non-invasive diagnostic systems, Near Infrared Spectroscopy, VLSI Architectures |  |
| 27 | **Dr. Siddhartha Sarma**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~siddhartha/index.html | Resource allocation in wireless networks, Wireless sensor network and IoT, Wireless energy harvesting. |  |
| 28 | **Dr. Sreelakshmi Manjunath**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~sreelakshmi/ | Communication Networks, Vehicular Networks, Control Theory, Non-linear Dynamics, Non-linear Controller Design&Time-delayed Systems |  |
| 29 | **Dr. Srinivasu Bodapati**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~srinivasu/ | VLSI Design, Nanoelectronics, Hardware security, Cryptography and FPGA based system design |  |
| 30 | **Dr. Srikant Srinivasan**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~srikant_srinivasan/ | IOT in Outdoor Environments, Raspberry Pi Sensor Networks, Machine Learning, Data Mining, Image Processing, Nanoelectronics/ Spintronic Device Modelling and Simulation Using Quantum and Semi-Classical Transport Techniques |  |
| 31 | **Dr.Srikanth Sugavanam**<br>**Assistant Professor**<br><br>https://www.srikanthsugavanam.com/ | Fibre Lasers, Real-Time Laser Characterization Techniques |  |

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|---|---|---|---|
| 32 | **Dr. Sriram Kailasam**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~sriramk/ | Distributed Complex Event Processing, Cloud Resource Scheduling, Scalable Algorithms for Formal Concept Analysis, Data Analytics for Scientific Data |  |
| 33 | **Dr. Tushar Jain**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~tushar/ | Control theory, fault tolerant control, industrial process control |  |
| 34 | **Dr. Varun Dutt**<br>**Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~varun/ | Artificial Intelligence, Human-Computer Interaction, Cognitive Science, Judgment and Decision Making |  |
| 35 | **Dr. VarunkumarJayapaul**<br>**Assistant Professor**<br><br>http://faculty.iitmandi.ac.in/~varunkumar/ | Algorithms and Data Structures |  |
| 36 | **Prof. Ramesh Oruganti**<br>**Adjunct Professor**<br><br>http://faculty.iitmandi.ac.in/~ramesho/ | Power Electronics, Solar photovoltaic energy systems |  |
| 37 | **Prof. Timothy A. Gonsalves**<br>**Professor Emeritus (Honorary)**<br><br>http://faculty.iitmandi.ac.in/~tag/ | Computer networks and distributed software systems |  |
| 38 | **Prof. Yvonne Dittrich**<br>**Adjunct Professor**<br>IT University Copenhagen<br><br>https://www.itu.dk/~ydi/ShortCV.htm | Software Engineering |  |
| 39 | **Prof. Rajan Kapur**<br>**Adjunct Professor**<br>President, Larankelo Ventures LLC<br>Boulder, Colorado, USA | Renewable Energy<br>Industrial Electronics<br>Head Mounted Displays |  |
| 40 | **Prof. B. D. Chaudhary**<br>**Emeritus Professor** | Software Technology |  |
| 41 | **Dr. Astrid Kiehn**<br>**Visiting Associate Professor**<br><br>http://faculty.iitmandi.ac.in/~astrid/ | Distributed Algorithms, Verification, Theoretical Computer Science |  |
| 42 | **Dr. Erwin Fuhrer**<br>**Visiting Assistant Professor** | MRI, RF hardware, Biomedical Engineering |  |

## Office Staff

| S. No. | Name & Designation | Designation & Qualifications | Photograph |
|---|---|---|---|
| 1 | Ms. Nalini Singh Gill | Junior Assistant<br>MCA |  |
| 2 | Ms. Rakhi Sankhyan | Office Assistant<br>B.Sc. (IT), MBA (HR) |  |
| 3 | Mr. Maneshwar | Multi-Tasking Staff<br>ITI (Welder Trade) |  |
| 4 | Mr. Tarun Verma | Junior Lab Assistant<br>Diploma (Electronics),<br>B.Tech. (Electronics) |  |
| 5 | Mr. Shivam | Lab Technical Assistant<br>Diploma (Electrical),<br>Pursuing AMIEE (Electrical) |  |
| 6 | Mr. Arun Kumar | Lab Technical Assistant<br>ITI (Electronics Trade) |  |
| 7 | Ms. Taruna Kumari | Lab Technical Assistant<br>B.E. & M.E. Pursuing |  |
| 8 | Sumit Maan | Lab Technical Assistant<br>M.Tech. |  |

# Research Projects

### Names of PI, CO-PI, Funding Agencies, Grant Received and Amount Spent etc.

### Externally Sponsored Research Projects

| S. No. | Project Title | Sponsoring Agency | Investigator | Amount Sanctioned (in Rs.) | Duration of Project |
|---|---|---|---|---|---|
| 1 | High-throughput phenotyping technologies for agricultural crop<br><br>Date of Sanction: 01.07.2020<br>Date of Completion: 30.06.2023 | Arnetta Technologies Pvt. Ltd | Dr. Srikant Srinivasan | 8,00,000 | 3 Years |

| | | | | | |
|---|---|---|---|---|---|
| 2 | Lakshman Rekha: AI-biometric driven home quarantine management application using mobile based continuous recognition and geofencing<br><br>Date of Sanction: 05.10.2020<br>Date of Completion: 04.10.2021 | IIT Jodhpur | Aditya Nigam (PI),<br>Dr. Arnav Bhavsar (Co-PI) | 10,00,000 | 1 year |
| 3 | A low- cost MEMS based and video- based monitoring and early warning system for rainfall induced landslides<br>Date of Sanction: 14.12.2020<br>Date of Completion: 13.12.2023 | DST | Dr. Venkata Kala Uday,<br>Dr. Varun Dutt (Co-PI),<br>Dr. Arnav Bhavsar (Co-PI) | 40,17,555 | 3 years |
| 4 | Human performance enhancement via tDCS in VR and performance forecasting via machine learning methods<br><br>Date of Sanction: 09.12.2020<br>Date of Completion: 08.12.2023 | DRDO | Dr. Varun Dutt,<br>Dr. Shubhajit Roy Choudhury(Co-PI),<br>Dr. Arnav Bhavsar (Co-PI) | 49,13,480 | 3 years |
| 5 | Control of permanent magnet synchronous machine for efficient operation of electric vehicle<br><br>Date of Sanction: 19.12.2020<br>Date of Completion: 18.12.2022 | SERB | Dr. Himanshu Misra | 31,38,360 | 2 years |
| 6 | High performance code generation using speculation<br><br>Date of Sanction: 22.12.2020<br>Date of Completion: 21.12.2022 | SERB | Dr. Manas Thakur | 25,67,730 | 2 years |
| 7 | Systems and methods for fast charging and efficient power management of electric vehicles<br><br>Date of Sanction: 22 .12.2020<br>Date of Completion: 21.12.2022 | SERB | Dr. Moumita Das | 32,83,500 | 2 years |
| 8 | Electric 3- wheeler charging strategies: assuring range in hill states<br><br>Date of Sanction: 18.02.2021<br>Date of Completion: 17.02.2022 | IEEE | Dr. Bharat Singh Rajpurohit | 18,72,000 | 1 year |
| 9 | Low-cost extensometer- based landslide monitoring and early warning device<br>Date of Sanction: 26.02.2021<br>Date of Completion: 25.02.2024 | DST | Dr. Kala Venkata Uday (PI),<br>Dr. Varun Dutt (Co-PI) | 44,87,288 | 3 years |
| 10 | Evaluation of risk perception, fear, social distancing, masks and treatments regarding Covid-19 in India<br><br>Date of Sanction: 26.02.2021<br>Date of Completion: 25.02.2024 | ICCSR | Dr. Varun Dutt | 44,87,288 | 3 years |

| | | | | | |
|---|---|---|---|---|---|
| 11 | Sustainable irrigation advisories for mid-himalayan farmers using smart satellite image analytics<br><br>Date of Sanction: 09.03.2021<br>Date of Completion: 08.03.2024 | DST | Dr. Manas Thakur (PI)<br>Prof. Yvonne Dittrich (PI) from IT University of Copenhagen, Denmark,<br>Dr. Srikant Srinivasan,<br>Dr. Shyam Kumar Masakapalli,<br>Dr. Ramna Thakur (CoPI's) | 99,29,444 | 3 years |
| 12 | Deployment of low cost landslide monitoring and warning systems<br><br>Date of Sanction: 24.02.2021<br>Date of Completion: 23.02.2024 | District Disaster Management Authority | Dr Varun Dutt (PI),<br>Dr. Kala Venkata Uday (Co-PI) | 49,20,000 | 3 years |
| 13 | Replicating human cognitive behavior on robots models using ACT-R cognitive architecture for search – and- retrieve mission in virtual environments | DRDO | Dr. Varun Dutt,<br>Dr. Arnav Bhavsar | 36,08,440 | 2 years |

**SPONSORED CONSULTANCY RESEARCH PROJECTS**

| S.No. | Proposal Title | Faculty name | Agreement signed with | Amount Sanctioned (in Rs.) | Duration of Project |
|---|---|---|---|---|---|
| 1 | Programme Analysis for optimizing R programs<br><br>Signing Date: 31.08.2020<br>Completion Date: 30.08.2021 | Dr. Manas Thakur | Mr. Mjana Kunc, Reactor Labs, Prague, Czech Republic | 34,82,400 | 1 Year |

## Progress of the Research Projects

**Dr. Jinesh Machchhar**

The problem of writing a robust implementation for swept volume computation, open for more than 5 decades, has been solved for the 2D case.

**Dr. Shubhajit Roy Chowdhury**

Our developed spiking electrodes for Noninvasive brain stimulation were successfully tested on rats.

**Dr. Manas Thakur**

MTP Work, titled "Improving Stack Allocation on Eclipse OpenJ9 using Precise Static Analysis", of Nikhil T R (2016), and Dheeraj and Swapnil Rustagi (2017) accepted for presentation at IBM Workshop on Advances in Open Runtimes and Cloud Performance Technologies (AORCPT 2020).

**Dr. Varun Dutt**

- **Interactive Climate Change Simulator:** a web-based tool to study the impact of different probabilities of climate change and the availability of feedback on the monetary actions (adaptation or mitigation) taken by individuals.
- **HackIT:** an experimental cybersecurity tool that allows analysts to simulate cyber infrastructure during the configuration phase and define the deception algorithm in the deception phase.
- **Deception Game:** a web-based simulation tool to study the effect of various parameters involved in the different cyberattack situations on adversarial decision-making.

**Dr. G. Shrikanth Reddy**
Product Developed:
- FSS based wide band absorber for X-band absorption.
- Wide scan Leaky wave antenna using an array of unit cell slots.

**Dr. Sriram Kailasam**
MTP work on Resilient framework for Distributed Formal Concept Analysis submitted to IEEE Transactions on Dependable and Secure Computing.

**Dr. Rahul Shrestha**
We have fabricated ASIC chip for the spectrum sensors that can be used for the cooperative cognitive radio network.

**Dr. Srikant Srinivasan**
FarmerZone App was developed and distributed to several thousand farmers.

## PUBLICATIONS/ PATENTS/ BOOKS/ BOOK CHAPTERS/ PAPERS NATIONAL AND INTERNATIONAL JOURNALS/ CONFERENCES.

### PATENTS

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2. Dinesh B., N. Gupta, and H. Shrimali, "Hybrid analog-to-digital converter with fractional / multi-bit per cycle conversion", Indian patent, application number 202011053662, filed in December 2020.
3. S. Roy Chowdhury, A. Dutta, A. Das, "Systems and methods for determining neurovascular reactivity to brain stimulation", US Patent No. 10874341 granted on 29th December 2020.
4. Shilpa Kharche, G. Shrikanth Reddy, "MIMO Diversity antenna", Application no. 338999-001 dated 12th February 2021.
5. Neleesh Yadav, Narsa Reddy 'Filter Capacitor Dynamics-Based Fault Detection Along With Time-Frequency Localization Of The Fault In Low-Voltage Dc Microgrid For Building Applications" application number 202111002237 dated 18th January 2021.

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2. G. Shrikanth Reddy "Compact wideband printed antenna", Handbook of Metamaterial-Derived Frequency Selective Surfaces, Springer
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6. V.K. Sharma, J. N. Tripathi, and H. Shrimali, "Deterministic Noise Analysis in Single-Stage Amplifiers by Extension of Indefinite Admittance Matrix", in IEEE Open Journal of Circuits and Systems (OJCAS), vol. 1, pp. 124-139, 2020.
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63. V. Singh, B. Pal and T. Jain, Integrated Methodology for State and Parameter Estimation of Spark-Ignition Engines, International Journal of Systems Science, Taylor & Francis, vol. 52, issue 11, pg. 2375-2396, 2021.
64. Tyagi, J. Biswas, K. Ghosh, A. Kottantharayil, and S. Lodha, "Performance analysis of silicon carrier selective contact solar cells with ALD MoOx as hole selective layer," Silicon, 2021.
65. D.Bera, R.Pratap, B. D Verma, B. Sen, T. Chakraborty, "QUINT: Node embedding using network hashing", IEEE Transactions on Knowledge and Data Engineering (TKDE), page(s): 1-14, 2021, doi 10.1109/TKDE.2021.3111997.
66. Deshpande, R.Pratap, "Sampling-based dimension reduction for subspace approximation with outliers". Theor. Comput. Sci. 858: 100-113, 2021, doi https://doi.org/10.1016/ j.tcs.2021 .01.021

**CONFERENCES ATTEND AND PAPER PRESENTED**

1. Bandopadhyay, G. Sharma, S. Roy Chowdhury, "A Computational Model to Analyse E/I (Excitation/Inhibition) Dynamics for Neural Network Integrated with Astrocyte", 2020 IEEE International Conference on Computational Intelligence in Bioinformatics and Computational Biology, Santiago, Chile, October 27-29, 2020.
2. Y. Arora, A. Dutta, S. Roy Chowdhury, "Pathways of hemodynamic response during anodal transcranial direct current stimulation: a computational approach" 5th International Conference on Neurorehabilitation (ICNR 2020), Vigo, Spain, October 13-15, 2020.
3. Y. Arora, S. Mukherjee, B. Biswas, V. Bedi, G. Dey, P. Mondal, S. Ghosh, S. Roy Chowdhury, "A Novel Near Infrared Spectroscopy Based Device for Albumin Estimation", 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2020), Palais des congrès de Montréal, Montréal, Québec, Canada July 20-24, 2020.
4. G. Sharma, R. Raj, S. Roy Chowdhury, "High definition transcranial direct current stimulation device for targeting cerebral cortex", IEEE International Instrumentation and Measurement Technology Conference 2020, Dubrovnik, Croatia, May 25-28, 2020.
5. R. M. Sudhan Rao, M. Asad and A. K. Singha, "Analysis and design of a digital average current-mode controlled buck converter," in proc. IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), 2020, pp. 1-4, doi: 10.1109/PEDES49360.2020.9379636.
6. S. Bhattacharya, A. K. Singha, and A. Sengupta, "Design of a robust controller for a voltage-mode controlled buck converter," in proc. IEEE India Council International Conference (INDICON), 2020, pp. 1-5, doi: 10.1109/INDICON49873.2020.9342588.
7. Muneeswaran, Jyoti, and S.Kailasam, "A Hybrid Partitioning Strategy for Distributed FCA", 2020 International Conference on Concept Lattice and its Applications (CLA), pp. 71-82, Tallinn, Estonia, June 2020.

8. Jyoti, A.Buzmakov, and S.Kailasam, "Towards Stable Significant Subgroup Discovery" 2020 International Conference on Concept Lattice and its Applications (CLA), pp. 287-292, Tallinn, Estonia, June 2020.
9. Merlin S, S.Kailasam and T. A. Gonsalves, "Benchmarking Distributed Stream Processing Frameworks for Real time Classical Machine Learning Algorithms", 2020 11th International Conference On Computing, Communication And Networking Technologies (ICCCNT 2020), IIT Kharagpur India, 2020.
10. Ganesan, S.Kailasam and Dileep A D, "Event-Driven Data Pipeline for Network Management Systems" 2020 11th International Conference On Computing, Communication And Networking Technologies (ICCCNT 2020), IIT Kharagpur India, 2020.
11. Karim and H.Misra, "Impact of Sine-Wave LC filter on Two-Level PWM VSI fed IM drive considering the long leads" Presented in NPSC 2020.
12. R. Shrestha and S.Telgote, "A Short Sensing-Time Cyclostationary Feature Detection Based Spectrum Sensor for Cognitive Radio Network," IEEE International Symposium on Circuits and Systems (ISCAS), pp. 1-5, Seville, Spain, Oct. 2020.
13. A.Verma and R. Shrestha, "A New VLSI Architecture of Next-Generation QC-LDPC Decoder for 5G New-Radio Wireless-Communication Standard," IEEE International Symposium on Circuits and Systems (ISCAS), pp. 1-5, Seville, Spain, Oct. 2020.
14. V.K. Sharma, J.N. Tripathi, H. Shrimali, "An Inspection Based Method to Analyse Deterministic Noise in N-port Circuits", in the IEEE EPEPS 2020, pp-1-3, Oct. 2020.
15. V.K. Sharma, J.N. Tripathi, H. Shrimali, "A Generalized Approach for Analyzing the Impact of Supply Noise in MOS Amplifiers", in the IEEE SPI 2020, pp- 1-4, May. 2020.
16. S. Dhiman, V.K. Sharma, H. Shrimali,"Design and Analysis of Low PSIJ, Energy Efficient Bootstrapped Driver for Space Application", in the IEEE ISCAS, Oct. 2020, Seville, Spain.
17. M. I. Qureshi and S. Thakor, "On the partition bound for undirected unicast network information capacity," in IEEE International Symposium on Information Theory (ISIT), pp. 1623-1628, LA, USA, June 2020.
18. S. Gujral, S. Sarma and S. Banerjee, "Transmit Power Minimization in Bidirectional Tag-to-Device Communications for IoT," 2021 13th International Conference on COMmunication Systems &NETworkS (COMSNETS), Bengaluru, India, pp. 572-580, Jan 2021.doi: 10.1109/COMSNETS51098.2021.9352909
19. S. Sahu and S. Sarma, "Making IPv6-over-BLE Energy-friendlier: An Adaptive Algorithm for Diverse Traffic," 2021 13th International Conference on COMmunication Systems & NETworkS (COMSNETS), Bengaluru, India, pp. 581-588, Jan 2021. doi: 10.1109/COMSNETS51098. 2021.9352938.
20. Chawla, R. K. Singh, A. Patel and A. K. Jagannatham, "Distributed Detection in Millimeter Wave Massive MIMO Wireless Sensor Networks," 2020 International Conference on Signal Processing and Communications (SPCOM), 2020, pp. 1-5.
21. M S A, T Jain, and J Yamé, "Robust fault detection and isolation for VAV terminal units in a multizone Building", 4th IEEE Conference on Control Technology and Applications (CCTA), pp.795-800, Montreal, Canada, August 2020.
22. V. Singh, B. Pal and T. Jain, State and Parameter Estimation for Spark Ignition Engine with Parameter Uncertainty, 28th IEEE Mediterranean Conference on Control and Automation, pg. 502-507, 2020.
23. Jyotibhushan P, A Kumar, G. S. Reddy, "Meander Line and Loop Resonator Loaded Dual Band Electrically Small antenna", 2020 IEEE-Union Radio-ScientifiqueInternationale-URSI Regional Conference on Radio Science ( RCRS), India, Feb. 2020.

24. N. Sharma, S. Uttrani, and V. Dutt, "Modeling the Absence of Framing Effect in an Experience-based Covid-19 Disease Problem," in International Conference on Cognitive Modelling, pp. 249-255, Irvine, CA, USA, June 2020.
25. R.Pratap, K.Revanuru, A. Ravi, R. Kulkarni, "Randomness Efficient Feature Hashing for Sparse Binary Data" the 12th Asian Conference on Machine Learning (ACML), pages 689-704, online conference, November 2020.
26. R.Pratap, A.Deshmukh, P. Nair, A. Ravi, "Scaling up Simhash" the 12th Asian Conference on Machine Learning (ACML), pages 705-720, online conference, November 2020.
27. Deshpande and R.Pratap, "Subspace approximation with outliers" the 26th International Computing and Combinatorics Conference (COCOON), pages 1-13, online conference, August 2020.
28. Deshpande, P.Kacham and R.Pratap, "Robust k-means++" the Association for Uncertainty in Artificial Intelligence (UAI), pages 799-808, online conference, August 2020.
29. S. Uttrani, N. Sharma, and V. Dutt, "Modeling the Absence of Framing Effect among Indian and US populations in an Experience-based COVID-19 Disease Problem," 2020 International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction and Behavior Representation in Modeling and Simulation, Washington DC, USA, October 2020.
30. S. Bhargav, S. Kaushik, A. Choudhury, and V. Dutt, "Development of a weighted ensemble approach for prediction of blood glucose levels," 1st International Conference on Computing and Machine Intelligence (ICMI 2021), pp. 297-301, Istanbul, Turkey, February 2021.
31. K. Rao, S. Chandra, and V. Dutt, "Desktop and Virtual-Reality Training under varying degrees of task difficulty in a complex search-and-shoot scenario," International Conference on Human-Computer Interaction, 2020, pp. 421-439, Copenhagen, Denmark, October 2020.
32. D. Sahoo, N. Sood, U. Rani, G. Abraham, V. Dutt, and A. Dileep, "Comparative analysis of multi-step time-series forecasting for network load dataset," 2020 11th International Conference on Computing, Communication and Networking Technologies (ICCCNT), pp. 1-7, Kharagpur, India, October 2020.

## OUTREACH/CONTINUING EDUCATION ACTIVITIES ORGANIZED

**Dr. Siddartha Sarma**

- AICTE Training and Learning (ATAL)online FDP on "Internet of Things and Its Applications."

**Dr. Srikanth Sugavanam**

- Invited talk for EU-H2020-ITN 'MEFISTA'/EU-H2020-EID 'REAL-NET'/EU-H2020-ITN 'WON'/EU-H2020-ETN 'POST-DIGITAL' Transferable Skills Workshop 1 (TSW 1) - "Constructive Alignment for Academic Communication".

https://mefista.astonphotonics.uk/transferable-skills-workshop-i-tsw-i/

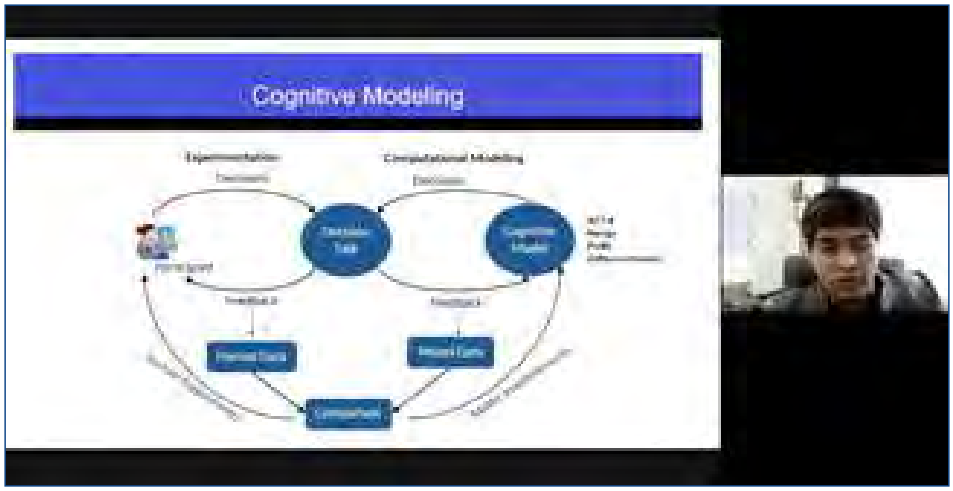
**Dr. Hitesh Shrimali**

- AICTE sponsored Short Term Training Program (STTP) on Mixed-Signal Design approaches for Artificial Intelligence Processors, delivered a lecture for LBRCE, AP, India (March 2021).
- A lecture was delivered on "Design and Modeling of Energy Efficient Hybrid Flash-SAR ADC" for NIT Jalandhar as a part of TEQIP (Aug. 22, 2020).
- A lecture delivered as a part of the Faculty Development Programme (FDP) on "Trends towards Industry 4.0 in Mixed Signal SOCs" for JUIT, Solan, HP (June 17, 2020).
- A lecture on "On-chip Power Delivery Networks" was delivered for IIT Jodhpur (May, 2020).

**Dr. Varun Dutt**

- DST-UKIERI International Workshop on Adversarial Cybersecurity: Indian Institute of Technology Mandi, India and London Metropolitan University, United Kingdom, hosted a two-day virtual workshop on "adversarial cybersecurity" on 23rd and 24th September 2020. This workshop was held in collaboration with the Centre for multidisciplinary Research, Innovation and Collaboration (CMRiC), United Kingdom. The workshop was funded by UK-India Education and Research Initiative and the Department of Science and Technology, India.

- 2nd Online Winter School on Cognitive Modeling: Indian Institute of Technology Mandi virtually hosted the 2nd Winter School on Cognitive Modeling (WSCM) from 15th to 17th December 2020. This initiative was hosted by IIT Mandi in collaboration with Himachal Pradesh Technical University (HPTU), the University of Groningen, the University of Waterloo, and the Indian Institute of Technology Roorkee. The event included key sessions from various national and international researchers and professionals to train students on the best practices in the area of cognitive modeling.




**Dr. Sreelakshmi Manjunath**

- 13th International Conference on COMmunication Systems & NETworkS (COMSNETS) 2021, Publicity Co-chair.

**Dr. Satinder Sharma**

- Participated as a representative from IIT Mandi: startup Hub, initiative Ministry of Electronics & IT (MeitY) Electronics Niketan 6, CGO Complex, New Delhi J.an 2020.

- Expert talks on, 'Materials and devices for advanced applications,28.07.2020, National Institute of Technical Teachers Training and Research (NITTTR) Chandigarh Sector 26, Chandigarh 160019.
- Invited talk on STC on "Nanoelectronics Devices and Circuits Design" July 8, 2020, National Institute of Technical Teachers Training and Research (NITTTR) Chandigarh Sector 26, Chandigarh 160019.
- Invited talk online Short Term Course on "Nanotechnology for Electronic and Photonic Devices (NanoDev-2020)" June 18 at Department of Electronics & Communication Engineering, Punjab Engineering College (Deemed to be University), Sector-12, Chandigarh.
- Invited talk Online STC on "Nanoelectronics Devices and Circuits Design", July 7, 2020, National Institute of Technical Teachers Training and Research (NITTTR) Chandigarh Sector 26, Chandigarh 160019
- Expert Lecture in STC on Quantum and Energy Materials: Potential & amp; Applications, on 22nd April 2020 at National Institute of Technical Teachers Training and Research (NITTTR) Chandigarh Sector 26, Chandigarh 160019.

**Dr. Srikant Srinivasan**

- Farmer Outreach on best practices of adopting precision agriculture.

## CONFERENCE/WORKSHOPS/OTHER INSTITUTE/INDUSTRY VISITED (INDIA OR ABROAD) OR INVITED LECTURES DELIVERED

**Dr. Hitesh Shrimali**

- Dr. Hitesh Shrimali attended IEEE ISCAS 2020 (virtually attended).

**Dr. Shubhajit Roy Chowdhury**

- Non-invasive sensing of pathophysiological parameters at the point of care at the Faculty Development Programme on Sensor Technology, National Institute of Engineering, Mysuru, September 21-25, 2020.
- Interdisciplinarity in Research at the Faculty Induction Programme on Research Methodology, South Asian Institute for Advanced Research and Development, September 20-24, 2020.
- Architectural Design of Low Power VLSI Circuits at the Faculty Development Workshop on Low Power VLSI Design for Communication Systems and Networks (LVCSN'20), NIT Jalandhar, September 16-20, 2020.
- "Architectural and Logic Synthesis of VLSI Circuits" (Series of three lectures) at the Faculty Development Programme on Analog and Digital VLSI Design, NITTTR Chandigarh, August 03-07, 2020.

**Dr. Manas Thakur**

- Multi-institutional invited talk titled "Java Performance in HotSpot JVM," organized by KITS Ramtek, 29th May 2020.
- Organized a guest lecture on "Analyzing and Optimizing Parallel Programs" by Prof. V Krishna Nandivada (IIT Madras) in the course CS502 Compiler Design, offered in Aug-Dec 2020.

**Dr. Varun Dutt**

- Scientific Russia-India Webinar on "Cyber-physical systems; Society 5.0; Artificial Intelligence".
- Indo-US human machine teaming workshop, Arlington, VA, USA.

- Fifth Brain Mapping and Artificial Intelligence Workshop, IIT Delhi.
- Faculty Development Program on cognition and computation, IIT Roorkee.
- 2nd Online Winter School on Cognitive Modeling, IIT Mandi.

**Dr. Rameshwar Pratap**

- Delivered a keynote talk at "Data Analytics and Predictive technologies" organized by IIT-BHU on 8th July, 2021. I presented our recent work on; Sketching and SamplingTechniques for Big Data.
- Delivered a keynote talk at "Online short term course on Data Analytics and its Application in Industries" organized by IIT-BHU on 19th December 2020.
- Delivered a talk at "Efficient Sketching Algorithm for Big Data", at RUSH-lab, RICEUniversity, USA, September 2020.
- Organized a special session on "Feature Extraction and Learning on Image and Text Data" to be held in conjunction with the conference "IEEE International Conference on Systems, Man and Cybernetics (SMC)-2020".

**Dr. Gopi Shrikanth Reddy**

- Presented Invited lectures for Multiple Faculty development program, IEEE regional Chapters, NKN. Some of the invited events are: IIT Palakkad, India, CUSAT, India, IIT Kharagpur, India, IIITDM Jabalpur, India, Xavier College Mumbai, Govt. Engg. College Sunder-nagar HP, Pillai University Mumbai, MITS Gwalior MP, VJTI Mumbai, VES Engineering college Mumbai.
- NKN lectures: Ultrawide band antennas, IIT Guwahati.

**Dr. Sriram Kailasam**

- Talk on "Research challenges/methodologies in large-scale data & compute parallelism on the cloud" as part of RGNIYD –NITJ Collaborative Short-term Certificate Course on Cloud Computing to be held from November 16-20, 2020.

**Dr. Himanshu Misra**

Delivered the following Lecture in the Faculty Development Programs:

- ATAL Faculty Development Program on Electric Vehicles MANIT on 01/01/2021.
- Delivered expert talk on the topic "General overview of DFIG and shunt active filtering in DFIG-DC system" to the students and faculty of Department of Electrical Engineering NIT Uttarakhand on 19/02/21.

**EXPERT TALKS IN THE SHORT-TERM COURSES**

- Delivered a lecture in online one-week short-term course on Research Trends in Energy and Power Systems (RTEPS) at MANIT Bhopal on 20/10/2020.
- Delivered a lecture in online one-week short-term course on Recent Trends in Microgrid 2020 (RTM-2020) at NIT Jamshedpur on 31/10/2020.
- Delivered a lecture in online one-week short-term course on "Recent Advances in Power Electronics & its Applications" at JEC Jabalpur on 23/09/2020.

**Dr. Satinder Sharma**

- S. K. Sharma, R. Kumar, M. Chauhan, K. Palit, and K. E. Gonsalves, accepted for invited talk in SPIE, Advanced EUV lithography at San Jose, California, USA, 26 March (2021). (Oral Talk will be held on Virtual mode, 22 Feb.2021)

- M. Jangra, D. S. Arya, R. Khosla, and S. K. Sharma; Design and Simulation of Capacitive Z-axis MEMS Accelerometers using SU-8, PolySi, Si 3 N 4, and SiC-based structural materials; IEEE-ICEE 2020, 5th International Conference on Emerging Electronics, Hosted by- Indian Institute of Technology Delhi, India from 26th - 28th Nov. (2020).
- M. Garg, D. S. Arya, M. G. Moinuddin, S. K. Sharma, P. Singh; Highly Sensitive Polymer Micro-Mesh for Measurement of Vacuum Packaged MEMS Devices; IEEE-ICEE 2020, 5th International Conference on Emerging Electronics, Hosted by- Indian Institute of Technology Delhi, India from 26th - 28th Nov. (2020).

**Dr. Adarsh Patel**

- **Delivered a talk (online mode) under FDP:** 5G Green Communication and Networks at Acharya Institute of Technology, Bengaluru, 18 -22 Jan 2021.
- Delivered a guest webinar as a part of the subject curriculum, Cognitive Radio **Networks:** Spectrum Sensing and The Road Ahead at Sri Sivasubramaniya Nadar College of Engineering, Chennai, 30 Sep. 2020.

**Dr. Tushar Jain**

- Plenary lecture at International Workshop organized by LaboratoireIngénierie Systèmeset Aide à la Décision (LISAD), EcoleNationale des Sciences Appliquées Agadir, December 19, 2020, Maroc.

**Dr. Srikant Srinivasan**

- Invited lecture: Rajiv Gandhi National Institute of Youth Development, FarmerZone - Delivering value to potato farmers, Oct. 21, 2020.
- Chief Guest: IIIT-Una Induction program 8 Dec. 2020.

## EMINENT GUEST/SCHOLARS/STUDENTS/INTERNS HOSTED

- **Name of the guest lecturer(s):** Prof. V. Krishna Nandivada.
  **Affiliation of the guest lecturer(s):** IIT Madras.
  **Date of the lecture(s) delivered:** 30th November 2020.
  **Title of the talk/event:** Challenges in Analyzing and Optimizing Parallel Programs.
  **A summary of the talk/event:** Prof. Krishna Nandivada from IIT Madras discussed various challenges, including detailed examples, while designing analyses and optimizations for parallel programs, as part of an invited lecture for the course CS502 Compiler Design taught by Dr. Manas Thakur (IIT Mandi), during the Sep-Dec 2020 semester.

- **Event:** DST - UKIERI Workshop on adversarial cybersecurity.

  Indian Institute of Technology Mandi, India and London Metropolitan University, United Kingdom hosted a two-day virtual workshop on “adversarial cybersecurity” on 23rd and 24th September 2020. This workshop was held in collaboration with the Centre for Multidisciplinary Research, Innovation and Collaboration (CMRiC), United Kingdom. The workshop was funded by the UK-India Education and Research Initiative and the Department of Science and Technology, India.

The purpose of the workshop was to bring together the best research minds of the world in the field of cybersecurity and related areas to discuss and to showcase their latest works in their respective specializations. The 23 workshop speakers (Table 1), represented over 16 organizations, including world-class research universities, institutes and government organizations such as Carnegie Mellon University, Cardiff University, IISc Bangalore, CMRiC, Lloyds Bank, C-DAC Mohali, and many more.

The agenda began with an inaugural ceremony where Prof. Jain, Dean (Infrastructure and Service), Indian Institute of Technology Mandi, gave an overview of the current cybersecurity situation around the world. He highlighted the importance of collaboration between leading institutes such as London Metropolitan University and Indian Institute of Technology Mandi on the grieving issues of cyber threats prevailing in the world. Mr. Rowan Kennedy and Mr. Dominic Stanton of the British Council expressed their hopes of building a stronger education bond between the United Kingdom and India through the workshop. Mr. SK Varshney, Scientist 'G', Department of Science and Technology, emphasized on strengthening relations between the two countries. He also shared about upcoming programs and initiatives between two countries to foster research. Speakers then delivered their talks, shared their research, and expressed their desires to collaborate with other researchers and institutes to further propagate the agenda. A total of 32 participants (Table 2) from various institutes across India, the United Kingdom and other countries across the world attended the workshop. The valedictory event concluded the two-day long workshop with highly encouraging words from Dr. Sulakshana Jain, Scientist D, Department of Science and Technology, India, Dr. Jaya Goyal, Head, Higher Education & Society, British Council, India.

As an outcome, the workshop covered research that focuses on adversarial mental models, the influence of recent and frequent experiences on adversarial decisions, and adversarial strategies for waging cyber-attacks. Researchers discussed the use of honeypots (deception), intrusion detection systems, and other approaches for monitoring suspicious network-related activities. In particular, researchers covered the influence of availability and accuracy of IDSs and the timing and amount of deception via honeypots in different sized networks. The use of game-theoretic and machine-learning tools and techniques in cybersecurity research was briefly discussed. For this, discussion on different cybersecurity games that allowed researchers to compute optimal Nash actions and deviations from adversary actions from Nash actions were also held. Also, cognitive, machine-learning, and deep-learning models were looked to be used to model decisions of adversaries and network events. The workshop also helped the students and researchers learn and experience-sharing about the cognitive and social aspects involved in cyber-attacks and cyber-defense.

**Table 1: List of Guest Speakers at UKIERI-DST virtual workshop on adversarial cybersecurity**

| S.No. | Name of the Speaker | Designation | Organization |
|---|---|---|---|
| 1. | Prof. Sandeep Shukla | Professor | Indian Institute of Technology Kanpur, India |
| 2. | Prof. Vassil Vassilev | Professor | London Metropolitan University, UK |
| 3. | Prof. Sylvia Ilieva | Professor | Sofia University, UK |
| 4. | Dr. Zahid Maqbool | Assistant Professor | Government Degree College Dooru, India |
| 5. | Dr. Cyril Onwubiko | Founder | Center for Multidisciplinary Research, Innovation and Collaboration (C-MRiC), UK. |

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|---|---|---|---|
| 6. | Mr. Anthony Phipps | Senior Manager | Cyber Security, Lloyds Bank, UK |
| 7. | Dr. Palvi Aggarwal | Post-Doc | Dynamic Decision- Making Laboratory, Carnegie Mellon University, USA |
| 8. | Prof. Aunshul Rege | Associate Professor | Temple University, USA |
| 9. | Mr. Sanjeev Kumar | Joint Directory | Centre for Development of Advanced Computing (C-DAC), Mohali, India |
| 10. | Prof. Santosh Biswas | Professor | Indian Institute of Technology Guwahati, India |
| 11. | Prof. S. Venkateshan | Associate Professor | Indian Institute of Information Technology Allahabad, India |
| 12. | Prof. Kanchi Gopinath | Professor | Indian Institute of Science, Bengaluru, India |
| 13. | Prof. Frank Wang | Professor | School of Computing, University of Kent, UK |
| 14. | Prof. Ruth Ikwu | Research Associate | Cardiff University, UK |
| 15. | Prof. Pierangelo Rosati | Assistant Professor | DCU Business School, Ireland |
| 16. | Mr. Viktor Sowinski-Mydlarz | Graduate Student | London Metropolitan University, UK |
| 17. | Mr. Herbert Maosa | Graduate Student | London Metropolitan University, UK |

**Event: 2nd Online Winter School on Cognitive Modeling, IIT Mandi**

Indian Institute of Technology Mandi virtually hosted the 2nd Winter School on Cognitive Modeling (WSCM) from 15th to 17th December 2020. This initiative was hosted by IIT Mandi in collaboration with Himachal Pradesh Technical University (HPTU), the University of Groningen, the University of Waterloo, and Indian Institute of Technology Roorkee. The event included key sessions from various national and international researchers and professionals to train students on the best practices in the area of cognitive modeling.

The second edition of winter school on cognitive modeling began with Prof. S. P. Bansal, Vice-Chancellor, Himachal Pradesh Technical University, delivering the inaugural address virtually on 15th December 2020. Other dignitaries during the inaugural address included Dr. Dhirendra Sharma, Dean of Engineering, Himachal Pradesh Technical University, Prof. Satish Chandra Jain, Dean of Infrastructure and Services, Indian Institute of Technology Mandi, and Prof. Venkata Krishnan, Dean of Sponsored Research, Industrial Consultancy, and International Relations. The inaugural event also included participants, speakers, and students from various countries across the globe.

During the three-day event, Dr. Marieke van Vugt discussed how accumulator models allow us to draw meaningful insights about an individual's decision-making strategy (such as whether the individual tends to be slow-and-accurate or fast-and-often-wrong) out of data from simple cognitive tasks. She also gave insight into how mental models can be applied to understand how depression works and the effects of meditation on the mind and brain.

Along with this, Dr. Terrence Stewart shared his knowledge on using tools like Nengo, which could be used to define different neuron types, learning rules, optimization methods, and reusable subnetworks to build large-scale brain models. He also covered how interdisciplinary researchers from diverse fields could answer questions about human cognition and the brain in his session.

Speaking about the impact of conducting a virtual winter school on cognitive modeling during

these challenging times, Prof. Varun Dutt, Associate Professor, School of Computing and Electrical Engineering, IIT Mandi, said, "The School provided participants from diverse backgrounds an exposure to different models and tools including instance-based learning theory), accumulator models, Spiking neural network architectures (like Nengo) and EEG pattern classification, which could be used to model people's decisions in a wide variety of basic and applied domains." Dr. Dutt also emphasized using tools like PyIBL to model people's thinking and decision-making in different real-world problems involving complex dynamics, time-delays, and uncertainties.

This year's Winter School featured engaging sessions to understand different tools for creating cognitive models, which included Nengo (neural simulator), PyIBL (used to model human decisions from experience), and Accumulator models (to model human decisions based upon accumulations to thresholds). Additional sessions elucidating cognitive models' industry applications discussed models for EEG-based image classification, stroke diagnosis, machine learning applications in healthcare, and social network analysis.

The three-day event concluded with the valedictory address of Dr. Samar Agnihotri, Chairperson, School of computing and electrical engineering, Indian Institute of Technology Mandi, Prof. Marieke van Vugt, University of Groningen (The Netherlands), Dr. Terrence Sttewart, University of Waterloo, Canada, and Prof. Varun Dutt, School of Computing and Electrical Engineering, Indian Institute of Technology Mandi.

**Table 2: List of Guest Speakers at 2nd Winter School on Cognitive modeling**

| S.No. | Name of the Speaker | Designation | Organization |
|---|---|---|---|
| 1. | Dr. Marieke van Vugt | Assistant Professor | University of Groningen, Netherlands |
| 2. | Dr. Terrence C. Stewart | Research Scientist | University of Waterloo, Canada |
| 3. | Dr. ParthaPratim Roy | Associate Professor | Indian Institute of Technology Roorkee |
| 4. | Dr. Shruti Kaushik | Senior Data Scientist | RxDataScience, USA |
| 5. | Mr. Abhinav Choudhury | Post Doctoral Fellow | INMAS DRDO, India |

## PROFESSIONAL ACHIEVEMENTS, HONORS AND AWARDS/ MEMBERSHIP OF PROFESSIONAL SOCIETIES

**Dr. Jinesh Machchar**

- Honorable mention award for paper titled "Conjugate shape simplification via precise algebraic planar sweeps toward gear design" at the Shape Modeling International Conference, 2020.

**Dr. HiteshShrimali**

- "Excellent and Consistent Teaching Performance Combined with Contributions Towards Institute Services" on the 12th Foundation Day of IIT Mandi (February 24, 2021).

**Dr. Shubhajit Roy Chowdhury**

- Selected as Associate Editor, Frontiers in Public Health.
- Selected as Review Editor, Frontiers in Computational Neuroscience.

**Dr. Varun Dutt**

- SKOCH Award (Gold), Safety & Security for Landslide Monitoring and Warning System, 2020.
- Prof. Varun Dutt is now serving as Project Director IIT Mandi iHub and HCI Foundation (a Technology Innovation Hub under National Mission on Interdisciplinary Cyber Physical Systems).

**Dr. Himanshu Misra**

- Committee Member as Track Chair of conference Springer EPREC-2021

**Dr. Rahul Shrestha**

- Awarded with the "Teaching Honor Roll Award" by the Indian Institute of Technology (IIT) Mandi for consistent teaching performance that is highly appreciated by the student community. Received this award from the Chief Minister of Himachal Pradesh, Shri Jai Ram Thakur, during the 12$^{th}$ Foundation-Day Celebration (on 24$^{th}$ of February 2021) of IIT Mandi.

**Dr. Srikant Srinivasan**

- Proposal reviewer for DBT-EUREKA's 2$^{nd}$ Global Stars India joint call on “Key Enabling Technologies for Healthcare, Agriculture and Water.

**NEW INITIATIVES/ NEW RESEARCH FACILITIES CREATED/ EQUIPMENT INSTALLED/ LABORATORY ESTABLISHED**

**Dr. Gopi Shrikanth Reddy**

- Partial Anechoic Chamber, Antenna Far-field radiation pattern testing facility, PCB fabrication facility, Absorptivity measurement facility.

**Dr. Rahul Shrestha**

- Recently installed 32 Channel Logic Analyzer to test the digital ASIC chips in the VLSI Design and Testing Lab at IIT-Mandi.

**STUDENT ACTIVITIES/ACHIEVEMENTS**

- The following article is solely written by my PhD student:
  S. Gujral, "Relay-Aided Bidirectional Communications Between Devices in a Hybrid User Scenario for IoT", accepted in National Conference on Communication (NCC), IEEE, 2021
- Dr. A. S. Joshi, Ph.D. "Multivalent Energy-Efficient CMOS Amplifiers and Data Converters for Signal Processing Applications. Awarded (2020) Dr. Hitesh Shrimali,SCEE,(Co-guide)
- Dr. S. Sharma , Ph.D. "High Gate Dielectrics for Two-Dimensional Multilayer Hafnium Disulfide based Interdigitated Electrodes - Field Effect Transistors: Next-Generation Technology" Awarded (2020) Dr. Hitesh Shrimali, SCEE, (Major Guide)
- Dr. P. Aggarwal, a former Ph.D. student, has received an offer to a full-time tenure track Assistant Professor position in the Department of Computer Science at the University of Texax at El Paso, USA.
- M.Subramaniam A was awarded student travel support to present the paper in 4$^{th}$ IEEE Conference on Control Technology and Applications (CCTA), August 24-26, Montreal, Canada, 2020.
- V. Singh got an internship an internship at Robert Bosch, Bangalore (11$^{th}$ January 2021 to 1$^{st}$ July 2021)."

## STUDENT PLACEMENTS

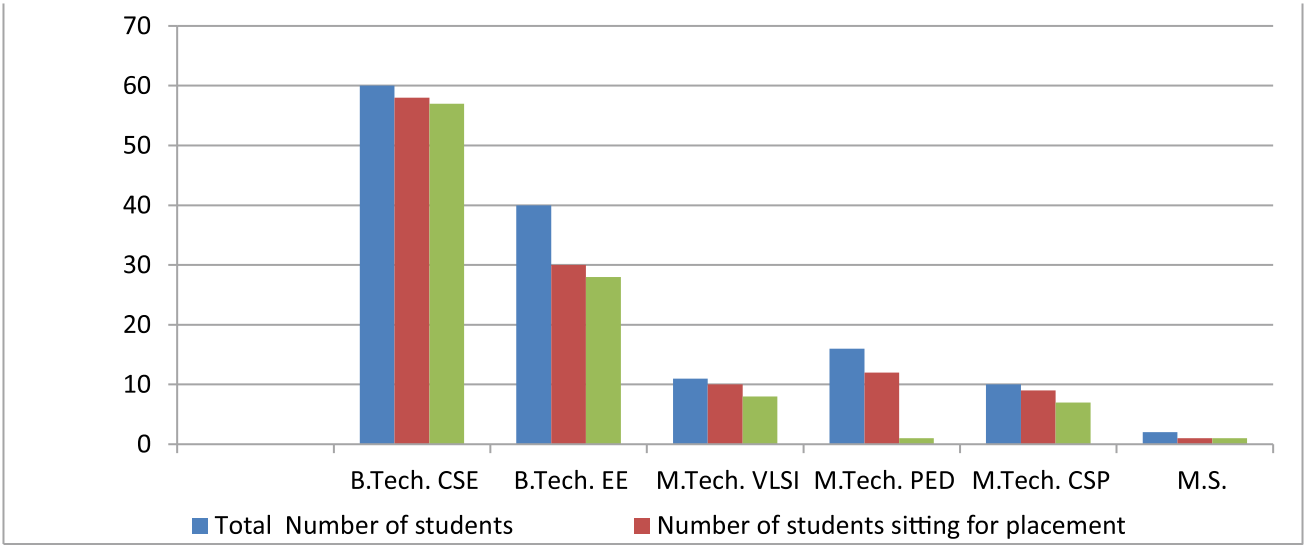


**Figure: Number of placements for the graduates of the year 2020**

- Statistics of employment of the CSE and EE graduates undergoing the B. Tech. program in SCEE. The employers include Razorpay, Service now, Worksapplication, Arcesium, Toppr, Microsoft, DeShaw, GoldmanSachs, SMS Datatech, GMO, Sprinklr, Cashfree, HSBC, Opentext, Sigmoid, TCS, 1mg, Aassnjobs, Robert Bosch, Samsung Delhi, LTI, IBM, Oyorooms, Internet Academy, Truminds, Brane Enterprises Private Limited, Marvell, eClerx, L&T, CGI, Signal Chip, Amazon, Publicis Sapient, LTI, Future first, Wipro & Mathworks, etc.
- Statistics of employment of the VLSI, PED and CSP graduates undergoing the M. Tech. program in SCEE. The employers include NXP, RedPine Signals, Cadence, Synopsys, Siganlchip, Marvell, Decision Point, Vehant Technologies, Eclerx, Qualcomm, TCS, Altiostar Networks Inc, L&T ECC, P2 Power, Signalchip & Marvelletc.

## STAFF MEMBER ACTIVITIES/ACHIEVEMENTS

- Mr. Manish Bansal - Moved to IIT Delhi for Ph.D.
- Ms. Payali Das - Moved to IIT Delhi for Ph.D.

## MEDIA COVERAGE IN NEWSPAPERS AND TV/ IMPORTANT PHOTOGRAPHS/ALBUMS

**Dr. Varun Dutt**

- Invited on a talk by DD News as a domain expert in the field of Landslide Monitoring Systems. Link to the video: https://youtu.be/sLYpRbPNYmY.
- Financial Express: https://www.financialexpress.com/auto/car-news/how-driving-the-new-hyundai-elantra-petrol-returned-more-fuel-efficiency-than-claimed-figure-road-trip-highways-mileage-how-to-get-best-mileage-car/2062390/.
- The Statesman: https://thestatesman.com/cities/shimla/automatic-thermal-screening-visitors-mandi-dc-office-1502919941.html.
- Analytics Vidhya Magazine: https://analyticsindiamag.com/iit-mandi-hosts-innovative-winter-school-on-cognitive-modelling/.
- DataQuest:https://www.dqindia.com/iit-mandi-host-virtual-workshop-cyber-security-registration-free/.
- BW Education: http://bweducation.businessworld.in/article/IIT-Mandi-To-Host-UKIERI-DST-Virtual-Workshop-On-Adversarial-Cyber-Security-In-Collaboration-With-London-Metropolitan-University-And-Centre-For-Multidisciplinary-Research-Innovation-And-Collaboration/16-07-2020-298170/.
- Career 360: https://news.careers360.com/iit-mandi-and-london-metropolitan-university-host-virtual-workshop.

# 3.2 SCHOOL OF ENGINEERING (SE)

School of Engineering (SE) is committed to serving society through innovation and excellence in engineering education and research focused on developing sustainable technologies. Our mission includes translating research into the public benefit, integrating research with engineering education, diversifying external research projects towards engineering solutions via a cross-disciplinary research approach, etc. The school is committed to a high standard of engineering education through outstanding teaching, innovative curricula, and an excellent research environment. School offers a number of common courses for B. Tech like Design practicum, Reverse engineering, Graphics for design, Materials science, Product realization technology, Mechanics of rigid bodies, Continuum mechanics and Engineering thermodynamics, and the core courses of Mechanical and Civil stream. Presently, the School of Engineering has 37 faculty members, including 2 Professors, 10 Associate Professors, 19 Assistant Professor, 1 Visiting Professor, 1 Visiting Assistant Professor, 1 Emeritus Professor, 2 Distinguished Visiting professors, and 1 Adjunct Professor. There are currently 101 Ph.D. (including ERPD & Part-time Ph.D. scholars), 31 MS, 97 M.Tech and B.Tech 195 (ME-107, CE-88) students in the school. The main research areas are broadly classified as Materials and Design, Manufacturing, Thermo-fluids Engineering, Energy, and sustainable Himalayan infrastructure. In the 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.

Additionally, molten metal's/alloys are also being explored in the school. Energy-efficient systems cover climate change studies, applications of phase change materials towards energy-efficient buildings, and the use of non-conventional energy sources at IIT Mandi 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, NRDMS, NMHS, MoES, DLR (German Aerospace Centre), BHEL etc. The school has several well-equipped UG labs (Design lab, Thermo-fluid lab, Mechanical workshop, Survey lab, Geotechnical lab, and Environmental Engineering & Earth Science lab. PG (Energy Engineering lab, Advanced Structural Engineering lab) and several research labs Smart Structure & System, IC Engine lab, Composite Design & Manufacturing, Thermo-Fluid, Geohazard, Acoustics Vibration lab, Nanoscale materials & Device lab, Smart Material & Structure Research Laboratory, Biosensor and Biomaterial Lab, Atmospheric Chemistry and Climate Change and I4S, etc.

## Faculty

| | | |
|---|---|---|
| 1. | **Dr. Viswanath Balakrishnan**<br>**Chairperson & Associate Professor**<br>Specialization: Growth of functional materials/thin films,<br>Electron microscopy &in situ exploration of structure-property relationships<br>Ph.D. (Materials Science) from IISc, Bangalore (2008)<br>Home Town: Chidambaram, Tamil Nadu<br>Phone: 01905-267142<br>Email: chairse@iitmandi.ac.in, viswa@iitmandi.ac.in |  |
| 2. | **Dr. Atul Dhar**<br>**Associate Professor**<br>Specialization: IC Engines, Alternative Fuels, Emission Control<br>Ph.D. from IIT Kanpur (2013)<br>Home Town: Sultanpur, Uttar Pradesh<br>Phone: 01905-267143<br>Email: add@iitmandi.ac.in |  |

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|---|---|---|
| 3. | **Dr. Arpan Gupta**<br>**Associate Professor**<br>Specialization: Acoustics,<br>Vibration, Bio-mechanics, Computation al methods - FEM, CFD, Lattice Boltzmann Method<br>Ph.D. from National University of Singapore (2012)<br>Home Town: Indore, MP<br>Phone: 01905-267922<br>Email: agupta@iitmandi.ac.in |  |
| 4. | **Dr. Amit Shukla**<br>**Assistant Professor**<br>Specialization: Control Systems, Robotics, Mechatronics,<br>Machine Vision and Artificial Intelligence<br>Ph.D. from Imperial College, London in 2012.<br>Home Town: Allahabad<br>Phone: 01905-267222<br>Email: amitshukla@iitmandi.ac.in |  |
| 5. | **Dr. Ashutosh Kumar**<br>**Assistant Professor**<br>Specialization: Geotechnical Engineering<br>Ph.D. from IIT Bombay (2018)<br>Home Town:<br>Phone: 01905-267825<br>Email: ashutosh@iitmandi.ac.in |  |
| 6. | **Dr. Deepak Swami**<br>**Assistant Professor**<br>Specialization: Groundwater flow and transport modelling, Water resources development and management, Disaster mitigation specially related to floods and flash flood.<br>Ph.D. from IITRoorkee (2014)<br>Home Town: Kota, Rajasthan<br>Phone: 01905-267912<br>Email: Deepak@iitmandi.ac.in |  |
| 7. | **Dr. Dericks Praise Shukla**<br>**Associate Professor**<br>Specialization: Remote Sensing & GIS, Hydro-geo-chemistry,<br>Water contamination mostly as and other Heavy metals,<br>Natural Hazards Assessment and Mapping<br>Ph.D. from University of Delhi (2012)<br>Home Town: Allahabad, Uttar Pradesh<br>Phone: 01905-267147<br>Email: dericks@iitmandi.ac.in |  |
| 8. | **Dr. Gaurav Bhutani**<br>**Assistant Professor**<br>Specialization: Fluid and Thermal sciences<br>Ph.D. from Imperial College London (2016)<br>Home Town: Delhi<br>Phone: 01905-267108<br>Email: gaurav@iitmandi.ac.in |  |
| 9. | **Dr. Himanshu Pathak**<br>**Assistant Professor**<br>Specialization: Computational Solid Mechanics, Fracture Mechanics, Functionally Graded Materials<br>Ph.D. from Indian Institute of Technology, Patna (2015)<br>Home Town: Muzaffarpur, Bihar<br>Phone: 01905-267908<br>Email: himanshu@iitmandi.ac.in |  |

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| 10. | **Dr. Jaspreet Kaur Randhawa**<br>**Assistant Professor**<br>Specialization: Nanomaterials.<br>Ph.D. from Gorakhpur University (2000)<br>Home Town: Mohali, Chandigarh<br>Phone: 01905-267056<br>Email: jaspreet@iitmandi.ac.in |  |
| 11. | **Dr. Kaustav Sarkar**<br>**Assistant Professor**<br>Specialization: Durability design of concrete, sustainable concrete production, finite element analysis, soft computing<br>Ph.D. from Indian Institute of Technology, Delhi (2016)<br>Phone: 01905-267901<br>Hometown: Kolkata<br>Email: srkr@iitmandi.ac.in |  |
| 12. | **Dr. Mohammad Talha**<br>**Associate Professor**<br>Specialization: Solid mechanics, Composite structures, Functionally graded materials, Structural mechanics, Uncertainty quantification and Imperfection sensitivity in composites.<br>Ph.D. from IIT Kharagpur (2012)<br>Home Town: Patna, Bihar<br>Phone: 01905-267152<br>Email: talha@iitmandi.ac.in |  |
| 13. | **Dr. Mousumi Mukherjee**<br>**Assistant Professor**<br>Specialization: Geotechnical Engineering<br>Ph.D. from Indian Institute of Technology, Kanpur (2016)<br>Home Town: West Bengal<br>Phone: 01905-267119<br>Email: mousumi@iitmandi.ac.in |  |
| 14. | **Dr. Maheshreddy Gadde**<br>**Assistant Professor**<br>Specialization: Earthquake Engineering and Engineering Seismology<br>Ph.D. from Indian Institute of Technology, Madras (2016)<br>Home Town: West Bengal<br>Phone: 01905-267223<br>Email: maheshreddy@iitmandi.ac.in |  |
| 15. | **Dr. Parmod Kumar**<br>**Assistant Professor**<br>Specialization: Thermal Engineering<br>Ph.D. from IIT Roorkee (2018)<br>Home Town: Solan (Himachal Pradesh)<br>Phone: 01905-267858<br>Email: parmod@iitmandi.ac.in |  |
| 16. | **Dr. Pyudi Anil Kishan**<br>**Assistant Professor**<br>Specialization: Computational Fluid Dynamics<br>Ph.D. from IIT Kharagpur (2009)<br>Home Town: Tirupati, Andhra Pradesh<br>Phone: 01905-267141<br>Email: kishan@iitmandi.ac.in |  |

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| 17. | **Dr. Pradeep Kumar**<br>**Assistant Professor**<br>Specialization: Fluid and Thermal Science<br>Ph.D. from IIT Kanpur (2009)<br>Home Town: Jaunpur, Uttar Pradesh<br>Phone: 01905-267112<br>Email: pradeepkumar@iitmandi.ac.in |  |
| 18. | **Dr. Rajeev Kumar**<br>**Associate Professor**<br>Specialization: Solid Mechanics, Vibration, FEM, Optimization<br>Ph.D. from IIT Roorkee in (2008)<br>Home Town: Jaspur, Uttrakhand<br>Phone: 01905-267148<br>Email: rajeev@iitmandi.ac.in |  |
| 19. | **Dr. Rahul Vaish**<br>**Associate Professor**<br>Specialization: Glasses & Glass-ceramics Ph.D. (Engg.),<br>Indian Institute of Science Bangalore (2010)<br>Home Town: Badaun, Uttar Pradesh<br>Phone: 01905-267139<br>Email: rahul@iitmandi.ac.in |  |
| 20. | **Dr. Rajesh Ghosh**<br>**Assistant Professor**<br>Specialization: Solid Mechanics, Biomechanics, Finite Element Analysis<br>Ph.D. from Indian Institute of Technology Kharagpur (2013)<br>Home Town: West Bengal<br>Phone: 01905-267903<br>Email: rajesh@iitmandi.ac.in |  |
| 21. | **Dr. Rik Rani Koner**<br>**Associate Professor**<br>Specialization: Hybrid Materials<br>Ph.D. from Indian Institute of Technology Guwahati (2009)<br>Home Town: Ballour, West Bengal<br>Phone: 01905-267220<br>Email: rik@iitmandi.ac.in |  |
| 22. | **Dr. Sandip Kumar Saha**<br>**Assistant Professor**<br>Specialization: Earthquake Engineering<br>Ph.D. from Indian Institute of Technology, New Delhi (2014)<br>Home Town: Binodia, Mursidabad , West Bengal<br>Phone: 01905-267907<br>Email: sandip_saha@iitmandi.ac.in |  |
| 23. | **Dr. Satvasheel Ramesh Powar**<br>**Assistant Professor**<br>Specialization: Dye-sensitized solar cells, Perovskite solar cells<br>Ph.D. from Monash University, Australia (2013)<br>Home Town: Kolhapur, Maharashtra<br>Phone: 01905-267136<br>Email: satvasheel@iitmandi.ac.in |  |

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| 24. | **Dr. Sayantan Sarkar**<br>**Assistant Professor**<br>Specialization: Atmospheric Chemistry, Aerosols, Climate Change<br>Ph.D. from Monash University, Australia (2013)<br>Home Town: Kolkatta, West Bengal<br>Phone: 01905-267829<br>Email: sayantan@iitmandi.ac.in |  |
| 25. | **Dr. Sudhir Kumar Pandey**<br>**Assistant Professor**<br>Specialization: Condensed Matter Physics and Material Sciences.<br>Ph.D. from UGC - DAE Consortium for Scientific Research, Indore (2007)<br>Home Town: Garhwa, Jharkhand<br>Phone: 01905-267852<br>Email: sudhir@iitmandi.ac.in |  |
| 26. | **Dr. Sunny Zafar**<br>**Assistant Professor**<br>Specialization: Manufacturing Engineering<br>Ph.D. from Indian Institute of Technology, Roorkee (2016)<br>Home Town: Chandigarh<br>Phone: 01905-267268<br>Email: sunnyzafar@iitmandi.ac.in |  |
| 27. | **Dr. Sumit Sinha Ray**<br>**Assistant Professor**<br>Specialization: Mechanical Engineering<br>Ph.D. University of Illinois, Chicago (2016)<br>Home town - Calcutta, West Bengal<br>Phone: 01905-267265<br>Email: sumitsinha@iitmandi.ac.in |  |
| 28. | **Dr. Subhamoy Sen**<br>**Assistant Professor**<br>Specialization: Structural Engineering<br>Ph.D. from: IIT Kharagpur (2016).<br>Hometown: West Bengal<br>Phone: 01905-267261<br>Email: subhamoy@iitmandi.ac.in |  |
| 29. | **Dr. Swati Sharma**<br>**Assistant Professor**<br>Specialization: Materials and Manufacturing<br>Ph.D. from University of California, USA<br>Hometown: Bhopal<br>Phone: 01905-267830<br>Email: swati@iitmandi.ac.in |  |
| 30. | **Dr. Venkata Uday Kala**<br>**Assistant Professor**<br>Specialization: Geotechnical Engineering,<br>Ph.D. from Indian Institute of Technology, Bombay (2013)<br>Home Town: Hyderabad<br>Phone: 01905-267149<br>Email: uday@iitmandi.ac.in |  |

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| 31. | **Dr. Vishal Singh Chauhan**<br>**Associate Professor**<br>Specialization: Design Engg. Electromagnetic Radiation during Deformation of metals and alloys, Solid Mechanics, FEM<br>Ph.D. from BIT Mesra, Ranchi (2009)<br>Home Town: Sanawad, MP<br>Phone: 01905-267044<br>Email: vsc@iitmandi.ac.in |  |
| 32. | **Prof. Ajit P. Annachhatre**<br>**Visiting Professor**<br>Specialization: Environmental Engineering<br>Ph.D. From: Indian Institute of Technology Mumbai (1987)<br>Home Town: Pune, Maharashtra<br>Phone: 01905-267905<br>Email: ajit@iitmandi.ac.in |  |
| 33. | **Prof. Ing. Balthasar Novák**<br>**Adjunct Professor**<br>Specialization: Civil Engineering<br>Ph.D. From: Technical University Darmstadt (1995)<br>Email: balthasar.novak@iitmandi.ac.in |  |
| 34. | **Dr. Prateek Saxena**<br>**Visiting Assistant Professor**<br>Specialization: Sustainable manufacturing,Tooling process chains, Paper-packaging,Additive Manufacturing and Tribology<br>Ph.D. from Technical University of Denmark<br>Home Town: Jaipur<br>Phone: 01905-267110<br>Email: prateek@iitmandi.ac.in |  |
| 35. | **Prof. Satish Chandra Jain**<br>**Emeritus Professor**<br>Specialization: Mechanical Engineering, Machine Design, Tribology, Vibration and Noise, Computer Aided Design<br>Ph.D. from Indian Institute of Technology, Roorkee (Erstwhile University of Roorkee) (1983)<br>Home Town: Patparganj New Delhi<br>Phone: 01905-267803<br>Email: satish@iitmandi.ac.in |  |
| 36. | **Prof. Subrata Ray**<br>**Visiting Distinguished Professor**<br>Specialization: Physical metallurgy, Composites and Tribology<br>Ph.D. from IIT Kanpur<br>Home Town: Kolkata, West Bengal<br>Email: sray@iitmandi.ac.in |  |
| 37. | **Prof. Sumant Nigam**<br>**Visiting Distinguished Professor**<br>Specialization: climate dynamics<br>Ph.D. From: Princeton University in 1984<br>Email: nigam@umd.edu, snigam@iitmandi.ac.in |  |
| 38. | **Prof. Tarun Kant**<br>**Visiting Distinguished Professor**<br>Specialization: Solid & Structural Mechanics- FEM, Composite Mechanics, Plates & Shells<br>Ph.D. From IIT Bombay<br>Phone: +91 22 2576 7310<br>Email: tkant@iitmandi.ac.in , tkant@civil.iitb.ac.in, |  |

## Office Staff

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|---|---|---|
| 1. | **Chandan Kumar**<br>Office Assistant<br>Phone: 01905-267138,<br>Email: seoa1@iitmandi.ac.in<br>Office: Room No. 212, A4-Building |  |
| 2. | **Mamta**<br>Office Assistant<br>Phone: 01905-267138<br>Email: seoffice@iitmandi.ac.in<br>Office: Room No. 212, A4-Building |  |

## Technical Staff

| | | |
|---|---|---|
| 1. | **Amit Sharma**<br>Sr. Lab Assistant<br>Mobile: +91-97363-18448<br>Phone: +91-1905-267178<br>Email: amits@iitmandi.ac.in<br>Office: Design lab, North Campus |  |
| 2. | **Ankush Kapil**<br>Sr. Lab Assistant<br>Mobile: +91-94595-10629<br>Phone: +91-1905-267018<br>Email: ankush@iitmandi.ac.in,<br>Office: Central Workshop, South Campus |  |
| 3. | **Anish Dhiman**<br>Technical Assistant<br>Mobile: +91-94594-77449<br>Phone: +91-1905-267018<br>Email: anishdhiman@iitmandi.ac.in<br>Office: Central Workshop, South Campus |  |
| 4. | **Bhuri Singh**<br>Mach. Lab Attendant<br>Mobile: +91-98052-95316<br>Phone: +91-1905-267018<br>Email: bhuri.iitmandi@gmail.com<br>Office: Central Workshop, South Campus |  |
| 5. | **Dinesh Thakur**<br>Junior Lab Asst.<br>Mobile: +91-9418169227<br>Phone: +91-1905-267241<br>Email:dinesh_thakur@iitmandi.ac.in<br>Office: Design lab, Norh Campus |  |
| 6. | **Dharampaul Singh**<br>Technical Assistant<br>Mobile: +91-94597-78507<br>Phone: +91-1905-267018<br>Email: dharampal@iitmandi.ac.in<br>Office: Central Workshop, South Campus |  |

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| 7. | **Dalvinder kumar**<br>Turner Mechanical workshop<br>Phone: +91-1905-267018<br>Mobile: +917988076620<br>Email: dalvinder@iitmandi.ac.in<br>Office: Central Workshop, South Campus |  |
| 8. | **Dhuni Chand**<br>Civil Lab Attendant<br>Mobile: +91-98826-82550<br>Email: bhuri.iitmandi@gmail.com<br>Office: Geotechnical Lab, North Campus |  |
| 9. | **Ram Singh**<br>Civil Lab Attendant<br>Mobile: +91-9882403748<br>Email: ramsinghmnd@gmail.com<br>Office: Construction Materials lab, North Campus |  |
| 10. | **Rakesh Kumar**<br>Jr. Technical Superintendent<br>Mobile: +91-86996-66497<br>Phone: +91-1905-2670183<br>Email: rakeshkumar@iitmandi.ac.in<br>Office: Central Workshop, South Campus |  |
| 11. | **Raj Kumar**<br>Technician<br>Mobile: +91-98055-77014<br>Phone: +91-1905-267018<br>Email: rajkumaruk1970@gmail.com<br>Office: Central Workshop, South Campus |  |
| 12. | **Sanjeev Sharma**<br>Civil Lab Assistant<br>Mobile: +91-7018283395<br>Email: cmlab@iitmandi.ac.in<br>Office: Construction Materials lab, North Campus |  |
| 13. | **Sunil Kumar**<br>Lab Technician<br>Mobile: +91-9882690412<br>Email:sunilk@iitmandi.ac.in<br>Office: Geotechnical Lab, North Campus |  |
| 14. | **Sunil Kumar**<br>Carpenter<br>Mobile: +91-98822-76516<br>Phone: +91-1905-267018<br>Email: suniliitmandi@gmail.com<br>Office: Central Workshop, South Campus |  |
| 15. | **Vivek Kumar**<br>Welder Mechanical workshop<br>Phone: +91-1905-267018<br>Mobile: +919805679909<br>Email: vivekkumar@iitmandi.ac.in<br>Office: Central Workshop, South Campus |  |

## EXTERNALLY SPONSORED RESEARCH PROJECTS

| Sr. No. | Project No. | Project Title | Sponsoring Agency | Investigators | Project Cost (in Rs.) | Duration of Project |
|---|---|---|---|---|---|---|
| 1. | IITM/DST/AG/323 | Metamaterial walls for improved acoustic performance in green building | DST | Dr. Arpan Gupta (PI)<br>Dr. Umberto Berardi (Co-PI) | 31,34,699 | 2 years |
| 2. | IITM/DST/KVU/300 | A low-cost MEMS-based and video-based monitoring and early warning system for rainfall-induced landslides | DST-NRDMS | Dr. K V Uday (PI),<br>Dr. Varun Dutt &<br>Dr. Arnav V Bhavsar (Co-PI) | 40,17,555 | 3 years |
| 3. | IIT/DST/KVU/316 | Low-cost extensometer-based landslide monitoring and early warning Device | DDP-DST | Dr. K V Uday (PI)<br>Dr. Varun Dutt (Co-PI) | 44,87,288 | 3 years |
| 4. | IITM/DDMA-M/VD/325 | Deployment of landslide monitoring system in District Mandi, HP | District Disaster Management Authority | Dr. Varun Dutt (PI)<br>Dr. K. V. Uday (Co-PI) | 49,20,000 | 3 years |
| 5. | IITM/NMHS/JKR/298 | Spring Rejuvenation for water security in Himalaya | NMHS | Dr. Jaspreet Kaur Randhawa | 33,71,280 | 3 years |
| 6. | IITM/LU-SW/SYS/330 | Coal-based economics in developing countries: An enviornmental, health and cost evaluation around mega thermal power plants | Linkoping University | Dr. Sayantan Sarkar (PI)<br>Dr. Shayamashree Dasgupta (Co-PI) | 30,83,500 | 3 years |
| 7. | IITM/MHRD-STARS/VB/295 | Phase selective CVD growth with controllable 1T- to- 1H phase transition in WS2 monolayer for optoelectronic device applications | MHRD-STARS | Dr. Viswanath Balakrishnan (PI) | 49,95,000 | 3 years |
| 8. | IITM/SWSM/APA/293 | Evaluation of laboratory/ analytical procedure and performance of water testing laboratories of Jal Shakti Vibhag in Himachal Pradesh | H.P. Jal Shakti Vibhag | Prof. Ajit P. Annachhatre (PI) | 9,12,000 | 9 months |
| 9. | IITM/DST/GA/318 | Designing 3D printable smart composite hydrogel- inks for tissue engineering applications | DST | Dr. Garima Agrawal (PI)<br>Dr. Rik Rani Koner (Co-PI) | 37,96,642 | 3 years |
| 10. | IITM/SERB/SYS/296 | Chemical speciation and airways deposition modeling of bulk and size-segregate aerosols in residential microenvironments from three northeast Indian states: implications for human exposure | SERB | Dr. Sayantan Sarkar | 29,32,560 | 2 years |

## SEED GRANT PROJECTS

| Sr. No. | Project No. | Project Title | Investigator | Amount Sanctioned (in Rs.) | Duration of Project |
|---|---|---|---|---|---|
| 1. | IITM/SG/2021/02-16 | Development of Design methodology for shallow foundation on Sloping ground subjected to hydraulic load and fault rupturing phenonmena: experimentaland Numerical investigations | PI: Dr. Ashutosh Kumar<br>Co-PI: Dr. Maheshreddy Gade | 16,00,000 | 3 Year |

## SPONSORED CONSULTANCY RESEARCH PROJECTS

| S.No. | File no. | Proposal Title | Investigator | Agreement Signed with | Amount Sanctioned (In Rs.) | Duration of project |
|---|---|---|---|---|---|---|
| 1 | IITM/CONS/UNDP/KVU/39 | Report on landslide risk mitigation strategies for Himachal Pradesh | Dr. Kala Venkata Uday | Mr. Manish Mohandas, UNDP, 55 Lodhi Estate, New Delhi | 1,61,070 | 15 days |
| 2 | IITM/CONS/BSNL/DS/40 | Third party site inspection of 'A' type school building for Kendriya Vidyalaya Saloh, Distt- Una (H.P.) | Dr. Deepak Swami | Mr. Vijay Kumar Sharma BSNL Civil Division, Hamirpur (H.P.) | 69,030 | 2 years |
| 3 | IITM/CONS/UNDP/DPS/42 | Preparation of report on landslide hazard zonation for Himachal Pradesh | Dr. Dericks P. Shukla | Mr. Manish Mohanda UNDP, 55 Lodhi Estates, New Delhi | 76,700 | 05 days |
| 4 | IITM/CONS/ESPT/AG/43 | Vetting of Acoustic design proposed by M/s Envirotech Systems Pvt. Ltd. For installation of full mission simulator at Thanjavur | Dr. Arpan Gupta | Mr. Manoj Kumar Gupta, Envirotech Systems Pvt. Ltd., B1A/19, First Floor, Commercial complex, Sector-51, Noida, U.P.-201307 | 61,360 | 1 month |
| 5 | IITM/CONS/KDME/SUS/44 | Rail structure inspection of a bridge near Gulbarga | Dr. Subhamoy Sen | Md. Misbahuddin, Sri Ramana Colony, Karmanghat, Saroornagar (M), Hyderabad- 500079 | 84,370 | 21 days |
| 6 | IITM/CONS/HIMUDA/KS/45 | Structural safety evaluation of the multistory hostel building at govt. degree college Theog | Dr. Kaustav Sarkar (PI) Dr. Sandip Saha (Co-PI) Dr. Mousumi Mukherjee (Co-PI) | Er. Kushal Sharma Himachal Pradesh Housing & Urban Development Authority Division Shimla | 4,95,000 | 2 months |
| 7 | IITM/CONS/UTCL/KVU/46 | Site visit for structural safety audit for H-1 block of ultratech cement | Dr. Kala Venkata Uday | Mr. Brajesh K. Singh UTCL, Baga | 27,612 | 7 days |

## IIT MANDI PROJECTS

| Sr. No. | Project Title | Investigator | Amount Sanctioned (in Rs.) | Duration of Project |
|---|---|---|---|---|
| 1. | Design and fabrication of low-cost Disinfection Tunnel for courier packages against SARS-CoV-2 virus | Dr. Himanshu Pathak (PI) Dr. Sunny Zafar (Co-PI) | 15,000 | 2 months |

## PROGRESS REPORT OF THE RESEARCH PROJECTS

**PI-Dr. Himanshu Pathak**

**Project Title:** Design analysis of adhesively bonded composite patch repair of cracked aluminum aircraft panels

**Project No.** IITM/DRDO/HP/252

**Duration of the Project:** December 2016 to August 2021

**Project Cost:** Rs.5.2 lakh

- The objective of this project is to develop an appropriate and efficient mesh independent computational model and code for patch repaired aircraft panel analysis. The work includes calculation of stress intensity factors, crack propagation and prediction of fatigue life of 2-D and 3-D repaired structure under cyclic loading environment.

**Project Title:** Development and Implementation of extended finite element (XFEM) model for ductile crack growth in structural engineering applications.
**Project No.:** IITM/SG/HP/54
**Duration of the Project:** June 2019 to June 2022
**Project Cost:** Rs. 8 Lakh

- A mesh-independent computational approach, namely "Extended Finite Element Method (XFEM)," has been implemented to model the elasto-plastic fracture problems. A complete computational methodology has been developed to model elasto-plastic fracture problems with geometrical and material non-linearities. To incorporate the proposed approach, an in-house MATLAB code has been developed.

**PI-Dr. Parmod Kumar**
**Project Title:** Investigations of chugging phenomenon in direct contact condensation towards mitigation of the pressure amplitude and oscillations.
**Project No.** IITM/SERB/PKU/273
**Duration of the Project:** December 2019 to 2021.
**Project Cost:** Rs.30.87 lakh

- The experimental facility has been developed to perform direct contact condensation based experiments and exhaustive experiments are being performed for vertical injection of steam into the subcooled water pool. Moreover, the numerical simulations are also being performed to understand the underlying condensation phenomenon. In this regard a user defined function (UDF) is developed for introducing interfacial mass transfer in volume of fluid method using software package ANSYS FLUENT. In modeling the emphasis is given on the interphase heat transfer using interfacial jump approach and vapour phase is being considered compressible.

**Project Title:** Intelligent design of intakes for hydraulic machines to retard the vortex induced entrainment.
**Project No.:** IITM/SEED/PKU/67
**Duration of the Project:** June 2019 to June 2022
**Project Cost:** Rs. 8 Lakh

- An experimental facility has been developed to perform the pump intake vortex induced air entrainment experiments. The experiments have been completed using a single cylindrical discharge tube of 25 mm internal diameter. The experiments have reported the four different characteristic features of the associated vortex structures. The findings of the experiments are submitted for publication in an international journal. The computational simulations of the phenomenon are being carried out using Eulerian approach based volume of fluid framework. The simulations will assist in understanding the detailed hydrodynamics of the interface evolution. Furthermore, the experiments are planned to be performed for multipoint outlets connected to the reservoir.

**PI-Dr. Rajeev Kumar**
**Project Title:** Design, Manufacturing and Testing of the Energy Systems
**Project No.:** IITM/DST-FIST/RK/209
**Duration of the Project:** 5 years (1.09.2018 to 31.08.2023)
**Project Cost :** Rs. 2,09,50,000/-

- Design, Manufacturing and Testing of the Energy Systems. In this project, a cold welding facility setup and Laser machining machine have been procured. Purchase of Spark Plasma Sintering facility is under process.

**PI-Dr. Sumit Sinha Ray**
**Project Title:** Efficient Removal of Most Penetrating Particles (diameter~ 300 nm) from Air/Water Using Supersonically-blown Ultrafine PVDF Nanofibers.
**Project No.:** IITM/SSR/SERB/215
**Duration of the Project:** 3 years (17.09.2018 to 16.09.2021)
**Project Cost:** Rs. 48,63,720/-

- Development of the fabrication process called as supersonic solution blowing for fabricating ultrafine and low GSM nonwoven membrane.
- Development of air filtration testing setup mimicking ASTM F2299 for positive pressure system with flexibility to change to incorporate ASTM F2100/EN 14683/IS 16289:2014 protocol.
- Development of air filtration testing setup mimicking ASTM F2299 for negative pressure system with flexibility to change to incorporate ASTM F2100/EN 14683/IS 16289:2014 protocol.
- Testing of 4 industrial samples and revenue generation from the developed experimental schemes.

**Project Title:** Treatment of Acid Mine Drainage for Heavy Metal removal
**Project No.:** IITM/SSR/MoM/221
**Duration of the Project:** 2 years (01.01.2019 to 31.12.2021)
**Project Cost:** Rs. 19,84,000/-

- Large scale fabrication of nanofiber membrane containing Chitosan, Lignin etc.
- Adsorption study for removal of various heavy metals like Copper, Lead, Arsenic, Chromium, Iron, Zinc etc. from water using said biopolymer membrane with maximum efficiency of 99% .
- Study with 4 L based prototype demonstrated removal efficiency of 90%.

**PI-Dr. Sunny Zafar**
**Project Title:** Development of carbon fiber reinforced polymer composites through microwave curing
**Project No.:** IITM/DRDO/SJ/249
**Duration of the Project:** 3 years (11.07.2019 to 10.07.2021)
**Project Cost :** Rs.15,25,800/-

- The project experiment work is completed. Comparative analysis is done on mechanical properties of carbon fiber-based composites developed through microwave curing and conventional curing. The project completion report is being developed.

**PI-Dr. Subhamoy Sen**
**Project Title:** Vibration-based health monitoring of tensegrity structures incorporating the effects of ambient temperature.
**Project No.** IITM/SERB/SUS/236
**Duration of the Project:** 3 years (30.03.2019 to 29.03.2022)
**Project Cost:** Rs. 33.70 lakh

- The work is about tensegrties, which is an innovative structure type. New form finding algorithm has been developed and a novel SHM technique has been developed. Published two high impact journals. The theoretical work is completed. The experimental work is pending.

**PI-Dr. Viswanath Balakrishnan**
**Project Title:** Scalable manufacturing of asymmetric micro supercapacitor for next generation energy storage devices.

**Project No.** IITM/DST/VB/195
**Duration of the Project:** 3 years (19.03.2018 to 18.07.2021)
**Project Cost:** Rs.68,60,600/-

- We are able to fabricate a macro supercapacitor device with desired energy and power density values along with a high specific capacitance value in terms of areal capacitance. We are also able to fabricate an IDE device using (i) Stamping, (ii) Photolithography and (iii) screen printing techniques. These devices give an idea about the success of fabricating IDE patterned devices using these approaches. Further, work is in progress towards studying their electrochemical supercapacitor performance and fabricating them on flexible substrates as well. In the other project related 2D materials, we are able to stabilize metastable phases and investigate the light driven phase transition kinetics. Expanding the same to other 2D materials and also optimizing methods for achieving longer stability to demonstrate the phase change based applications.

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## Patents

| Sl. No | File no./ Application number | Year of filing | Patent detail/Title | Inventor detail | Current status |
|---|---|---|---|---|---|
| 1. | 202011006402 | 2020 | A rapid and efficient strategy for creating economical antibacterial surfaces on portland cement based structures | Dr. Rahul Vaish | Under Review |
| 2. | 201911045685 | 2020 | Vibration induced waste-water cleaning and bacterial disinfection using glass-ceramics containing piezoelectric crystals | Gurpreet Singh, Moolchand Sharma, and Dr. Rahul Vaish | Under Review |
| 3. | 202011021910 | 2020 | Single step synthesis of multimodal magneto-fluorescent core-shell superparamagnetic | Dr. Jaspreet Kaur Randhawa | Filed |
| 4. | 202011052699 | 2020 | System For Waste Water Treatment | Dr. Atul Dhar, Satvasheel Powar & Hemant Thakur | Published on 09.04.2021 |
| 5. | Appl. No. 202021031349, Patent No. 367354 | 2020 | Method for Forming TiO2 paste at Ambient Temperature | Dr. S.Powar, P. Kajal, S. Goswami | Published on 18.09.2020 and Granted on 24.05. 2021 |
| 6. | 202021049173 | 2020 | System for cooking eatables | Dr. S. Powar, A. Dhar, P. Saini, S. Pandey | Published on 1st January 2021 |
| 7. | 338273-001 | 2021 | Indian Design: Space Heating fins | Dr. S. Powar, A. Dhar, A. Kaundal, | Filed |
| 8. | 338274-001 | 2021 | Indian design: Cookstove design with topout cover | Dr. S. Powar, Dr. A. Dhar, A. Kaundal | Filed |
| 9. | 338275-001 | 2021 | Indian design: Cookstove design with top cover | Dr. S. Powar, Dr. A. Dhar, A. Kaundal | Filed |
| 10. | 338736-001 | 2021 | Indian design: Foldable Solar thermal collector | Dr. S. Powar, Dr. A. Dhar, P. Saini | Filed |
| 11. | 202111009994 | 2021 | System and method for separating air from air-liquid mixture | Dr. Parmod Kumar and Rahul Kumar Mondal | Filed |
| 12. | 202011022177 | 2020 | Nanofibers from Plastic Bottles | Dr. Sumit Sinha Ray, Sheshang Singh Chandel, Prakash Giri, Ashish Kakoria | Filed |
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## INTERNATIONAL CONFERENCES ATTENDED AND PAPERS PRESENTED

1. Dr. Atul Dhar, Organized a Panel Discussion Session in V SEEC 2020 Conference organized by ISEES on topic Future Fuels for Sustainable Transport on 19 December 2020.
2. Ashwani Kumar Sharma, Ashutosh Kumar, Vasilis Sarhosis (2021) "Evaluating the seismic performance of domestic and historical masonry structures in Himachal Pradesh region of India." Recent Advances in Earthquake Engineering, Proc. of Virtual Conference on Disaster Risk Reduction VCDRR 2021 (Lecture Notes in Civil Engineering, Springer, pp 1-12), Editors: Kolathayar, Sreevalsa, Chian, Siau Chen (Eds.) ISBN 978-981-16-4617-1 (Accepted, in press). (Ashwanisharma, my M.Tech. student presented the paper)
3. Choudhary AK, Bharti D, Bhutani G., Continuum modeling of snow avalanche dynamics using multiphase non-Newtonian fluid mechanics, Proceedings of the 8th International and 47th National Conference on Fluid Mechanics and Fluid Power, 2020/12,
4. Singh N.K., Bhutani G., An adaptive-mesh open-source finite-element framework for the solution of power-law non-Newtonian fluid flows, Proceedings of the 8th International and 47th National Conference on Fluid Mechanics and Fluid Power, 2020/12.
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6. Akkapelli A., Bhutani G., Numerical modelling of free-surface flows using shallow water equations in a finite element framework, Proceedings of the 8th International and 47th National Conference on Fluid Mechanics and Fluid Power, 2020/12.
7. Agarwal N., Bhutani G., LES modeling of volcanic ash particle-settling in water using an adaptive-mesh finite element method, Proceedings of the 8th International and 47th National Conference on Fluid Mechanics and Fluid Power, 2020/12.
8. Das S. and Sarkar K., A spatially continuous driving rain map of India at 0.5° X 0.5° gridded scale, 15th International Conference on the Durability of Building Materials and Components, 20-23 Oct., UPC-BarcelonaTECH, Barcelona (Spain), Presented online in Oct, 20.
9. Mohammad Amir, Mohammad Talha, Free Vibration Analysis of the Functionally Graded Porous Circular Arches in the Thermal Environment, Recent Advances in Theoretical, Applied, Computational and Experimental Mechanics, 2020, Springer, Singapore.
10. Ankit Gupta, Mohammad Talha, Vibration Response of Shear Deformable Gradient Plate with Geometric Imperfection, 2020, Recent Advances in Theoretical, Applied, Computational and Experimental Mechanics, Springer, Singapore.
11. Mohammad Shakir, Mohammad Talha, Natural Frequency of Higher-Order Shear Deformable FGM Plates with Initial Geometric Imperfection Resting on Elastic Foundation, Recent Advances in Computational Mechanics and Simulations,153-161, 2021, Springer, Singapore
12. Mondal R. K., Guleria S. D. and Kumar P., "Free surface vortex and associated air entertainment at the intake of a centrifugal pump," Paper number: FMFP2020-150, 8th International and 47th National Conference on Fluid Mechanics and Fluid Power (FMFP), 9-11, 2020, IIT Guwahati, India.
13. Debnath D. and Kumar P., "Revealing the Anomalies associated with Droplet Spreading Dynamics," Paper Number: FMFP2020-155, 8th International and 47th National Conference on Fluid Mechanics and Fluid Power (FMFP), December 9-11, 2020, IIT Guwahati, India.
14. Singh A. and Kumar P., "Dynamics of the Drop Impact Phenomenon onto a Deep Liquid Pool with Initial Axisymmetric Wavy Interface," Paper Number: FMFP2020_040, 8th International and 47th National Conference on Fluid Mechanics and Fluid Power. (FMFP-2020), December 9-11, 2020, IIT Guwahati, India.

15. Guleria, S.D. and Kumar P., "Influence of Water Pool Temperatures on the Direct Contact Condensation: A Numerical Study," Paper Number: FMFP2020-201, Proceedings of the 8th International and 47th National Conference on Fluid Mechanics and Fluid Power (FMFP) December 9-11, 2020, IIT Guwahati, Assam, India.
16. Singh I., Kumar P. and Dhar A., "Design of an ORC Based System for Waste Heat Recovery of Engines: A Theoretical Approach," Paper Number: FMFP2020-148, Proceedings of the 8th International and 47th National Conference on Fluid Mechanics and Fluid Power (FMFP) December 09-11, 2020, IIT Guwahati, Assam, India.
17. Harsh Arora, Ranjeet Jha and Pradeep Kumar, foil NET - A convolution based neural network for prediction of pressure field around oscillating airfoil, Proceedings of the 8th International and 47th National Conference on Fluid Mechanics and Fluid Power (FMFP) December 09-11, 2020, IIT Guwahati, Guwahati-781039, Assam, India.
18. Sharma S., Kumar R., & Talha M. (2020), Nonlinear Vibration Control of a Smart Cantilever Beam with Optimized Poling Direction of Piezoelectric Actuators, International Conference on Smart Materials for Sustainable Technology (SMST-2020), Goa, India.
19. Satish Kumar, Dr. Rajeev Kumar, and Prof. S. C. Jain (2020), Theoretical Analysis Of Vertical Contact-Mode Triboelectric Energy Harvester, International Conference on Smart Materials for Sustainable Technology (SMST-2020), Goa, India.
20. Jitendra Adhikari, Rajeev Kumar, Satish Chandra Jain (2020), Electric Power Generation by harvesting energy through Piezoelectric PZT-PZNM Tile, International Conference on Smart Materials and Sustainable Technology (SMST 2020), Goa, India.
21. Kumar, Tarun, Rajeev Kumar, and S. C. Jain. "Finite element modeling of big turbo-generator rotor vibrations using newmark-beta integration method." IOP Conference Series: Materials Science and Engineering. Vol. 876. No. 1. IOP Publishing, 2020.
22. Dr. Swati Sharma, attended the Carbon MEMS workshop (online mode), July 2020, Organized by DTU Denmark.
23. N. Aswal, E. Kuncham, S. Sen, L. Mevel, Robust Interacting Particle-Kalman Filter based structural damage estimation using dynamic strain measurements under non-stationary excitation-an experimental study, SHMII-10 2021–10th International Conference on Structural Health Monitoring.
24. N. Aswal, S. Sen, L. Mevel, Damage Detection in Tensegrity Using Interacting Particle-Ensemble Kalman Filter, I, European Workshop on Structural Health Monitoring, 732-741.
25. Kant T. (2020), Origin of the introduction of higher-order displacement polynomials through thickness in the theories of beams, plates and shells, Inaugural Keynote Lecture, Proc. International Conference on Recent Advances in Computational and Experimental Mechanics 2020 (ICRACEM2020), IIT Kharagpur, 4-6 September 2020.

## INVITED LECTURERS/TALKS/CONTINUING EDUCATION PROGRAMS

**Dr. Atul Dhar**

- Delivered online lecture for TEQIP Faculty Development Programme at IET Lucknow on 11th Feb. 2021 on Topic "Waste Heat Recovery and Utilization Options for Diesel Engines".
- Delivered a lecture on "Waste Heat Recovery Options for Transportation Sector" in One-week Short-term Staff Training Program on "Recent Trends in Energy Conversion Technologies" organized by Curtin University Malaysia in collaboration with The Institute of Engineers Malaysia. July 13-20, 2020.

**Dr. Arpan Gupta**

- Invited as a speaker for Industrial Noise and Vibration Control (26-28 November 2020), IIT Indore and also for Noise and Vibration of Mechanical Systems (29-31 Oct 2020), IIT Indore.

**Dr. Ashutosh Kumar**

- Invited Talk on "Integrating data, innovation and development of sensing technology and numerical modelling while practicing civil engineering" during a Workshop on Transcending Innovations in Startup at Jawaharlal Nehru Government Engineering College Sundernagar, Mandi, Himachal Pradesh [March 6, 2021].
- Invited talk on "Combined Pile-Raft Foundation System-A cost-effective and sustainable foundation design philosophy for high-rise structures" at Five-day faculty development programme on "AICTE Sponsored Virtual Short Term Training Programme (STTP) on the theme Sustainable Materials and Resilient Buildings-Philosophy, Design Implementation and Performance organized by KIT Warangal. [Nov. 23-28, 2020, Interaction on web platform].
- Invited talk on "Performance of piles and piled raft foundation under earthquake conditions: Theory, Research and Practice" at Five-day faculty development programme on "Earthquake Geotechnics" organized by NIT Andhra Pradesh. [Sept. 22-26, 2020, Interaction on web platform].
- Invited talk on "Performance of Historic infrastructure during 2015 Gorkha Earthquake sequence" on a TEQIP-III sponsored Short-term training programme on "Urban Heritage Conservation: Issues and Challenges" organized by SVNIT Surat. [August 31- September 4, 2020].
- Invited talk on "Evaluation of Seismic Safety of Historic Urban Infrastructure of Kathmandu City Post 2015 Gorkha Earthquake: An Interdisciplinary Perspective" on an International Webinar series (Australia-India-UK) on 'Natural Disaster Resilience for Built Infrastructure' jointly hosted by University of Technology Sydney (UTS) Australia and Indian Institute of Technology Madras (IITM) India. [July 24-28, 2020].
- Invited by KIIT Society of Civil Engineering in association with ASCE and ICE student Chapter on the Theme "Knowledge Forum- A guide to your future lecture series" to interact with faculty and students as a Proud Alumnus from the School of Engineering, KIIT University. [July 19, 2020].

**Dr. Gaurav Bhutani**

- Delivered an invited talk at One Week (Online) Professional Development Programme on "Experimental Methods for Engineers" from 21$^{st}$ to 25$^{th}$ December 2020 at Department of Mechanical Engineering, Amity School of Engineering. The talk was titled "inverse methods for accurate measurements.

**Dr. P. Anil Kishan**

- Resource Person for AICTE sponsored FDP program (Online) on Advances in Computational Fluid Dynamics and Its Applications, at Geethanjali College of Engineering and Technology, Hyderabad, during Jan – Feb 2021 (24 sessions, 1.5-2.0 hours per each session: ~48 hours.

**Dr. Himanshu Pathak**

- Webinar on Computational modeling of composite materials: Fracture and Mean field Homogenisation study hosted by MES (17$^{th}$ March 2021).
- Webinar on APDL Programming for Composite hosted by IIT Mandi (5$^{th}$ February 2021).
- Webinar on Modelling of Smart Materials: Fracture and Mean field Homogenisation study

hosted by C. V. Raman Global University Bhubaneswar (20th January 2021).

- Webinar on FEM for Engineering Applications hosted by Govt. Engineering College, Sitamarhi (31st October 2020).
- Webinar on FEM and XFEM Implementation in 2D domain hosted by ABES Engineering College, Ghaziabad (20th and 23rd October 2020).
- Webinar on FEM and XFEM Implementation in 2D domain hosted by ABES Engineering College, Ghaziabad (8th August 2020).
- Webinar on Advanced FEM: Concept & Applications hosted by Pune University (27th May 2020).

**Dr. Kaustav Sarkar**

- Delivered an online talk on Atmospheric corrosivity map for the management of steel infrastructure in India in the TEQIP-III sponsored one-week virtual STTP on Advanced Design of Steel Structures, organized by the Dept. of Civil Engg., SVNIT Surat during 21-25 Dec.'20.
- Delivered online talks in the faculty development programme on Material, Analysis & Repair of Structures (MARS 2020), organized by the Dept. of Civil Engg., GEC Bharatpur under the aegis of TEQIP-III during 7-12 Sep.'20

(a) Atmospheric corrosivity map of India for the management of steel infrastructure

(b) Understanding the severity and pattern of rainfall manifestation in India for the durable design of concrete structures.

- Delivered an online talk on Understanding climatic severity for designing sustainable structures in the one-day colloquium on New Era in Civil Engineering organized by the Dept. of Civil Engg., Shiv Nadar University on 15th Sep.'20.

**Dr. Parmod Kumar**

- Delivered a webinar on "Fundamentals of Multiphase Flow and its Modelling" at DVR and Dr. HS MIC College of Engineering, Andhra Pradesh and Maharana Pratap Group of Institutions, UP.
- Delivered a lecture on "Multiphase Flow and Computational Fluid Dynamics" at Mahatma Gandhi Govt. Engineering College Jeori, HP.
- Delivered a lecture on "Waste heat recovery options for transportation sector and process industries" in QIP course on Waste Heat Recovery at IIT (BHU) Varanasi.
- Delivered a lecture on "Applications of differential equations in fluid dynamics" in online workshop on Differential Equations and its Applications at IIT Mandi.

**Dr. Pradeep Kumar**

- Invited for the expert talk in Modern CFD with Industrial and Environmental Application in Short Term Training Program at NIT Calicut.

**Dr. Rajesh Ghosh**

- Invited for the lecture application of Solid Mechanics in Orthopaedic Biomechanics": TEQIP-III sponsored five days online Faculty Development Programme on 'Modeling, Simulation and Experimental Approaches of Mechanical Systems' (MSEAMS-2020) organized by Government College of Engineering, Kalahandi, Odisha from 24th to 28th August 2020.

**Dr. Rajeev Kumar**

- Invited for the lecture Basics and Fundamentals of FEM, Short Term Training Program on Finite Element Analysis Using Ansys-2020ABES Ghaziabad Nov 24, 2020.

**Dr. Sunny Zafar**

- Delivered a lecture on Manufacturing of Carbon Fibre Reinforced Composites Using Microwave Energy on 17th December 2020 in the Expert lecture under TEQIP-III Microwave

Material Processing: Opportunities and Challenges" NIT Uttrakhand via online mode.

- Delivered a lecture on Sustainable Manufacturing of Carbon fiber composites through microwave on 22nd December 2020 program AICTE AQIS sponsored STTP on "Eclectic Research Trends in Manufacturing Poornima University, Jaipur via online mode.
- Delivered a lecture on Gas Tungsten Arc Welding in the event of Welding Winter Camp (IIW India) ABES Engineering College on 22nd January 2021, Ghaziabad via online mode.
- Delivered a lecture on Composites and their Manufacturing Processes in the International Workshop on Design and Manufacturing of Composites for Engineering Applications, Ghaziabad 1st February 2021 via online mode.
- Delivered a lecture on Microwave Processing of Novel Materials in the AICTE-RGPV Online Teachers Training Programs 17th February 2021, SGSITS, Indore.
- Delivered a lecture on Manufacturing of Wood Plastic Composites using Microwave-Assisted Compression Molding in the TEQIP III sponsored course on "Sustainable Composites: Processing, Characterization & Applications 23rd February 2021 NIT Uttrakhand via online mode.
- Delivered a lecture on Manufacturing of polymer composites using microwave energy in the Aicte Approved Sttp On "Composites: Fracture Toughness, Nde & Failure Analysis at 19th March 2021 PHCET, Rasayani via online mode.

**Dr. Sandip Saha**

- Delivered an expert lecture in a Two Week International Online Faculty Development Programme "Recent Advances and Innovations in Design of Structures, 2020 (Raids-2020)" organized by Department of Civil Engineering, G. B. Pant Institute of Engineering and Technology, Pauri, Uttarakhand, India, during December 07 – 18, 2020.
- Delivered an expert lecture in a 5-Days faculty development program (FDP) on "Future Trends in Earthquake Resistant Design of Structures (FTERDS 2020)" organized by Bundelkhand Institute of Engineering & Technology Jhansi, during August 17 – 21, 2020.

**Dr. Vishal S. Chauhan**

- Chaired the Technical Session in the International Conference on Evolution in Manufacturing (ICEM – 2020) held during December 10-12, 2020, organized by Malaviya National Institute of Technology Jaipur in association with the National Institute of Technology Uttarakhand and National Institute of Technology Warangal (Online mode).
- Delievered a talk on "Deformation induced electromagnetic radiation" in the Short term course on New Generation Functional Materials and Their Applications (NFMA-2021), February 3-7, 2021 National Institute of Technology Hamirpur (Online mode).

**Dr. Viswanath Balakrishnan**

- Delivered invited lecture in Electron Microscopy of Society of India Symposium organized by IIT Kanpur and IIT Kharagpur.

## VISIT TO ACADEMIC INSTITUTES AND LECTURES DELIVERED

- Dr. Parmod Kumar, Visited Mahatma Gandhi Govt. Engineering College Jeori, HP and delivered a lecture on "Multiphase Flow and Computational Fluid Dynamics".
- Dr. Pradeep Kumar, delivered a talk on Mechanical Engineering Seminar Series in Mechanical Engineering at IIT Kanpur.
- Dr. Pradeep Kumar, delivered a talk at the School of Mechanical Sciences at IIT Goa, Goa.

## SHORT TERM COURSES/WORKSHOPS ORGANIZED

An International workshop on Design and Manufacturing of Composites for Engineering Applications was successfully organized by School of Engineering, IIT Mandi during 1st February to 5th February 2021 in online mode given the pandemic situation. Over 120 participants attended the workshop, among which participants were faculty and students from engineering colleges and technical institutes (IITs, NITs, State Government Engineering Colleges) from all over the country. A few participants were from universities abroad (Sapienza University of Rome). Industry personnel from ISRO, TATA Steel, LM Wind Power etc., also participated in the workshop. Speakers included subject experts from IIT Kanpur, IIT Roorkee, University of Salerno, PSI Switzerland, IIT Bombay, KMUTNB, Thailand, Institute of Research Hydro Québec, Canada and also IIT Mandi. Dr. Sunny Zafar and Dr. Himanshu Pathak from the School of Engineering, IIT Mandi were the coordinators of this workshop.

Figure 1: Inaugural speech by
Dr. Sunny Zafar, Coordinator of Workshop

Figure 2: Speech by
Prof. S.C. Jain (Chief Guest)

Figure 3: Speech by Dr. Viswanath
B. (Chairperson School of Engineering)

Figure 4: Vote of Thanks by
Dr. Himanshu Pathak (Co-coordinator of workshop)

## PROFESSIONAL FACULTY/STUDENTS ACHIEVEMENTS/HONOURS/AWARDS

1. Dr. K.V. Uday received the 2020 Gold SKOCH Award in the "Safety and Security" category for the landslide monitoring and warning system implemented in Mandi district.
2. Dr. Swati Sharma has been selected as a council member of the Indian Carbon Society which serves as a platform to facilitate collaborative research between institutes/ national labs and industry.
3. Prof. Tarun Kant, received Vasvik Award for Mechanical & Structural Science & Technology for the year 2020.
4. Dr. Parmod Kumar, Received "ASCE 2019 International Journal of Geomechanics outstanding reviewer recognition" by International Journal of Geomechanics, published by American Society of Civil Engineers, ASCE.
5. Dr. Ashutosh Kumar, Received "ASCE 2019 International Journal of Geomechanics outstanding reviewer recognition" by International Journal of Geomechanics, published by American Society of Civil Engineers, ASCE.
6. Mr. Rajeev Kumar working with Dr. Sunny Zafar received the best paper award in ICAMSE-2021 organized by Punjab University, Chandigarh.
7. Mr. Mahipal Kularia (D20012) working with Dr. Sandip Kumar Saha selected for the Prime Minister's Research Fellows (PMRF).
8. Sourabh Dogra, MS student under the supervision of Dr. Arpan Gupta, awarded Best Presenter award for "Low-cost Portable Smart Ventilator" in International Conference on Future Technologies in Manufacturing, Automation, Design and Energy ICoFT2020.
9. Rishi Kant Thakur, a student under the guidance of Dr. Rajeev Kumar and Prof, S. C. Jain, won second place and a $400 prize from the sponsored agency" IEEE Industry Application Society (IAS), USA" for a project titled "Auto -tuned Ventilator: A contactless treatment machine especially for COVID-19 patients."
10. Dr. Sumeet Kumar Sharma, who completed Ph.D. under the supervision of Dr. Vishal Singh Chauhan, was selected as Assistant Professor (Ad Hoc) in NIT Hamirpur.
11. Dr. Sharad Kumar Gupta, who completed Ph.D. under the supervision of Dr. Dericks P Shukla, was awarded AGU travel grant and also got selected as Scientist C in Punjab Remote Sensing Centre, Ludhiana.
12. Dr. Mohammad Amir, who completed Ph.D. under the guidance of Dr. Mohammad Talha, received Post Doctoral position at the School of Engineering at Hankyong National University, South Korea.
13. Harsimranjit Kaur, a Ph.D. student, working with Dr. Dericks P Shukla, got ISPRS travel grant.
14. Ashish Kakoria, a Ph.D. student under the supervision of Dr. Sumit Sinha Ray, was awarded a travel grant to attend International Workshop on Advanced Materials 2020, Dubai.
15. Yati Aggarwal, a Ph.D. student under the supervision of Dr. Sandip Kumar Saha, was awarded a grant-in-aid of 100,000 JPY to attend the 17$^{th}$ World Conference in Earthquake Engineering, Sendai, Japan.
16. Dharani Raj S.V., who is pursuing M. Tech. Project under the supervision of Dr. Mousumi Mukherjee, was awarded with DAAD Fellowship to pursue part of his M.Tech. project work at TU Munich, Germany.

## MEMBERSHIP OF PROFESSIONAL SOCIETIES

**Dr. Sandip Saha**

- Indian Society of Earthquake Technology (ISET), India (Life Member).
- Indian Association for Computational Mechanics (IndACM) (Life Member).

**Dr. Rajeev Kumar**

- SSME, ISRO.
- IEEE Society.

**Dr. Ashutosh Kumar**

- Life member of Indian Geotechnical Society (LM- 4794).
- Member of International Society for Soil Mechanics and Geotechnical Engineering for 2018-2021.

**Dr. Parmod Kumar**

- Life member of Indian Society of Heat and Mass Transfer (ISHMT).

**Dr. Swati Sharma**

- Life member of Indian Carbon Society.

## OUTREACH ACTIVITIES

- Facilitated the signing of an MoU with the Department of Revenue (Disaster Management), Govt. of HP - signed on 20.10.2020. (PI- Dr. Kaustav Sarkar)
- Facilitated the signing of an MoU with HP PWD for the provision of technical assistance and third-part inspection of bridges being constructed under the PMGSY scheme – signed on 06.03.2021. (PI- Dr. Kaustav Sarkar)
- Dr. Sandip Saha, Become a member of the Technical Advisory Committee for the scrutiny of projects under HP State Disaster Mitigation Fund.

## A FEW MAJOR INSTRUMENTS INSTALLED IN LABS

**Figure 1: Fibre Laser Cutting Machine (FIST)**

**Figure 2: Cold Welding Machine (FIST)**

# 3.3 SCHOOL OF BASIC SCIENCES (SBS)

The School of Basic Sciences at IIT Mandi is a cluster of various disciplines of science such as Mathematics, Physics, Chemistry and Life Sciences and related domains. The core of the school consists of 39 faculties (plus visiting professor and teaching fellow) having expertise in contemporary fields of research. The school started its Ph.D. program in 2010, and presently, 173 research scholars have enrolled to pursue research in various disciplines. The school aims to create an ambiance for the smooth pursuit of scholarly activities in research and education to make an international impact. The School of Basic Sciences has started M.Sc. program in Chemistry with specialization in various areas such as Organic Chemistry, Inorganic Chemistry, and Physical Chemistry & Nanosciences from the year 2014. The School of Basic Sciences has also started Integrated-Ph.D.Physics in the year 2015, M.Sc. Mathematics & M.Tech. Biotechnology program in the Year 2016 and M. Sc. Physics in 2017. The school had also started three new B.Tech. Programs jointly with other schools in 2019. The school faculty members are closely working with the engineering colleagues on different research projects.

## Faculty

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|---|---|---|
| 1 | **Dr. Suman Kalyan Pal**<br>**Professor and Chairperson, SBS**<br>Specialization: Fast and Ultrafast Laser Spectroscopy<br>Ph.D. from Indian Association for the Cultivation of Science, Jadavpur (2006)<br>Home Town: Katwa, West Bengal<br>Phone: 01905-267040,<br>Email: suman & chairsbs |  |
| 2 | **Dr. Aditi Halder**<br>**Associate Professor**<br>Specialization: Design and development of new functional nanomaterials for the application of renewable energy, nano-electronics and sensor<br>Ph.D. from Indian Institute of Science (2009)<br>Home Town: Kolkata, West Bengal<br>Phone: 1905-267140<br>Email: aditi |  |
| 3 | **Dr. Ajay Soni**<br>**Associate Professor**<br>Specialization: Nanomaterials and Experimental Condense Matter Physics<br>Ph.D. from UGC-DAE Consortium for Scientific Research, Indore (2009)<br>Phone: 01905- 267135<br>Email: ajay |  |
| 4 | **Dr. Amit Balkrishna Pawar**<br>**Assistant Professor**<br>Specialization: Organic Chemistry<br>Ph.D. from IISc Bangalore<br>Home Town: Pune, Maharashtra<br>Phone: 267116<br>Email: amitpawar |  |
| 5 | **Dr. Amit Jaiswal**<br>**Assistant Professor**<br>Specialization: Nano biotechnology<br>Ph.D. from Indian Institute of Technology Guwahati (2013)<br>Home Town: Kolkata, West Bengal<br>Phone: 01905- 267137<br>Email: j.amit |  |

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|---|---|---|
| 6 | **Dr. Amit Prasad**<br>**Assistant Professor**<br>Specialization: Immunology/Microbiology<br>Ph.D.from Sanjay Gandhi PG Institute of Medical Sciences, Lucknow (2008)<br>Home Town: Ranchi, Jharkhand<br>Phone:01905-267136<br>Email: amitprasad |  |
| 7 | **Dr. Aniruddha Chakraborty**<br>**Associate Professor**<br>Specialization: Theoretical Chemistry<br>Ph.D. from Indian Institute of Science (2005)<br>Home Town: Kolkata, West Bengal<br>Phone: 01905-267145<br>Email: achakraborty |  |
| 8 | **Dr. Arti Kashyap**<br>**Associate Professor (Joint Appointment)**<br>Specialization: Magnetism and magnetic materials<br>Ph.D. from Indian Institute of Technology Roorkee<br>Home Town: Mandi, Himachal Pradesh<br>Phone: 01905-267042<br>Email: arti |  |
| 9 | **Dr. Baskar Bakthavachalu**<br>**Assistant Professor**<br>Specialization: Genetics and Molecular Neuroscience<br>Ph.D. from National Centre for Cell Science<br>Home Town: Chennai<br>Email: Baskar |  |
| 10 | **Dr. Bhaskar Mondal**<br>**Assistant Professor**<br>Specialization: Computational Chemistry and Catalysis<br>Ph.D. from Indian Association for the Cultivation of Science, Kolkata<br>Home Town: Basirhat, West Bengal<br>Phone: 267828<br>Email: bhaskarmondal |  |
| 11 | **Dr. Bindu Radhamany**<br>**Associate Professor**<br>Specialization: X-ray spectroscopy<br>Ph.D. from UGC - DAE, consortium for scientific research, Indore (2005)<br>Home Town: Kollam, Kerala<br>Phone: 01905-267060<br>Email: bindu |  |
| 12 | **Dr. C. S. Yadav**<br>**Associate Professor**<br>Specialization: Low Temperature Physics<br>Ph.D. from Jawaharlal Nehru University (2008)<br>Phone: 01905-267135<br>Email: Shekhar |  |
| 13 | **Dr. Chayan K. Nandi**<br>**Professor**<br>Specialization: Physical Chemistry<br>Ph.D. from Indian Institute of Technology Kanpur (2006)<br>Home Town: Sarangapur, Bankura, West Bengal<br>Phone: 01905-267047<br>Email: Chayan |  |
| 14 | **Dr. Eike F. Schwier**<br>**Visiting Assistant Professor**<br>Specialization: Surface Science, Photoelectron Spectroscopy, Density Functional Theory<br>Ph.D. from University of Fribourg, Switzerland<br>Home town: Bremen, Germany |  |

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| 16 | **Dr. Garima Agrawal**<br>**Assistant Professor**<br>Specialization: Polymer Science and Technology, Materials Chemistry , Nanomaterials, Smart Materials, Biodegradable Polymers, Biomaterials<br>Ph.D. from RWTH Aachen University, Germany<br>Home Town: Jaipur, Rajasthan<br>Phone: 267827<br>Email: Garima |  |
| 16 | **Dr. Girish Sharma**<br>**Assistant Professor**<br>Specialization: Theoretical condensed matter physics<br>Ph.D. from Clemson University (USA)<br>Home Town: Shimla, HP<br>Email: girish |  |
| 17 | **Dr. Hari Varma**<br>**Associate Professor**<br>Specialization: Atomic and Molecular physics<br>Ph.D. from Indian Institute of Technology Madras (2008)<br>Home Town: Kochi, Kerala<br>Phone: 01905-267064<br>EMail: hari |  |
| 18 | **Dr. Kalpesh Haria**<br>**Assistant Professor**<br>Specialization: Operator Theory<br>Ph.D. from IIT Bombay (2014)<br>Home Town: Jamnagar, Gujarat<br>Phone: 01905-267114<br>Email: Kalpesh |  |
| 19 | **Dr. Kaustav Mukherjee**<br>**Associate Professor**<br>Specialization: Experimental Condensed Matter Physics<br>Ph.D. from UGC - DAE Consortium for Scientific Research (2008)<br>Home Town: Kolkata, West Bengal<br>Phone: 01905-267043<br>Email: Kaustav |  |
| 20 | **Prof. Kenneth Gonsalves**<br>**Visiting Distinguished Professor**<br>Specialization: Materials Synthesis<br>Ph.D. from University of Massachusetts at Amherst<br>Home Town: Charlotte, NC, USA<br>Phone: 01905-237976<br>Email: Kenneth |  |
| 21 | **Dr. Manoj Thakur**<br>**Associate Professor**<br>Specialization: Optimization, Soft Computing, Machine Learning & its Application to Computational Finance<br>Ph.D. from Indian Institute of Technology Roorkee (2007)<br>Home Town: Roorkee, Uttarakhand<br>Phone: 01905-267154<br>Email: manoj |  |
| 22 | **Dr. Muslim Malik**<br>**Associate Professor**<br>Specialization: Differential Equations<br>Ph.D. from Indian Institute of Technology Kanpur (2006)<br>Home Town: Balrampur, UP<br>Phone: 01905-267119<br>Email: muslim |  |
| 23 | **Dr. Nitu Kumari**<br>**Associate Professor**<br>Specialization: Differential Equations, Dynamical Systems, Nonlinear Dynamics<br>Ph.D. from Indian School of Mines Dhanbad (2009)<br>Home Town: Dhanbad, Jharkhand<br>Phone: 01905-267057<br>Email: nitu |  |

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| 24 | **Dr. Pradeep Kumar**<br>**Assistant Professor**<br>Specialization: Raman and Infrared Spectroscopy<br>Ph.D. from Indian Institute of Science (2014)<br>Home Town: Rohtak, HR<br>Phone: 01905-267152<br>Email: pkumar |  |
| 25 | **Dr. Pradeep Parameswaran**<br>**Professor**<br>Specialization: Inorganic/Materials/Nano-Chemistry<br>Ph.D. from University of Hyderabad (2006)<br>Home Town: Varavoor, Thrissur District, Kerala<br>Phone: 01905-237931/267045<br>Email: Pradeep |  |
| 26 | **Dr. Pradyumna Kumar Pathak**<br>**Associate Professor**<br>Specialization: Quantum Optics, Quantum Information and Nano photonics<br>Ph.D. from Physical Research Laboratory, Ahmedabad<br>Home Town: Mathura, Uttar-Pradesh<br>Phone: 01905- 267046<br>Email: ppathak |  |
| 27 | **Dr. Prasad Kasturi**<br>**Assistant Professor**<br>Specialization: Proteostasis, Aging, Stress Response and C.elegans<br>Ph.D. from University of Fribour<br>Home Town: Nizamabad<br>Email: prasadkasturi |  |
| 28 | **Dr. Prasanth P. Jose**<br>**Associate Professor**<br>Specialization: Soft condensed matter physics<br>Ph.D. from Indian Institute of Science (2005)<br>Home Town: Palakkad, Kerala<br>Phone: 01905-267064,<br>Email: Prasanth |  |
| 29 | **Dr. Prem Felix Siril**<br>**Professor**<br>Specialization: Chemistry of Nanomaterials<br>Ph.D. from DDU Gorakhpur University (2003)<br>Home Town: Thiruvananthapuram, Kerala<br>Phone: 01905-267040,<br>Email: prem |  |
| 30 | **Dr. Prosenjit Mondal**<br>**Associate Professor**<br>Specialization: Molecular Endocrinology and Metabolism<br>Ph.D. from Institute of Life Sciences Bhubaneswar (2008)<br>Home Town: Babunpur, Burdwan<br>Phone: 01905-267135<br>Email: Prosenjit |  |
| 31 | **Dr. Qaiser Jahan**<br>**Assistant Professor**<br>Specialization: Harmonic and Wavelet Analysis<br>Ph.D. from ISI Kolkata (2014)<br>Home Town: Allahabad<br>Phone: 01905-267050<br>Email: Qaiser |  |

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|---|---|---|
| 32 | **Dr. Rajanish Giri**<br>**Assistant Professor**<br>Specialization: Biophysics and protein folding, Intrinsically Disordered Proteins, T Cell Engineering, Protein Engineering<br>Ph.D. from Sapienza University of Rome, Rome, Italy (2013)<br>Home Town: Allahabad<br>Phone:01905- 267154,<br>Email: rajanishgiri |  |
| 33 | **Dr. Rajendra K. Ray**<br>**Associate Professor**<br>Specialization: Computational Fluid Dynamics, Numerical Methods for PDEs<br>Ph.D. from Indian Institute of Technology Guwahati (2009)<br>Home Town: Sainthia, West Bengal<br>Phone: 01905- 267041<br>Email: Rajendra |  |
| 34 | **Dr. Sarita Azad**<br>**Assistant Professor**<br>Specialization: Statistical Time Series Analysis<br>Ph.D. from Delhi University and Indian Institute of Science (2008)<br>Home Town: New Delhi<br>Phone: 01905-267141<br>Email: Sarita |  |
| 35 | **Dr. Shyam Kumar Masakapalli**<br>**Associate Professor**<br>Specialization: Metabolic Systems Biology (Fluxomics and metabolomics), Plant and microbial metabolism, NMR and GC-MS.<br>Ph.D. from University of Oxford, UK (2012)<br>Home Town: Rayagada, Odisha<br>Phone: 01905-267147,<br>Email: shyam |  |
| 36 | **Dr. Subrata Ghosh**<br>**Professor**<br>Specialization: Organic Chemistry<br>Ph.D. from Indian Institute of Technology Guwahati (2006)<br>Home Town: Bolpur-Santiniketan, West Bengal<br>Phone: 01905-267065,<br>Email: Subrata |  |
| 37 | **Dr. Syed Abbas**<br>**Associate Professor**<br>Specialization: Differential Equations and Ecological modelling<br>Ph.D. from Indian Institute of Technology Kanpur (2009)<br>Home Town: Gonda, Uttar Pradesh<br>Phone: 01905- 267148<br>Email: abbas |  |
| 38 | **Dr. Trayambak Basak**<br>**Assistant Professor**<br>Specialization: Metabolic diseases, extracellular matrix, Proteomics<br>Ph.D. from CSIR-Institute of Genomics and Integrative Biology<br>Home Town: Dhupguri, West Bengal<br>Email: Trayambak |  |
| 39 | **Dr. Tulika Prakash Yadav**<br>**Associate Professor**<br>Specialization: Bioinformatics, Systems Biology, Metagenomics, Comparative Genomics, Protein Function and Structural analysis<br>Ph.D. from IGIB, CSIR, Delhi (2005)<br>Home Town: Delhi<br>Phone: 01905-237922<br>Email: Tulika |  |

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|---|---|---|
| 40 | **Dr. Venkata Krishnan**<br>**Associate Professor**<br>Specialization: Materials Chemistry, X-ray Science<br>Ph.D. from University of Stuttgart, Germany (2006)<br>Home Town: Coimbatore, Tamil Nadu<br>Phone: 01905-267065<br>Email: vkn |  |
| **FACULTY FELLOWS** | | |
| 41 | **Dr. Sweta Tripathi**<br>**Ramalingaswamy Faculty Fellow**<br>Specialization: Virology, Innate Immunity, Cancer Biology<br>Ph.D.: Boston University<br>Home Town: Gorakhpur<br>Email: shwetatripathi |  |

## Office Staff

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|---|---|---|
| 1 | **Anoop Kumar**<br>Office Assistant<br>Phone: +91 1905 267061<br>Email: sbsoffice@iitmandi.ac.in<br>Office: Room no. 209-A3 Building |  |
| 2 | **Alka**<br>Office Assistant<br>Phone: +91 1905 267061<br>Email: sbsoa1@iitmandi.ac.in<br>Office: Room no. 209- A3 Building |  |
| 3 | **Palvi Sharma**<br>Technical Assistant<br>Phone: +91 1905 267061<br>Email: palvisharma@projects.iitmandi.ac.in<br>Office: Chemistry Lab- Ground Floor, A6 Building |  |
| 4 | **Sushma**<br>Project Associate<br>Phone: 267226<br>Email: sushma_verma@iitmandi.ac.in<br>Office: Physics Lab – Ground Floor, A6 Building |  |

**Research Projects from IIT Mandi Seed Grants, Sponsored Projects, Brief Progress of The Work Done Against Project, Highlighting The Major Achievements During this Period. Names of PI, CO-PI, Funding Agencies and Amount of Grant Received etc.**

| Sl. No. | IIT Mandi Reference/ Project No. | Project Title | Sponsoring Agency | Principal Investigator & Coordinator(s) | Amount Sanctioned In (Rs.) | Duration |
|---|---|---|---|---|---|---|
| 1 | IITM/SERB/PFS/190 | Development of pristine graphene as a catalyst support | SERB | Dr. Prem Felix Siril (PI)<br>Dr. Subrata Ghosh (Co-PI) | 29,54,600 | 3 years |
| 2 | IITM/SERB/RKR/208 | Development of an efficient numerical method for solving stochastic partial differential equation and its application to turbulent flow analysis | SERB | Dr. Rajendra Kumar Ray | 20,09,918 | 3 years |

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|---|---|---|---|---|---|---|
| 3 | IITM/SERB/PCP/210 | Organic-Inorganic hybrids for Photochromic photocatalytic and antioxidant applications | SERB | Dr. Pradeep C Parameswaran | 39,44,600 | 3 years |
| 4 | IITM/CSIR/ACY/212 | Curve crossing problems: Semi-analytical method for arbitrary coupling | CSIR | Dr. Aniruddha Chakraborty | 2,49,833 | 3 years |
| 5 | IITM/SERB/NKU/213 | Study of vector- borne diseases under the influence of environmental pollution | SERB | Dr. Nitu Kumari | 22,28,160 | 3 years |
| 6 | IITM/SERB/NG/214 | Role of micro RNAs controlled by cmyc and Bmi1 in human glioma stem cells | SERB | Dr. Neha Garg | 47,57,058 | 3 years |
| 7 | IITM/DST/AKP/216 | Uplifting hilly livelihood through the eco-friendly utilization of lantana weed | DST | Dr. Arti Kashyap | 25,19,642 | 3 years |
| 8 | IITM/DST-FIST/AH/217 | FIST for improvement of S & T infrastructure- FIST project | DST | Dr. Aditi Halder | 1,12,00,000 | 5 years |
| 9 | IITM/DBT/AP/219 | Understanding the role of miRNAs and pattern recognition receptors mediated modulation of innate immune cells in neurocysticercosis | DBT | Dr. Amit Prasad | 53,31,550 | 3 years |
| 10 | IITM/DST-IR/MT/220 | Development of decision support systems integrating parallel adaptive heruristic algorithms of large- scale multi-objective optimization problems for socio- economic and environmental planning | DST | Dr. Manoj Thakur (IIT Mandi) Dr. Andranik S Akopov (Russia) | 26,20,400 | 2 years |
| 11 | IITM/DBT-IYBA/RG/228 | Implications of disordered regions in Zika virus capsid folding and functions | DBT-IYBA | Dr. Rajanish Giri | 57,08,800 | 3 years |
| 12 | IITM/SERB/SKP/229 | Study the dynamical evolution of spin and valley related many particle electronic states in two dimensional transition metal dichalcogenides using ultrafast time- resolved spectroscopy | SERB | Dr. Suman Kalyan Pal | 35,00,716 | 3 years |
| 13 | IITM/SERB/AS/230 | Large unit cell materials with intrinsically low thermal conductivity for thermoelectric application | SERB | Dr. Ajay Soni | 47,12,400 | 3 years |
| 14 | IITM/DBT/PM/233 | The role of ectopic liver derived systemic factors in regulating betacell function | DBT-IYBA | Dr. Prosenjit Mondal (PI) DBT | 50,63,000 | 3 years |
| 15 | IITM/SERB-MATRICS/NKU/246 | Modeling and control of the hinglish invasion in India: A mathematical study | SERB | Dr. Nitu Kumari | 6,60,000 | 3 years |
| 16 | IITM/DRDO/PFS/272 | Micronization and Encapsulation of explosive by expansion of CO2- expanded liquid solutions | DRDO | "Dr. Prem Felix Siril (PI) (IIT Mandi) Dr. Sameer Dalvi, IIT Gandinagar" | 22,64,850 | 3 years |
| 17 | IITM/CSIR/ACY/277 | Electron solvation by a layer of polar adsorbates realstic model | CSIR | Dr. Aniruddha Chakraborty | 4,32,000 | 3 years |
| 18 | IITM/DST-INSPIRE/GA/279 | Designing functional nanomaterials for drug delivery | DST | Dr. Garima Agrawal | 35,00,000 | 5 years |
| 19 | IITM/SERB/PM/281 | Function and mechanisms of sorcin in diet induced fatty liver diseases and lipid metabolism | SERB | Dr. Prosenjit Mondal, Dr. Subrata Ghosh (Co-PI), Dr. Mohan Kamthan (Co-PI) | 43,60,000 | 3 years |

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| 20 | IITM/SERB/RG/282 | Mechanistic insights into the folding and function of Zika Virus NSI protein: implications for replication complex formation | SERB | Dr. Rajnish Giri | 57,97,000 | 3 years |
| 21 | IITM/SERB/TPS/283 | Evaluation and design of novel synthetic microbial consortia for bioprocessing of rubber and plastic waste to industrial biomolecules | SERB | Dr. Tulika P Srivastava, Dr. Shyam Kumar Masakapalli (Co-PI) | 41,51,400 | 3 years |
| 22 | IITM/SERB/SB/284 | Identification problem on dynamic equation on time scale | SERB | Dr. Syed Abbas | 6,60,000 | 3 years |
| 23 | IITM/SERB/AH/286 | Low cost flexible and rechareable Zn-air battery for portable device application | SERB | Dr. Aditi Halder | 42,17,400 | 3 years |
| 24 | IITM/DST/VD/288 | National mission on interdisciplinary cyber physical system (NM-ICPS) implementation mechanisms-Technology innovation hubs (TIH s) | DST | Dr. Prem Felix Siril (PI), Dr. Varun Dutt, Dr. Arnav Bhavsar, Dr. Anil K Sao, Dr. Aditya Nigam, Dr. Gopi Srikanth Reddy, Dr. Srikant Srinivasan, Dr. Dileep A.D. and Dr. Satyajit Thakor are the (Co-PIs) | 7,25,00,000 | 5 years |
| 25 | IITM/SERB/NKU/294 | Modeling COVID-19 to study the impact of various societal factors on the control of pandemic | SERB | Dr. Nitu Kumari | 5,50,000 | 1 year |
| 26 | IITM/SERB/BM/299 | Computation design of non-noble metal catalysts for photocatalytic N2 activation | SERB | Dr. Bhaskar Mondal S | 19,91,000 | 2 years |
| 27 | IITM/DST(WOS-A)/KGH/302 | Design and synthesis of imninosugar-base seven membered fused deazapurine nucleosides and nucleotides | DST (WOS-A) | Dr. Ketaki Ghosh Dr. Subrata Ghosh (Mentor) | 30,30,480 | 3 years |
| 28 | IITM/SERB/GA/303 | Designing functional microgels based agrochemical delivery systems with moisture preservation | SERB | Dr. Garima Agrawal | 24,31,000 | 2 years |
| 29 | IITM/SERB/GS/305 | Disorder. topology and correlations in dirac matter | SERB | Dr. Girish Sharma | 13,62,372 | 2 years |
| 30 | IITM/SERB/ABP/306 | Total synthesis of Indolizinone, Quinolizinone and Quinazolinone based natural products via cp*co(III)-Catalyzed cascada C-H functionalization | SERB | Dr. Amit Balkrishna Pawar | 30,44,254 | 2 years |
| 31 | IITM/SERB/KM/307 | Exploration of physical properties of heusler alloys a prospective class of multi-functional material | SERB | Dr. Kaustav Mukherjee | 49,87,400 | 3 years |
| 32 | IITM/DST/AS/308 | Design of novel layered materials in bulk and 2D form for thermal energy harvesting | DST | Dr. Ajay Soni | 38,36,880 | 3 years |
| 33 | IITM/SERB/QJ/309 | Theory of wavelets on local fields and shearlet coordbit spaces | SERB | Dr. Qaiser Jahan | 6,60,000 | 3 years |

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| 34 | IITM/SERB/CKN/310 | Unique fluorescent nanodots as a marker to ease the method of correlative super resoltion microscopy | SERB | Prof. Chayan Kanti Nandi | 66,92,400 | 3 years |
| 35 | IITM/DST/AKP/312 | Livelihood generation and improvement for women entrepreneurs in small scale fruits and vegetable farming and post- harvesting management | DST | "Dr. Arti Kashyap (PI) Dr. Surya Prakash Upadhyay (Co-PI)" | 35,65,540 | 3 years |
| 36 | IITM/DBT-RF/PKS/315 | Unraveling the role of inter-tissue stress communication in maintaining organism-wide proteostasis during stress and aging | DBT | Dr. Prasad Kasturi | 42,50,000 | 5 years |
| 37 | IITM/DST/GA/318 | Designing 3D printable smart composite hydrogel- inks for tissue engineering applications | DST | Dr. Garima Agrawal (PI), Dr. Rik Rani Koner (Co-PI) | 37,96,642 | 3 years |
| 38 | IITM/DST/MTH/319 | Sustainable irrigation advisories for mid-himalayan farmers using smart satellite image analytics | DST | Dr. Manas Thakur (PI) Prof. Yvonne Dittrich (PI) from IT University of Copenhagen, Denmark, Dr. Srikant Srinivasan, Dr. Shyam Kumar Masakapalli, Dr. Ramna Thakur (CoPI's) | 99,29,444 | 3 years |
| 39 | IITM/DST/SKP/320 | Optical control of valleytronics materials | DST | Prof. Suman Kalyan Pal (PI), Prof. Tonu Pullerits from Sweden | 54,25,000 | 3 years |
| 40 | IITM/SERB/BB/321 | Flavivirus RNA interacting stress granule complex as determinants of host adaptation and infectivity | SERB | Dr. Baskar Bakthavachalu | 38,40,000 | 3 years |
| 41 | IITM/ICMR/RG/322 | Drug discovery and folding mechanism against RNA dependent RNA polymerase of Japanese encephalitis virus | ICMR | Dr. Rajanish Giri | 5,66,500 | 3 years |
| 42 | IITM/HPSAMB/HT/326 | Engineering design improvisation of packaging material leading to market friendly prototypes that retains fruits quality | H.P State Agriculture Marketing Board | Dr. Mohammad Talha, Dr Shyam Kumar Masakapalli | 17,88,000 | 1.5 years |
| 43 | IITM/SU-UK/VKN/328 | Low cost recycling of coronavirus contaminated medical waste (ReCocir) | Swamsea University (UK) | Dr. Venkata Krishnan | 7,16,087 | 3 years |
| 44 | IITM/SERB/SAT/329 | Entropy region information inequalities and their applications | SERB | Dr. Satyajitsinh Ajitsinh Thakor (PI) Dr. Syed Abbas (Co-PI) | 37,13,677 | 3 years |
| 45 | IITM/DBT-WIA/BB/331 | How does ataxin-dependent stress-granule assembly contribute to neurodegenerative disease | DBT WellcomeTrust India Alliance | Dr. Baskar Bakthavachalu | 3,60,73,321 | 5 Years |
| 46 | IITM/SU-UK/VKN/333 | Agreement between Swansea University, Marley Limited, Manonmaniam Sundaranar University and IIT Mandi | Swansea University (UK) | Dr. Venkata Krishnan | 1,81,440 | 3 Years |

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|---|---|---|---|---|---|---|
| 47 | IITM/ICMR/TB/334 | High- Resolution plasma proteomic and lipidomic analyses for fibrosis- related metabolic assessment in dilated cardiomyopathy (DCM) patients in India- A multi- center based study | ICMR | Dr. Trayambak Basak | 30,27,638 | 1 Year |
| 48 | IITM/NBHM-DAE/MM/336 | Inverse problems for the abstract differential equations and fluid dynamics | NBHM | Dr. Muslim Malik | 15,15,900 | 3 Years |
| 49 | IITM/DIC-Committee/86 | Design Innovation Centre | MHRD | Dr. Shubhajit Roy Chowdhary<br>Dr. SK Masakapali<br>Dr. Atul Dhar,<br>Dr. Mohammad,<br>Dr. Kaustav Sarkar | 1,30,00,000 | 7.2 Years |
| 50 | IITM/MHRD(UAY)/SG/121 | Development of Indigenous photoresists technology for semiconductor industries: impact on Indian economy, skilled manpower development and employment possibility | MHRD | Dr. Subrata Ghosh (PI)<br>Dr. Satinder K. Sharma (Co-PI)<br>Dr. Pradeep C. Parameswaran (Co-PI) | 2,39,00,000 | 5.3 years |
| 51 | IITM/ISRO-SCL/SG/124 | Development of Indigenous photoresist stripping formulation for SCL, Mohali | SCL Mohali | Dr. Subrata Ghosh | 4,89,850 | 5.1 months |
| 52 | IITM/MHRD-IMPRINT/SRC/138 | A microfluidic based point of care testing device for measuring urine albumin using a novel organic dye | MHRD-IMPRINT | Dr. Shubhajit Roy Chowdhury(PI)<br>Dr. Subrata Ghosh (Co-PI), Dr. Prosenjit Mondal (Co-PI) | 73,20,000 | 4.1 years |
| 53 | IITM/SERB/VKU/139 | Improving Bio-engineering strategies to achieve soil stability | SERB | Dr. Kala Venkata Uday (PI), Dr. Shyam Kumar Masakapalli (Co-PI) | 51,33,040 | 3.6 years |
| 54 | IITM/DBT-RF/ST/156 | Role of human cathelicidine in gastric carcinogenesis | DBT | Dr. Shweta Tripathi | 88,00,000 | 5 years |
| 55 | IITM/SERB-RF/NG/113 | Ramanujan Fellowship | SERB | Dr. Neha Garg | 1,02,40,000 | 5 year |
| 56 | IITM/SERB/PPJ/168 | A comparative study on microscopic structure and dynamics near glass transition in linear polymer melt at low & high densities | SERB | Dr. Prasanth P Jose | 20,23,780 | 3 years |
| 57 | IITM/DBT/PM/170 | Novel NIR-1 and NIR-2 dyes and their functionalised nanoparticles for non-invasive imaging, tracking and target delivery of theranostic in progressive liver disease prognosis and therapy | DBT | Dr. Prosenjit Mondal (PI)<br>Dr. Subrata Ghosh (Co-PI) | 60,25,600 | 3 years |
| 58 | IITM/MHRD-IMPRINT/AD/169 | Sustainable waste water treatment through bio-photoelectro catalysis and bio production | MHRD-IMPRINT | Dr. Atul Dhar (PI)<br>Dr. Rahul Vaish<br>Dr. Shyam Kumar Masakapalli, Dr. Aditi Halder, Dr. Tulika P Srivastava, Dr. Rik Rani Koner | 3,84,34,000 | 4. 8 years |
| 59 | IITM/DST(WOS-B)/RSO/180 | Development and dissemination of Agri- based technologies being optimized at IIT Mandi from lab to farmer's field of mid Himalayan region | DST (WOS-B) | Dr. Reshma Sao (PI)<br>Dr. Shyam Kumar Masakapalli (Mentor) | 26,80,000 | 3 years |

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|---|---|---|---|---|---|---|
| 60 | IITM/DBT-Indo-UK/SS/192 | Smart Agriculture: Farmer Zone | DBT | Dr. Srikant Srinivasan (PI), Dr. Renu M.R, Dr. Siddhartha Sarma, Dr. A.D. Dileep, Dr. Shyam Kumar Masakapalli, Dr. Shyamasree Dasgupta (Co-PI's) from IIT Mandi & Dr. S.K. Chakrabarti (PI) from CPCRI, Shimla, Dr. Tina Barsby (PI) from NIAB(UK) and Dr. Andre Laperriere (PI) from GODAN (USA) & Dr. David Hughes (PI) from University of Pennsylvania | 9,47,76,400 | 3.3 years |
| 61 | IITM/SCL/SG/199 | Development of two types of POST ETCH RESIDUE STRIPPERS suitable for cleaning and removal of residues after plasma etching & photo resist ashing of metal & dielectric layers | SCL Mohali | Dr. Subrata Ghosh | 39,00,000 | 2 years |
| 62 | IITM/DST-INSPIRE/KJH/211 | Study of standard noncommuting and commuting dilations of commuting tuples | DST-INSPIRE | Dr. Kalpesh Jayantilal Haria | 35,00,000 | 5 years |
| 63 | IITM/SERB-NPDF/DKU/227 | Exciton manipulation in layered dichalcogenides- group II-VI semiconductor nanostructured materials | SERB | Dr. Dushyant Kushavah (PI) Dr. Suman Kalyan Pal (Mentor) | 19,20,000 | 2 years |
| 64 | IITM/MHRD-SPARC/SKM/258 | Developing novel strategies to capture Phytopathogen-agricultural host metabolic crosstalk by cell type specific 13 C metabolic phenotyping | MHRD-SPARC | Dr. Shyam Kumar Masakapalli (PI), Prof. Suvendra Kumar Ray and Dr. Siddhartha Sankar Satapathy (Co-PI's) from Tezpur University, and collaboration with Prof. George Ratcliffe (PI) and Prof. Nicholas Kruger (Co-PI) from University of Oxford, UK | 46,81,775 | 2 years |
| 65 | IITM/MHRD-SPARC/PFS/260 | Developing conducting polymer nanostructures and their nanocomposites as visible light photocatalysts for environmental remediation using flow chemistry | MHRD-SPARC | Dr. Prem Felix Siril (PI), Dr. Suman Kalyan Pal (Co-PI) from IIT Mandi, and collaboration with Prof. Samy Remita (PI) from Universite Paris-SUD and Dr. Chouki Zerrouki and Dr. Najla Fourati (Co-PI's) from Conservatoire National des Art et Maitiers de Paris | 60,83,710 | 2 years |

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|---|---|---|---|---|---|---|
| 66 | IITM/MHRD-SPARC/RG/261 | Biophysics of Zika virus envelope protein, membrane fusion and inhibitor discovery | MHRD-SPARC | Dr. Rajanish Giri (PI), Dr. Sanjeev Kumar Singh (Co-PI) from Alagappa University, and collaboration with Prof. Indira U. Mysorekar (PI) from Washington University in ST. Louis and Dr. Vladmir N Uversky (Co-PI) from University of Florida | 97,23,515 | 2 years |
| 67 | IITM/HDC/SKM/287 | Farming of unexplored herbs of mid-himalayan region and develop a sustainable supply model involving local farmer in the mid-himalayan region | Himalayan Drug Company | Dr. Shyam Kumar Masakapalli | 5,68,800 | 1 year |
| 68 | IITM/DRDO/AS/290 | Study of mode-wise thermal conductivity and surface- state transport in bismuth- antimony chalcogenide samples of DLJ using Raman Spectroscopy and physical property measurement system | DRDO | Dr. Ajay Soni | 15,24,000 | 1 year |
| 69 | IITM/INT/BioX-Co/22 | Establishment & Maintenace of Science Laboratory | | BioX Coordinatior | 53,50,000 | 3 years |
| 70 | IITM/INT/SCJ/21 | DIY Kit & Tinkering Lab | | Dr. SC Jain (PI), Co-PI's: Dr. Rajeev Kumar, Dr. Rahul Vaish, Dr. Srikant Srinivasan, Dr. Hitesh Shrimali, Dr. Chander Shekhar, Dr. Syed Abbas, Dr. Aditi Halder, Dr. Shyam Kr Masakapalli | 10,00,000 | 1 year |
| 71 | IITM/INT/TP/07 | Enabling Women in the Kamand Valley for Career Development using mobile and internet | | Dr. Tulika P Srivastava | 3,48,500 | 3.6 years |
| 72 | IITM/INT/RG/18 | Multidisciplinary approach for alzheimer's disease: targeting amyloid beta aggregation | | Dr. Rajanish Giri as (PI from IIT Mandi), Dr. Kailash Chandra (PI from IIT Ropar) and Dr. Prem Felix Siril, Dr. Subrata Ghosh as Co-PI's from IIT Mandi | 7,50,000 | 1.9 years |
| 73 | IITM/INT/TPS/20 | Operations, management and data analytics of the next generation sequencing (NGS) facility | | Dr. Tulika P Srivastava | 6,00,000 | 1.1 years |
| 74 | IITM/CONS/ShopX/AP/47 | Report on germ killing capability of UV-C device by Shop-X | M/s ShopX-10i Commerce Services Pvt. Ltd. Bengaluru | Dr. Amit Prasad | 38,350 | 11 days |

## INTERNAL PROJECTS

| S.No. | IIT Mandi Reference No./ Project No. | Project Title | Sponsoring Agency | Principal Investigator & Co-ordinator(s) | Amount Sanctioned in (Rs.) | Duration of Project |
|---|---|---|---|---|---|---|
| 1 | IITM/INT/BioX-Co/22 | Establishment & Maintenace of Science Laboratory | IIT Mandi | BioX Coordinatior | 53,50,000 | 3 years |

## PROGRESS OF PROJECTS

**Prof. Suman Kalyan Pal**
**Title:** Study the dynamical evolution of spin and valley related many-particle electronic states in two-dimensional transition metal dichalcogenides using ultrafast time-resolved spectroscopy
**PI:** Suman kalyan Pal
**Funding Agency:** SERB
**Amount:** 35 lacs

### Progress

The objectives of this project are to study many-body interactions and exciton dynamics in 2D transition metal dichalcogenides (TMDs) with the help of ultrafast spectroscopy and try to understand the spin and valley related problems. To investigate the effect of plasmonic field on TMDs, we exfoliated MoS2 and prepared gold nanorods (Au-NRs). Photoluminescence of MoS2 has been affected by Au-NRs. The change in PL property of MoS2 in the presence of Au-NRs could be attributed to plasmon induced electron transfer from Au-NRs to MoS2.

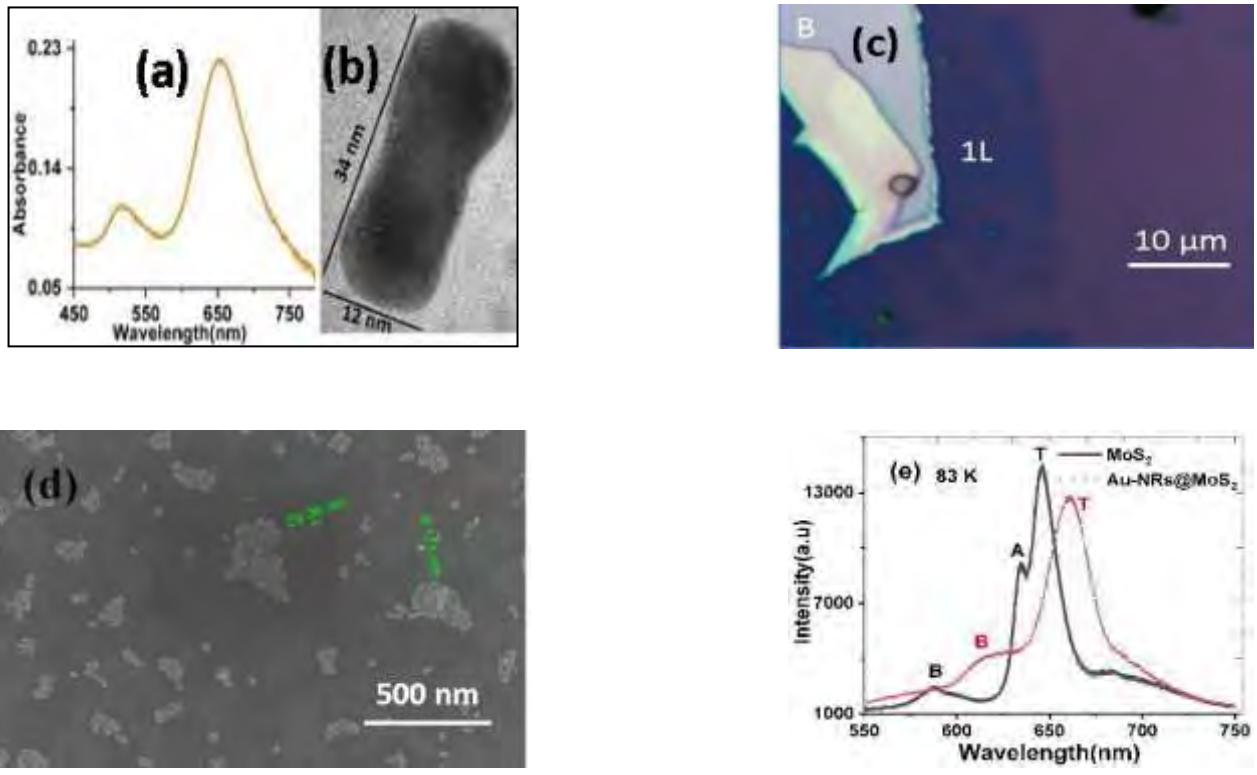


**Figure** (a) Absorption spectrum showing transverse and longitudinal bands, and (b) TEM image of Au-NRs. (c) Optical image of $MoS_2$ exfoliated over $SiO_2$/Si substrate. (d) SEM image of Au-NRs drop casted over $MoS_2$ forming Au-NRs@$MoS_2$ heterostructure. (e) Comparison of PL for $MoS_2$ and Au-NRs@$MoS_2$ heterostructure at 83 K obtained by 532 nm laser excitation.

**Dr. Kaustav Mukherjee**
**Project Sanctioned (As PI):** Exploration of physical properties of Heusler alloys - a prospective class of multi-functional material.
**Sponsoring Agency:** DST-SERB, India.
**Amount:** Rs 49, 87, 400
**Duration:** Dec 2020 – Dec 2023.

Melting of spin ice state and development of fifth order susceptibility with magnetic field in pyrochlore Tb2Sn2O7

Pyrochlores offer an ideal playground to investigate the magnetic ground state of frustrated magnetic systems. In this class of materials, competition between various magnetic interactions remains frustrated and prevents an ordered magnetic state at low temperatures. Tb2Sn2O7 has recently attracted significant attention due to its ordered spin-ice state. Additionally, application of external magnetic field might result in exotic magnetic states. Our studies on Tb2Sn2O7, reveals the presence of a new phase associated with evolution of positive fifth order susceptibility at low temperatures and high magnetic fields. In this compound, at zero fields, for a stabilized spin-ice state, the non-degenerate ground state and the excited doublet at energy play an imperative role. Under magnetic fields, decreases and it results in an increased mixing of wave functions of the ground and excited doublet state. It leads to an enhancement of quantum fluctuations, as a result of which, the spin-ice state is melted. Above 10 kOe, magnetic field strengthens the magnetic anisotropy energy which might be responsible for development of the positive fifth order susceptibility due to establishment of the quasi-doublet ground state. Our study suggests that quasi-doublet state may be the key ingredient for evolution of such higher-order moment in this compound.

Coexistance of non-Fermi liquid behavior and bi-quadratic exchange coupling in La-substituted **CeGe:** Non-linear susceptibility and DFT + DMFT study

Studies connected with the investigations of “non-Fermi liquid” (NFL) systems continue to attract interest in condensed matter physics community. Understanding the anomalous physical properties exhibited by such systems and its related electronic structures is one of the central research topics in this area. In this context, Ce-based and Ce-site diluted (with non-magnetic ions) compounds provide a fertile playground. Here, we present a detailed study of non-linear DC susceptibility and combined density functional theory plus dynamical mean field theory (DFT+DMFT) on Ce0.24La0.76Ge. Theoretical investigation of 4f partial density of states, local susceptibility and self-energy demonstrates the presence of NFL behavior which is associated with fluctuating local moments. Non-linear DC susceptibility studies on this compound reveal that the transition from NFL state to the new phase is due to development of the bi-quadratic exchange coupling and it obeys the non-linear susceptibility scaling. Under the application of magnetic fields, local moments interact spatially through conduction electrons resulting in magnetic fluctuations. Our studies point to the fact that the origin of the observed bi-quadratic exchange coupling is due to the spatial magnetic fluctuations.

Optical phonon modes assisted thermal conductivity in p-type ZrIrSb Half-Heusler alloy: A combined experimental and computational study

Half Heusler (HH) alloys with 18 valence electron count have attracted significant interest in the area of research related to thermoelectrics. Understanding the novel transport properties exhibited by these systems with semiconducting ground state is an important focus area in this field. Large thermal conductivity shown by most of the HH-alloy possesses a major hurdle in improving the figure of merit. Additionally, understanding the mechanism of thermal conduction in heavy constituents HH alloys is an interesting aspect. Here, we have investigated the high

temperature thermoelectric properties of ZrIrSb through experimental studies, phonon dispersion and electronic band structure calculations. ZrIrSb is found to exhibit substantially lower magnitude of resistivity and Seebeck coefficient near room temperature, owing to existence of anti-site disorder between Ir/Sb and vacant sites. Interestingly, in ZrIrSb, lattice thermal conductivity is governed by coupling between the acoustic and low frequency optical phonon modes, which originates due to heavier Ir/Sb atoms. This coupling leads to an enhancement in the Umklapp processes due to the optical phonon excitations near zone boundary, resulting in a lower magnitude of L. Our studies point to the fact that the simultaneous existence of two heavy mass elements within a simple unit cell can substantially decrease the lattice degrees of freedom.

**Dr. Aniruddha Chakraborty**
**Project Sanctioned (As PI):** Electron solvation by a layer of polar adsorbates - realistic model.
**Sponsoring Agency:** CSIR, India.
**Amount:** Rs. 3,96,000

**Summary:** An electron near a metal surface feels the charge of its image in the metal and therefore it moves under the influence of this attractive potential. Harris et. al., reported an experimental study of the dynamics of electron in image states of a metal surface having polar adsorbates on it - they find two kinds of states, viz., one localized and the other delocalized. There have been attemps to model the process, but the problem is the nature of the image potential state is not known owing to the lack of detailed knowledge of the geometry of the metal surface. All the theoretical calculations done so far have used flat metal surface. In this project we have considered a model in which we account for non-flateness of the surface, analytical part of the calculation for effective potential is done and we are in the process of verifying our calculation.

**Project Sanctioned (As PI):** Curve Crossing Problems with Arbitrary Coupling.
**Sponsoring Agency:** CSIR, India.
**Amount:** Rs. 7,54,400

**Summary:** Nonadiabatic transition due to potential energy curve crossing is an interesting mechanism to induce electronic transitions in collision process. There are examples where the transition is in between two states and also there are cases of involvement of more than two states in the process. There are only few cases where exact analytical solution of two state problem is available but those involve specific shape of potentials and coupling term. We have done calculations, where coupling term is an arbitrary function of position and currently, we are extending it to the case where coupling term is both function of position and time.

**Dr. C. S. Yadav**
**Project Title:** Study of Nernst effect in the superconductors and semimetallic compounds
**Sponsored agency:** DST-SERB
**Highlight of the project work:** We developed an experimental set up at SBS, IIT Mandi, as part of the project of the DST SERB project titled 'Study of Nernst effect in the superconductors and semimetallic compounds'. This set up capable of Nernst coefficient and Seebeck coefficient down to low temperature 1.8 K. Nernst coefficient proves an important tool to study the transport dynamics of the charge carrier in the correlated electron material, and is one of its kind in the country. Designed set up not only fulfilled the requirement of the project outcome but is currently being used for other related research activities.
**Cost of project:** Rs. 15 Lakh (Student fellowship was not requested for this project)

Project was completed in March 2020. The outcome of the designed experimental set up was published in the 'Review of Scientific Instruments'.

**Dr. Prosenjit Mondal (PI)**
DHR- GIA/2020/000788 Feb, 24th 2021 (Grants Approved but sanction letter awaited)
**Title:** Targeted Mass Spectrometry based approach to measure plasma acetylated High Mobility Group Box 1
**Budget:** INR. 49,73,701 (proposed)
Funding agency- DHR
**Co-PI:** Trayambak Basak, SBS, IIT Mandi.

**Dr. Garima Agrawal (PI)**
**Project title:** Designing 3D Printable Smart Composite Hydrogel-Inks for Tissue Engineering Applications
**Scheme:** India - South Korea Joint Research project
**Sponsoring Agency:** DST
**Co-PI:** Dr. Rik Rani Koner
**Amount sanctioned in Rs:** 37,96,642/-
**Duration of project:** 3 years
The project started in the middle of March 2021 only. The purchase of required chemicals was initiated in the mentioned time period.

**Project title:** Designing functional microgels based agrochemical delivery systems with moisture preservation
**Sponsoring Agency:** SERB
**Co-PI:** NA
**Amount sanctioned in Rs:** 24,31,000/-
**Duration of project:** 2 years
The project started on 18th December 2020 and it is completely experimental in nature. Due to the prevailing Covid-19 situation at that time, the student could join the campus (in person) at the end of March 2021 only. In the meantime, literature survey was done to deeply understand the current state of the art in the given area.

**Project title:** Designing Functional Nanomaterials for Drug Delivery
**Sponsoring Agency:** DST
**Co-PI:** NA
**Amount sanctioned in Rs:** 35,00,000/-
**Duration of project:** 5 years
Herein, multifunctional nanoparticles with gold shell over an iron oxide nanoparticles (INPs) core have been prepared. The fabricated system combines the magnetic property of INPs and the surface plasmon resonance of gold. The developed nanoparticles have been coated with thiolated pectin (TPGINs), which provides stability to the nanoparticles dispersion and allows the loading of hydrophobic anticancer drugs. Curcumin (Cur) has been used as the model drug and an encapsulation efficiency of approximately 80% in TPGINs has been observed. Cytotoxicity study with HeLa cells showed that Cur-loaded TPGINs have better viability percent (~30%) than Cur alone (~40%) at a dose of 30 $\mu$g of TPGINs.

**Dr. Hari Varma**
**Major achievements EMR/2016/002695**
- SOAIC features are observed in confined atomic systems having low Z-values for the trapped atoms. It is found to modify the photoionization parameters of confined atomic systems.
- Correlation effect on the near threshold region is carried out for the open shell atoms using a combination of GRASP and RATIP software packages. The obtained results on cross section

and angular distribution parameters show very good agreement with the available experimental data of Na atom.

- Effect of confinement on Na atoms produces several Cooper like minima in the cross-section profiles.
- Photoionization studies of atomic clusters using TDLDA within the jellium frame showed the existence of plasmonic features in the ionization dynamics in the near-threshold region.

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## PAPER ACCEPTED IN REPUTED INTERNATIONAL JOURNALS

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4. H. Yang, M.K. Hooda, C.S. Yadav, D. Harbovsky, A. Hauzzi and Y. Klien Anomalous charge transport of superconducting CuxPdTe2 under high-pressure Physical Review B 103, 235105 (2021).
5. N. Ali, B. Singh, Vijay R., Surender Lal, C. S. Yadav, K. Tarafder, and S. Ghosh Ferro-magnetism in Mn doped ZnO: A joint theoretical and Experimental study Journal of Physical Chemistry C 125, 7734 (2021).
6. S. Chandra, S. Abbas, Analysis of Mixed Weyl-Marchaud Fractional Derivative and Box Dimensions, Fractals, accepted, 2021.
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12. Configuring device architecture with new solution-processable host for high performance low color-temperature OLEDs with ultra-low driving voltage, Diksha Thakur, Deepak Kumar Dubey, Rohit Ashok Kumar Yadav, Subrata Banik, Jayachandran Jaya kumar, Chien-Hong Cheng, Jwo-Huei Jou and Subrata Ghosh, Organic Electronics, https://doi.org/10.1016/j.orgel.2021.106127.
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## NATIONAL CONFERENCES ATTENDED AND PAPERS PRESENTED

- Bharath M., Priyamedha Sharma, Jaskirat Brar, and R. Bindu; Electronic structure of doped BaBiO3, AIP Conference Proceedings 2265, 030362 (2020).

## INTERNATIONAL CONFERENCES ATTENDED AND PAPERS PRESENTED

**Dr. Prosenjit Mondal**

- Inceptor, a Promising New Target for Diabetes Treatment. Organized by Helmholtz Center Munich on March,10$^{th}$ 2021.
- Islet Biology Workshop 12/20/20 organized by Diabetes Research Center (DRC)| |University of Washington.

- 4th Good Clinical Practice (GCP): Virtual Workshop - 2020, 18th - 20th December, 2020, PGIMER, Chandigarh.

**Dr. Syed Abbas**

- Conducted a minisymposia and given a talk in the conference ADENA, IIT Guwahati, 2020.

**Prof. Chayan K. Nandi**

- Chayan K. Nandi* "Paving the path to the future of carbogenic nanodots" International conference on recent development in chemistry, NIT Durgapur, 3-5th March 2021.
- Neeraj Soni, Shivendra Singh, Shubham Sharma, Gayatri Batra, Kush Kaushik, Chethana Rao, Navneet C. Verma, Bhaskar Mondal, Aditya Yadav and Chayan K. Nandi* "Absorption and Emission of Light in Carbon NanoDots" FCS virtual meeting, IIT Bombay, 7-12th Dec 2020.

## INVITED LECTURERS/TALKS/CONTINUING EDUCATION PROGRAMS

1. Prof. Suman K. Pal delivered a talk on Transient Absorption Spectroscopy: A Tool to Study Fast Processes in Materials, in a one-week Short term course on "Spectroscopic Techniques for Material Characterization" organized by Materials Research Center, MNIT, Jaipur, 4 - 8 Jan, 2021.
2. Dr. Amit B. Pawar delivered a Lecture at IIT Jodhpur on "Cp*Co(III)-Catalyzed C H Functionalization" on 29th January 2021.
3. Dr. Bhaskar Mondal delivered invited lectures in the AICTE sponsored online QIP course on topic "Advanced Technology for Materials Engineering" at IIT Indore, India, January 19-24, 2021.
4. Dr. Garima Agrawal delivered an invited talk on "Smart Polymers and Nano/Micro-Materials for Targeted Applications" in Faculty Development Program at VIT- Centre for Nano-technology Research (February 2021).
5. Dr. Garima Agrawal delivered an invited talk on "Raman and DLS Analysis of Polymeric Biomaterials" at IIT Patna (December 2020).
6. Dr. Prosenjit Mondal delivered a guest lecture for Research Cell at Kasturba Medical College and Hospital, Manipal Title of the "Hyperinsulinemia in pathogenesis of insulin resistance and diabetes: An interplay between pancreatic beta-cell and peripheral organs" on July 10, 2020
7. Dr. Prosenjit Mondal delivered a talk in National webinar on Environment and Disease organized by Panskura Banamali College with IQAC on 8th August, 2020 title of the talk "Environmental Factor in Metabolic Diseases".
8. Dr. Syed Abbas delivered invited lecture on "Mathematics" in NTSE camp, held at IIT Delhi, 2021.
9. Dr. Syed Abbas delivered invited lecture on "Importance of Mathematics" at Children Science Congress, IIT Mandi, 2020.
10. Dr. Syed Abbas delivered invited lecture on "fractional calculus and applications" in a webinar by TISS, Mumbai, 2020.
11. Prof. Subrata Ghosh delivered a talk on "Not the triplet energy alone; Impact of structural composition of molecular host on PHOLED performance" in a webinar at NIT Rourkela in July 2020.
12. Dr. Girish Sharma delivered guest online seminar at University of Basel, Switzerland, "Superconductivity and metallic state transport in magic angle twisted bilayer graphene", August 2020.
13. Dr. Girish Sharma delivered guest online seminar at Los Alamos National Laboratory (USA), "Superconductivity and metallic state transport in magic angle twisted bilayer graphene", August 2020.

14. Dr. C. S. Yadav delivered two invited talk on "Unusual quantum oscillations and topological surface states in ZrTe5"at APW-RIKEN-Tsinghua-Kavli workshop "Highlights on condensed matter physics" Dates: Sept. 2-4, 2020.

15. Dr. C. S. Yadav delivered two invited talk on 'Exotic Quantum Phenomenon in Condensed Matter' at the Faculty Development Program at Jamia Milia Islamia University New Delhi on Sept 14, 2020.

## WORKSHOP/ CONFERENCE ORGANIZED

1. Virtual training workshop of Himachal school teachers for children science congress 2020, (October 13th, 2020) Organizers: Dr. Ajay Soni, Dr. Syed Abbas, Dr. Aditi Halder, Dr. Prosenjit Mondal, Dr. S.Roy Chaudhary (from SCEE), Prof. S. C. Jain and Dr. Swati Sharma (from SE).

2. Virtual workshop on differential equations & their applications (Nov 27-28, 2020) Organizers: Dr. Muslim Malik and Dr. Parmod (from SE).

3. Indo-UK symposium on "Fluxomics of Microbe and Plant Systems (FluxMAPS 2021)", held on March 24-25, 2021 jointly by IIT Mandi and University of Oxford, UK. The event is supported by MHRD-SPARC and UKIERI. Organizers: Dr. Shyam Kumar Masakapalli.

## PATENTS FILED/ AWARDED

| Sl. No. | Patent Application no. | Patent titled | Inventor | Co-Inventor(s) | Status |
|---|---|---|---|---|---|
| 1 | Patent application no. 201711003716<br><br>Patent Number: 342426 | Compounds for visualization and quantification of albumin, method for preparation and use thereof | Prof. Subrata Ghosh &<br>Dr. Prosenjit Mondal | Gourav Dey | Granted |
| 2 | Patent application no. 202011038666 | "Pharmaceutical composition comprising Nano formulation of Low Dose Naltrexone (LDN) and GLP1 agonist (exendin4) and/or anti-microbials" | Dr. Prosenjit Mondal | Abhinav Choubey | Filed |
| 3 | Patent application no. 202011019980 | "Carbogenic Fluorescent Nanodot as New Probe for Super Resolution Microscopy and Method of Application Thereof" | Prof. Chayan K. Nandi | Navneet C. Verma,<br>Aditya Yadav,<br>Chethana Rao | Filed |
| 4 | Patent application no. 202011021910 | "Single Step Synthesis of Multimodal Magnetofluorescent Core Shell Superparamagnetic Iron Oxide Nanodots" | Prof. Chayan K. Nandi<br>Dr. Jaspreet K Randhawa | Ashish Tiwari,<br>Anup Singh | Filed |
| 5 | Patent application no. 202141007495 | "A process for i- line resist dissolution modulation using hydroxy-polymer" | Prof . Pradeep C. Parameswaran,<br>Dr. Satinder Sharma,<br>Prof. Subrata Ghosh,<br>Prof. Kenneth E. Gonsalves | Santu Nandi, Lalit Khillare, M. Yogesh, Suman Dolai, Narayan Tiwari, Paritosh Jain and Surinder Singh. | Filed |
| 6 | Patent application no. 202111015581 | "System and method for concentrating the waste and producing valuable gases from waste of treated water" | Dr. Shyam Kumar Masakapalli<br>Dr. Atul Dhar | Jyotika Thakur,<br>Hemant Thakur | Filed |

## PROFESSIONAL ACHIEVEMENTS, HONOURS AND AWARDS

1. Dr. Amit B. Pawar currently working a Scientific Editor for Synthetic Reaction Updates, a literature updating service for organic chemists from the Royal Society of Chemistry.
2. Dr. Bhaskar Mondal working as Guest Editor: Special Issue on "Computational Catalysis" in the Journal of Computational Biophysics and Chemistry, World Scientific Publications.
3. Dr. Syed Abbas inducted as Member of "Global Young Academy", 2020.
4. Prof. Chayan K. Nandi: Guest Editor, Frontiers in Chemistry (June 2020).
5. Five faculty members become Professor:

Dr. Suman K. Pal
Dr. Subrata Ghosh
Dr. Prem F. Siril
Dr. Chayan K. Nandi
Dr. Pradeep C. Parameswaran

## MEMBERSHIP OF PROFESSIONAL SOCIETIES

1. Dr. Syed Abbas is a member of International Society of Difference Equations.
2. Prof. Chayan K Nandi is Lifetime member of Materials Research Society of India, 2020.
3. Dr. Girish Sharma is a member of American Physical Society.
4. Dr. C. S. Yadav is a member of American Physical Society.

## OUTREACH ACTIVITIES

- Dr. Prosenjit Mondal delivered a Talk in Children Science Congress held in October 13$^{th}$-2020 organized by HIMCOSTE & Education Department, Govt. of HP.

## ANY OTHER INFORMATION

1. INYAS National Award 2020 for Research Excellence: Best Ph.D. Thesis in the Area of Carbon Materials, was received by Dr. Navneet Chandra Verma, who completed his Ph.D. under the Guidance of Prof. Chayan K. Nandi at 2020.
2. Two former M.Sc. (chemistry) students of Dr. Aniruddha Chakraborty got PMRF (one is doing Ph.D. in IIT Kanpur and other is doing Ph.D. is IIT Bombay).
3. For the first time we offered remote internship, the student joined in the supervision of Dr. Aniruddha Chakrabortyis Mr. Chirag Arora (final year M.Sc. Chemistry student of IIT Kharagpur), now he has got a Ph.D. position at Princeton University, USA.
4. Prof. Subrata Ghosh served as reviewer for many journals, as Ph.D. thesis reviewer and also served as external examiner for other organizations.

# 3.4 SCHOOL OF HUMANITIES AND SOCIAL SCIENCES (SHSS)

The nature of 2020-21 was unprecedented. It started as a year of uncertainty with the academic community being clueless about how the situation can be tackled and then exploring the options to cope with the new reality. The School of Humanities and Social Sciences also struggled and coped with the situation, as did the rest of the world. Despite challenges, the faculty at the school received new externally funded/sponsored projects addressing local, regional and global development challenges. Monographs, edited volumes, journal papers in the top academic outlets of reputed presses (including Cambridge University Press, Duke University Press, Sage, Elsevier, Taylor & Francis etc.) were published by the faculty, individually, with students and as parts of collaborations. The faculty members participated in several national and international conferences hosted online. Important workshops, such as capacity building workshops on climate vulnerability assessment, were conducted to train the government officials from all parts of the country in an online mode.

The School scaled new heights by as the first batch of M.A. Programme in Development Studies (2018-20 Batch) graduates in 2020. For the second batch (2019-21), while the Field Study could not be conducted, the school initiated a new group-project based course entitled: Crisis and Recovery: A Guided Project on COVID-19. The course was designed to equip students, particularly in MA Development Studies, to diagnose issues and suggest measures that should help the State build resilient and responsive systems during the current COVID 19 crisis. The School also graduated its third Ph.D. student in Convocation 2020 in the field of History. As the School of Humanities and Social Sciences forges ahead creating its unique identity within the broader vision of the Institute, the year 2020-21 stands out as a singular year of challenges and overcoming challenges to achieve success.

First pioneer batch of 12 students from M.A Development Studies had graduated from School of Humanities & Social Sciences.

## Faculty

| S. No. | Name & Specialization | Photograph |
|---|---|---|
| 1 | **Dr. Suman**<br>**Assistant Professor & Chairperson**<br>Specialization: Colonialism, Post-colonialism, Imperialism and Romance Literature<br>Ph.D. from Indian Institute of Technology Delhi.<br>Home Town: Faridabad<br>Phone: 01905-267919<br>Email: suman.sigroha |  |
| 2 | **Dr. Aruna Bommareddi**<br>**Assistant Professor**<br>Specialization: Comparative Literature, Indian Literature in English<br>Ph.D. from University of Hyderabad<br>Home Town: Hyderabad, Andhra Pradesh<br>Phone: 01905-267121<br>Email: aruna |  |
| 3 | **Dr. Devika Sethi**<br>**Assistant Professor**<br>Specialization: Modern Indian History, Colonialism and Decolonization, Free Speech and Censorship<br>Ph.D. from Jawaharlal Nehru University, New Delhi<br>Home Town: Allahabad, Uttar Pradesh<br>Phone: 01905 267244<br>Email: devika |  |

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|---|---|---|
| 4 | **Dr. Manu V. Devadevan**<br>**Assistant Professor**<br>Specialization: Literary practices in South Asia, Political and Economic Processes in premodern South Asia & South Asian Epigraphy<br>Ph.D. from: Mangalore University, Mangalagangothri, Mangalore.<br>Phone: 01905-267147<br>Email: manu |  |
| 5 | **Dr. Neha Kaushik**<br>**Assistant Professor**<br>Specialization: Translation Studies, Women's Writing, Comparative Linguistics, German Studies<br>Ph.D. from Jawaharlal Nehru University, New Delhi<br>Home Town: New Delhi<br>Phone: 267267<br>Email: nehakaushik |  |
| 6 | **Dr. Nilamber Chhetri**<br>**Assistant Professor**<br>Specialization: Sociology<br>Ph.D. from Jawaharlal Nehru University, New Delhi<br>Home Town: Kalimpong, West Bengal<br>Phone: 267269<br>Email: nilamber |  |
| 7 | **Dr. Puran Singh**<br>**Assistant Professor**<br>Specialization: Corporate Finance, Microfinance<br>Ph.D. from Punjab University, Chandigarh<br>Home Town: Mandi, Himachal Pradesh<br>Phone: 01905 267916<br>Email: puran |  |
| 8 | **Dr. Rajeshwari Dutt**<br>**Assistant Professor**<br>Specialization: Latin America, Social and Cultural History<br>Ph.D. From Carnegie Mellon University, USA<br>Home Town: Kolkata, West Bengal<br>Phone: 01905-267043<br>Email: rdutt |  |
| 9 | **Dr. Ramna Thakur**<br>**Assistant Professor**<br>Specialization: Development Economics<br>Ph.D. from Himachal Pradesh University, Shimla<br>Home Town: Mandi<br>Phone: 01905-267044<br>Email: ramna |  |
| 10 | **Dr. Saumya Dixit**<br>**Assistant Professor**<br>Specialization: Post consumption consumer behaviour, e-waste management, e-wom management<br>Ph.D. from IIIT Allahabad<br>Home Town: Allahabad, Uttar Pradesh<br>Email: saumya |  |
| 11 | **Dr. Shyamasree Dasgupta**<br>**Assistant Professor**<br>Specialization: Energy and Environmental Economics, Economics of Climate Change, Applied Econometrics<br>Ph.D. from Jadavpur University, Kolkata<br>Home Town: Kolkata, West Bengal<br>Phone: 01905-267122<br>Email: shyamasree |  |

| | | |
|---|---|---|
| 12 | **Dr. Surya Prakash Upadhyay**<br>**Assistant Professor**<br>Specialization: Sociology of Religion, Urban Sociology, Post-Reform India<br>Ph.D. from Indian Institute of Technology Bombay<br>Home Town: Lucknow, Uttar Pradesh<br>Phone: 01905-267136<br>Email: surya |  |
| 13 | **Dr. Varun Dutt**<br>**Associate Professor (Joint Appointment)**<br>Specialization: Judgment and Decision Making, Environmental Decision-making, Artificial Intelligence, Human-Computer Interaction<br>Ph.D. From Carnegie Mellon University, USA<br>Home Town: Lucknow, Uttar Pradesh<br>Phone: 01905-267150<br>Email: varun |  |

## VISITING & ADJUNCT FACULTIES

| | | |
|---|---|---|
| 14 | **Dr. Purnima Bajre**<br>**Visiting Assistant Professor**<br>Specialization: Language processing and Elementary Education along with Cognitive Psychology<br>Ph.D. from IIT Bombay<br>Home Town: Patna<br>Email: purnimabajre |  |
| 15 | **Dr. Ingrid Shockey**<br>**Adjunct Associate Professor**<br>Specialization: Environmental Sociology<br>Ph.D. from Brandeis University, USA<br>Home Town: Northampton, MA, USA |  |
| 16 | **Prof. Venkataraman Ranganathan**<br>**Visiting Distinguished Professor**<br>Specialization: Economics, Energy, Environment & Climate Change<br>Ph.D. from IIM Ahmedabad<br>Home Town: Bengaluru<br>Email: ranga | |
| 17 | **Mr. Gokul Somasekhran**<br>**Teaching Fellow**<br>Specialization: German Literature<br>Pursuing Ph.D. from Free University Berlin<br>Home Town: Thrissur, Kerala<br>Phone: 01905-267144<br>Email: gokul | |

## EXTERNALLY SPONSORED RESEARCH PROJECTS

| S. No. | IIT Mandi Reference/ Project No. | Project Title | Sponsoring Agency | Principal Investigator & Coordinator(s) | Department/ School | Amount Sanctioned In (Rs.) | Duration of Project |
|---|---|---|---|---|---|---|---|
| 1 | IITM/DIRI/PS /237 | Role of AADHAAR in improved last mile delivery of banking service: A Study of Himachal Pradesh | Digital Identity Research Initiative | Dr. Puran Singh (PI), Dr. Shyamasree Dasgupta (Co-PI) | SHSS | 43,45,380 | 20 Months |
| 2 | IITM/DBT-Indo-UK/SS/192 | Smart Agriculture: Farmer Zone | DBT | Dr. Srikant Srinivasan (PI), Dr. Shyamasree Dasgupta (Co-PI) | SCEE, SBS & SHSS | 7,16,00,000 | 3 years |
| 3 | IITM/TDD-HP/RT/231 | Socio-economic profile of tribes of Himachal Pradesh | Tribal Development Department HP | Dr. Ramna Thakur (PI), Dr. Rajeshwari Dutt (Co-PI) | SHSS | 5,00,000 | 3 years |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 | IITM/DST-ICPS/VD/251 | A game theoretic approach involving experimentation and computational modelling of hacker's decision using deception in cyber security | DST-ICPS | Dr. Varun Dutt (PI), Dr. V.S.C Pammi CBCS, University Allahabad | SHSS & SCEE | 31,00,000 | 3 years |
| 6 | IITM/DEST-HP/VD/240 | Public perception of air pollution and the development and testing of a low-cost air pollution sensing and warning system | DEST, HP | Dr. Varun Dutt (PI), ER. Pratik Chaturvedi DTRL, DRDO | SHSS & SCEE | 6,79,679 | 2 years |
| 7 | IITM/DRDO-DTRL/VD/179 | Development and evaluation of low-cost landslide early warning solutions | DRDO-DTRL | Dr. Varun Dutt (PI), Dr. Venkata Uday Kala (Co-PI) SE | SHSS & SCEE | 9,99,460 | 3 years |
| 8 | IITM/NDMA/VD/184 | Development and evaluation of low-cost landslide monitoring solutions | NDMA | Dr. Varun Dutt (P.I), Dr.Venkata Uday Kala (Co-PI) SE | SHSS & SCEE | 27,85,080 | 3 years |
| 9 | IITM/MHRD-SPARC/RT/259 | Area deprivation and the prevalence of non-communicable diseases: Analysis at the block level in Punjab | MHRD-SPARC | Dr. Ramna Thakur (PI), Dr. Rajeshwari Dutt & Dr. Chander Singh (Co-PI's) and collaboration with Prof. Martin Siegel (PI) from Technische Universitat Berlin and Dr. Warner Maier (Co-PI) from Helmholtz-Zentrum Munich | SHSS | 60,88,190 | 2 years |
| 10 | IITM/DST/SDG/278 | Vulnerability profiles for India: State and district level | DST | Dr. Shyamasree Dasgupta | SHSS | 80,51,832 | 10 Months |
| 11 | IITM/SW-FDFA/SDG/34 | Climate vulnerability and risk assessment at the national level using a common methodological framework | Swiss Agency for Development Corporation (SDC) | Dr. Shyamasree Dasgupta | SHSS | 65,52,238 | 1 year 3 months |
| 12 | IITM/LU-SW/SYS/330 | Coal-based economies in developing countries: An environmental, health and cost evaluation around mega thermal power plants | VR: Swedish Research Council | Dr. Sayantan Sarkar (PI), Dr. Shyamasree Dasgupta Co-PI) | SE & SHSS | ~90,00,000 (IIT Mandi) | 3 years |
| 13 | IITM/ICSSR/SSG/264 | A study of the intersections of oral history and religion for sustainable development in the fragile Himalayas located in Himachal Pradesh | ICSSR | Dr. Suman Sigroha | SHSS | 5,00,000 | 2 years |
| 14 | IITM/ICSSR/RT/289 | Do health policies require to address gender related unique needs to control non-communicable disease in India | ICCSR | Dr. Ramna Thakur | SHSS | 10,00,000 | 2 years |
| 15 | IITM/DST/AKP/312 | Livelihood generation and improvement for women entrepreneurs in small scale fruits and vegetable farming and post- harvesting management | DST | "Dr. Arti Kashyap (PI), Dr. Surya Prakash Upadhyay (Co-PI)" | SBS & SHSS | 35,65,540 | 3 years |
| 16 | IITM/DST/MTH/319 | Sustainable irrigation advisories for mid-himalayan farmers using smart satellite image analytics | DST | Dr. Manas Thakur (PI), Prof. Yvonne Dittrich (PI) from IT University of Copenhagen, Denmark, Dr. Srikant Srinivasan, Dr. Shyam Kumar Masakapalli, Dr. Ramna Thakur (CoPI's) | SCEE, SBS & SHSS | 99,29,444 | 3 years |

## Details of Research Grants/Seed Funding from the Institute

| S. No. | File no. | Proposal Title | Faculty name | Department/ School | Amount Sanctioned In (Rs.) | Duration of Project |
|---|---|---|---|---|---|---|
| 1 | IITM/SG/ DSE/65 | The Kangra Earthquake (1905): A Social and Political History<br><br>Date of approval: 17.04.2018<br>Date of completion: 17.04.2021 | Dr. Devika Sethi | SHSS | 5,00,000 | 3 years |
| 2 | IITM/SG/ SDG/57 | Comprehensive Valuation of Forest Ecosystem Services and Understanding the Method of Value Formation: A case Study in Himachal Pradesh<br><br>Date of approval: 03.05.2017<br>Date of completion: 02.05.2021 | Dr. Shyamasree Dasgupta | SHSS | 5,00,000 | 4 years |
| 3 | IITM/INT/ SDG/17 | Transitioning to E-Autos in hill states – A case study of Mandi town<br><br>Date of approval: 09.03.2018<br>Date of completion: 31.05.2021 | Dr. Shyamasree Dasgupta (SHSS), Dr. Narsa Reddy (SCEE), Dr. Rajan Kapur (SCEE) | SHSS & SCEE | 31,00,000 | 3.2 years |
| 4 | IITM/SG/ RD/36 | Mayans in 19th Century Mexico & Belize<br><br>Date of approval: 04.06.2015<br>Date of completion: 31.01.2021 | Dr. Rajeshwari Dutt | SHSS | 6,20,0000 | 5.5 years |

## BOOKS PUBLISHED

### Books (single author)

1. Rajeshwari Dutt, Empire on Edge: The British Struggle for Order in Belize during Yucatan's Caste War, New Tork: Cambridge University Press, 2020.
2. Bommareddi, Aruna. Narrative Traditions of a Telugu Epic: Palna¯tivi¯rula Katha. Shimla: IIAS 2020.ISBN: 9789382 396741

### Book Reviews

1. Dutt, Rajeshwari (2020). Conflict and Carnage in Yucatán: Liberals, the Second Empire, and Maya Revolutionaries, 1855–1876. By Richmond, Douglas W. Tuscaloosa: University of Alabama Press, 2015. Maps. Figures. Notes. Bibliography. Index. xv, 177 pp. Cloth, $49.95. Hispanic American Historical Review, Duke University Press, 100 (4).
2. Dutt, Rajeshwari (2020). Violence and the Caste War of Yucatán. By Wolfgang Gabbert. Cambridge: Cambridge University Press, 2019. Pp. 342. $120.00 cloth. The Americas, Cambridge University Press, 77 (4).
3. Chhetri, Nilamber. 2020. Kingship and polity on the Himalayan borderland: Rajput identity during the early colonial encounter, by Arik Moran. Asian Studies Review, DOI: 10.1080/10357823.2020.1801126
4. Chhetri, Nilamber. 2021. Narrating Love and Violence: Women contesting Caste, Tribe, and State in Lahaul, India, by Himika Bhattacharya. European Bulletin of Himalayan Research. (Accepted).

## BOOK CHAPTERS PUBLISHED

1. Dasgupta, S*., Das, N. and Roy, J. (2021). Index decomposition analysis of energy use in India in Chakraborty, T., Mukherjee, D., Saha, S. (Eds.) Contemporary Issues in Sustainable Development: The Case of India. Routledge. New York.
2. Devadevan, M., (2021)'From Corporal Time to Cognitive Time: Kannada Word-scape in Transition, 10th to 12th Century', in Shonaleeka Kaul (ed), Retelling Time: Alternative Temporalities from Premodern South Asia, Routledge, New Delhi.

3. T. Saini, G. Tomar, D. C. Rana, S. Attri, and V. Dutt, "A Weighted Ensemble Approach to Real-Time Prediction of Suspended Particulate Matter," in Advanced Computing. D. Garg, K. Wong, J. Sarangapani, and S. K. Gupta, Eds., Singapore: Springer, 2021, pp. 381-394.
4. S. Kaushik, A. Choudhury, V. Dutt, N. Dasgupta, S. Natarajan, and L. A. Pickett, "Evaluating single- and multi-headed neural architectures for time-series forecasting of healthcare expenditures" in Computational Intelligence: Theoretical Advances and Advanced Applications. C. S. B. Dinesh and R. Mangey, Eds.: De Gruyter, 2020, pp. 159-176.
5. P. Kumar, P. Sihag, A. Pathania, P. Chaturvedi, K. V. Uday, and V. Dutt, "Comparison of Moving-Average, Lazy, and Information Gain Methods for Predicting Weekly Slope-Movements: A Case-Study in Chamoli, India," in Understanding and Reducing Landslide Disaster Risk: Volume 3 Monitoring and Early Warning. N. Casagli, V. Tofani, K. Sassa, P. T. Bobrowsky, and K. Takara, Eds.: Springer, 2021, pp. 321-330.
6. A. Choudhury, S. Kaushik, and V. Dutt, "Influence of Followers on Twitter Sentiments About Rare Disease Medications," in Intelligent Data Engineering and Analytics. S. C. Satapathy, Y. Zhang, V. Bhateja, R. Majhi, Eds., Singapore: Springer, 2021, pp. 595-603.

## PAPER PUBLISHED IN INTERNATIONAL JOURNALS

1. Chhetri, Nilamber. 2021. Gendered frames of Mobilization: Differential Participation of Women in Ethno-Politics of Darjeeling. Indian Journal of Gender Studies. https://doi.org/10.1177/0971521520974846
2. Chhetri, Nilamber. 2021. Negotiated Spaces, Shared Place Identities: Roadside Settlements and Culture of Belonging in a Himalayan Town. South Asia: Journal of South Asian Studies. DOI: 10.1080/00856401.2021.1845453.
3. S. Kaushik, A. Choudhury, S. Natarajan, L. A. Pickett, and V. Dutt, "Medicine expenditure prediction via a variance-based generative adversarial network," IEEE Access, vol. 8, pp. 110947-110958, 2020.
4. M. Kumar and V. Dutt, "Understanding Decisions in Collective Risk Social Dilemma Games Using Reinforcement Learning," IEEE Transactions on Cognitive and Developmental Systems, vol. 12, no. 4, pp. 824-840, 2020.
5. R. Tyagi, P. Aggarwal, M. Mohanty, V. Dutt, and A. Anand, "Computational cognitive modeling and validation of Dp140 induced alteration of working memory in Duchenne muscular dystrophy," Scientific Reports, vol. 10, no. 1, pp. 1-12, 2020.
6. H. Katakwar, P. Aggarwal, Z. Maqbool, and V. Dutt, "Influence of network size on adversarial decisions in a deception game involving honeypots," Frontiers in Psychology, vol. 11, p. 2385, 2020.
7. K. Agarwal, P. Uniyal, S. Virendrasingh, S. Krishna, and V. Dutt, "Spam Mail Classification Using Ensemble and Non-Ensemble Machine Learning Algorithms," Lecture notes in Network and Systems, vol. 141, pp. 179-189, 2021.
8. A. K. Rao, S. Chandra, and V. Dutt, "Desktop and Virtual-Reality Training Under Varying Degrees of Task Difficulty in a Complex Search-and-Shoot Scenario," Lecture Notes in Computer Science, vol. 12428, pp 421-439, 2020.
9. P. Chaturvedi and V. Dutt, "Understanding Human Decision Making in an Interactive Landslide Simulator Tool via Reinforcement Learning," (in English), Frontiers in Psychology, vol. 11, p. 3985, 2021.
10. V. Thakur, K. Robinson, E. A. Oguz, I. Depina, A. Pathania, P. Kumar, P. Chaturvedi, K. V. Uday, & V.Dutt, "Early Warning of Water-Triggered Landslides," Lecture Notes in Civil Engineering, vol. 140, pp 139-150, 2021.
11. S. Sangar, V. Dutt, and R. Thakur, "Coping with out-of-pocket health expenditure in India: evidence from NSS 71st round," Global Social Welfare, vol. 7, no. 3, pp. 275-284, 2020.

12. Dr. Manu V. Devadevan,'The Tarisappa i Copperplate Grant and the Early Christians of India', Nidan, Vol. 5, No. 2, special issue on 'Multi-religious Entanglements in Peninsular India', edited by Ines G. Zupanov, pp. 5-26.
13. Bommareddi, Aruna. "Translating Region: A Case of Kannada and Telugu Oral Epics." The
14. Criterion: An International Journal in English Vol. 12, Issue-I, February 2021 ISSN: 0976-8165
15. Bommareddi, Aruna. Region as a contested space in hardy's novels. International Journal of Humanities and Social Science Research. Volume 7; Issue 1; 2021; Page No. 153-158. ISSN: 2455-2070.
16. Bommareddi, Aruna. "The colonial and post-colonial archive and the idea of Andhra" Journal of Research in Humanities and Social Science Volume 9 ~ Issue 2 (2021) pp:10-14 ISSN(Online):2321-9467.
17. Sangar, S., & Thakur, R. Infectious diseases in India: assessing the role of household amenities and socio-demographic determinants. Journal of Public Health, 1-9, 2021.
18. Thakur, R., & Sangar, S. Socioeconomic differentials in the burden of paying for healthcare in India: a disaggregated analysis. Health Systems, Taylor & Francis,1-11, 2020.

## PAPER PUBLISHED IN NATIONAL JOURNALS

1. Sanyal, K., Kaur, A. and Dasgupta, S*. (2021). So near yet so far: A narrative from a Forest-dwelling Gaddi Community in Chamba, Himachal Pradesh. Ecology, Economy and Society-the INSEE Journal. 4 (2354-2021-249), pp, 123-128.
2. Barua, A., Dasgupta, S, et al. (2020). How Vulnerable are India's Himalayan Region States to Climate Change? Economic and Political Weekly – Engage. ISSN- 2349-8846.

## NATIONAL CONFERENCE

1. Dutt, Rajeshwari (2020, October), "India-Latin America Connections through History: The Indian Uprising of 1857 and Belize during Yucatán's Caste War". International Webinar on Global Shifts: Lessons from Canada and Latin America. Centre for Canadian, US and Latin American Studies, School of International Studies. Jawaharlal Nehru University. New Delhi.
2. Gupta, S., & Singh, P. (2021). Factors affecting Banking Agents' Intention to Continue: Empirical Study in rural India. 3rd Annual Indian Public Policy Network Conference.
3. Ray, S. S., & Singh, P. (2021). MVP Discovery by Early Stage Startups: A Qualitative Analysis of Founders' Hindsight. In R.Sharma, S. Shukla, A. Kumar, A.K. Dwivedi & G. Batthini (Eds.), Fourteenth Biennial Conference on Entrepreneurship. Bookwell Delhi. http://library.ediindia.ac.in:8181/xmlui//handle/123456789/12646.
4. Gupta, S., & Singh, P. (2020). Technology readiness and intention to continue: A study of banking agents in HP. 3rd ICDE and 14th ISDSI Annual Conference 2020 on Building New Digital Ecosystem.
5. Ray, S. S., & Singh, P. (2020, December 27-29). Demystifying Minimum Viable Product: Theory, Perceptions, and Practice [Paper presentation]. 3rd ICDE & 14th ISDSI Annual Conference 2020, Naya Raipur, Chhattisgarh, India.
6. Shyamasree Dasgupta.Keynote address in the meeting with stakeholder State Government Departments of Punjab on Climate Vulnerability Assessment on 5th January, 2021.
7. Shyamasree Dasgupta. Explaining the steps of vulnerability assessment: Role of indicators and data requirements. Webinar on Climate Change Vulnerability Assessment in Haryana State organized by the Environment & Climate Change Department, Haryana Climate Change Cell (NMSKCC). 20th July 2020
8. Shyamasree Dasgupta. Climate Change Risk Assessment: The Framework and its Application. Webinar on Climate Change, Organized by the NABARD on the occasion of the 39th Foundation of NABARD. 14th July 2020.

## INTERNATIONAL CONFERENCES

1. Dr. Manu V. Devadevan,'The Life and Times of Narayana Guru: Preliminary Thoughts on His Changing World-View,' Webinar Conference, Critique and Constructions: Contemporary Writings on Histories of Keralam (In Honour of Dr. A. Paslithil and Dr. M.T. Narayanan on their retirement), SreeSankaracharya University of Sanskrit, Kalady, 24 February to 13 March 2021 (presented on 5 March 2021).
2. Thakur, R. presented a paper titled, "Do socioeconomic and risk factors play different roles among men and women in case of diabetes in India? A cross-sectional analysis", 9th Annual Conference of the Indian Health Economics and Policy Association (IHEPA), January 22-23, 2021. (Online).
3. Thakur, R. presented a paper titled, "Does health expenditure vary among energy poor and non-poor households in India? An investigation from NSS data" in the 9th Annual Conference of the Indian Health Economics Association (held through online mode) during January 22-23, 2021. (Online).
4. Thakur, R. presented a paper titled, "Assessing exposure from cooking with solid fuels and respiratory diseases among different socio-demographic groups in India" at 8th Annual Conference of the Indian Health Economics and Policy Association (IHEPA) held at National Institute of Science Education and Research (NISER) Bhubaneswar during January 23-24, 2020.
5. Shyamasree Dasgupta: 'Adam Smith, Karl Marx and J.M. Keynes in the history of development thoughts' – Invited talk at Department of Economics, East Delta University, Bangladesh on 22nd November 2020
6. S. Uttrani, N. Sharma, and V. Dutt, "Modeling the Absence of Framing Effect among Indian and US populations in an Experience-based COVID-19 Disease Problem," 2020 International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction and Behavior Representation in Modeling and Simulation, Washington DC, USA, October 2020.
7. S. Bhargav, S. Kaushik, A. Choudhury, and V. Dutt," Development of a weighted ensemble approach for prediction of blood glucose levels," 1st International Conference on Computing and Machine Intelligence (ICMI 2021), pp. 297-301, Istanbul, Turkey, February 2021.
8. A. K. Rao, S. Chandra, and V. Dutt, "Desktop and Virtual-Reality Training under varying degrees of task difficulty in a complex search-and-shoot scenario," International Conference on Human-Computer Interaction, 2020, pp. 421-439, Copenhagen, Denmark, October 2020.
9. D. Sahoo, N. Sood, U. Rani, G. Abraham, V. Dutt, and A. Dileep, "Comparative analysis of multi-step time-series forecasting for network load dataset," 2020 11th International Conference on Computing, Communication and Networking Technologies (ICCCNT), pp. 1-7, Kharagpur, India, October 2020.
10. N. Sharma, S. Uttrani, and V. Dutt, "Modeling the Absence of Framing Effect in an Experience-based Covid-19 Disease Problem," in International Conference on Cognitive Modelling, pp. 249-255, Irvine, CA, USA, June 2020.

## GRANT/FELLOWSHIPS/MEMBERSHIP OF PROFESSIONAL SOCIETIES

1. Member, International Association for Energy Economics (https://www.iaee.org/) Dasgupta, S.
2. Member, The International Society for Ecological Economics (https://www.isee.org/) Dasgupta, S.
3. Life Member, Indian Econometric Society (http://www.tiesindia.net/) Dasgupta, S.

4. SYLFF Fellow,Jadavpur University - SYLFF Network (http://www.jusylffprogram.org.in) Dasgupta, S.
5. Life Member,Bengal Economic Association, India (http://goethals.in/bea/default.htm) Dasgupta, S.
6. Life Member,Indian Society for Ecological Economics, India (http://www.ecoinsee.org/) Dasgupta, S.
7. Sustainability Transitions Research Network(STRN) (http://www.transitionsnetwork.org) Dasgupta S.
8. The International Network of Resource Information Centre (The Balaton Group) Dasgupta, S.
9. Founding member of Bangalore Historians Society Dr. Manu Devadevan.
10. Founding member of I-SHORE (Institute for Social Science, Humanities and Oceanic Research) Dr. Manu Devadevan.

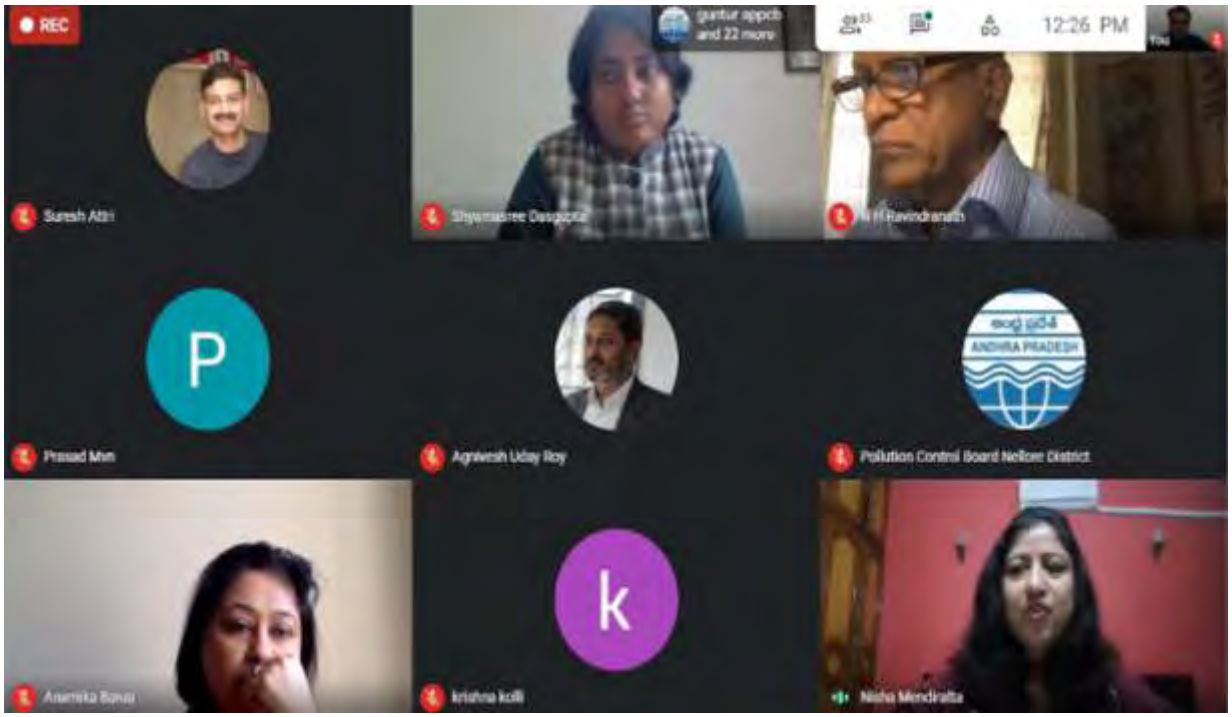
## TALKS, WORKSHOPS & NATIONAL CONFERENCES ORGANIZED

Talk Organized

| Speaker | Title of the Talk | Date |
|---|---|---|
| **Dr. Preeti Maan** | Perception of Development & Wellbeing | 12th March 2021 |

**Capacity Building Workshop on Vulnerability Assessment in India Using a Common Framework (24th- 26th November 2020) and the follow-up dissemination workshop on 10th December, 2020:**

As a part of the research project on a Pan-India climate vulnerability assessment, funded by the Department of Science and Technology, Government of India and Swiss Agency for Development and Cooperation, Indian Institute of Technology, Mandi (IIT Mandi) in collaboration with the Indian Institute of Technology, Guwahati (IIT Guwahati) and Indian Institute of Science, Bengaluru, organized the second capacity building workshop during 24th-26th November 2020. In the workshop twenty representatives from eight states participated and were trained. Because of COVID-19 pandemic, the workshop had to be held on a virtual platform. The target audience for the workshops are the representatives from the State Government Departments; State Climate Change Cells, State Pollution Control Boards, Department of Environment, Forestry, etc.The workshop introduced the state government representatives to the common methodological framework; allowed the project team to assess and understand the requirements of the States and their current capacities; data availabilities; and train them in carrying out the vulnerability assessments using the common framework. Dr. Shyamasree Dasgupta (PI of the Project, IIT Mandi), Prof. Anamika Barua (Co-PI, IIT Guwahati), Prof. N. H. Rabindranath (Resource Person, Retd. Prof. IISc Bengaluru), Dr. Nisha Mendiratta (Associate Head, Department of Science and Technology, Government of India), Dr. Mustafa Ali Khan, Team Leader, 3SCA Swiss Agency for Development and Cooperation (SDC) and Dr. Susheela Negi, Scientist E, SPLICE, Department of Science and Technology, Government of India were participated in the workshop. Following the two capacity building workshops on vulnerability assessment with the participants from the state departments during 12th-15th February 2020 & 24th-26th November 2020, the dissemination workshop related to on 10th December 2020. This workshop also gives the platform to participants to share their experiences and challenges that they faced during the preparation of their state vulnerability report. Fifty-eight participants from different states participated in the dissemination workshop. The final report of the project was also planned to be released soon by DST and SDC.


**Covid-19 Projects by M.A. Students**

In the winter semester of 2021 (Feb-Jun, 2021), SHSS ran a unique course entitled: Crisis and Recovery: A Guided Project on COVID-19. The course was designed to equip students, particularly in MA Development Studies, to diagnose issues and suggest measures to help the State build resilient and responsive systems during the current COVID 19 crisis. The course aligned with the overall aim of the M.A. Development Studies program to produce thinkers and practitioners who can respond to emerging societal crises by diagnosing challenges of development. In this course, groups of 3-4 students had the opportunity to work with faculty members on a range of topics, including the adaptive capacity of the health sector in India and its relationship to the prevalence of COVID-19, the impact of governmental schemes on migrant workers during the pandemic and the impact of socio-economic factors and COVID-19 on global human mobility.

**Following Projects were Undertaken as a Part of this Course:**

**Title:** Pre-existing health-sector vulnerability and COVID-19: A state-level study in India.
**Faculty supervisor:** Dr. Shyamasree Dasgupta.
**Description of project**
On January 30, 2020, the World Health Organization (WHO) announced the SARS-COV-2 (COVID-19) outbreak as a public health emergency, followed by declaring it as a global pandemic on March 11, 2020. The spread of COVID-19, therefore, exerts significant additional pressure on the already limited health infrastructure in the country. Population density, access to drinking water and sanitation, level of education, employment, income, poverty, etc. are the related matters of concern, especially in the face of a pandemic. Against this backdrop, the objective of this study is to:

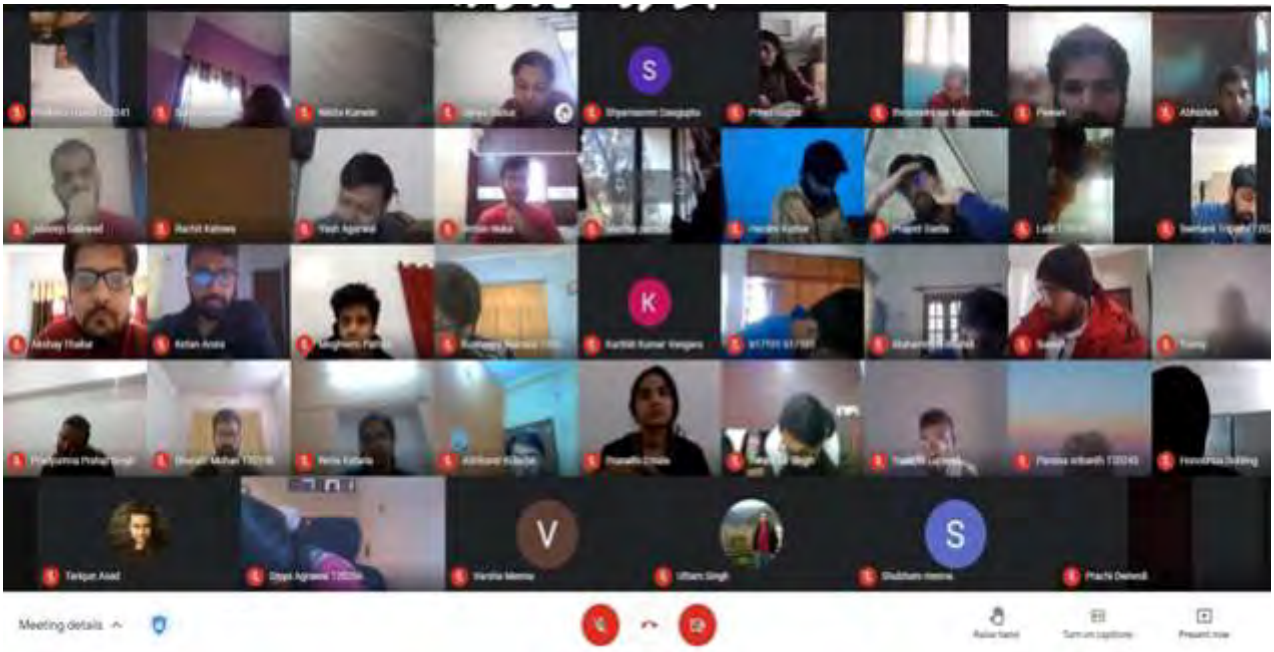
- Calculate the existing state-level health-vulnerability of India based on the sensitivity of the health sector in terms of already prevailing communicable and non-communicable diseases and the available health infrastructure.
- Find out the correlation between pre-existing health vulnerability and state-level the latest figures of confirmed COVID-19 cases per million populations and related Closed Case Fatality Rates (CCFR).
- Compare the calculated health-vulnerability indices with a range of socioeconomic and public health-related indicators to understand important covariates and their overall implications. The study will be based on analysis of secondary quantitative data; no specific software knowledge is required.

**Title:** Informal and Migrant workers during and after the Pandemic
**Faculty Supervisor:** Dr. Nilamber Chhetri
**Description of Project**
The Covid-19 has created a global crisis of unforeseen proportions. It has brought into relief the inadequacies of relief measures undertaken by both the center and the state governments especially in relation to informal and migrant labours which have further added to their precocity.
Considering the present situation, this study will try to map the massive reverse migration of people during the lockdown and its impact on the rural economy. Specifically, the study will try to note the containment measures and other welfare means adopted by the government such as PM Gareeb Kalyan Rojgar Abhiyaan and try to understand its impact. In this connection the study will focus on different governmental measures undertaken to provide relief to the returning migrants in rural areas. It will try to highlight the functioning of migration facility centers, functioning of grievance redressal processes, and the changing regime of labour laws related to wages, social security, and leaves. It will also try to unearth the gender dynamics unfolding within this landscape. The research will mainly draw data from secondary sources, and other primary sources like government reports, social assessment reports prepared by different NGO to note the changing approach to work and labour in the context of the pandemic.

**Title:** Comparing COVID-19's impact on the mobility of people in India and USA.
**Faculty Supervisor:** Dr. Varun Dutt
**Description of Project**
**Overview:** Mobility during the COVID-19 pandemic involves stress and risk for both individuals or communities. More risk-averse individuals are less likely to go out of their homes and interact with other people, while less risk-averse (or risk-seeking) people will seek out opportunities to go out and be more social. Prior research shows that the risk-attitude of people is moderated by the experience of an event and the consequence of the event. However, less is known how people's

risk-attitude and mobility for Covid-19 pandemic is determined by their experience of the virus and its consequences. Also, less is known how people's risk-attitude and mobility is governed by their location (being in India or in the US). The primary focus of this study is to investigate how theories of risk-attitude could help explain people's mobility during the Covid-19 pandemic in India and the US. Students may work in groups and survey the Indian and US populations via crowdsourcing. Also, students would analyze people's mobility data using Google's mobility API.

**Screenshot of Online Classes**



**M.A. Development Studies Pioneer Graduating Batch 2018-2020**

# 4. A BRIEF REPORT ON COLLABORATION (MoU) BETWEEN INDIAN INSTITUTION OF TECHNOLOGY MANDI AND INSTITUTIONS OVERSEAS

## International Activities of IIT Mandi with Institutions located Overseas

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 Engineering, Electrical Engineering, Civil Engineering, Mechanical Engineering, Basic Sciences, 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 invites a team of 25 undergraduate students and two faculty mentors from WPI to visit the Institute for two-months between mid-March and early May, and these students worked with a similar number of IIT Mandi undergraduate students in solving a number of socioeconomic issues concerning the local communities in Mandi and Kamand but due the pandemic situation, this year this visit could not performed.

### International Students at IIT Mandi

At present, there are 14 International students enrolled for Masters and Ph.D. programmes at IIT Mandi. Of these, 05 students are from Bangladesh, 07 students are from Nepal, and 02 students are from Ethiopia.

### Events with International Participation

There were a number of workshops/Talks conducted online at IIT Mandi involving visitors from universities abroad between April 2020 and March 2021. The details of these workshops/talks are given below.

- Indian Institute of Technology Mandi virtually hosted the 2$^{nd}$ Winter School on Cognitive Modeling (WSCM) from 15$^{th}$ to 17$^{th}$ December 2020. This initiative was hosted by IIT Mandi in collaboration with Himachal Pradesh Technical University (HPTU), the University of Groningen, the University of Waterloo, and the Indian Institute of Technology Roorkee. The event included key sessions from various national and international researchers and professionals to train students on the best practices in the area of cognitive modeling.
- SCRI (Society for Collaborative Research and Innovation) IIT Mandi organized a virtual talk on "Using Maths to Clean up our Ocean" by Dr. Tom Crawford on 15$^{th}$ January 2021. Tom is an Early Career Teaching and Outreach Fellow in Mathematics at St Edmund Hall and is also responsible for the teaching of Visiting Students. Tom specialized in Applied Mathematics and completed his Ph.D. in Fluid Dynamics at the University of Cambridge under the supervision of Prof. Paul Linden. He obtained his undergraduate degree in Mathematics from Oxford in 2012, where he studied at St John's College. Alongside his teaching commitments, Tom works closely with the outreach team at Teddy Hall and regularly gives talks in schools and universities across the UK. His award-winning website tomrocksmaths.com hosts videos, podcasts, puzzles, and articles that aim to make mathematics entertaining and understandable to all. Tom works with several partners, including the BBC and the Numberphile YouTube channel – the largest mathematics education channel on the platform with over 3.5 million subscribers.
- An International workshop on Design and Manufacturing of Composites for Engineering Applications was successfully organized by the School of Engineering, IIT Mandi from 1$^{st}$ to 5$^{th}$ February 2021 in online mode, given the pandemic situation. Over 120 participants attended the workshop, among which participants were faculty and students from engineering colleges

and technical institutes (IITs, NITs, State Government Engineering Colleges) from all over the country. A few participants were from universities abroad (Sapienza University of Rome). Industry personnel from ISRO, TATA Steel, LM Wind Power etc., also participated in the workshop. Speakers included subject experts from IIT Kanpur, IIT Roorkee, University of Salerno, PSI Switzerland, IIT Bombay, KMUTNB, Thailand, Institute of Research Hydro Québec, Canada and also IIT Mandi.

- Indo-UK Symposium on "Fluxomics of Microbe and Plant Systems (FluxMAPS 2021)" was successfully held on 24th-25th March 2021 jointly by Indian Institute of Technology Mandi, India and University of Oxford, UK. The themes covered were Flux Balance Analysis in Plant Systems and 13C Metabolic Flux Analysis in Plant and Microbial Systems. Scientists, faculty and scholars working in relevant areas greatly benefited from the symposium supported by MHRD-SPARC and UKIERI.
- A 4-days weekend workshop titled "Foundations of Machine Learning and Applications" was successfully organized by the IIT Mandi iHub and HCI Foundation and the Indian Institute of Technology Mandi. The workshop targeted motivated executives and working professionals willing to work in the area of Machine Learning. International expert speakers were Dr. Shih-Chun Lin from NTU, Taiwan, and Dr. Stefano Rini from NYCU, Taiwan.

**IIT Mandi Students Visiting Institutions Abroad**

Several IIT Mandi graduate and undergraduate students visited several EU institutions under academic exchange in 2020. The undergraduate visits included: 03-students to RWTH Aachen Germany and 04-students of M. Tech to Germany under DAAD (KOSPIE) program.

**International Visitors at IIT Mandi**

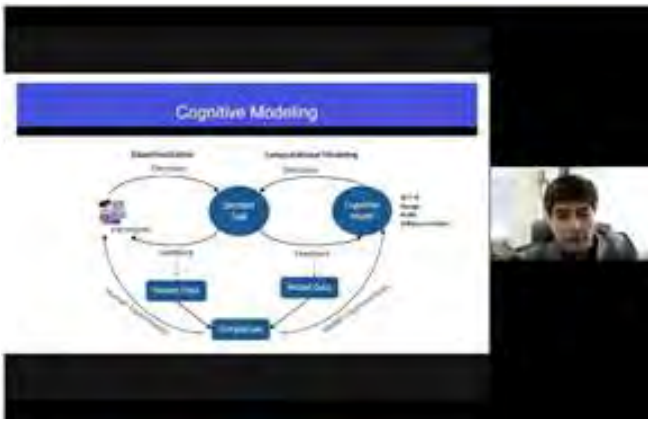
Dr. Erwin Fuhrer from Germany joined IIT Mandi as Visiting Assistant Professor for one year.

**MoU**

IIT Mandi signed MoU with Technical University Dresden in August 2020 and with Kyushu University in Japan in December 2020.

**SCRI (Society for Collaborative Research and Innovation) IIT Mandi organized a virtual talk on "Using Maths to Clean up our Ocean" by Dr. Tom Crawford on 15th January 2021**

**International workshop on Design and Manufacturing of Composites for Engineering Applications organized by School of Engineering, IIT Mandi from 01st to 05th February 2021**




**Indian Institute of Technology Mandi virtually hosted the 2nd Winter School on Cognitive Modeling (WSCM) from 15th to 17th December 2020**

## 5.1 Advanced Material Research Centre (AMRC)

## Overview

The Advanced Material Research Centre (AMRC) supports and nurtures the research enterprise at the Indian Institute of Technology Mandi (IIT Mandi) by providing state-of-the-art instrumentation with ancillary equipment and necessary expertise. With our vast facilities, we offer our analytical services to various Schools at IIT Mandi, as well as other external academic institutes and commercial organizations.

**Students are working in AMRC Synthesis lab**

## Policies of AMRC

At AMRC, we provide shared labs with advanced equipment and skilled technicians to enable cutting age research at all levels, keeping proper safety measures in mind.

### Structure of AMRC

AMRC is overseen by the AMRC coordinator, co-coordinator, instrument faculty in-charges and several efficient staff members.

### Maintenance

Over the past years, AMRC continued to house several advanced types of equipment, which are regularly maintained and, in cases of downtime, are efficiently repaired. Research scholars are trained to handle these sophisticated instruments in a timely manner.

**Dr. R. R. Koner**
(AMRC Coordinator)

**Dr. C. S. Yadav**
(AMRC Co-Coordinator)

**Ms. Isita Nandi**
(Project Scientist)

**Mr.Puneet Sood**
(Project Engineer)

**Mr. Arjun Barwal**
(Project Engineer)

**Mr. Sunil Thakur**
(Project Engineer)

**Mr. Naveen Thakur**
(Project Engineer)

**Mr. Dushyant Gumra**
(Office Assistance)

**Mr. Karm Singh**
(Lab Attendant)

### Maintenance

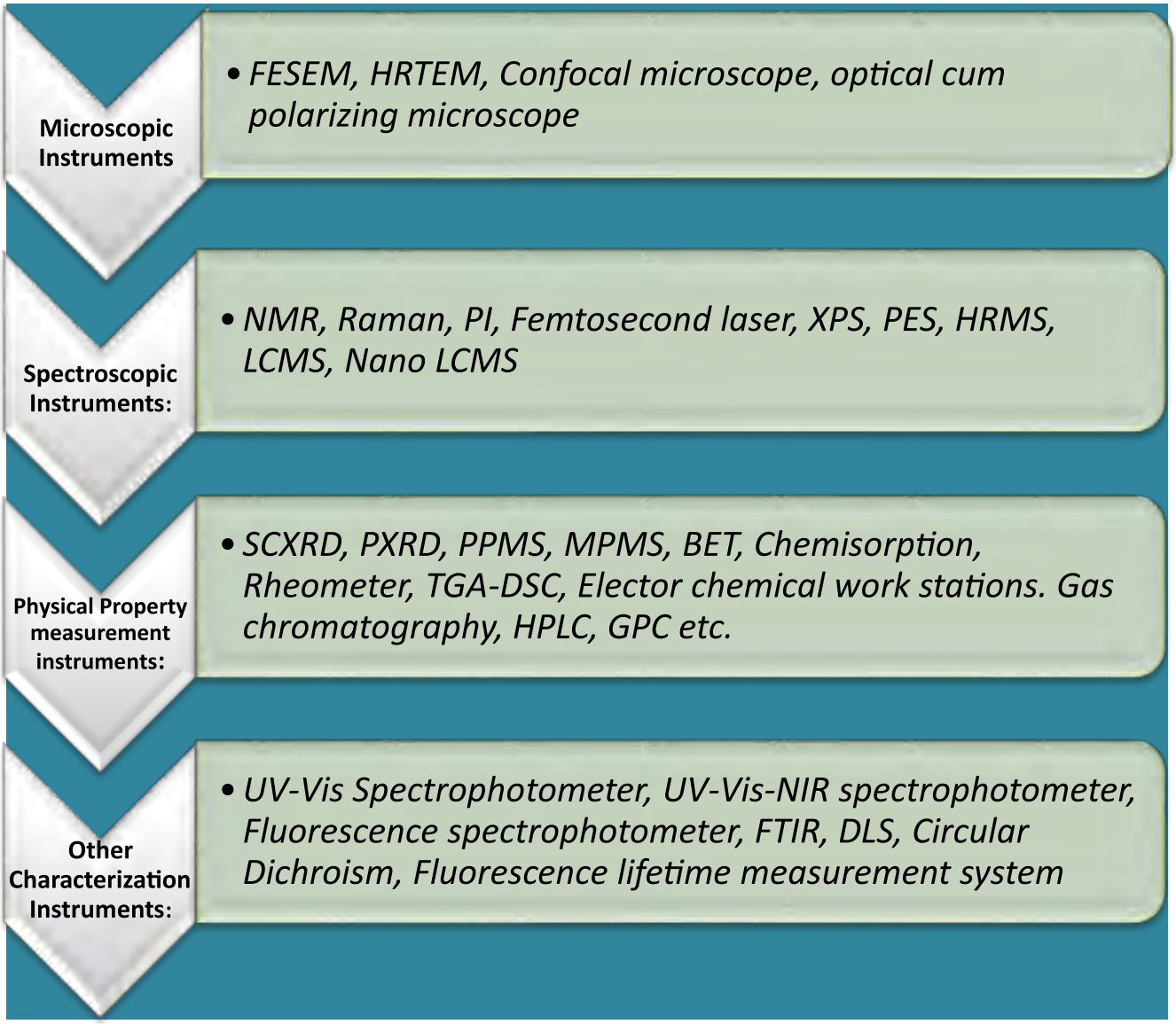
Over the past years, AMRC continued to house several advanced equipment, which are regularly maintained and in cases of down-time are efficiently repaired. Research scholars are trained for handling these sophisticated instruments in a timely manner.

### Safety

Safety is a high priority at AMRC. To ensure safety in research conduct, safety training & safety tests are arranged routinely for the scholars and students who are using AMRC facilities. Continuous observation is carried out by IIT Mandi Safety committee, the coordinator and staff.

### Facilities

AMRC houses 76 numbers of various types of sophisticated and general characterization instruments which is covering the energy, environment, electronics, magnetism, organic displays, solar cells, drug delivery, and nanotechnology research fields. A total of more than 55 faculty members from physics, chemistry, biology and engineering disciplines are participating on a regular basis. Among 30 are the core faculty of AMRC.



# Sophisticated Instruments of Advanced Material Research Centre

High Resolution Mass Transmission Electron Microscope

Field Emission Scanning Electron Microscope

Confocal Microscopy

High Resolution Spectrometer

Pump Probe Electron

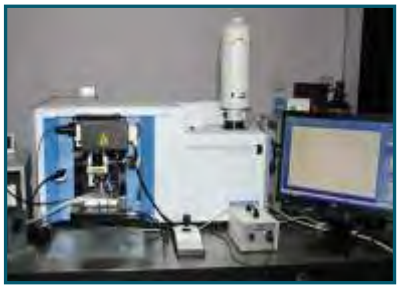
Physical Property Measurement System

Magnetic Property Measurement System

X-Ray Photo Spectroscope

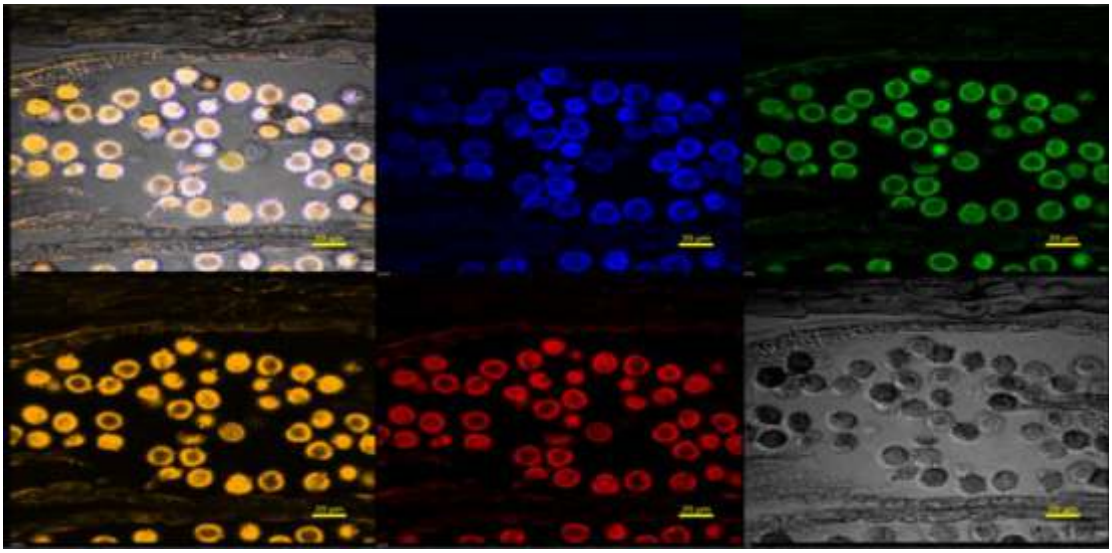
Nuclear Magnetic Resonance Spectroscope

Liquid Nitrogen Plant

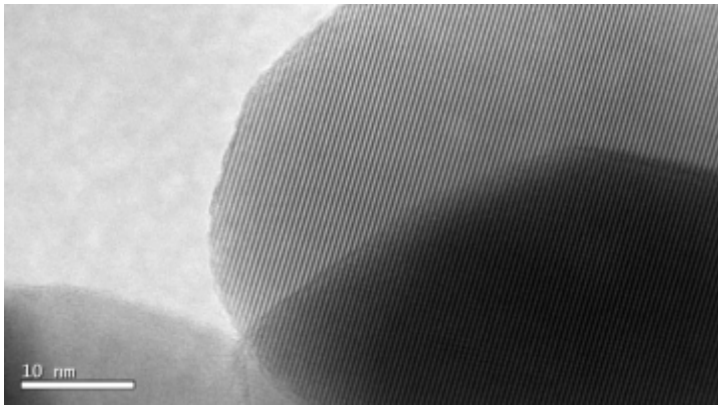


Raman Spectrometer

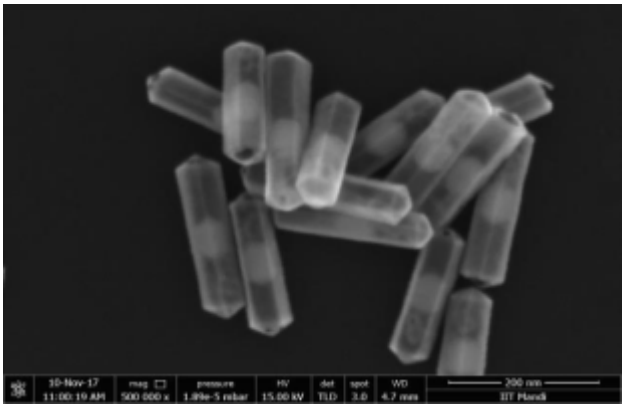
## Images obtained from different instruments



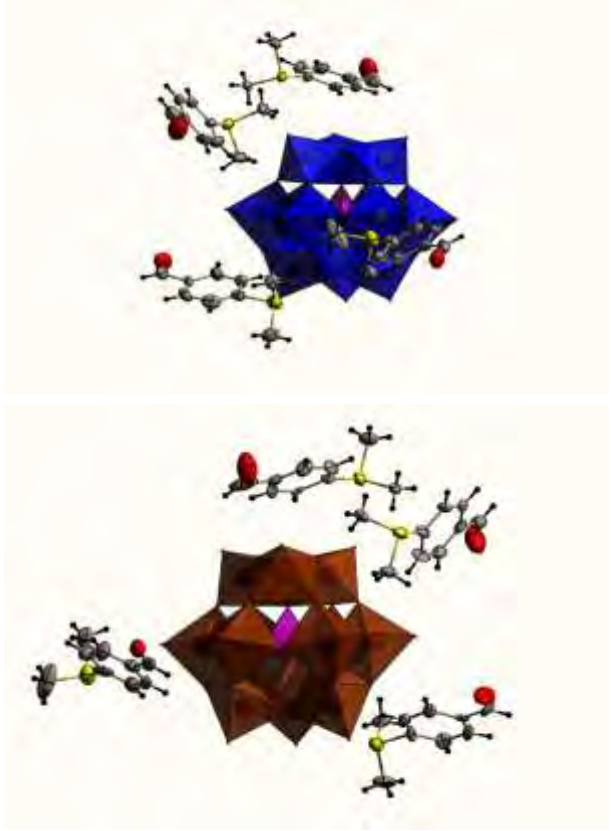
Confocal imaging of Pollen grains under different laser excitation



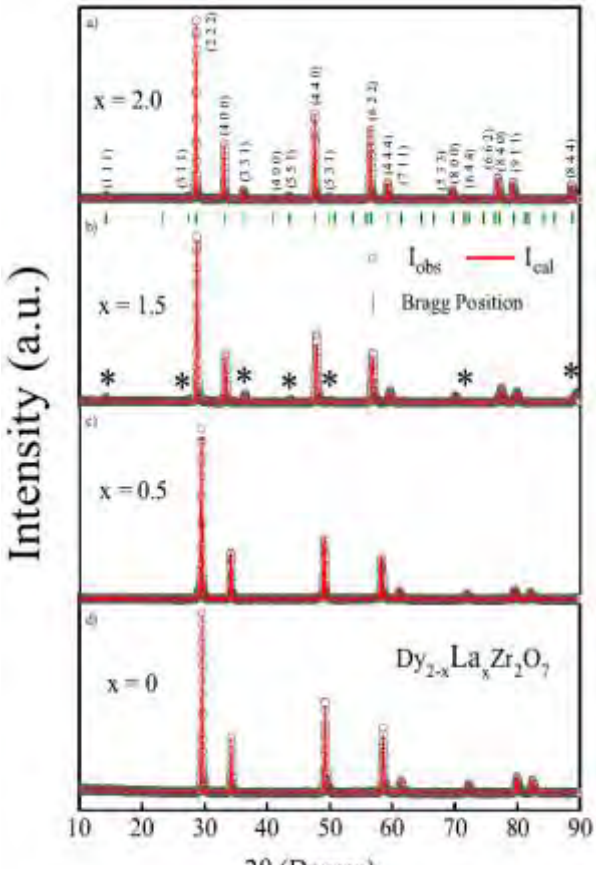

Nickel Nanoparticle HRTEM Image by FEI G2 S Twin TEM



Gold Nanocapsules image by FEI NovaNano SEM



Silicomolybdicacid images&Silicotungstic acid images by SC-XRD(Super Nova dual source)




Ritveld fined x-ray diffraction pattern of La substituted $Dy_2Zr_2O_7$ showing the evolution from disorder fluorite to pyrochlore structure

Advanced Material Research Center (AMRC) is catering instrumental facilities to both internal and external researchers in the various fields of material research on payment basis. It has developed a well-maintained and easy access system to facilitate the researchers. It is needless to say that by the toil of last eight years, the centre has efficiently reached to the every corner of the country to provide its facility.

**List of the external users are given below:**

❖ **Name of the Institutes in Himachal Pradesh**

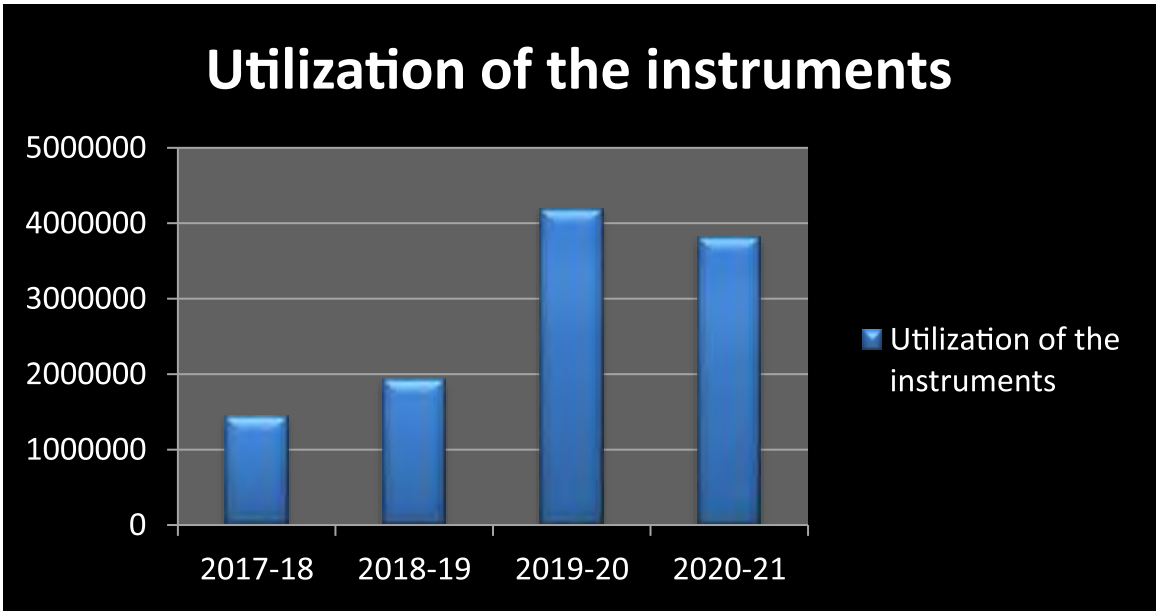
- NIT Hamirpur, HP
- CSIR-IHBT Palampur, HP
- HPU Shimla, HP
- Shoolini University, HP
- Sri Sai University, Palampur HP
- Jaypee University, HP
- Carrier Point University, HP
- Arni University, Kangra, HP
- Maharaja Agra Sen University, Baddi, HP
- Laureate Institute of Pharmacy, Kathog, Kangra, HP
- M Pharmacy Institute, Jwalamukhi. HP
- Indus International University, Bathu, Una, HP
- A.P.Goyal Shimla University, Shimla, HP
- Baddi University, Baddi, HP
- Eternal University, Baru Sahib, Kangra, HP
- School of Pharmacy and Emerging Science University, Baddi, HP
- YS Parmar University, Solan, HP

❖ **Name of the Institutes other than Himachal Pradesh**

- NIT Jalandhar, Punjab.
- NIT Manipur
- NIT Delhi, New Delhi.
- NIT Durgapur, West Bengal.
- NIT Karnataka.
- NIT Trichy, Tamil Nadu
- IIT Gandhinagar
- IIT Ropar, Punjab
- IIT Guwahati, Assam.
- IIT Kharagpur, West Bengal.
- IIT Delhi.
- IIT Patna, Bihar.
- Shiv Nadar University, New Delhi
- HNBG University, Uttarakhand.
- Madhav University, Rajasthan.
- Indian Institute of Petroleum. Dehradun.
- B.B. Ambedkar University, Lucknow.
- IIT Madras, Tamil Nadu.
- JNU New Delhi.
- CSIR NPL New Delhi.
- CSIR CMERI Durgapur, West Bengal.
- IISC Bangalore, Karnataka.
- INST Mohali, Chandigarh, Punjab.
- Jamia Millia Islamia University, New Delhi.
- Doon University, Uttarakhand.
- Kuruhshetra University, Kurukshetra.
- Agra University, Agra.
- Punjab University, Patiala
- Manipur University.

❖ **Name of the Industries**

- **Crystal Morphix Technology, Hyderabad**




**Year-wise utilization of the AMRC instruments**

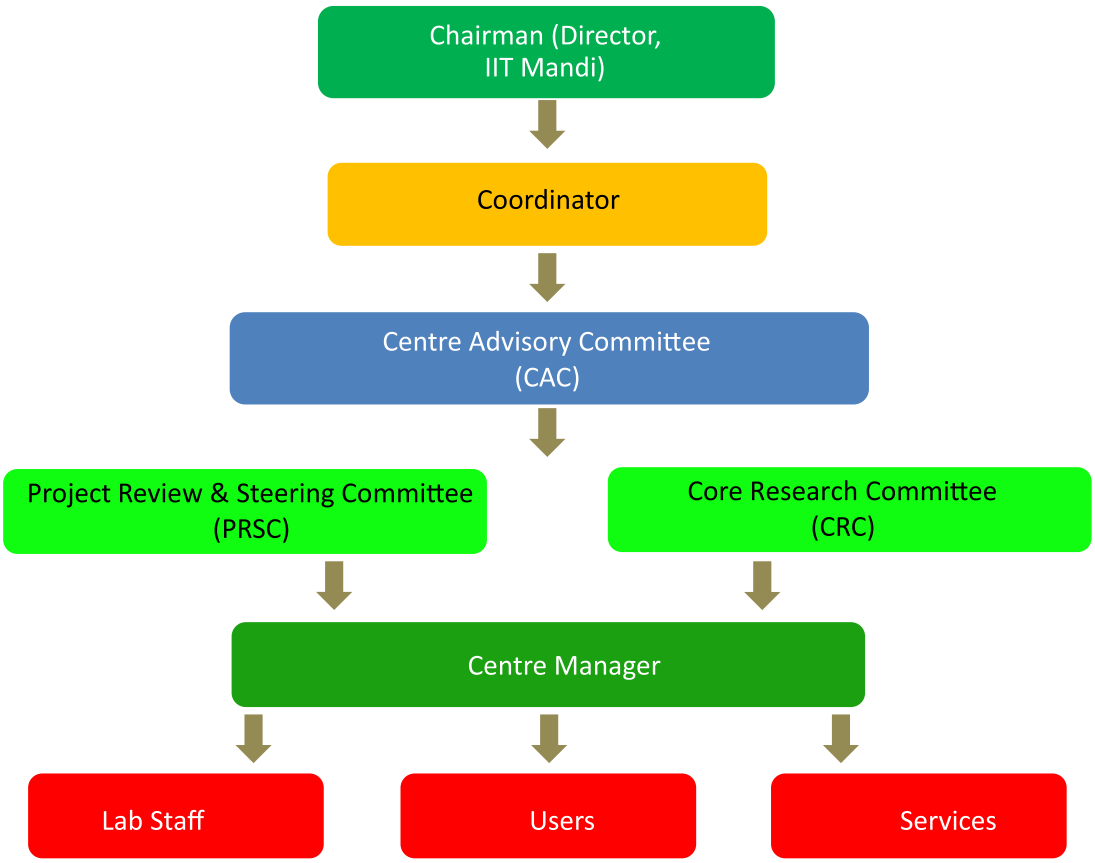
**Research Scholars Working with Different Instruments**

## 5.2 Centre for Design & Fabrication of Electronic Devices, (C4DFED) @ Indian Institute of Technology (IIT)-Mandi, (Himachal Pradesh), India

**Co-ordinator: Prof. Satinder Kumar Sharma**

**https://c4dfed.iitmandi.ac.in**

### Organizational Structure C4DFED Facility@ IIT Mandi



## "Project Review & Steering Committee (PRSC)"

| | |
|---|---|
| Prof. Satinder Kumar Sharma (SCEE, IIT Mandi) | Coordinator |
| Prof. Ajit Kumar Chaturvedi | 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 (SBS, IIT Mandi) | Member |
| Dr. Hitesh Shrimali (SCEE, IIT Mandi) | Member |
| Dr. Viswanath Balakrishnan (SE, IIT Mandi) | Member |
| Dr. Ajay Soni (SBS, IIT Mandi) | Member |
| Dr. Ankush Bag (SCEE, IIT Mandi) | Member |
| Dr. Amit Jaiswal (SBS, IIT Mandi) | Member |

## "Core Research Committee (CRC)"

| S. No. | Name | School | E-mail id: |
|---|---|---|---|
| 1 | Dr. Ajay Soni | SBS, IIT Mandi | ajay@iitmandi.ac.in |
| 2 | Dr. Amit Jaiswal | SBS, IIT Mandi | j.amit@iitmandi.ac.in |
| 3 | Dr. Ankush Bag | SCEE, IIT Mandi | ankushbag@iitmandi.ac.in |
| 4 | Dr. C. S. Yadav | SBS, IIT Mandi | shekhar@iitmandi.ac.in |
| 5 | Dr. Gaurav Bhutani | SE, IIT Mandi | gaurav@iitmandi.ac.in |
| 6 | Dr. G. Shrikanth Reddy | SCEE, IIT Mandi | gopishrikanth@iitmandi.ac.in |
| 7 | Dr. Hitesh Shrimali | SCEE, IIT Mandi | hitesh@iitmandi.ac.in |
| 8 | Dr. Kunal Ghosh | SCEE, IIT Mandi | kunal@iitmandi.ac.in |
| 9 | Dr. Pradeep Kumar | SBS, IIT Mandi | pkumar@iitmandi.ac.in |
| 10 | Prof. Pradeep Parameswaran | SBS, IIT Mandi | pradeep@iitmandi.ac.in |
| 11 | Dr. Rahul Shrestha | SCEE, IIT Mandi | rahul_shrestha@iitmandi.ac.in |
| 12 | Prof. Satinder K. Sharma | SCEE, IIT Mandi | satinder@iitmandi.ac.in |
| 13 | Dr. Satvasheel Ramesh Powar | SE, IIT Mandi | satvasheel@iitmandi.ac.in |
| 14 | Dr.Shubhajit R. Chowdhury | SCEE, IIT Mandi | src@iitmandi.ac.in |
| 15 | Dr. Srikant Srinivasan | SCEE, IIT Mandi | srikant@iitmandi.ac.in |
| 16 | Dr.SrinivasuBodapati | SCEE, IIT Mandi | srinivasu@iitmandi.ac.in |
| 17 | Prof. Subrata Ghosh | SBS, IIT Mandi | subrata@iitmandi.ac.in |
| 18 | Dr. Swati Sharma | SE, IIT Mandi | swati@iitmandi.ac.in |
| 19 | Dr. Venkata Krishnan | SBS, IIT Mandi | vkn@iitmandi.ac.in |
| 20 | Dr. Viswanath Balakrishnan | SE, IIT Mandi | viswa@iitmandi.ac.in |

## Executive Summary

This document serves as the center for Design & Fabrication of Electronic Devices (C4DFED)'s official annual report for FY 20-21, ending March 31, 2021. C4DFED 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. Shri R. Subrahmanyam, Secretary (HE), Ministry of Human Resource Development (MHRD), Government of India, inaugurated this high-end state-of-the-art facility on 31st October, 2018.

The ultimate goal of this Centre is to cater the different needs 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 C4DFED facility at IIT Mandi has been fully operational forthe last two years. It is now capable of handling research projects like Development and Application of Nanoelectronics, 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 benefit from this infrastructure available at IIT Mandi. The user charges collected in two past quarter are around 4 Lakhs. This is also a source of revenue generation for the self-sustainability of the facility.

Along with that, many government institutes like ISRO, DRDO, DST 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 cleanroom & plant room operations, which are equipped with AHUs, MAUs, Chillers, UPS and BMS.

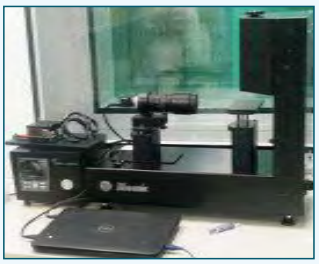
To make C4DFED facilities self-reliance and self-sustainable, a cumulative effort has been started. In this regard, an expert committee from different institutes/organizations from India (IIT Mandi, IIT Delhi, IISc, IIT Ropar, ISRO, DRDO and company etc) and abroad have visited in person/skype IIT Mandi C4DFED facility, on 11th Dec 2019 and as per their suggestions center is going to organizing more training programs, workshops and conference like previous year.

## Highlights of C4DFED

| | |
|---|---|
| Users | • All IIT Mandi faculties who have similar research interest.<br>• Masters and Ph.D. students of IIT Mandi & other institutes<br>• Academic, Research & Industrial institutes |
| Total Cost of the project | Rs.10 Crores + Rs.40 Crores Equipment |
| Electrical Power required | 600 KVA |
| Class 100 area | 1200 Sq. Ft. |
| Class 1000 area | 450Sq. Ft. |
| Class 10000 area | 350 Sq. Ft. |
| Class 100000 area | 2000 Sq. Ft. |

# List of Facilities/Equipments at C4DFED, IIT Mandi

| Sr. No. | Equipment | Model | Make | Category | Images |
|---|---|---|---|---|---|
| 1 | Atomic Force Microscope | 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 | GeminiSEM 500 | Carl Zeiss Microscopy | Sophisticated Equipment |  |
| 5 | Helium Ion Beam Lithography | 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 | eLINE Plus | RAITH | Sophisticated Equipment |  |
| 8 | Mask Aligner | EVG610 | EV Group | Sophisticated Equipment |  |
| 9 | Stylus Profilometer | Nano Map - LS | AEP Technology | 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 | 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 | Super-ES2 | E-Spin nanotech | Sophisticated Equipment |  |
| 20 | 3 Zone Furnance | 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 |  |

**Number of Students/Researchers Benefited from C4DFED facility at IIT Mandi so far**

- **Academic year (2020-21): 52**

**List of Publications and Patents from C4DFED Users**

A total of 18 publications have been generated from the C4DFED facility for FY. 2020-21. The list is as follows:

**Publications in Journals**

1. 2,2'-(Arylenedivinylene)bis-8-hydroxyquinolines exhibiting aromatic $\pi$-$\pi$ stacking interactions for solution processable high-performance p-type organic semiconductors, Suman Sehlangia, Shivani Sharma, Satinder K. Sharma, Chullikkattil P. Pradeep; Materails Advances, 3 (2021). DOI: 10.1039/d1ma00215e.
2. Integration of high-performance cost-effective copper-metal-organic-nanoclusters based gate dielectric for next-generation CMOS applications, Prachi Gupta, Rudra Kumar, Satinder K. Sharma, Wiley: Advanced Electronic Materials,7,4 (2021). Https://doi.org/10.1002/aelm.202000835.
3. Digitally Assisted Secondary Switch-and-Compare Technique for a SAR ADC; Ashish Joshi, Hitesh Shrimali, and Satinder K. Sharma; IEEE Transactions on Circuits and Systems II: Express Briefs, 21,1 (2021), Doi:10.1109/TCSII.2021.3053210.
4. Maskless lithography: an approach to SU-8 based sensitive and high-g Z-axis polymer MEMS accelerometer; Mandeep Jangra, Dhairya Singh Arya, Robin Khosla, and Satinder K. Sharma; Microsystem Technologies, 3, (2021). Doi.org/10.1007/s00542-021-05217.
5. Integration of Ferroelectric Materials: An Ultimate Solution for Next-Generation Computing and Storage Devices; Robin Khosla and Satinder K. Sharma;, accepted ACS Applied Electronic Materials, 3, 7, 2862–2897, (2021). Doi.org/10.1021/acsaelm.0c00851.
6. Probing Ferrimagnetic Semiconductor with Enhanced Negative Magnetoresistance: 2D Chromium Sulfide; Mohamad G. Moinuddin, Srikant Srinivasan, Satinder K. Sharma, Advanced Electronic Materials. Communication,9,2001116(2021). Https://doi.org/10.1002/aelm.202001116.
7. Impact of Charge Trapping and Constant Voltage Stress on Epitaxial p-Ge-on-p-Si and HfO2 based Al/HfO2/p-Ge-on-p-Si/Al structures; Sumit Choudhary, Daniel Schwarz, Hannes Funk, Robin Khosla, Satinder K. Sharma and Jorg Schulze, IEEE Transactions on Nanotechnology, Vol. 20,(2021). Doi. 10.1109/TNANO.2021.3069820.
8. High-Temperature (200 C) Stable Switching Response of Ga2O3 SBDs on Sapphire; Manoj K Yadav, Arnab Mondal, Mohamad G. Moinuddin, Satinder K Sharma, Ankush Bag, IEEE Transactions on Device and Materials Reliability, 1530-4388 (2021).Doi:10.1109/ TDMR.202. 3125244.
9. An Efficient Hydrogen Gas Sensor Based on Hierarchical Ag/ZnO Hollow Microstructures; Sonalika Agarwal, Sanjay Kumar, Himanshu Agrawal, Mohamad G. Moinuddin, Manoj Kumar, Satinder K. Sharma, Kamlendra Awasthi; Sensors and Actuators: B. Chemical 346 (2021).Doi.org/10.1016/j.snb.2021.130510.
10. Metal(Pt)/Ferroelectric (SrBi2 Ta2O9) /Insulator (La2O3)/Semiconductor (Si), MFIS structures for non-volatile memory applications, Shivendra K. Rathaur, Robin Khosla, Satinder K. Sharma, Appl. Phys. Lett. 119, 063505 (2021).Doi: 10.1063/5.0055792.

11. Nanoscale Probing of Surface Charges in Functional Copper-Metal Core Organic Clusters Thin Films by Kelvin Probe Force Microscopy; Rudra Kumar, Prachi Gupta, Satinder K Sharma; Advanced Materials Interfaces, 8, 2100529 (2021).https://Doi.org/10.1002/admi.202100529.

**Publications in Conferences**

1. Satinder K. Sharma, Rudra Kumar, Manvendra Chauhan, Kumar Palit, and Kenneth E. Gonsalves, invited talk in SPIE, Advanced EUV lithography at San Jose, California, USA, 26 March (2021). (Oral Talk on Virtual mode, 22 Feb.2021).
2. Design and Simulation of Capacitive Z-axis MEMS Accelerometers using SU-8, PolySi, Si 3 N 4, and SiC-based structural materials; Mandeep Jangra, Dhairya Singh Arya, Robin Khosla, and Satinder K. Sharma; IEEE-ICEE 2020, 5th International Conference on Emerging Electronics, Hosted by- Indian Institute of Technology Delhi, India from 26th - 28th Nov. (2020).
3. Highly Sensitive Polymer Micro-Mesh for Measurement of Vacuum Packaged MEMS Devices; Manu Garg, Dhairya S. Arya, Mohamad G. Moinuddin, Satinder K. Sharma, Pushpapraj Singh; IEEE-ICEE 2020, 5th International Conference on Emerging Electronics, Hosted by- Indian Institute of Technology Delhi, India from 26th- 28th Nov. (2020).

**Ongoing Projects and Funding at the Centre**

- Development of Indigenous photoresists technology for semiconductor industries: impact on Indian economy, skilled manpower development and employment possibility~ Rs 239 Lakhs, form MHRD, India (September 2016 – July 2020).
- Design and fabrication of an interface ASIC for a vibratory gyroscope sensor application~ Rs 45.76 Lakhs, Funding Agency-ISRO, India (November 2018-November 2020).
- C4DFED (Clean Room) Facility Project (IITM/INT/C4DFED-CO/27) funded by IIT Mandi.

**National and International Distinguished Visitor at the Center:**

- Dr. Sanjay Kundu, IPS, Director General of Police, Shimla, Himachal Pradesh, visited the Center on 30/12/2020.
- Mr. Jai Ram Thakur, Chief Minister, H.P, visited the Center on 24/2/2021.

**Rate Structure for C4DFED Facility Users**

C4DFED based facilities are available to internal and external users on nominal charges. Below is the rate structure of the C4DFED facility, which is also available online.

| S.No. | Equipment | Make/Model | Academic Subsidized Charges for Internal Users in (Rs.) | Charges for External Academic users in (Rs.) | Charges for Industry users in (Rs.) |
|---|---|---|---|---|---|
| 1 | FESEM | Zeiss | 750 | 1,875 | 3,750 |
| 2 | HE Ion Microscope | Orion, Zeiss | 2,000 | 5,000 | 10,000 |
| 3 | AFM | Bruker | 500 | 1,250 | 2,500 |
| 4 | Raith EBL (exposure only) | Raith | 1,000 | 2,500 | 5,000 |
| 5 | Ellipsometer (Data Acquisition) | Accurion | 500 | 1,250 | 2,500 |
| 6 | Ellipsometer (Modeling & Analysis) | Accurion | 2,500 | 6,250 | 12,500 |
| 7 | Maskless Lithography (Exposure only) | Intelligent Micro Patterning | 200 | 500 | 1,000 |
| 8 | Optical Lithography | EV Group | 250 | 625 | 1,250 |
| 9 | Stylis Profiler | AEP Technology | 100 | 250 | 500 |
| 10 | Optical Profiler | Bruker | 150 | 375 | 750 |
| 11 | RIE | Planer Tech. | 300 | 750 | 1,500 |
| 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 Syatem 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) | 1,500 (per run) |
| 18 | Spin Coater (Controlled atmosphere) | Laurell | 75 (per sample) | 200 (per sample) | 600 (per sample) |
| 19 | Spin Coating (In air) | Spectro Spin | 50 (per sample) | 125 (per sample) | 250 (per sample) |
| 20 | Contact Angle | SEO Phoenix 300 Touch Contact Angle | 50 (per sample) | 125 (per sample) | 400 (per sample) |
| 21 | 3D printer | XYZ Printing Pro | 100 | 250 | 500 |
| 22 | Electro Chemical Analyzer | CH Instruments | 100 | 250 | 500 |
| 23 | Three Zone Furnace 1000 °C | Thermofisher scientific | 100 | 250 | 500 |
| 24 | Vacuum Oven | Nanosemi Technology | 100 per day | 250 per day | 500 per day |
| 25 | DI Water | Millipore | 50 per liter | 125 per liter | 250 per liter |
| 26 | Clean Lab Space (5'x5') | - | 2,000 per day | 5,000 per day | 10,000 per day |

## 5.3 BioX

Situated in the largely agrarian, scenic and fragile Central Himalayas, IIT Mandi has a focus on agriculture and the environment. Another important focus area of research is human health. Towards this, IIT Mandi has initiated activities in the life sciences in the broad areas of immediate relevance to the Himalayan region, and health care particularly for the rural and lower-income strata of society. There is an immediate need to extend the benefits of advanced knowledge and technology to the traditional farmers, particularly those engaged in the cultivation of fruits, vegetables, saffron and medicinal plants in this region. Also, with the advancements in technology, better health care regimes need to be evolved.

Towards these goals, IIT Mandi has taken initiatives to conduct interdisciplinary research and developments including faculties from various disciplines of basics sciences and engineering. As a part of this initiative the BioX Centre was conceived at IIT Mandi in 2012, driven by the need for affordable health care for India, and advanced technology interventions in agriculture and for the preservation of the environment in the Himalayan Region. Since then, IIT Mandi has recruited six faculties and two fellows in Life Sciences as a part of the School of Basic Sciences. These faculties and fellows along with the faculties from the other Schools, including the School of Computing and Electrical Engineering and School of Engineering, are engaged in highly interdisciplinary research in the focus areas of life sciences, biophysics, nanotechnology, bioinformatics, plant systems biology, and others. In addition, IIT Mandi also made an initial investment of Rs. 10 crores for purchasing lab equipment related to these areas. A similar amount of funding has also been received by the individual faculties and researchers working in the Centre from different funding agencies including DBT, DST, SERB, MHRD, etc. As it had reached a critical mass, the formal structure of the BioX Centre was finally approved in December 2016.

The broad vision of the BioX Centre at IIT Mandi is to perform cutting-edge research in the focus areas of Systems and Synthetic Biology with applications in Health care, Agriculture, and Environment. The BioX Centre is envisioning to push the frontiers of technology development and engineering toward advancements in disease prevention and affordable health care, agricultural practices with respect to the Himalayan region, and Himalayan Biodiversity exploration for biotechnological applications by bridging the gap between life sciences, physical sciences, and engineering. Some of the important missions of the 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 focus on life sciences and technology development.

Currently, a group of 20 faculties within IIT Mandi with different expertise whose research focus aligns with the vision of the BioX Centre form a core part of the Centre. These include faculties from the School of Basic Sciences (Biologists, Chemists, Mathematicians, Computational Biologists), School of Engineering (Mechanical Engineering), and School of Computing and Electrical Engineering (Computational Engineering and Electrical Engineering).

**Dr. Prosenjit Mondal**
**BioX Coordinator**
**Prodipta Mukherjee Ray**
**Project Associate**

**Project Associate**

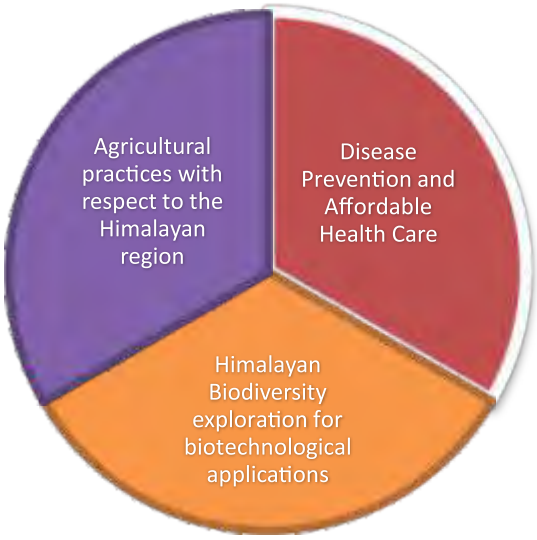



**Figure: Thrust areas of research being carried out at IIT Mandi**

## The Thrust Areas of Research which are being Focused at the Centre

**Disease Prevention and Affordable Health Care**

- Biomedical Devices & Instrumentation
- Biomechanics
- Biomedical imaging
- Nanobiotechnology
- Biomaterials
- Diagnostics and Therapy for Diseases

**Himalayan Biodiversity Exploration for Biotechnological Applications**

- Natural Products Biotechnology For Health and Industry
- Exploration of Novel microbes (enzymes) in extreme environments for industrial and biotechnological applications

**Agricultural Practices with respect to the Himalayan Region**

- High-throughput phenotyping in agriculture
- Systems analysis of important crop pathogens for management

**The laboratories and technology platforms that currently exist at the BioX Centre of IIT Mandi include:**

- Advanced Materials Research Center (AMRC) (equipped with high end facilities like NMR, Mass-Spec, Single crystal XRD, Confocal Microscope, Spectrophotometers, etc)
- High-Performance Computing facility
- Molecular and Systems biology
- Nanotechnology
- Next Generation Sequencing facility
- Animal House facility
- Cell and Tissue culture facilities
- Expanding in other Omics

Cell and Tissue Culture facilities

Fungal Culture Facilities

Next Generation Sequencing Facility

Gas Chromatography (Mass Spec)

Bioreactor

Fow Cytometer

UV-VIS NIR

Fluorescence Microscope

Stop Flow

Basic Molecular Biology Lab

Systems Biology Lab

Plant Growth Lab

Medicinal Plant Garden

Botanical Garden

Herbarium

Gel doc

Flux Analyser

Cryostat

Ultracentrifuge

Multiplate reader

**Figure: Existing research facilities at the BioX Centre**

- **Advanced Materials Research Center (AMRC)** (equipped with high-end facilities like NMR, Mass-Spec, Single crystal XRD, Confocal Microscope, Spectrophotometers, etc)

- **High Performance Computing facility**

**Figure: Other research facilities of the institute being used by the researcher of the BioX Centre.**

The Centre facilities are also an integral part of the ongoing M.Tech. in Biotechnology program of the School of Basic Sciences at IIT Mandi. The M.Tech. in Biotechnology program was started in August 2016 to train the next generation of students with cutting-edge knowledge and skills suitable towards biotechnological research and bio-pharma based industry. M.Tech in the Biotechnology programme at IIT Mandi is intended to nurture and train the students with a strong interest in research and Bio-industry to meet the existing challenges of the biomedical research/industry. The curriculum is directed towards fundamental and practical understanding of the core biotechnology areas along with specialized fields in the form of specialization programs in "Systems Biology" and "Medical and Nano-biotechnology". In addition, elective courses from other disciplines provide interdisciplinary exposure to the students. The core-subjects, specialized theme areas of BioX, electives from other schools, hands-on laboratory training along with the Thesis project component to be undertaken in-house/ other R&D institutes/ industries enrich students with right skills required in the current Job market both in academia and industries, on completion of the program. The first batch of M.Tech. students (8 nos) has already completed their degrees.

The BioX Centre serves as a platform to foster R & D and teaching in several areas of biotechnology, including systems biology, bioinformatics, biophysics of misfolding diseases, Intrinsically Disordered Proteins (IDPs), metabolic engineering, nanobiotechnology, translational medicine, synthetic biology, etc. exploiting their strong synergy with different areas of technology. Currently, more than fifty research scholars pursuing their Ph.D. degree in the related areas, are using the facilities developed at the BioX Centre. The BioX Center faculty have been able to publish their research work in peer-reviewed international journals of high impact.

# Publications

## Journal

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| Defended Ph.D. students (BioX, SBS) | Supervisor |
|---|---|
| Dr. Deepak Sharma | Dr. Rajanish Giri |
| Dr. Nitin Sharma | Dr. Rajanish Giri |
| Dr. Naina Arora | Dr. Amit Prasad |
| Dr. Kundalik Gadhawe | Dr. Rajanish Giri |
| Dr. Subrata Mondal (SE) | Dr. Rajesh Ghosh |
| Dr. Fauzul Mobeen | Dr. Tulika P. Srivastava |
| Dr. Yashika Arora (SCEE) | Dr. Shubhajit Roy Chowdhury |

**Events Organized**

- Indo-UK symposium on “Fluxomics of Microbe and Plant Systems (FluxMAPS 2021)” Date: March 24-25, 2021.
  **Organizing Institutes:** Indian Institute of Technology Mandi, India and University of Oxford, UK.
  **Organized by:** Dr Shyam Kmasakapalli

- Online workshop on “Next Generation Sequencing Applications: Systems Biology and Metagenomics”.
  **Date:** (6 days from October 14th 2020 to October 29th 2020.)
  **Venue:** Department of Biotechnology, School of Life Sciences, Mozoram University
  **Organized By:** Dr. Tulika Prasad Srivastava

# 6. Research Groups

## 6.1 Design and Innovation Centre; Patents, Design and Innovation Culture

### About DIC at IIT Mandi

The Design and Innovation Centre at IIT Mandi provides the necessary ecosystem for graduates and research scholars to hone much-needed skills that are required to design and develop products and technologies. Since India is moving towards "Make in India" policy and IIT Mandi's mission and vision are coherent with the country vision, our institute attempts to produce graduates and research scholars with skills that would enable them to think independently in terms of creativity and innovation. With the conviction that technological innovation constitutes an essential element for achieving progressive development and permanent improvement in any activity, state-of-the-art design centre is being set-up in the campus funded by MHRD. Since the next wave of economic growth globally will be led by innovation and entrepreneurship, this would be the key economic driver for India in the coming years.

The Design and Innovation Centre, an Rs.1.6 crore project funded by the Ministry of Human Resource Development, Govt. of India, has provided seed support to the Centre. The center is equipped enough to support the prototype and product development endeavors of the students and faculty members of IIT Mandi. Facilities like 3D printer, PCB fabrication unit, magnetic stirrers, Elvis System Development board, and other development and test facilities are available at the centre. The institute is all set to provide easy access of the center to its students round the clock.

### The objectives of the innovation council at IIT Mandi are:

- To provide a necessary ecosystem and resources to students and faculty members for design and innovation-related activities.
- To train and inculcate the spirit of entrepreneurship among students and faculty members.
- Adopt/introduce courses to promote design and innovation.

### Resource strength of DIC institution

- Total No. of DIC Members: 07
- Total No. of faculty Mentors: 07
- Pre-Incubation Units: 01
- Incubation Units: 01
- IP Facilitation Unit: 01

### Facilities provided by Design and Innovation Centre

Facilities directly provided by the Institute Innovation Council through the Design and Innovation Centre:

The following tools and equipment are available inside the Design and Innovation Centre

| S.No. | Item | Amount in (Lakhs of Rs.) | Justification |
|---|---|---|---|
| 1 | Tap and Die Set (2) | 0.4 | Small manufacturing tool |
| 2 | Digital multimeter (2) | 0.4 | Useful for selecting electrical components and probing their condition |
| 3 | Hand Tools Set (3) (wrenches, screwdrivers, chisels, and hammers etc.) | 1.5 | Small manufacturing tool |
| 4 | DC Power Supplies (2) | 0.4 | Important small routine tool for electrical component development |
| 5 | FPGA Board (5) | 1 | Important small routine tool for electrical component development |

| | | | |
|---|---|---|---|
| 6 | Microcontroller Board (10) | 0.5 | Important small routine tool for electrical component development |
| 7 | Logic Probe (2) | 0.1 | Important small routine tool for electrical component development |
| 8 | NI ELBIS Board | 2.0 | Important small routine tool for electrical component development |
| 9 | pH probes, pH meters | 0.5 | Important small routine tool for understanding chemical properties |
| 10 | Temp Probe | 0.2 | Important small routine tool for understanding chemical/physiological properties |
| 11 | Magnetic stirrers | 0.2 | Routine tool for mixing solutions |
| 12 | Weighing balance (2) (battery operated) | 0.2 | Routine lab equipment |
| 13 | Mass flow meters | 1.0 | Routine lab equipment important for liquid and gases quantity control |
| 14 | Electrodes material - Copper, Aluminium etc. | 0.5 | Useful in electrochemical applications |
| 15 | Soldering station (3) | 0.6 | Useful for circuit fabrication |
| 16 | Consumable raw materials like sheet metals, wires, tube, rods etc. | 1.0 | Consumables |
| 17 | Resistance box | 0.05 | Resistors needed for building circuits |
| 18 | Capacitors | 0.05 | Capacitors needed for building circuits |
| 19 | Inductors | 0.05 | Inductors needed for building circuits |
| 20 | IC chips | 0.5 | ICs for building circuits |
| 21 | Connecting wires, strippers, etc | 0.01 | Connecting wires for circuits, strippers to cut wires |
| **Total Budget** | | **11.16 Lakhs** | |

## Photographs of Some Equipments

**PCB prototyping unit**

**3D printer**

**Arduino Mega Board**

**CPLD-FPGA trainer board**

**NI ELVIS prototyping board**

**pH meter**

**Magnetic Stirrer**

**Currently, the Institute is in the process of procuring**

- COMSOL Multiphysics (for modeling and simulation).
- Exaar kit (for Virtual Reality environment).
- Desktops and Workstations.

**Facilities of Other Laboratories Accessible to Users:**

**Electronics Lab**

The Digital / analog lab is accessible to students of all the departments. The lab is well equipped with Digital storage oscilloscope function generators, digital multimeters, general purpose ICs, etc. used in design and implementation of basic electronic circuits. Experiments performed in the lab range from hardware design and implementation of rectifiers, analysis of transistor characteristics, comparators, synchronous and asynchronous counters,op amp applications etc.

**Control Systems, Robotics and Embedded Systems Lab**

The Control System & Robotics Lab. is accessible to students of all the departments. The lab. is well equipped with controlling equipments i.e Balanduino, Multi Tank System, Robotics Arm, Lab view Starter kit etc. This lab has some trainer kits such as DC Motor Control Trainer kit, Heating Ventilation & Air conditioning Control Trainer, Mechatronic Sensors Control Trainer, Rotary Inverted Pendulam Control Trainer, VTOL Control.

**Electrical Machines Lab**

Electric machines lab is equipped with all devices and equipment needed to make all tests and measurements. The students are required to become familiar with major types of DC/ AC motors, DC/ AC generators and transformers, either single-phase or three-phase.

**Signal Processing and Communication Lab**

Understanding the communication systems and implementation of theory is not easy without laboratory experiments and demonstrations. The SPCOM (Signal Processing and Communication) lab provides the necessary facility to execute the lab experiment to undergraduate and post-graduate students in Electrical engineering. The objective of SPCOM lab is to give a good understanding to students in the rapidly evolving world of modern communications. The students can perform multiple experiments in communication theory using lab instruments.

**Central Workshop**

Mechanical workshop is a place where students acquire knowledge on the operation of various processes involved in manufacturing and production. The workshop is intended for training and prototyping for students and research labs. The workshop makes students competent in handling practical work in an engineering environment by learning by doing. The workshop has various shops with state-of-the art equipment such as machine shop, foundry shop, CNC shop, welding shop, and 3D printing to name a few. The workshop is supported by well-trained technical staff in their respective trades. The engineering performed in the mechanical workshop focuses on producing specialized, high-precision, low-volume parts for laboratory and research work.

**Achievements During the Year 2020-21:**

**Patent Granted**

- M. Amudhan, K.V. Uday, N. Chaudhary, N. Kadela, "Detection unit and method of operation thereof", Indian Patent no. 372004 dt. 31.10.2020.
- S. Roy Chowdhury, A. Dutta, A. Das, "Systems and methods for determining neurovascular reactivity to brain stimulation", US Patent No. 10874341 granted on 29-12-2020.

**Workshop Organized**

- Biofest 2021: This was a 3 days event that included expert talks, presentations by students and interaction with M.Tech. and Ph.D. students of IIT Mandi.

**Innovation Oriented Talks Delivered by IIT Mandi Faculty**

- Dr. Shubhajit Roy Chowdhury delivered a lecture on "Non invasive sensing of pathophysiological parameters at the point of care" at the Faculty Development Programme on Sensor Technology, National Institute of Engineering, Mysuru, September 21-25, 2020.
- Dr. Shubhajit Roy Chowdhury delivered a lecture on "Interdisciplinarity in Research" at the Faculty Induction Programme on Research Methodology, South Asian Institute for Advanced Research and Development, September 20-24, 2020.

**Few best DIC Faculty/Student members and their Achievements/ Rewarded for the Innovations at Different Forum in the year 2020-21**

- Dr. Varun Dutt was awarded SKOCH Award (Gold), Safety & Security for Landslide Monitoring and Warning System in the year 2020.
- Dr. Amit Jaiswal was selected as an Associate of the Indian Academy of Sciences, Bengaluru in the year 2020.

**Best Innovations in the Institute in the Year 2020-21**

- Dr. Sumit Sinha Ray invented a textile fabric-based face mask which was of the N99 standard.
- Dr. Amit Jaiswal invented a self-cleaning based face mask, which could provide a shield against bacteria and viruses and also does not require soap based cleaning procedure.
- Dr. Shubhajit Roy Chowdhury developed a non-invasive brain stimulation system for restorative neurorehabilitation.

**Start-ups Opened in 2020-21**

- A group of students, Naman Chaudhary, M. Amudhan, N. Kadela, guided by Dr. Kala VenkataUday developed a smart road monitoring system to avoid accidents on hill roads. The students have also opened a start-up to take their idea forward.

**Break through Innovations Developed at the Institute**

- A group of chemistry researchers led by Prof. Subrata Ghosh, Prof. Pradeep Parameswaran, Prof. Satinder Sharma and Prof. K.E Gonsalves developed an indigenous photoresist with which the cost of fabricating an IC can be dramatically reduced.
- A group of nanobiotechnology researchers developed an MoS2 based material for masks under the leadership of Dr. Amit Jaiswal which leads to development of self-cleaning based

face mask, which could provide a shield against bacteria and viruses and also do not require soap-based cleaning procedure.

- A group of researchers led by Dr. Shubhajit Roy Chowdhury invented a low-cost headband based on non-invasive brain stimulation which could cure stroke patients without going through painful physiotherapy procedures.
- A group of researchers led by Dr. Varun Dutt and Dr. Kala VenkataUday invented a low-cost technology to forecast the occurrence of landslides in hilly terrain.

**Ranking of Institute in 2020**

NIRF ranking: 31 (Among Engineering Institutions)

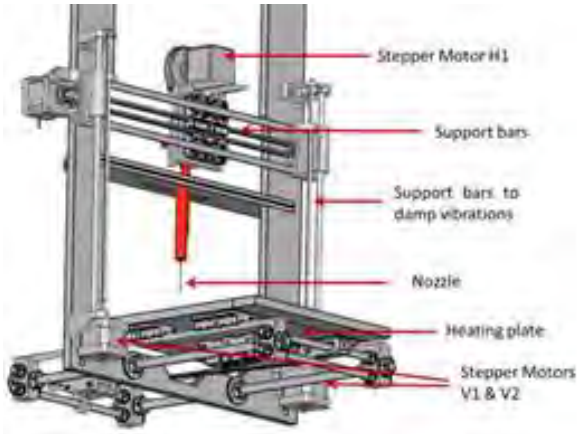
ARIIA ranking: 07

**Social Media and Connections of the Institute**

Facebook: www.facebook.com/IITMandi2009

Twitter: www.twitter.com/iit_mandi

**Photographs of innovations**




**Low cost 3D printer**

**Ignis Bellator: The fire warrior**


**Automatic Ration Vending Machine**

**Low cost urine albumin estimation system**

**All season's jacket**

**Contact:**

Dr. Shubhajit Roy Chowdhury
Mobile no.: 9816683456, Email: src@iitmandi.ac.in

### 6.2 Condensed Matter Physics

The condensed Matter Physics group consists of young and dynamic faculty members from the School of Basic Sciences and School of Engineering at IIT Mandi. Currently, more than ten faculty members have a research focus on condensed matter physics-related activities and the group members are studying physical properties of materials by using various experimental techniques, computational protocols and theoretical models. The focus of the research activity is fourfold; (i) Understanding the fundamental physics of the various phase transitions and material properties for technological applications, (ii) Exploratory research for new materials, (iii) Future energy and nanoelectronic applications, and (iv) Design and understand the fundamental physics problems using computational tools. Based on the nature of work, these areas have been elaborated as topological Quantum Materials, Graphene and 2D Materials, Superconductivity and Electron-Electron/Phonon Correlation, Multiferroics, Magnetocalorics, Heusler Alloys, Nano-Science and Nanotechnology, Organic Electronics and Functional Devices, Optical Spectroscopy and Optoelectronics, Thermoelectricity and Energy Conversion Materials, Soft Condensed Matter Physics, Computational and Theoretical Condensed Matter Physics, Electronic Band Structural Calculations, Correlated and Disordered Electronic Systems, Phase Transitions. The faculty members working in the experimental condensed matter physics are Dr. Ajay Soni, Dr. Bindu Radhamany, Dr. C.S.Yadav, Dr. Kaustav Mukherjee, Dr. Pradeep Kumar, and Dr. Suman K. Pal. The theoretical condensed matter physics group consists of Dr. Arti Kashyap, Dr. Girish Sharma, and Dr. Sudhir K. Pandey. In total, there are more than 50 researchers (including faculty members, Ph.D. students and Project associates) who are working in the different aspects of condensed matter physics at IIT Mandi.

In the year 2020-2021, condensed matter group members have published more than 70 research articles in the reputed research journals of the field. The major research journals are Science, Nature Communications, Physical Review B, Physical Review Research, ACS Photonics, Applied Surface Science, IEEE Electron Device Letters, Nanotechnology, Review of Scientific Instruments, Euro Phys. Letter, J. Phys. Chem. Lett., J. Phys: Cond. Matter, J. Magn.& Mag. Mater., Appl. Phys. Lett., J. Phys. D: Appl. Phys., J. Alloy and Comp., ACS Appl. Energy Mater., ACS Omega, J. Phys. Chem. Letter, Computation Material Science, JACS, and Adv. Funct. Mater. There has been a very active representation of CMP members in various reputed national and international conferences, where the faculty and research scholars have presented their work in the form of invited/contributory talks and poster etc. Currently, the faculty members are pursuing several funded national and bilateral research projects of total worth more than 3.5 Crore from various external-funding agencies like DST-SERB, CSIR, BRNS, Indo-Sweden and Indo-Russia bilateral grants, and DRDO. Some representative results of the research work are given below.

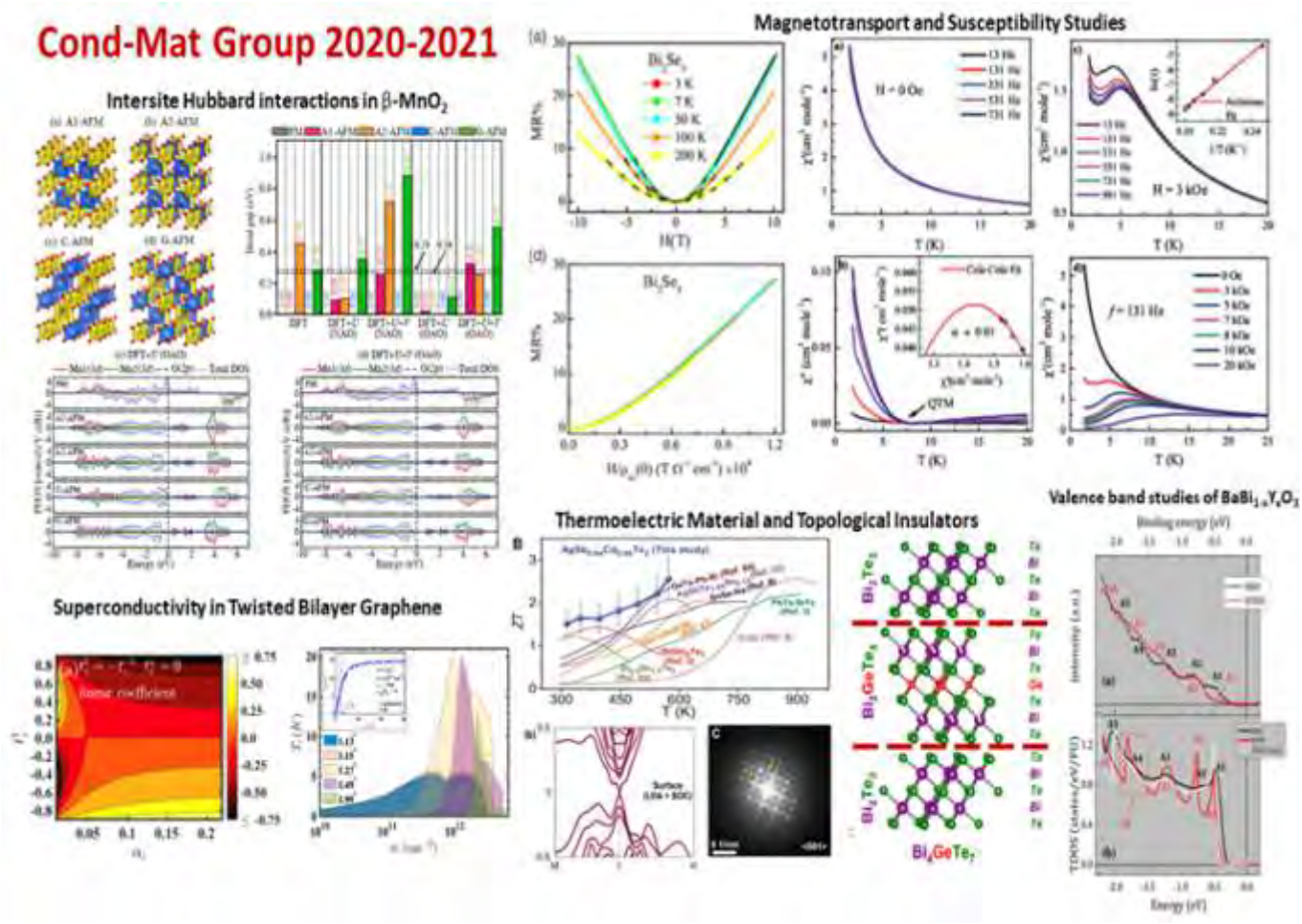



**Figure: Some results from the research work published by condensed matter physics group**

## 7. CENTRAL LIBRARY

Central Library plays a vital role in furthering the academic and research mission of IIT Mandi and facilitates the 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 support 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 the library are operational at two different campuses i.e. South Campus and North Campus. The detail of these libraries are given below:

### Central Library @ North Campus (A16 Building)

Maximum collection pertaining to the print books is available within this unit. Almost all collections related to the different course subjects except Physics, Chemistry and Biotechnology are available within this building for circulation purposes. A16 is a big building having three floors having 192 seating capacities.

**Satellite Library @ North Campus (A12 Building – Top Floor)**

Satellite Library has the facility of low voice discussion reading room with 50 seating capacity.

**Library @ South Campus (A5 Building – First Floor)**

Book Circulation facility along with 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 along with the Xerox and scanning facility is also available in this unit.

**Software Used in Library**

- **KOHA:** For automation purpose.
- **DSpace:** For digitization purpose.
- **Linux:** For operating system.
- **Piwigo:** For photographs repository.

**Collection Development and Management**

Collection building is one of the important functions of the library that supports the 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.

**Print Documents Added During the Year 2020-21**

During the period of 2020-21, Central Library acquired 170 books. The total collection for print books reached to 20137. It also added a 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 was also circulated by e-mail. An email alert is also sent to the requesting faculty members(s) about the arrival of their publications.

**Electronic Resources Subscribed During the Year 2020-21**

Central Library provides web-based access to the following e-resources:

- **Full-text e-journals:** Access to 8000+ full-text journals from the following databases:

  AIP, ACM Digital Library, ACS, APS, ASME, Cell Press, IOP, Elsevier's ScienceDirect, IEEE Electronic Library, JSTOR, SIAM, Springer Link, Taylor & Francis (S&T complete Collection), Nature, Annual Reviews etc.
- **Bibliographic e-databases:** SciFinder,MathSciNet& Web of Science.
- **Thesis & Dissertations:** Proquest Dissertation and Thesis Database, Institute's Thesis Database, etc.
- **Standards:** BIS Standards, IEEE Standards
- **Archives:** Institutional Archives, Sabin Americana
- **Video Resources:** Jove – Biology, Chemistry, Biochemistry, Bioengineering, Immunology and Engineering collection.
- **E-Books:** Central Library provides access to a collection of more than 21774 e-Books in various disciplines. The e-book collection contains titles that are rigorous recommendations 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.

**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. The circulation desk is kept open for 35 hours a week. On average, the monthly circulation transactions are about 400.

**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, 21774 electronic books and databases.

**OPAC (On-line Public Access Catalogue)**

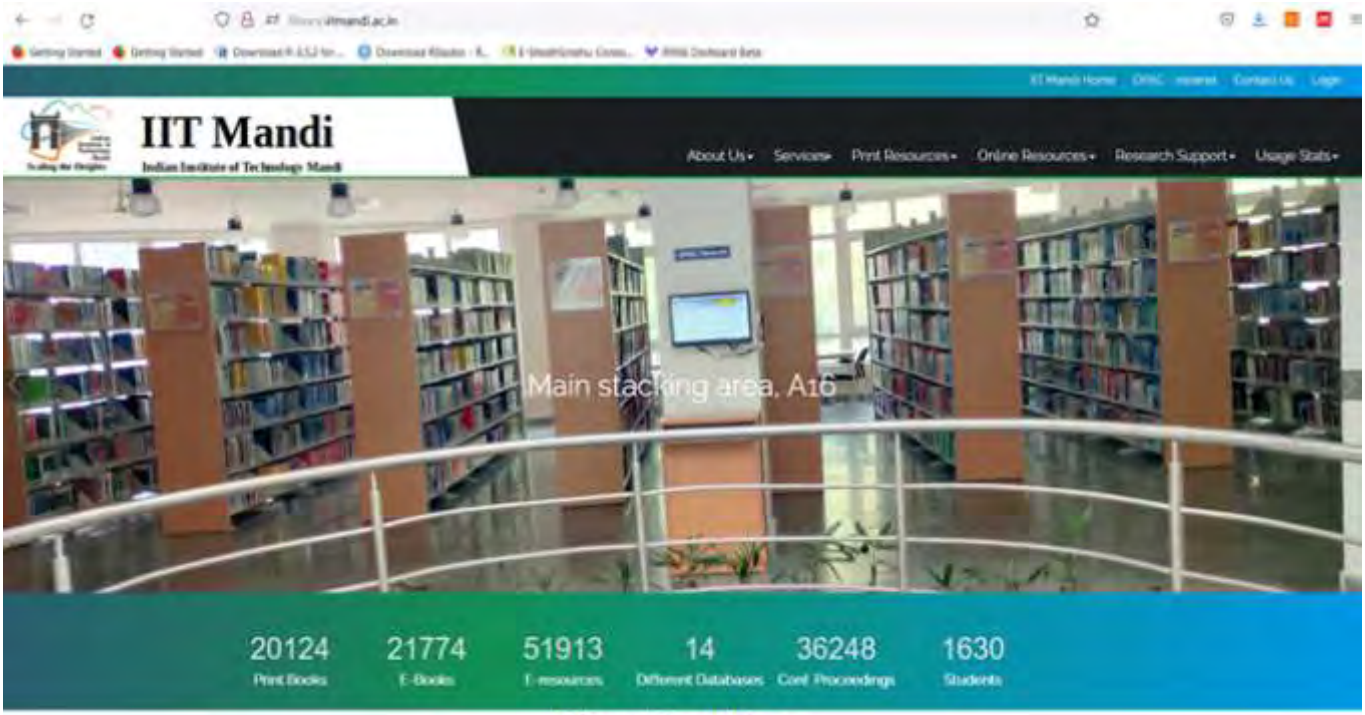
The OPAC is one of the most heavily used databases of the library and is accessible 24*7 via library web page (http//www.webopac.iitmandi.ac.in/). Besides listing all the documents available in the library, it allows on-line renewal and reservation, circulation and tells the current status of each & every book. OPAC is searchable by author, title, accession number, subject and several other fields.

**Services Offered**

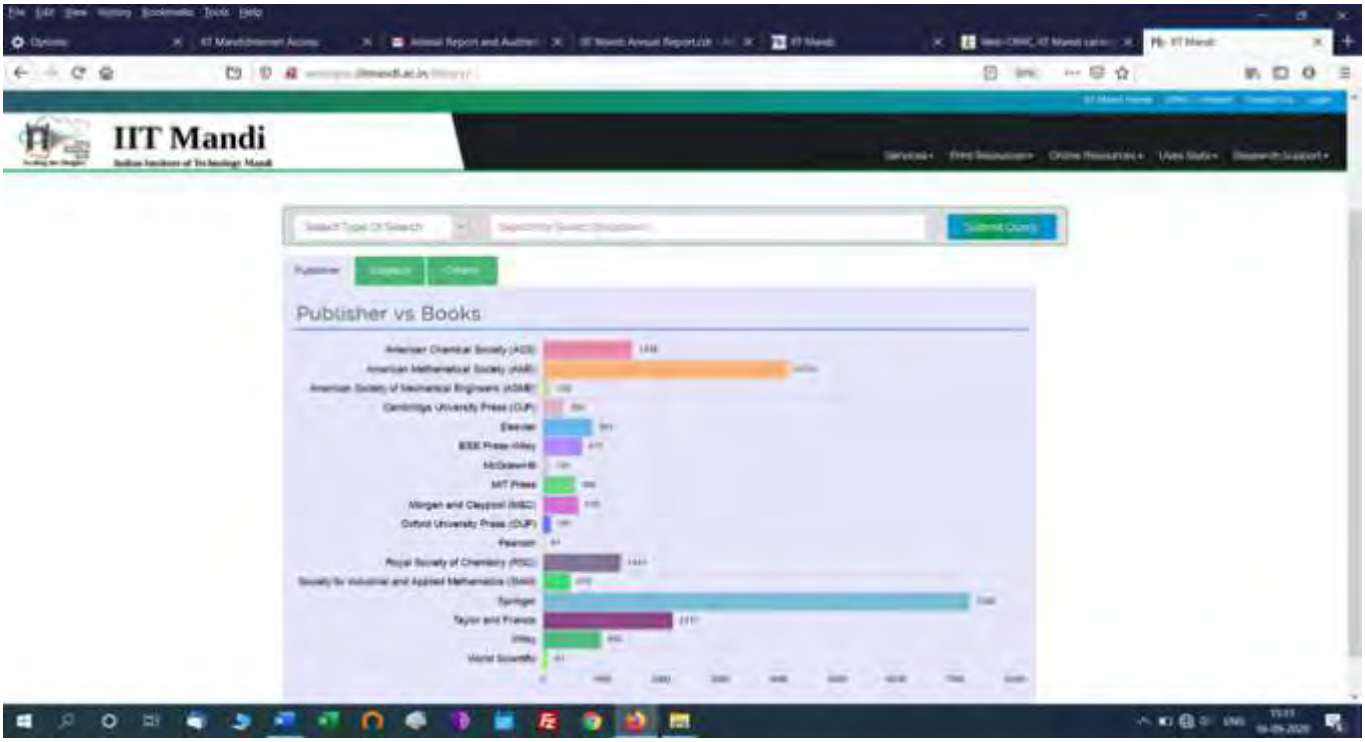
- Fully-automated Circulation facility
- Online book reservation, Information search, Patron's library book loan status check
- WebOPAC (Web based Online Public Access catalogue)
- Reserve collection development for student's in-house reading
- New Arrival Book Section
- Reference Service
- Inter-Library 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

**Future Plans**

- Single Search solution.
- Online recommendation platform for different library resources.
- More Smart Rooms.
- Discussion Rooms.
- Space for the Archive.




Library Home Page



## 8. EIGHTH CONVOCATION

As part of this Convocation 147 B.Tech. students, 97 M.Tech., 77 M.Sc. (Chemistry, Mathematics, Physics), 12 M.A. in Development Studies, 11 M.S. (by Research) and 39 Ph.D. Scholars graduated from the Institute.

| Awards | Student |
|---|---|
| President of India Gold Medal | Neelotpal Dutta (B16106) |
| Director's Gold Medal | Anand Ramrakhyani (B16124) |
| Institute Silver Medal: CE | Gaurav Meena (B16130) |
| Institute Silver Medal:CSE | Abhigyan Khaund (B16082) |
| Institute Silver Medal:EE | Ram Lakhan (B16138) |
| Institute Silver Medal:ME | Neelotpal Dutta (B16106) |
| Rani Gonsalves Memorial Medal | Palak Gupta (B16067) and Vishnu Priya Jindal (B16041) |
| Balasundaram Endowment Prize in German Language | Hritik Gupta (B16097) |
| Institute Silver Medal (M.Sc. (Chemistry) | Abhishek Jain (V18033) |
| Institute Silver Medal (M.Sc. (Physics) | Bhisma Narayan Mahanty (V18079) |
| Institute Silver Medal (M.Sc. (Applied Mathematics) | Alka Singh Chauhan (V18008) |
| Institute Silver Medal (M.Tech. MES) | Vagish Kumar (T18127) |
| Outstanding Academic Achievement Award (M.Tech. Biotech) | Nikita Deshwal (T18208) |
| Outstanding Academic Achievement Award (M.Tech in CSP) | Ankit Chakraborty (T18033) |
| Outstanding Academic Achievement Award (M.Tech in EEM) | Mohit Barthwal (T18151) |
| Outstanding Academic Achievement Award (M.Tech in VLSI) | Saswath T (T18004) |
| Outstanding Academic Achievement Award (M.Tech in PED) | Patel Parth Hasmukhbhai (T18069) |
| Outstanding Academic Achievement Award (M.Tech in SE) | Mahipal Kulariya (T18109) |
| Outstanding Academic Achievement Award (M.A) | Rajat Chaudhary (A18008) |

## 9. STUDENTS AMENITIES AND ACTIVITIES

### SCIENCE AND TECHNOLOGY COUNCIL

**Society Advisor:** Dr. Srikant Srinivasan

**Secretary:** Vipul Sharma

Clubs under SnTC

| S.No. | Club Name | Club Coordinators | Club Advisor |
|---|---|---|---|
| 1 | **Programming Club** | Subhash Suman<br>Saransh Jain | Dr. Sreelakshmi Manjunath |
| 2 | **Robotronics Club** | Dipanshu Verma<br>Abhishek Parmar<br>Pritish Chugh | Dr. Amit Shukla |
| 3 | **Space Technology and Astronomy Cell (STAC)** | Yuvraj Misra<br>Lalit Narayan Mudgal | Dr. Arnav Bhavsar |
| 4 | **E-Cell** | Khyati<br>Parshva Jain<br>Sahas Goyal | Dr. Saumya Dixit |
| 5 | **Yantrik Club** | Tanmay<br>Akshansh Dhiman<br>Ritwik Kamesh | Dr. Gaurav Bhutani |
| 6 | **Nirmaan Club** | Ankit Gupta<br>Amit Kumar Jatav<br>Huzaifa S. Electricwala | Dr. Dericks Shukla |
| 7 | **Society of Automotive Engineers (SAE)** | Aditya Nautiyal<br>Nikhil Katnour | Dr. Arpan Gupta |

**Code Forces Challenge Winter 2020 (Date: 2/11/2020)**

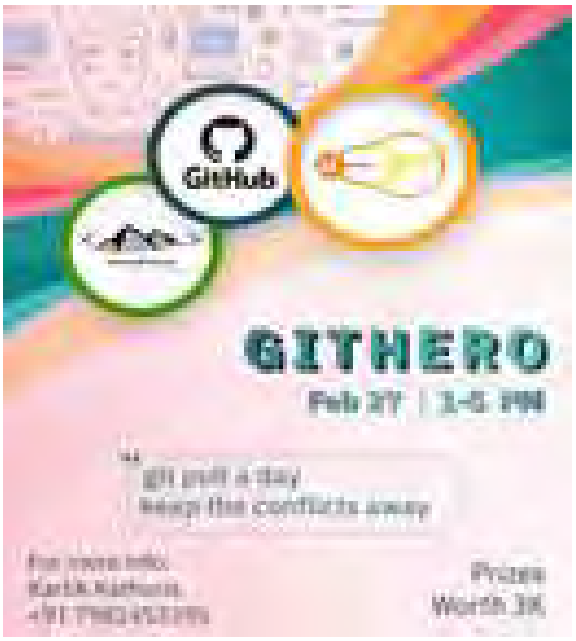
Codeforces is one of the best platforms for competitive coding and is usually known for its short challenges/contests where programmers from every corner of the world participate. The Programming Club along with ACM Student Chapter conducted a Code Forces Challenge series from 02/11/2020 -19/12/2020. The Challenge Series consisted of 6 codeforces rounds. The rankings were calculated using the GP-15 ranking system.


**Money Heist (Date: 3/1/2021)**

This event was also a part of Game Trilogy Weekend (2nd and 3rd January) and was in collaboration with E-Cell IIT Mandi.

A one of its kind game where you get to rob a bank and compete with other teams simultaneously to see who makes the most money at the end of the day. It was a strategy-making Team event to test intellect, management skills.

**Date:** 3rd January 2021 (4 pm - 8 pm).




**GitHero Utkarsh-21 (Date: 27/2/2021)**

Kamand Prompt organized git hero which aimed at freshers so that they can learn about git and GitHub. A series of challenges were prepared which the participants needed to complete. The challenges were ranging from easy to hard and many freshers took part in it. They get to learn how to make Pull Requests, add remotes, squash commits, rebasing and stashing commits, cherry-pick and drop buggy commits. The challenges were posted at https://github.com/KamandPrompt/git_hero_2021/issues and more than 100 PRs were made during the contest!

The main organizers of the contest were Priyam and Pranshu from 2nd year (Member of Core-team Kamand prompt IIT Mandi) who made challenges that involved first yearites making pull requests in a manner so that they can learn more about the features of git and github. The challenges were so well thought out that almost all the people who participated in the contest felt that they learned something new which will be surely helpful to them later.

Before the event, Kamand Prompt had organized sessions on Git and Github to teach students about the basics, especially focusing on what is the need to learn git and GitHub and also

teaching them about the basics of the same. Hence, the challenges were made so that students who attended those sessions could perfectly apply what they learned from those sessions. In some challenges, they were even asked to learn a few new things and apply the same within the given time of the contest. An example of a sample pull request created by the student during the contest, where Priyam also told them what more they could improve and perform better. Many students even tried solving the contest after the time limit as they felt it is great in general for learning basic and advanced git and GitHub. A total of 128 pull requests have been made by participants, some even by students after the contest to improve their submissions.

**Capture the Stone CTF Utkarsh-21 (Date: 27/2/2021)**

The System Administration and Infosec Club (S.A.I.C) organized it's first-ever Capture The Flag event of even semester.

The CTF platform was hosted on the SNTC server: https://tartarusctf.iitmandi.co.in/. This event was open to all but mainly focused on gaining the interest of the 1st and 2nd yearites towards computer security. It consisted of 10 challenges on topics ranging from cryptography, web exploitation, reverse engineering, and pwn. The event saw total participation from 97 participants and was required to exploit the questions.

**The top scorers for the CTF were:**

The CTF was put together by Yash Bansod, Divyasheel Kumar, Dhruv Pindawala, and Milind Topno, and the platform used was built by our alumnus Abhigyan Khaund. Our aim was to build a community of members who help each other in the field of security therefore we were active on our discord server to help the participants with doubts and hints. Our Discord server will also serve as a hub for discussions for future events.

**Hack30 (Date: 28/2/2021)**


The Programming Club organized a 30 Hours Hackathon named Hack30, in which teams have to work together on a general problem and develop a software solution for the same using various technologies. The theme of the problem statement was - Covid19 and Problems in Health, Education, and Lifestyle due to the pandemic.

**Time - 28th Feb 4 pm to 1st March 10 pm**

The timeline and problem statement are on this link. We organized a fairly simple set of rules with an open style of submission. The focus was on driving ideas and trying out the framework rather than completed products. Also, this was the first hackathon for the freshers, so coordinators, seniors, and alumni were active during the whole hackathon on Discord to discuss their ideas and help the teams in the implementation. To enhance the engagement we also had a prize for the best Team Introduction Video and the submissions were fun and full of creativity.

Team Size - max. 3 | Students Participated - Around 160

Final Submission here. | Team Introduction Videos here.

**Tezos & Frost Hack organized a workshop on the Basics of Blockchain.**

A workshop on Blockchain was organized by Tezos so that people could use Tezos and build products based on blockchain in Frosthack. This workshop turned out to be very effective for students who were new to Tezos and blockchain as we observed a very high number submissions based on blockchain in Frosthack.


Prizes by Tezos:

25000 INR for building a Flutter Tezos Wallet App.Speaker - Soumya Ghosh Dastidar

LinkedIn: https://www.linkedin.com /in/gdsoumya/

YouTube Livestream link : youtube.com/watch?v=k7ZqYKgDyUQ

**Guidance session for National level hack (ACM-W) (Date: 1/11/2020)**

To increase the participation of IIT Mandi girls in out of the college hackathons, ACM-W conducted special guidance sessions. This session was targeted at the 5th National level hackathon for women in Computing organized by ACM-W India. Out of the 20 qualifier teams, 5 were from our college, 3 of which reached the final round of the hackathon, and 1 team received the 2nd rank at national level.

(IIT Mandi girls with other finalists at the virtual ceremony of 5th National level hackathon for women in computing).

**Utkarsh'21: Electra (Date: 26/2/2021)**-Electra: the third astrothon in the Pleiades series was conducted on Feb 26th-27th under Utkarsh'21. The first part of the problem statement was based on orbital simulation wherein the participants were required to gain an understanding of the physics underlying orbital theory while also taking general relativistic effects into account. The task was then to simulate the orbit of planet Mercury around the Sun, and also that of two neutron stars about each other. The second part focused on the application of ML in deblurring astronomical images.

**Utkarsh'21: Curiosity (Date: 27/2/2021)**-Curiosity, the astroquiz, was the second event conducted by STAC in collaboration with Qurosity, under Utkash '21. The event was hosted by Vineet Ahuja and coordinated by Janhavi Shedge, and saw a participation of about 30 students. The quiz dealt with concepts related to astronomy, space technology, astrophysics, etc.

**Talk:** Shedding Light on Dark Matter (Date: 9/3/2021)-There's more to the universethan what meets the eye. From observing the motion of galaxies, scientists predict that 95% of what makes up the universe is invisible to us. Dark matter is one of the most fascinating and mysterious topics in astronomy. But what made scientists theorize the existence of dark matter? What makes up dark matter? Is it just a theory, or has it been observed?

**Talk:** Life Cycle of Stars (Date: 10/3/2021)-What does it feel to look at the sky during a starry night? Stars light up our universe, and they embroider the night sky. So let's know more about Stars with us. We will be talking about Stars, their life, evolution and death. To answer all questions about the object which lights the universe, STAC presented a talk on 'Life Cycle of Stars' by Mr. Abhijeet Manhas. This was conducted on 10th March 2021 at 6 PM.

**Talk on Product Management by Mr. Manohar Kanapaka (Date: 7/10/2020)**

Mr. Manohar is working as a Product Manager at WebDunia. He has a degree in management from IIM Indore and is an alumnus of IIT Mandi. The talk was conducted as an interview on Youtube live (E-Cell channel). We got 70+ live viewers. Currently, there are 550+ views on this session. Questions from the audience were answered during the session. Mr. Manohar gave a detailed overview of what exactly product management is. After the session, Mr. Manohar also provided a list of helpful resources for students to start a journey in this field.

**Start-Up Now**

E-Cell collaborated with IIT Mandi Catalyst to conduct this event. Teams had to pitch their idea of startup and get a chance to pitch at HST 2020. Participants had to submit videos of their pitch. We got 4 submissions. These submissions were judged by the Catalyst team.



This event was conducted to bring up more entrepreneurs at IIT Mandi. In continuation of our previous event, this one offered a chance to raise real capital and receive incubation support. We hope that such experiences have actually helped students brush up their skills and learn from past mistakes. In the future, we expect more startups to be selected and incubated by IIT Mandi Catalyst.

**Startups and Beyond Talk by Mr. Saksham Grover (Date: 28/2/2021)**

Mr. Saksham Grover is an alumnus of our college from the first batch who graduated in 2013. In 2015 he co-founded a startup - Driverskart. They raised 500k USD in 2016 and acquired it in 2017. Presently he works as a Business intelligence manager at YouTube. The talk was conducted as an interview on Youtube live (E-Cell channel). We got 50+ live viewers. Currently, there are 250+ views on this session. Questions from the audience were answered during the session.

**Makers Summit by Inc42 (Date: 12/3/2021)**

We presented the very famous Maker's Summit by Inc42 via discord stream from 12th March to 14th March where we can watch, discuss, and chit chat about topics ranging from How India Win-Wins the future to building India's AI-powered Content Engine.


**Participated in Inter-IIT Civil Conclave IIT Roorkee-Date: (7-9/11/2020)**

Civil Conclave is an Inter IIT annual technical event for civil engineering students organized by IIT Roorkee. Three teams of total 12 students had participated there in case study competitions of Tinker the Water Wheel, Structural Design Dilemma and Rejuvenating River Ganga.

**Utkarsh'21 | CIVIZ: Date-(27/02/2021)**

This competition was organized by NIRMAAN club in Utkarsh'21. This was a quiz competition on "Fluid Mechanics". It was scheduled for 26th and 27th Feb. Students from B.Tech. 1st year to M.Tech. 2nd year participated in this competition. We got more than 90 entries for it and it was not possible for us to conduct it in a single round so we decided to conduct it in 2 rounds. There were a total of five groups in the 1st round and from each group the top 3 students qualified for the final round. We conducted the final round on 27th Feb at 1pm over Kahoot. Some of the B.Tech. students did better than pg students.



**Construction Photography-Date: (27/03/2021-10/04/2021)**

**Achievements by the Students of SAE Supra**

Our students regularly participate in many technical events happening outside our institute and also regularly contribute to other major initiatives as well. Here are some of the achievements of our students in such events:

- 12 students were selected in the prestigious Google Summer Of Code (GSoC) 2021 Program. These are Priyam Seth, Divyasheel Kumar, Pranshu Kharkwal, Nippun Sharma, Suraj Kulriya, Chandan Prakash, Sarthak Garg, Rahul Saini, Naveen Sai, Shardul Semwal, Rishabh Garg, Bhavna Kosta.
- 3 students were selected as mentors in Google Summer Of Code (GSoC) 2021 Program. These are Dheeraj Yadav, Jai Luthra, Kartik Kathuria.
- Team ML_Hacksters consisting of Naveen Saisreenivas and Nippun Sharma stood 10th among 2000 participants in Cascade Cup 2020, IIT Guwahati, stood 2nd among 800+ participants in Data Analytics Challenge 2021, BIT Mesra and stood 3rd among 178 teams in AstraZeneca AI Challenge 2021, Shaastra, IIT Madras.
- Akriti and Yamini Sharma were selected in GirlScript Summer Of Code 2021.
- Vipul Sharma was selected as a GitHub Campus Expert in the Campus Experts Program run by GitHub in December 2020. In this program, people are mentored to build and grow a community in their college campus.
- Team NaamMeinKyaRakhaHain consisting of Yash Verma, Nippun Sharma, Naveen Saisreenivas stood 3rd at FrostHack 2021 IIT Mandi among 1400+ participants.
- Pritish Chugh was one of the top 5 participants in Fury-road and Robosoccer events held at Advitiya 2020, IIT Ropar.
- Nishita, Ruchika Sharan and Mehak Jain grabbed the runner-up position in ACM-W National Hackathon 2020 winning a cash prize of Rs. 15000.
- Dipanshu Verma and Ayushman Dixit built an app that in COVID era restricted army officers to accumulate in shops. It is hosted at acsa.iiots.in .
- 5 people were selected in Linux Foundation CommunityBridge 2020 which is a program similar to GSoC, in which students are selected and paid to contribute to open source projects. There are Piyush Goyal, Yash Varshney, Nidhi Jain, Jahnvi Gupta and Dipanshu Verma.
- Piyush Goyal was selected in Google Season Of Docs 2020 Program as a technical writer.
- Siddharth Dhama stood 1st at Geoffrey Hinton Fellowship Hackathon 2021.
- Team consisting of Siddharth Dhama and Rupesh Kumar stood 7th in Summer AI Challenge 2021, IIT Kharagpur.
- Dhruv Pindawala has been recognized thrice in the United Nations Hall Of Fame at https://unite.un.org/content/hall-fame for finding vulnerabilities in their systems. He has also been acknowledged by govts. of Argentina, Siberia, Nigeria, India and Brazil for finding vulnerabilities in their systems as well.
- Prajwal Sood stood 2nd at API Hacks, Chandigarh University 2021 and was the winner for Spyne. AI Problem Statement at Electrothon 2021, NIT Hamirpur.
- Performance at Inter IIT Tech Meet 9.0, IIT Guwahati - This Tech Meet was held in online mode which had its own set of challenges for the participants. This year, we won 3 medals for our performance in various events –

**Gold Medal in QuantInsti Algorithmic Trading**

- Aryan Goyal (B19073), Vineet Ahuja (B19122), Dheeraj Yadav (B17041), Sanskar Gupta (B18140), Anshika Bajpai (B19127)
- Silver Medal in SaptangLabs Security Hackathon
- Milind Topno (B18069), Yash Bansod (B18095), Pranshu Kharkwal (B19136), Dhruv Pindawala (B19033), Divyasheel Kumar (B19081)
- Bronze Medal in Bridgei2i Automated Headline and Sentiment Generator
- Abhijeet Manhas (B18043) , Khyati Agarwal (B18064), Piyush Goyal (B18077) , Prakhar Uniyal (B18128) , Naman Tayal (B18123) , Prajjwal Jha (B17051) , Manan Shah (B19042), Rishabh Garg (B19107) , Paras Jain (B19100) , Yash Verma (B19144)

## CULTURAL SOCIETY

**Society Advisor:** Dr. Puran Singh

Dr. Neha Kaushik (co-advisor)

**Secretary:** Tushar Tyagi

### Clubs under Cultural Council

| S. No. | Club Name | Club Coordinators | Club Advisors |
|---|---|---|---|
| 01 | **Photography and Moviemaking Club** | Rupesh Kumar<br>Khubi Kumar<br>Aarushi Gajri | Dr. Siddharth Sharma |
| 02 | **Dance Club** | Anooshka Bajaj<br>Pratiksha Jain | Dr. Puran Singh |
| 03 | **Music Club** | Aniruddha Prakash<br>Mayank Jindal<br>Naveen Saisreenivas | Dr. Puran Singh |
| 04 | **Drama Club** | Bhumanyu Goyal<br>Shivani Pandey<br>Samarth Neema | Dr. Puran Singh |
| 05 | **Fine Arts Club** | Ekansh Sharma<br>Sonali | Dr. Hitesh Shrimali |
| 06 | **Design Club** | Nayaan | Dr. Satyajit Thakor |

**Kala:** The Cultural League (04.10.2020 - 05.11.2020)

Kala is the collaborative tournament having events of all the 6 cultural clubs, with engaging team events. Many events have the essence of multiple clubs, which adds to the thrill. The senior club members form teams, and the team members are selected by a fierce round of auction. After the teams are formed, they compete over a span of one month to be the ultimate cultural champion.


**Events:** Fusion Dance Video: A dance video which needs to have 5 different dance forms performed by different team members. **Giving Kala life (Character design Competition):** Teams created a 2D digital character of Kala as they perceive it. **Show it off (Photography competition): Teams clicked amazing photographs over two themes:** Flat-lay and Product photography. **Cook your own video call story (Drama competition):** Teams created amazing video call stories and brought back the essence of Drama in online mode. **Makes Sense? (Art Competition):** Teams needed to make 4 different sketches/paintings(or a mix of both) which ultimately need to come together to form a piece of art, while each one of the single art pieces also makes sense in themselves.

**Medley Music Competition:** Teams created a medley of three different songs, sung by three different singers with background music also provided by the teammates. Ad Making Competition: Teams came up with a product idea for which they created an advertisement over the span for 3 weeks. Everything, the script, the acting, the background music, the medley, the designing and the editing was done by the teams themselves.

**Wildlife photography workshop**

**Date:** 3/10/2020

**Name of Guest - Mr. Raghav Gupta**


Photography and Moviemaking Club in collaboration with Career and Placement Cell conducted a wildlife photography workshop with Mr. Raghav Gupta, who is not only in the field of photography but is also an IRS officer who cracked the prestigious CSE(2011) with AIR 102! He started the workshop with some technical terms related to photography which he would use to describe details relating to his own photographs. He taught us how to capture photographs of various birds and animals

from across the country. He showed several examples of his own photography and discussed in detail how he captured it in both a technical sense and also gave the geographical background and biodiversity-related insight. He fielded questions relating to equipment and technique from the participants. This workshop was attended by more than 40 students, and this workshop was also streamed live on the "Perception IIT Mandi" channel on youtube.

**Diwali photography competition**

**Date: 13/11/2020**

A photography event allowing all to showcase their customs and traditions at the festival of lights. This event is an annual tradition of the PMC. This year it was judged by Dr. Timothy Gonsalves.



**Advanced Photography Workshop**

**Date: 16/01/2021**

**Mentor: Jassi Oberai**

The club organized an advanced photography workshop taken by Jassi Oberai who is an esteemed travel photographer. His workshop covered landscape and portrait photography. He shared several of his photographic works and talked about how he captured each one. He spoke extensively about the psychology behind clicking a photograph in a world that has digressed to snap-shooting culture. His work has spanned continents and he has through his photography told stories from around the country. The session was attended by 30 participants and was highly interactive.

**LUMOS**

Lumos was one of the only sessions this year that took place on campus. It gave a chance to club members to work with club equipment and garner more knowledge about photography. It took place over 2 days and was conducted in a manner which adhered to social distancing measures to ensure safety. There was a free flow of knowledge and expertise and it aimed to make sure that the club is able to continue with a strong foundation of technique and skill.

**DAY 1 (Light Painting and Steel Wool):**

The club members practiced steel wool burning photography which is done post sunset. It is a long exposure photography that captures the sparks from the burning steel wool which is held by the subject of the picture. Light painting with plastic tubes was also practiced. The plastic tubes have unique colours which when rotated in long exposure form aesthetically pleasing patterns. Light painting is also done in the dark.

**DAY 2 (Portrait photography):** Portrait photography was conducted in the PMC studio and was an attempt at capturing low-key portraits using light and expression. Club Members played both models and photographers and understood better the art of studio photography.

**Inez-Himachal Showreel**

Inez means "Pure" and "Holy" and that is what the Land of Gods, Devbhumi Himachal is all about. It is a compilation of some of the most breathtaking places in Dharamshala and Chamba. Consisting of beautifully captured shots arranged in a manner that depicts the stunning beauty of the state. The video was released on May 27, 2021 and is on the Perception Youtube channel.


**Nikon Street Photography Date: 25/02/21**

Street photography workshop by Nikon, to be conducted in online mode. Workshop was taken by Yusuf Kathawala. It was streamed live on our youtube channel. (Perception IIT Mandi)

**IIT Goa Photography Contest**

Winner Second Place: Tushar Tyagi

Theme: Diwali Night Photography Competition

Detailed descriptions about event/activity with no. of participants, name of guest, photographs (mandatory), end with short summary-(Font style-Times New Roman, Size-12, Format-Justify, Unbold).

**Breakout 2.0**

Participation in Comedy Bliss

(Standup comedy event of IITH)

Date: 14 February 2021

The club participated in Standup Comedy Event organized by IIT Hyderabad for IIT BHU, IIT Goa, IIT Mandi, IIT Hyderabad.

Participants - Devansh Kochar, Bhumanyu Goyal.

This was the club's first step into the genre of comedy. The event was a quite new and amazing experience for the club as it opened a new dimension to work on!

## Teacher's Day Timelapse Painting

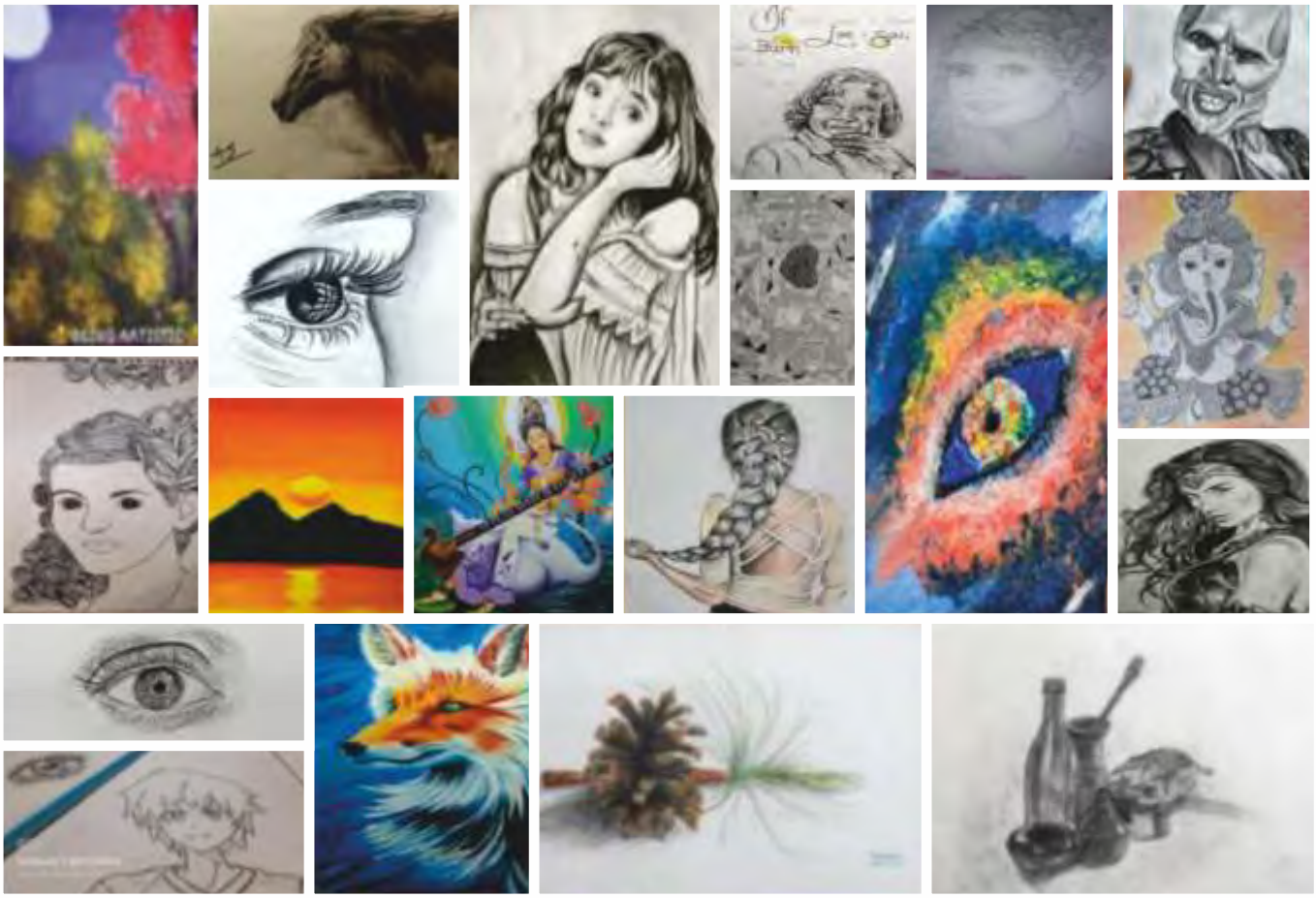
### 13th September

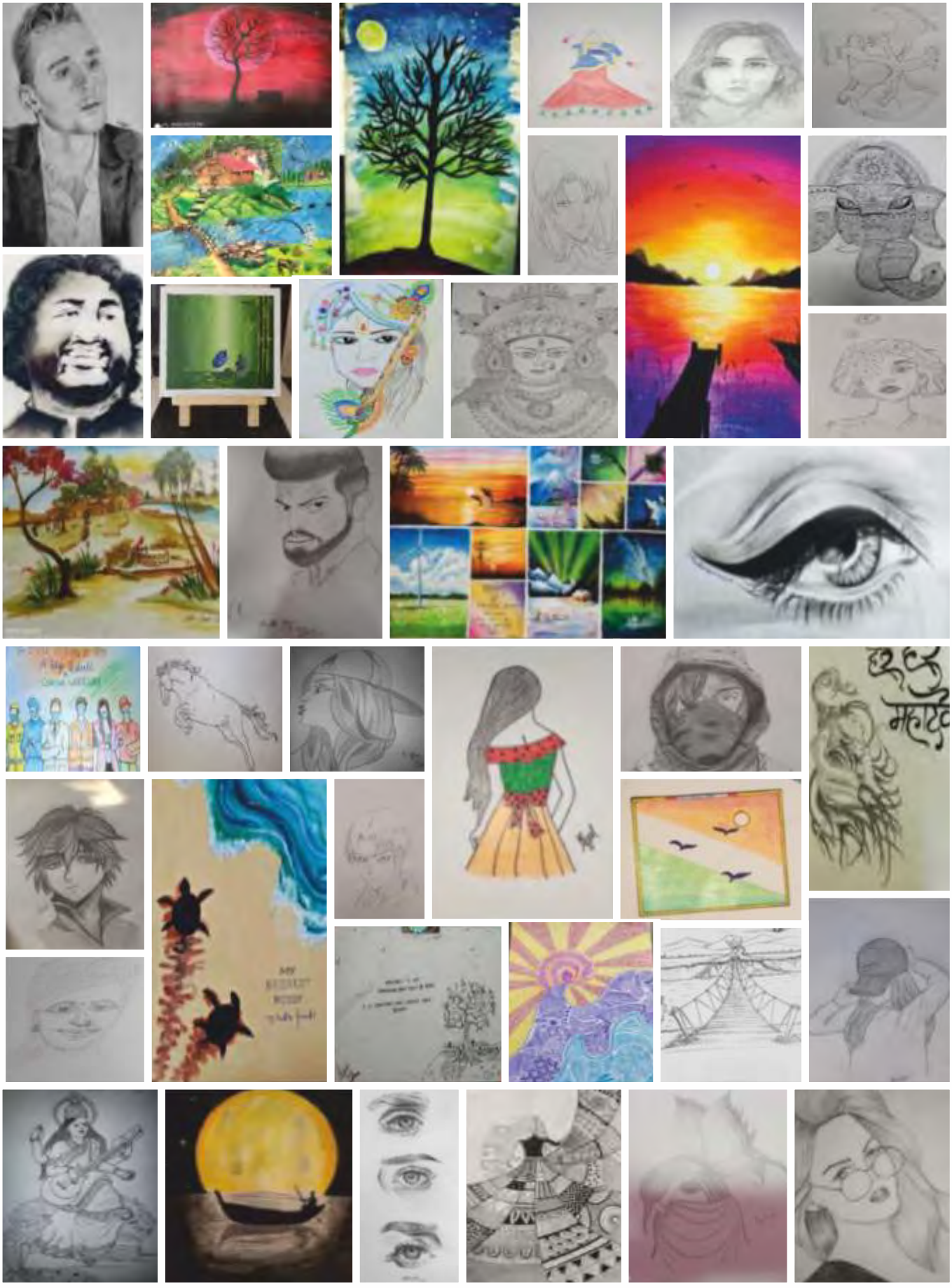
The club members brainstormed ideas to celebrate Teachers Day in an artistic manner. Collages and video compilations were thought of and the end idea was decided to be a timelapse of the painting of the college. Pictures of the campus were shared by the core team of 10 members, and Sonali was given the task of working on the painting. Sonali was helped by the core members in working on the painting with painting know-how and tips. The short event was fun and helped the members know each other in a more personal manner.

## Art Showcase

Jan- March

Throughout the months of January to March, all new club members were actively pushed to hone their skills, and showcase their artwork. Help and support was given to members with the interest to learn. Various artworks of different types were seen.





**Women's Day Poster Making Competition (09-03-2021)**

In this event, Designauts collaborated with IEEE to host a poster making competition on the theme, Indian Women in STEM.

# LITERARY SOCIETY

**Advisor and Co-advisor:** Dr. Surya Prakash and Dr. Neha Kaushik
**Name of Secretary:** Shikha Chaudhary
**Name of all club coordinators & co-coordinators:**
**1- Writing Club**
V Madhumita (Coordinator)
Ridhi Ratan (Coordinator)
**2- Debating club**
Yuvraj Singh Bishnoi(coordinator)
Devansh Kochar(Coordinator)
**3- Quizzing Club**
Anwesh Das (Coordinator)
Raman Soni(Coordinator)


**Participation in Rostra (Literary Fest BIT Mesra)**
Date: 26th - 28th March 2021
Rostra is the annual Literary Festival of BIT Mesra. Three teams from the literary Society (Writing and debating club) of IIT Mandi had participated in Rostra and had performed wonderfully well in the events they participated in. Of the 7 events they had participated in, they won medals in 6 events. They also bagged both the gold and silver medals in the overarching championship.

**Achievements in Rostra'21**
**Participation in Steller 2021 - Tape A Tale**
Date: 14th January 2021
Steller is an yearly event organized by Tape A Tale, in collaboration with some interested colleges all across the country, to search for the best story teller. The literary society of IIT Mandi along with writing club organized a preliminary event, and selected the top 10 participants to represent the college in the first round of Steller 2021. The best performer from among these 10 participants was selected to move on to round 2 of Steller 2021, which was an inter-college competition.

**Participation in Sweven (Literary Fest NIT Andhra pradesh)**
Sweven is the annual Literary Festival of NIT Andhra Pradesh. We are going to represent our literary society in NIT's Ap fest. The fest is going to be conducted from 25th - 27th june. The events for which we are preparing are - Recon , MUN and model parliament, creative writing.
Hindi Sahitya Quiz: Date- 29/02/2020
This event was the concluding event of Hindi Pakhwada 2020. This solo participation event contained questions about popular Hindi literature and other Hindi media. This was a single-round quiz.
Hindi week writeups- Hindi pakhwada is celebrated from 14 sept-28 September & 7 writeups were posted on social media page alternatively on this occasion.

**Poetry Night: Date - 18th February**
A gathering of poets is always a treat for the mind. After witnessing such enthusiastic participation in all the editions of Voice Your Thoughts, we wanted to bring together all those amazing poets and hear them perform their works. From introspection to love, from tragedy to light-hearted humour, from joy to loneliness, 20 participants presented their poetry and transformed words into perspectives. Club, and was a friendly face-off between the two clubs. A prompt for script writing

was released every week and the writers wrote their scripts and challenged actors from the Drama Club to act it out. The actors posted their acts and challenged more writers for the next prompt and this cycle continued for the entire month. The scripts were posted on the social media handles of Literary Society.

**Gandhigiri**

**Date- 4 october**

Gandhigiri was a debating competition. In the event both the teams were given a situation. And then there was a riddle round in which they had to solve the riddle. The team which solved the riddle first was given the advantage of choosing their stand on the topic. The topics were such that one can either solve them by gandhian ways of non-violence and forgiveness or by violent and unethical ways. 8 teams each having 3 members participated in the event. Initial rounds were judged by club coordinators and former coordinators. The Final round was judged by Prof. Devika Sethi.

**Should there be privatisation of Public Sectors**

In view of the recent happenings, debating club organised a debate on whether there should be privatisation of PSUs or not. The event took place on google meet, there were diverse opinions among students and the debate was quite informative. The host and Judge of the event was Mr. Vaibhav Sharma, a 4th year student and club mentor. He also shared many points on the issue.

Session Recording: https://drive.google.com/file/d/1CdFQkM2I4ddO PWfgpB7hxEGivE21xDS9/view?usp=sharing

**Should there be Uniform Civil Code**

Uniform Civil Code has been an important issue since the independence of our country. Many people are of the view that there should be same governing laws for all religions in their personal matters such as marriage, divorce, inheritance etc. But many also believe that Uniform Civil Code will affect the diversity of our country. After a long debate in constituent assembly, our constitution makers came up with article 44, which is listed in the Directive principles of state policy, which says that the state shall endeavour to secure a Uniform Civil Code. All these things were discussed before the debate started. Naman Tayal (former coordinator of club) was judge of this event.

**Was lockdown in India worth it**

The COVID pandemic affected lives of millions of people and it was spreading very fast in India also. Our government imposed a very strict nation-wide lockdown. But many say that lockdown was not the correct solution and many also believes that lockdown was necessary to build the health infrastructure.

The debate was only for core club members and there was no prize in this debate. There were two teams one in the favour of lockdown and other was opposing it. Both the teams stated their views and then they gave reasons for their views. There was no judge in this debate, the club members themselves made teams and then conducted this debate.

**Webinar – Governance in India and Ideological shift in Policies**

The Debating club invited former Coal and School Education secretary of India, Mr. Anil Swarup (IAS retd.) for a session on governance in India and the ideological shift in policies of our country over the years. Mr. Swarup first told us about what kind of policies were there during different governments and then he explained us that why we need to shift our policies in order to achieve a high growth both economically and socially. He also shared his experiences of working with government at different levels. The session was attended by more than 80 students. At the end of

his session, he took questions form students and there were many students who were curious to know many things about the government policies. It was around 1hour long session. He also shared about this event on his official twitter handle.
Session Recording: https://drive.google.com/file/d/1rcXSttRrak7lKJh9FNAW1bVB_ffvpkpIO/view?usp=sharing

**Other Developments**
Vivaan'21- The annual literary magazine of IIT Mandi ,could not be released in the last 2 session due to certain logistics issues. After a lot of delays and discussions with the coordinators and the last 2 secretaries, we combined Vivaan'19, Vivaan'20 and Vivaan'21. The designing is complete and the compilation part is pending.

## 9.1 SPORTS SOCIETY

**Name of Society:** Sports Society'

**Name of Secretary:** Aakash Maurya

**Name of Society Advisor and Co-advisor:** Dr. Shyamashree Dasgupta (Sports Advisor) and **Dr. Rahul Shreshtha**

(Sports Co-advisor)

**Name of respective clubs:** Mountain Biking Club.

**Clubs Advisor:** Dr. Adarsh Patel (Mountain Biking Club Advisor)

Name of all activity coordinators & co-coordinators

1. Sahil Sharma (Overall Coordinator, PG Men)
2. Yati Aggarwal (Overall Coordinator, PG Women)
3. Rajan Garhwal (Overall Coordinator, UG Men)
4. Rashika Rathi (Overall Coordinator, PG Women)
5. Utkarsh Jain (Web Coordinator)
6. Sagar Kumar (Content Coordinator)
7. C.Giri Varshith (Game Coordinator, Basketball Men)
8. Pooja Patidar (Game Coordinator, Volleyball Women)
9. Srishti Ginjala (Game Coordinator, Badminton Women)
10. Princi Gupta (Game Coordinator, Lawn Tennis Women)
11. Solai Adithya A (Game Coordinator, Table Tennis Men)
12. Naveen Khangrawat (Game Coordinator, Cricket)
13. Rohan Nuka (Game Coordinator, Badminton Men)
14. Pragyanshu Chaudhary (Game Coordinator, Chess)
15. Akshay Kumar (Game Coordinator, Athletics Men)
16. Niveditha N (Game Coordinator, Athletics Women)
17. Shaik Mohammad Shoeb (Game Coordinator, Volleyball Men)
18. Mukul Dhiman (Game Coordinator, Weightlifting)
19. Akanksha Sinha (Game Coordinator, Basketball Women)
20. Divyasheel Kumar (Game Coordinator, Football)
21. Anooshka Bajaj (Game Coordinator, Table Tennis Women)
22. Shrawan Sundesha (Game Coordinator, Hockey)

23. Yatharth Mogra (Game Coordinator, Lawn Tennis Men)
24. Atul Jain (Coordinator, Mountain Biking Club)
25. Abhishek Kulhadiya (Co-coordinator, Mountain Biking Club)

**Intra-college Friendly Tournaments**

**Date: 1 November - 13 December 2020**

Friendly Tournaments for Cricket, Football, Volleyball, Badminton, Table Tennis were held for students, staff and faculties on campus during November and December. During that time, less than one-quarter of the whole IIT Mandi Community was present on campus and was placed under several restrictions due to the COVID-19 pandemic. The students present mostly belonged to Post-Graduates and Research scholars. These tournaments helped the participants to become physically active and mentally fit during the lockdown-like situation. A total of more than 100 participants participated in all tournaments combined.

More participation in campus sports activities was seen from PG students and Staff/Faculties due to their majority on campus during the tournaments. The competitions were intense, and the differences between winners and runner-ups were small. Such exclusive contests promote the participation of PG in sports activities.

**Online Chess Tournaments**

**Dates: 12 November 2020, 2-3 January 2021**

A total of 3 different online chess tournaments were conducted during the tenure. These tournaments were open for the entire IIT Mandi Community. The tournaments were conducted on an online chess platform called "LiChess" and followed the Swiss format rules. Each tournament was different in terms of its rating and tournament structure. Participants were matched according to their platform profiles and availability during the dedicated game window. The leaderboard was generated after the game window expires and winners were declared.

The first tournament was Blitz (5+0) rating and was conducted on 12$^{th}$ November 2020. The second tournament was Rapid (10+0) rating and was conducted on 2 and 3 January 2021. A total of about 55 and 65 participants, respectively, were observed.

**Kamand Premier League Season 2, Cricket**

**Date: 30 January - 7 March 2021**

An auction-based intra-college tournament for cricket was held for students, staff and faculties on campus. Since auctions were done to make teams, the teams formed were diverse and players irrespective of their student program, staff or faculty stature participants played, keeping the spirit of the game up front. Such an auction-based tournament for sports was held for the first time and was a major success. Even in the COVID-19 pandemic arose lockdown-like situation with more than half of the IIT Mandi Community being at their homes, the tournaments were intense and spectacular to watch. The tournament scores were streamed live on the "Cricheroes" app and website, with a total of 16,796 views for the tournament on the website/app. We could also find sponsorships for players jerseys, trophies and mementos. We invited Dr. Rahul Shrestha (Sports Co-Advisor) and members from the IIT Mandi Catalyst (Sponsors) as guests of honour in the closing ceremony. A total of more than 75 participants played the tournament, and more than 150 registered for the action. This tournament was a huge success, given the restrictions we had during that time. We could hear people talking about it on the campus and witnessed people who watched the matches live/ on the app and supported their teams. It helped to find the best players

of the college and inculcate the habit of learning from teammates in a highly competitive environment.

Half-century Ride - 20 March 2021: It was the longest ride of the session. There were 12 riders along with a faculty member (Arnav sir ) who participated in this ride. We go by road from North campus to love the cafe, then do off-road riding from love cafe to Arneher. It was the most adventurous ride, which performs by using an off-road route. The total distance covered was approx. 50 km.

## RESEARCH SOCIETY

**Dean Academic:** Prof. Pradeep Parameswaran

**Associate Dean Research:** Dr. Rahul Vaish

**Research Secretary:** Pawan Kumar Mandal

**Members of Research Council:**

| Name | Roll Number | School | Course |
|---|---|---|---|
| Sai Sushma P | S19012 | SCEE | MS |
| Aryan Bhambu | V19059 | SBS | M.Sc. |
| Shivam Gujral | D17026 | SCEE | Ph.D. |
| Gokul Krishna | D19001 | SE | Ph.D. |
| Pawan Kumar Mandal | D17044 | SBS | Ph.D. |
| Abhishek Singh | T19050 | SE | M.Tech. |
| Manvendra Singh | T19138 | SCEE | M.Tech. |
| Sour abh Garg | D16084 | SBS | Ph.D. |
| Aman Mishra | D18067 | SHSS | Ph.D. |
| P. Vineeth. Daniel | D16075 | SBS | Ph.D. |
| Arman Khan | T20009 | SE | M.Tech. |

| S.No | Club Name | Club Coordinator/'s | Club Advisors |
|---|---|---|---|
| 1. | IEEE Student Branch Chapter | ○ Manish Sharma<br>○ Jahnvi Gupta | Dr. Amit Kumar Singha |
| 2. | ACM | ○ Kartik Kathuria<br>○ Vyom Goel<br>○ Kiarav Bansal | Dr. Manas Thakur |
| 3. | ACM-W | ○ Nishita Sharma<br>○ Ruchika Sharan | Dr. Sreelakshmi Manjunath |
| 4. | SCRI | ○ Manoj Kumar<br>○ Apoorav Singh Deo | Dr. Aniruddha Chakraborty |

## IEEE Student Branch Chapter Club Details

| Club Name | Faculty Advisor Name | Chairperson | Vice Chairperson | Secretary | Treasurer |
|---|---|---|---|---|---|
| IEEE Student Branch | Dr. Amit Kumar Singha | Manish Sharma | Jahnvi Gupta | Tushika Singh | Siddhant Kumar |
| IEEE SIGHT Group | Dr. Bharat Singh Rajpurohit | Venkata Aditya Duggaraju | Sachin Chauhan | Utkarsha | Sanjana K |
| IEEE PELS-IES Society | Dr. Moumita Das | Siddhant kumar | Mohsin Asad | Garima Chahar | Venkata Aditya Duggaraju |
| IEEE WiE Affinity Group | Dr. Renu M Rameshan | Tushika Singh | Niveditha N | Kratika Gupta | Harnaman Kaur |
| IEEE IAS -PES Society | Dr. Bharat Singh Rajpurohit | Sachin Chauhan | Deepshikha Panda | Anuj Kumar Rao | Jaswant Singh |
| IEEE RAS Society | Dr. Tushar Jain | Divanshu Gupta | Ankit Karan | Diksha | Abhishek Dhyani |

## ACM and ACM-W Student Chapter

**Name of all Clubs Advisor:**

- ACM Chapter: Dr. Manas Thakur
- KamandPrompt and ACM-W Chapter: Dr. Sreelaksmi Manjunath
- ACM Chapter Coordinators Coordinators:
- Kartik Kathuria
- Vyom Goel
- Kiarav Bansal
- ACM-W Chapter Coordinators:
- Nishita Sharma
- Ruchika Sharan

## S.C.R.I.

**Name of Faculty Advisor: Dr. Aniruddha Chakraborty**

- Coordinator & Co-Coordinators:
- Mr. Manoj Kumar
- Mr. Apoorav Singh Deo

A Talk on Accelerating Social Innovations through Humanitarian Engineering Date: 26/03/2021

Guest Speaker: Mr. Sampathkumar Veeraraghavan, IEEE HAC 2021 chair, Past chair IEEE SIGHT

The talk began with the speaker giving a glimpse about the 17 sustainable development goals that aim to address pressing global challenges. After explaining the interconnectivity of thegoals, the necessity to address them, etc. the speaker then emphasized the challenges that are faced commonly at the global level to the sustainable development program. With the help of a few statistics, the magnitude of these issues to be addressed was explained in detail. Talking about the

need to solve these issues, the speaker then introduced to the audience the theory of Humanitarian engineering which is an interconnection of science, engineering and society. Citing a few examples of his personal journey as an IEEE humanitarian volunteer as a student, the speaker explained the opportunities that were present for engineers if they were to take up addressing the sustainable development challenges. After giving the introduction, the speaker then moved on to introducing IEEE HAC/SIGHT to the audience. The role of HAC in IEEE framework, how it helps fulfil the IEEE goals was explained. The speaker laid emphasis on the benefits than an IEEE SIGHT volunteer could enjoy both personally and professionally when involved. An overview about the IEEE SIGHT group was presented through membership statistics and proposal funding statistics. The speaker then swiftly moved on to explaining about the HAC/SIGHT projects in detail which included the information of funding, type of project, etc. The author presented a few of the past SIGHT funded projects to enlighten the audience the kinds of proposals that could be funded using SIGHT. The speaker gave light about the special initiative-COVID projects program. The information about the SIGHT resources for the volunteers was provided by the speaker. With the session coming to an end, it was open for Q&A;  A. The audience actively involved in getting their queries addressed by the speaker regarding proposals, funding etc. The session was interactive, full of information and received a good feedback from the audience.

**No. of attendees in this session: 55**

**Venue: Virtual**

**IEEE Lecture "How to Write Thesis and Research Paper" PELS Day Celebration**

**Date: 20/06/2020**

**Speaker:** Prof. Ramesh Oruganti (Singapore): On the occasion of IEEE PELS day celebration, we have organized a IEEE PELS lecture delivered by Prof. Ramesh Oruganti, visiting professor Indian Institute of Technology Mandi, Himachal Pradesh, India. He has delivered the lecture titled "How to Write Thesis and Research Paper". As the final year students are moving towards their graduation and since in the present scenario of Covid-19 graduating students are out of the campus and facing hard days for writing thesis at their places. Therefore, IEEE PELS SB Chapter IIT Mandi has organized an IEEE PELS Lecture on the occasion on PELS Day (June 20) IEEE Student Branch

Chapter Indian Institute of Technology Mandi, India conducted an IEEE PELS Lecture (Webinar) on "How to Write Thesis and Research Paper" to celebrate the IEEE PELS Day 2020, June 20th, 2020, at 11:00 am- 01:00 pm. The webinar was delivered by Professor Ramesh Oruganti. It was broadcasted (from A-1, NKN, IIT Mandi) through the "Cisco Webex" virtual meeting platform.

**No. of attendees: 50 (Online) 13 (offline)**

IEEE PELS Distinguished Lecture: Wireless Grid Integration of EVs for V2G Application PELS Day Celebration

**Date: 22/06/2020**

**Speaker: Prof. Udava Kumara Madawala (University of Auckland, Auckland, NZ)**

**Venue: Virtual**

IEEE Student Branch Chapter Indian Institute of Technology Mandi, India conducted a Webinar on "Distinguished Lecture on Wireless Grid Integration of EVs for V2G Applications" to celebrate the IEEE PELS Day 2020, June 22th, 2020, at 10:00 am. The webinar was delivered by Professor Udaya Kumara Madawala from University of Auckland, Auckland, New Zealand, Fellow IEEE. It was broadcasted (from SC, NKN, IIT Mandi) through the "Cisco Webex" virtual meeting platform. About the Speaker: Dr. Madawala is a Distinguished Lecturer of the IEEE Power Electronic Society, and has more than 30 years of both industry and research experience in the fields of power electronics and energy. He has served both the IEEE Power Electronics and Industrial Electronics Societies in numerous roles, relating to conferences, technical committees, and chapter activities. He is currently an Associate Editor for the IEEE Transactions on Power Electronics, and a Member of the Sustainable Energy Systems Technical Committee and the Oceania Liaison Chair of Membership Development Committee of the IEEE Power Electronics Society.

**No. of attendees: 78 (Virtually: 71, in person: 7)**

**IEEE IES Distinguished Lecture on Smart Microgrid Management**

**Date: 21/09/2020**

**Speaker: Prof. Mo-Yuen Chow (North Carolina State University, North Carolina, USA)**

**Venue: A1- NKN, IIT Mandi**

**Online Platform: Cisco WebEx**

On 21st September 2020, We organized an IEEE PELS-IES DL delivered by Professor Mo-Yuen

Chow, IEEE Fellow, North Carolina State University, North Carolina, USA. He delivered the DL on the topic Smart Microgrid Management. Smart Microgrids are known as a powerful platform for exploiting the Electrical Energy Storage Systems (EESSs). On the other hand, the Energy Efficiency Programs (EEPs) are recognized as an integral and highly valuable element of smart MGs investments and operations. About the Speaker: Prof. Chow earned his degree in Electrical and Computer Engineering from the University of Wisconsin-Madison (B.S., 1982); and Cornell University (M. Eng., 1983; Ph.D., 1987). Upon completion of his Ph.D. degree, Dr. Chow joined the Department of Electrical and Computer Engineering at North Carolina State University as an Assistant Professor. He became an Associate Professor in 1993, and a Professor since 1999. Dr. Chow is a Changjiang Scholar and a Visiting Professor at Zhejiang University. He worked in the U.S. Army, TACOM TARDEC Division as a Senior Research Scientist during the summer of 2003. He spent his sabbatical leave as a Visiting Scientist in 1995 in ABB Automated Distribution Division. **No. of attendees: 44 (online) 10 (Offline)**

IEEE PELS Distinguished Lecture on Model predictive control in power electronics: a critical review and recent industrial products

**Date: 11/03/2021**

**Speaker: Professor Tobias Geyer, (ABB Corporate Research, Switzerland, and Stellenbosch University, South Africa)**

IEEE Student Branch Chapter Indian Institute of Technology Mandi, India conducted a webinar on Distinguished Lecture on "Model predictive control in power electronics: a critical review and recent industrial products" on 11th March, 2021. The one hour and 15 minutes long DL started at 12:00 noon. The webinar was delivered by Professor Tobias Geyer, ABB Corporate Research, Switzerland, and Stellenbosch University, South Africa. It was broadcasted from (A1 NKN, IIT Mandi) through the “Cisco WebEx” virtual meeting platform. About the Speaker Prof. Tobias Geyer (M’08 - SM’10) received the Dipl.-Ing. and Ph.D. degrees in electrical engineering from ETH Zurich, Zurich, Switzerland, in 2000 and 2005, respectively, and the Habilitation degree in power electronics from ETH Zurich, Zurich, Switzerland, in 2017. He is currently a Senior Principal Scientist for power conversion control at ABB’s Corporate Research Centre, Baden-Dättwil, Switzerland. He was appointed as an extraordinary Professor at Stellenbosch University, Stellenbosch, South Africa, from 2017 to 2020. **No. of attendees: 56 (44 online and 12 on venue)**

**IEEE Lecture on Disruption in Transport Sector**

**Speaker: Prof. K. N. Srivastava**

IEEE Student Branch Chapter Indian Institute of Technology Mandi, India conducted a Webinar on “Disruption in Transport Sector” on March 30th, 2020, at 17:00 hrs. The webinar was delivered by, Prof. K. N. Srivastava. It was broadcasted (from A1, NKN, IIT Mandi) through the “Cisco Webex” virtual meeting platform. About Speaker Prof. Kailash Srivastava, is a power system professional turned academician with well-rounded experience of 36+ years ranging from top multinational company in Europe to top educational institutions in Europe and Asia. Kailash is a Swedish national and now dedicated to higher education quality enhancement through his accumulated experience and out-of-box ideas. Kailash's global perspective on academia, industry, technology and society enables him spot opportunities to effectively improve the system. Specialties: Research, Technology Disruption, Strategic Planning, Higher Education, Consulting, Innovative Education Systems Design, Strategic Cost Management, Mentoring, Coaching, Power Systems, Modelling, Simulation, Delivering presentations that sticks.**No. of attendees: 25**

IEEE Professional Lecture on “A Journey from Academia to industry-Date 27/03/2021

**Speaker: Dr. Jyotirmoy Ghosh (Lead Design Engineer, NXP)**

IEEE PELS Student Branch Chapter Indian Institute of Technology Mandi, India conducted a Webinar on "A Journey from Academia to Industry" on March 27th, 2020, at 10:00 hrs in collaboration with IEEE IAS SBC IIT Mandi. The webinar was delivered by Dr. Jyotirmoy Ghosh. It was broadcasted (from A1, NKN, IIT Mandi) through the "Cisco Webex" virtual meeting platform. About the Speaker: Dr. Jyotirmoy Gosh received his B.E. degree in Electrical Engineering from Jadavpur University Kolkata, in 2005. He Completed M.S. (By Research) and Ph.D. from Indian Institute of Technology Kharagpur, in 2009 and 2019, respectively. Dr. Ghosh was involved in different research projects on analog VLSI, Power Management IC, Switched-Mode Power Supply (SMPS). Dr. Ghosh joined Freescale semiconductor as Senior Analog Design Engineer in 2014. Presently portable Power Management in NXP Semiconductor. **No. of attendees: 55**

IEEE Professional Lecture: "Career Mould"-Date 27/03/2021

**Speaker: Prof. Ravindra Arora (Senior Life Member, IEEE) Venue: A1-NKN, IIT Mandi**

IEEE PELS Student Branch Chapter Indian Institute of Technology Mandi, India conducted a Webinar on "Career Mould" on March 27th, 2020, at 12:00 hrs. in collaboration with IEEE IAS SBC IIT Mandi. The webinar was delivered by, Prof. Ravindra Arora (Senior Life Member, IEEE). It was broadcasted (from A1, NKN, IIT Mandi) through the "Cisco Webex" virtual meeting platform. About the Speaker Dr. Ravindra Arora, Professor Dr.-Ing. (Technical University, Dresden, Germany). Dr. Ravindra Arora obtained his Doctor- Ingenieur degree in Electrical Engineering from Technical University, Dresden, Germany in 1973. **No. of attendees: 55**

IEEE Professional Lecture on Career Opportunity in Academia and Research-Date 27/03/2021

**Speaker: Prof. Sri Niwas Singh (Fellow, IEEE)**

IEEE PELS Student Branch Chapter Indian Institute of Technology Mandi, India conducted a Webinar on "Career Opportunity in Academia and Research" on March 27th, 2020, at 15:30-16:30 hrs. in collaboration with IEEE IAS SBC IIT Mandi. The webinar was delivered by, Prof. Sri Niwas Singh (Fellow, IEEE). It was broadcasted (from A1, NKN, IIT Mandi) through the "Cisco Webex" virtual meeting platform. **No. of attendees : 40**

IEEE Professional Lecture on "Career Counselling and Job Opportunities"-Date 27/03/2021

**Speaker: Dr. Tomy Sebastian (IEEE IAS Past President)**

IEEE PELS Student Branch Chapter Indian Institute of Technology Mandi, India conducted a Webinar on "Career Counselling and Job Opportunities" on March 27th, 2020, at 17:30-18:30 hrs. in collaboration with IEEE IAS SBC IIT Mandi. The webinar was delivered by, Prof. Sri Niwas Singh (Fellow, IEEE). It was broadcasted (from SC, NKN, IIT Mandi) through the "Cisco Webex" virtual meeting platform. 13 About the Speaker Dr. Tomy Sebastian received th B.Sc (Eng.) degree from Regional Engineering college Calicut (presently NIT, Calicut), India, the M.S. degree from Indian Institute of Technology Madras, MA.Sc. and Ph.D. degrees from the University of Toronto, Canada, from 1979 to 1980, he was with the R&D center of KELTRON, Trivandrum, india, from 1987 to 1992. Dr. Sebastian has done extensive research in the area of permanent motor design and control issues and applications in steering systems. He has published over 45 technical articles and holds 25US patents. In 2003 he was elected as Fellow of IEEE. He served on the IEEE Industry Application Society Board during 2004-05 as the chair of the Industrial Power Conversion systems department. During 2008-09, he served as a distinguished Lecturer of IEEE Industry Application Society. **No. of attendees: 42**

**WiE Ideathon 2020-Date – 19th Dec. 2020**

WiE Affinity Group of IEEE SB Chapter IIT Mandi organized an Ideathon during 19-20 December, 2020. Due to the current pandemic, we all have to study online. This has its pros and cons. Even with ongoing classes, the education system of many schools and colleges continue to face multiple challenges in terms of the quality and delivery of education.

In this Ideathon, students in a group of 3 had to come up with an innovative tech-based solution that can bridge the gap and streamline the education system so that the learning can be more effective. The event started at 12 noon, 19 Dec, 2020 and lasted for 48 hours wherein participants had to come up with their solution on the topic- "Where education meets technology" showcasing it using a 2 min video and a presentation. They were compelled to think of some innovative ideas that can really be implemented in this new normal.

Around 24 students participated in this event. The core team members guided them throughout the event and provided necessary help whenever needed. The participants were very enthusiastic. They were made to think out of the box. They also learnt how to first analyse all the prospects of an idea before implementing it.

It was great to see such amazing ideas submitted by them.

**Women's day celebration-Date – 8th March 2021**

Women's Day serves to be one of the most important events celebrated worldwide. We didn't want to miss the chance to celebrate the wonderful day. Thus, WiE Affinity Group of IEEE SB Chapter IIT Mandi in collaboration with Women's cell IIT Mandi celebrated International Women's dayon 8 March, 2021. Due to the current pandemic it was held in hybrid mode (both in-person and online). The celebration saw various programs which included various cultural performances by females residing on the campus. It also had an amazing talk by a former college student and the Rani Gonsalves award recipient, Neha Muthiyan who gave an amazing talk encouraging all the females of the institute to do better and aim big.

The event also saw 2 Wie, IEEE speakers; one third-year undergraduate at the college, Miss Nishita Sharma and another college student studying in final year, Miss Manvi Gupta. Both had enriching talks which emphasized on the fact that nothing is impossible and cited examples from their own life where they discussed situations that they thought were hard to overcome but time gave them all courage to come back with better energy and enthusiasm.

The event witnessed a lightning talk by the chief guest Dr. Sharmila Mande, distinguished Chief Scientist, TCS Research.

The event was a great success and was highly appreciated.

**IEEE IAS-PES Distinguished Lecture on "Condition monitoring and fault diagnosis of electric machines" Speaker: Prof Jose A. Antonino-Date - 27/07/2020**

This was the very first event of its kind which organized to just resume the strength getting motivation even hit by this ongoing pandemic. So, IEEE IAS organised an IEEE IAS DL delivered by Prof. Jose A. Antonino-Daviu from Universitat Politecnica de Valencia, Valencia, Spain. He has delivered the DL on the topic of condition monitoring and fault diagnosis of electric machines. This topic is not just in a hot demand of the industries but also has a vital role in supporting the current infrastructure that depends mostly on the electrical machinery. So, we have to incorporate the ideas of monitoring and its fault diagnosis for machines to make an industry run without any discontinuity. **Number of attendees: 60 (Virtually: 50, in person: 10)**

**IEEE talk on "Cutting Edge Applications of undergraduate control"-Date - 7th November 2020**

IEEE RAS Student branch chapter, IIT Mandi organized an online talk on "cutting edge applications of undergraduate control" on 7th November 2020. The talk was delivered by Dr. Ramprasad Potluri, associate professor at IIT Kanpur. The talk began around 12 pm(IST) and lasted for 2 hrs with Q & A in between the talk. Following subtopics such as Path-tracking control of moon rover using kinematic-based methods, CSL and NCSL which is Control Systems Laboratory and its experiments that have already run 10 years continuously at IITK, built at less than a tenth of the cost of commercially-available experimental setups and page-separation-lifting-turning mechanism of a Automatic book copier was discussed in brief.

Around 35 students attended the talk virtually through CISCO Webex platform. All the questions of attendees were well answered within the duration of the talk. **No. of attendees: 35(Virtually: 32, in person: 3)**

**Date: 6-8 Feb 2021, Venue - Online**

IEEE Student Branch IIT Mandi collaborated with Society for Promotion of Electronics Culture (SPEC) NIT Hamirpur in organising a three days long Hackathon "Electrothon".

ELECTROTHON 3.0 was the third iteration of the annual Hackathon run by NIT Hamirpur's Team SPEC. Team SPEC was able to not only build and manage this goliath mission in the grueling time of the COVID-19 pandemic, but also perform it in online mode. The event was held from January 31st to February 7th. Pre-hackathon workshops and webinars were carried out on 31 January, 2nd, 3rd and 4 February, and the hackathon was held with more workshops and webinars interspersed between them from 7 to 8 February.

It received an overwhelming response from students across India, making the hackathon a great success.

**This year, the great event saw 44 sponsors, 1800+ registrations from around the globe, and 4 foreign teams, out of which 700 brilliant participants were shortlisted for the final Hackathon after the ideation process. Also, with great zest and enthusiasm, students attended every workshop and webinar. Under the guidance of our two diversity partners, Aspire For Her and The Girl Code, we have organized unique workshops and events to diversify our participants and provide a forum for girl coders to excel.**

There were more than 20 participants from IIT Mandi as well and two teams bagged prizes as well in different categories.

**CodeForces Challenge Winter 2020**

Codeforces is one of the best platforms for competitive coding and is usually known for its short challenges/contests where programmers from every corner of the world participate. The ACM Student Chapter along with the Programming Club conducted a CodeForces Challenge series from 02/11/2020 - 19/12/2020. The Challenge Series consisted of 6 code forces rounds. The rankings were calculated using the GP-15 ranking system.

**Hack30**

The Programming Club & ACM Student Chapter together organized a 30 Hours Hackathon named Hack30, in which teams have to work together on a general problem and develop a software solution for the same using various technologies. The theme of the problem statement was - Covid19 and Problems in Health, Education, and Lifestyle due to the pandemic.

**Time** - 28th Feb 4 pm to 1st March 10 pm

**The timeline** and problem statement are on this link.

We organized a fairly simple set of rules with an open style of submission. The focus was on driving ideas and trying out the framework rather than completed products.

Also, this was the first hackathon for the freshers, so coordinators, seniors, and alumni were active during the whole hackathon on Discord to discuss their ideas and help the teams in the implementation.

**Tezos & Frost Hack organized a workshop on the Basics of Blockchain.**


A workshop on Blockchain was organized by Tezos so that people could use Tezos and build products based on blockchain in Frosthack. This workshop turned out to be very effective for students who were new to Tezos and blockchain as we observed a very high number of submissions based on blockchain in Frosthack.

Prizes by Tezos: 25000 INR for building a Flutter Tezos Wallet App.Speaker - Soumya Ghosh Dastidar LinkedIn : https://www.linkedin.com/in/gdsoumya/

YouTube Livestream link : youtube.com/watch?v=k7ZqYKgDyUQ

Talk by Dr. Tom Crawford (University of Oxford) on "Using Math to Clean-up Our Oceans"

SCRI (Society for Collaborative Research and Innovation) IIT Mandi organized a virtual talk on "Using Math to Clean up our Ocean" by Dr. Tom Crawford on 15th January 2021. In this talk speaker tries to answer the following question:

**Dr. Tom Crawford, during his talk**

Tom is an Early Career Teaching and Outreach Fellow in Mathematics at St Edmund Hall and is also responsible for the teaching of Visiting Students.

Tom specialized in Applied Mathematics and completed his Ph.D. in Fluid Dynamics at the University of Cambridge under the supervision of Prof. Paul Linden. He obtained his undergraduate degree in Mathematics from Oxford in 2012 where he studied at St John's College.

Alongside his teaching commitments, Tom works closely with the outreach team at Teddy Hall and regularly gives talks in schools and universities across the UK. His award-winning website tomrocksmaths.com hosts videos, podcasts, puzzles and articles that aim to make mathematics entertaining and understandable to all. Tom works with several partners including the BBC and the Numberphile YouTube channel – the largest mathematics education channel on the platform with over 3.5-million subscribers.

During the talk, all SCRI core members were present virtually. Mr. Apoorav Singh Deo (SCRI Coordinator) started the session with a short introduction of Society for Collaborative Research and Innovation and its working. Dr. Syed Abbas (Associate Prof. SBS) introduced the speaker to the audience and gave a motivational speech about the usefulness of applied mathematics.

Talk by Dr. Sabrina Maniscalco (University of Helsinki) on "How Quantum Computing Will Change the World". Prof. Sabrina Maniscalco gave her talk on 26-02-2021. Prof. Sabrina Maniscalco is a professor of Theoretical Physics at University of Turku, Finland and also Adjunct Professor at Aalto University Finland. She has a lot of experience in communicating science in particular to a topic such as Quantum Mechanics and its applications. She had been invited to many institutes for talks on Quantum Systems and its applications.

She gave her talk on "HOW QUANTUM COMPUTING WILL CHANGE THE WORLD (AND HOW IT WILL NOT)". This talk was organized, keeping in mind the heterogeneity of the students attending the talk. This talk was aimed to introduce what Quantum Computing actually is and how it is going to affect the world around us. Dr. Hari Varma (Associate Professor at School of Basic Sciences, IIT Mandi) introduced the speaker to the audience, Nearly 70 listeners joined us on various platforms. After the end of the talk some related questions were answered.

Hands-on LaTeX workshop by Dr. D. Bijulal from Govt. Engineering College, Barton Hill, Thiruvananthapuram. SCRI IIT Mandi organized a hands-on LaTeX workshop on 13-03-2021. After a high demand from students, SCRI organized this workshop. There were two sessions in the workshop. SCRI members Manoj, Apoorav and Sahil were present during the workshop to handle any technical glitch. The workshop went smoothly and SCRI received great feedback from students. Here are some of the comments:

SCRI broadcasted this workshop live on YouTube and Webex. There were 182 students who had registered for the workshop. SCRI provided certificates to all those students who attended both the sessions of the workshop. SCRI will keep organizing these types of workshops in the future. The videos of the workshop are also available on the YouTube channel of SCRI. So far, SCRI received more than 1000 views for this worksop on our YouTube channel.

## 9.2 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". This reflects the essence of democratic living and upholds the need for selfless service. The overall objective of this scheme is Education and service to the community by the community.

**Advisor:** Dr. Sumit Sinha Ray

**Co-advisor:** Dr. Mahesh Reddy Gade

**Associating Staff:** Prateek Pathania (Junior Assistant-Students)

**151st Gandhi Jayanti Celebrations, Date: 26.09.2020 to 02.10.2020**

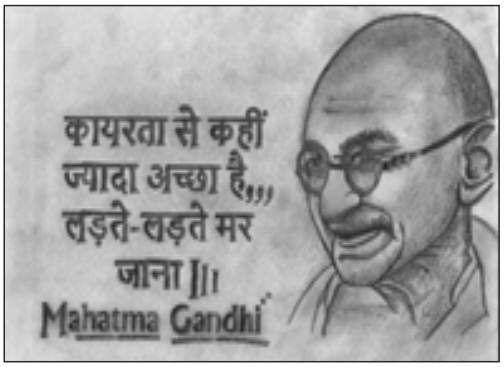
NSS unit IIT Mandi on the occasion of the 151st Birth Anniversary of Mahatma Gandhi organized several online events related to Gandhian history, philosophy, etc. All the events were conducted in a one-week time span. The Cultural Society and Literary Society of IIT Mandi conducted some events on the occasion of Gandhi Jayanti, in association with National Service Scheme (NSS), IIT Mandi. The events of the Literary Society were Quizzing Competition, Movie Screening and Writing Competition. The Cultural Society conducted Sketching and Photography Competition. Even though the events were conducted online mode, the students showed a huge amount of participation which made the competitions more exciting. The Quiz Competition (The Gandhi Quiz) was to test and enhance the knowledge about Gandhi Ji of the students. The students participated in teams as well as solo.

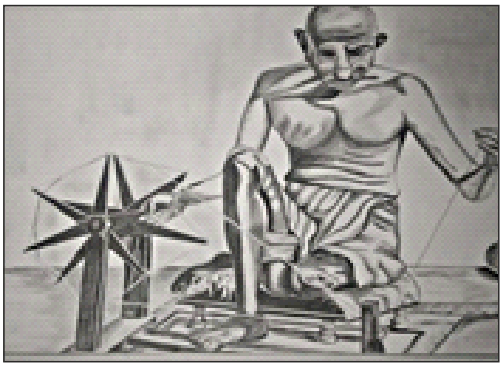
**Photography event:** The advent of 'Bapu' in the nationalist movement brought a revolution that shook foreign rule and inspired the entire country. So, amidst the ongoing online semester, Cultural society had outlined something interesting to organize for the occasion of Gandhi Jayanti. PMC organized a photography event this week on the theme: social issue. A lot of participation from the students was seen in the Photography competition. Every entry showed a different story which made the competition tough. The winning entries were:

**Movie Screening:** In between all these events there was a Movie Screening of the Oscar winning film "Gandhi(1982)". This screening was arranged for both the students who were present in the Campus as well as for those who are at their homes. This movie made all the students experience the life of Gandhi more closely. Students were also given an insight on how he led the nation for the freedom struggle and realized dreams of billions of Indians for "FREE INDIA", for which he happily sacrificed his entire life for this greater cause. He believed in social equality and always stressed on leading a simple yet noble life.

**Sketching Contest:** On the occasion of Gandhi Jayanti, an online sketching contest was organized with the theme- "On Thoughts of Mahatma Gandhi". A total of 10 entries were received over the week and the result was as follows:

The entries were judged by Dr. Tripti Singh, Assistant Professor PDPM



**Writing and quizzing competition:** Literary Society of IIT Mandi conducted some events on the occasion of Gandhi Jayanti, Quizzing competition -This event was part of Gandhi Jayanti week. Held on Dare2Compete. With teams of 2 members. This quiz had and two rounds, an elimination round with 8 teams progressing to the final round. Participants – 60.

## HIKING AND TREKKING CLUB

**Advisor:** Dr. Siddhartha Sarma

**Co-advisor:** Dr. Adarsh Patel

**Coordinator:** Rohit Kumar Bhamu

**Co-Coordinator:** Zaidan Bhat

**Co-Coordinator:** Mohit Kumar

**Reached 500 Instagram followers**

In March 2021, the Hiking and Trekking Club has built a dedicated social media team that maintains our social media handles and we have amassed more than 500 followers now.

## 9.3 GUIDANCE AND COUNSELING SERVICE (GCS)

Apart from the regular guidance sessions and facilitating counseling for students in need, the Guidance and Counseling Service (GCS) conducts various student outreach, wellness and motivation activities throughout the year. Activities conducted by the GCS during academic year 2020-21 are detailed below.

- **Open house for prospective undergraduate students, 11.10.2020**
- An online open house for prospective UG students was organized for the first time. 53 prospective candidates attended the open house. A team consisting of Deans, B.Tech. program faculty advisors, Chief warden, Career and Placement advisor, JEE Chair, and

student representatives answered queries about the admission process, course details of different B.Tech. programs, campus life, future prospects etc.

- **Admission help desk Induction program for First-year B.Tech. students November 2020.**
- The JEE (adv) and undergraduate admission schedule was disrupted due to the pandemic and the first-year students joined the Institute in November 2020. An online admission help-desk was set up GCS to guide students with admission formalities and queries related to the Institute. The help desk was managed by JS-GCS and 51 student volunteers. A seven-day Induction program was conducted for incoming undergraduate students from 21.11.2020 to 27.11.2020. About 50 faculty members mentored the first year B.Tech. students for English and Communication, Exploring Engineering and Soft skills.
- **Orientation programs for PG and Ph.D. students**
- Orientation program was organized for the incoming PG and Ph.D. students to introduce them to the academics, research and student life at IIT Mandi. Two such orientation programs were organized by GCS.

- Aug-Dec 2020 semester: For M.Sc./M.Tech./MA/MS/Ph.D./iPh.D. students on 15.9.2020
- Feb-June 2021 Semester: For MS/Ph.D. students, 13th to 17th Feb 2021.

The welcome function by Director and Deans and introduction to the program structure and familiarization with the research facilities by the School chairs and faculty mentors was followed by online sessions on different topics relevant for the scholars. These included sessions on Professional ethics and etiquette, Study hacks: Reading, Listening and Note taking, Presentation skills and public speaking, Art of internet surfing and Online tools, 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 as well as workshop by Teaching and Learning Committee.

- **Wellness and Mental health and Awareness Campaign**
- Yoga for wellness: One week Yoga camp in September 2020.
- Meditation session in collaboration with IIT Delhi: Number of online sessions held = 18.

## 9.4 CAREER AND PLACEMENT CELL

**Career and Placement Cell (CnPC)**

Career and Placement Cell (CnPC) help students to find suitable career for them by organizing various career and guidance sessions. The CnP Cell also conducts campus internship and placement drives in which companies from various domains participate and recruit interns and employees from IIT Mandi.

Career and Placement Cell organized the following Career Sessions in the academic year (April 2020 to March 2021)

- **Career session on preparation of GATE on 23rd April 2020:**
  Speaker: Mr.Tushar Aggarwal (B.Tech. 2019 batch) has secured AIR 13 in GATE 2020 in Civil Engineering.
- **Webinar on Placement Awareness on 19th July 2020:**
  Speaker: Akshat Srivastava (IIM Calcutta, IIT Kanpur alumnus, currently a part of Boston Consulting Group. He was also the Placement coordinator at IIM Calcutta.
- Webinar on How to plan for Civil Services Examination during Covid-19 on 30th July 2020:

The focus point for this session was UPSC exam-Specific insights like exam pattern, questions, and trend analysis, intelligent time management, and effective preparation tips during Covid-19, Tips and Tricks to prepare crisp notes and handle exam pressure. Speaker: Mr. Mukesh Jha (Senior Faculty at Byju's for Geography, Ecology, and Environment)

- **Webinar on Resume building on 7th August 2020:**

  Speaker: Mr. Rajeev Markanday (Hitbullseye)

- **Career Session on Non - Core Career Opportunities on 31st October 2020:** In this session covered aspects of the non-core opportunities considering the current competition and also answered the queries from the students.

  Speaker: Mr. Prateek Gauba is an alumnus of IIT Mandi who graduated in 2016 with a B.Tech. in Mechanical Engineering. He is currently working at Toppr as a product manager. He was awarded the gold medal by IIT Mandi Director and was also the student coordinator of Career and Placement Cell in his 3rd & 4th year of B.Tech.

- **Webinar on Group Discussions and Personal Interviews on 21st November 2020:**Topics covered in this session are Do's and Don'ts in GD and PI, Conventional and unconventional GD topics, Commonly asked HR round questions, Preparation for GD rounds and Personal Interviews

  Speaker: Mayank Chauhan - Mayank is currently a final year MBA student at IIM Ahmedabad. He received a PPO from his internship at Accenture Strategy and PPIs from Amazon and P&G.

- **All about GATE on 5th December 2020 by T.I.M.E. Pvt. Ltd.**

  Career in Civil Service on 13th December 2020: Highlights of the Workshop were: 1. Information about Civil Services of India. 2. Exposure to different fields in Civil Services.3. How Civil Services is a fulfilling job.4. Motivation to prepare for the exam.5.Q & A session with serving Civil Servant.

  Speaker: Dilkhush Meena (Mr. Dilkhush Meena has completed his B.Tech. in Electrical Engineering from IIT Indore. After completing his B.Tech. in 2015 he started his preparation for UPSC Civil Services Examination. He cleared the UPSC exam in 2019 and got Indian Administrative Service) Ruchika Bhardwaj (Eminent Faculty with NEXT IAS with vast experience of civil service examination coaching. Known for her presentation skills and mentoring civil service aspirants since 2006).

- **Technical talk on Bluetooth Low Energy Mesh Technology on 16th December 2020:**

  Speaker: Mr.Alok Mittal (Sr. Group Manager leading Bluetooth mesh technology from ST Microelectronics)

- **Talk on What a Biden Presidency likely means for Indian Students on 22nd December 2020:**

  Speakers: Team Galvanize

- **Webinar on Importance of Higher Education, Scientific, and Core Jobs by Veda Gate Academy on 15th February 2021:**

  Speaker: Sai Prasad Chowdary (Senior GM, BD Veda Gate Academy Pvt Ltd)

- **Webinar on Art of getting interviewed on 23rd February 2021:** Understand the particulars of the right ways of getting interviewing, importance of company research, presenting self, customizing the interview pitch as per the targeted role, art of asking questions.

  Speakers: Officials from Publicis Sapient

- **Webinar on Recent trends in Data and AI- Webinar on 26th February 2021:** A session on how to take a leap from Now to Next by sharing business insights from the corporate standpoint.

  A technical Guest lecture by Abhishek Kumar, Senior Manager Data Science at Publicis Sapient.

## ALUMNI AFFAIRS CELL

**Introduction:** Indian Institute of Technology (IIT) Mandi is now an Institute that has 1000+ alumni and this number will grow to larger proportions in the future. As the alumni are valued members of the Institute, it is important to engage them in Institute building activities.

**Mission:** The Mission of the Alumni Affairs Cell shall be:

- To contribute to the Institute's vision of being recognized among the world's leading institutions in academics, research, outreach, and innovation;
- To provide a vibrant forum that promotes interaction and networking among alumni of the Institute;
- To help alumni achieve their professional and societal goals;
- To facilitate the association of alumni with their Alma Mater;
- To function on a charitable basis, and to run the Affairs Cell on 'no profit no loss' basis;
- To create awareness about the Institute and its alumni in the public;
- To assist deserving students from socially and economically disadvantaged sections of the society; and
- To help alumni in their hour of need.

**Membership:** Graduate who has received degree awarded by the Institute is considered as alumna/alumnus/alumni of the Institute automatically.

### Alumni Chapters

| City | Name of Secretary |
|---|---|
| Bangalore | Mr. Chamundeswar |
| National Capital Region | Mr. Vivek Sharma |
| Hyderabad | Mr. Ayush Yadav |
| Mumbai | Mr. Ravi Kumar |

### Alumni engagement activities

| Webinar | Topic of the event | Date of the event | Name of Alumni | Graduated |
|---|---|---|---|---|
| College to Tech Giants-Journey after graduation | How to prepare for industry career and what are the current industry requirements? | 11.07.2020 | Himanshu Devan Moiz Ahmed Anand Dhandhania | 2014 |
| College to Tech Giants-Journey after graduation | How to prepare for industry career and what are the current industry requirements? | 03.10.2020 | Shiv Baishya | 2014 |
| Journey after graduation | How to prepare for industry career and what are the current industry requirements? | 08.11.2020 | Mohit Malhotra Saurabh Jain Divya Gandhi | 2013 |
| Ask me Anything | How to prepare for UPSC? | 25.07.2021 | Mohit Rawat | 2015 |

### Notable Alumni

| Name | Graduated Year | Roll No. | Achievement |
|---|---|---|---|
| Mohit Kumar Malhotra | 2013 | B09066 | Scientist-Defense Ministry of Govt. of India |
| Deepanshu Rastogi | 2013 | B09086 | Engineering Services Examination-2015, AIR – 58.Assistant Director in National Power Committee Division of Central Electricity Authority |
| Amanjot Kaur | 2013 | B09004 | Data Scientist in Rubicon Toronto Canada. |
| Dhirendera Kumar Singh | 2014 | B10057 | First Entrepreneur of IIT Mandi |
| Athar Aamir Khan | 2014 | B10055 | CSE 2015, AIR - 2 |
| Pradeep Seervi | 2015 | B11070 | Gate 2015, AIR - 1 |
| Shubham Ajmera | 2015 | B11035 | First IIT Mandi Student Placed At Google |
| Aditya Chauhan | 2015 | S12021 | Received Youngest Scientist Award |
| Anil Jhajharia | 2015 | B11003 | Assistant commissioner of Income Tax |
| Manish Ladla | 2015 | B11066 | Assistant Commissioner of Police, DANIPS service |
| Aman Agarwal | 2016 | B12110 | CAT 2015, 99.91% |
| Abhijit Sachdev | 2016 | S13004 | GATE, AIR – 99.7% |
| Aman Gupta | 2017 | B13106 | CEO,Apply Nordic,oslo Norway |
| Lalit Shakywal | 2017 | B13313 | Scientist B, Group A Officer, Government of India at DRDO |
| Raspreet Singh | 2017 | B13325 | 196th Rank UPSC -2020 |
| Dr. Navneet Chandra Verma | 2017 | D14009 | Inyas Award-2021 |
| Dr. Neha Sharma | 2018 | D12087 | Assistant Professor, IIIT Una |
| Dr. Shubit Kumar Jain | 2018 | D12070 | Assistant Professor, Mathematics, NIT Hamirpur |
| Dr. Thirumurugan C | 2019 | D11045 | Assistant Professor, Vellore Institute of Technology, Tamil Nadu |
| Divanshu Gupta | 2020 | T18133 | Assistant Professor, Punjab College of Technical Engineering |
| Dr. Shaifu Gupta | 2020 | D14002 | Assistant Professor, IIT Jammu |
| Dr. Indu Yadav | 2020 | D14030 | Assistant Professor, IIIT Una |
| Dr. Sandeep Kumar Shukla | 2020 | D14015 | Assistant Professor, Galgotias University, Noida |
| Dr. Abhilash Malayil | 2020 | D14007 | Assistant Professor, Department of Collegiate Education Government of Kerala |

## 9.5 WOMEN CELL

### IIT Outreach Program and Participation of Women Education Program

Faculties from IIT Mandi actively participate in various educational initiative for the empowerment of women activities.

International Women's Day was first time celebrated by the United Nations in the year 1975. International Women's Day is celebrated for the continuous effort and struggle we put forward to achieve gender equality and women's empowerment. On this occasion, women's center at IIT Mandi had organized an event on 8th March,2021. The chief guest Dr Sharmila Mande, Chief Scientist, TCS Research & Innovation. The program was in mixed mode as many of the students were at home due to the covid pandemic situation. Our two alumni, Rani Gonsalves Award, winner Damini Singhal (currently working in Microsoft, USA) and Neha Muthiyan (currently Software Engineer at Bloomberg, London) delivered an online talk to encourage the girls students for pursuing their dreams in higher education and employment. Taking leadership as challenge was the main emphasis of the program.

From the women center we have organized many online talks last year. One of them was by a young women entrepreneur from Bangalore, Dr. Ekta Chowdhury. This program was also attended by many students on the online platform. On the other regarding outreach, we have delivered many talks to different colleges.

## 10. MEDIA COVERAGE

### Media Outreach 2020-21

In the year 2021, there were approximately 253 print coverage, 713 online coverage and 30 electronic coverage for IIT-Mandi. Publications that have Covered IIT Mandi the Most include Hindustan Times, The Statesman, The Pioneer, Telangana Today, The Times of India – Education Time, The Economic Times, Deccan Herald, The Hans India, Dainik Jagran, The Tribune, Hindustan, The Hindu Business Line, The Financial Express, Mint, Education World, Western Times, Morning India and many more.

### Major Highlights

IIT-Mandi celebrated the 12th Foundation Day of IIT Mandi with Hon'ble Chief Minister of Himachal Pradesh Shri Jai Ram Thakur as the Chief Guest

Indian Institute of Technology Mandi began its journey in 2009 and has since progressed rapidly with many firsts and pioneering initiatives in engineering education, Research and Development (R&D), societal impact and international collaborations.

Indian Institute of Technology Mandi celebrated its 12th Foundation Day on 24th February 2021. Hon'ble Chief Minister of Himachal Pradesh, Shri Jai Ram Thakur graced the occasion as the Chief Guest in the esteemed presence of Shri Ram Swaroop Sharma, Member of Lok Sabha as the Guest of Honor.

Addressing the Institute during this grand occasion, Hon'ble Chief Minister of H.P. and Chief Guest of 12th Foundation Day at IIT Mandi, Shri Jai Ram Thakur said," I am honoured to be a part of the 12th Foundation Day celebration at IIT Mandi. I am glad our state is hosting one of the best minds of our country as faculty members and students at IIT Mandi. The Institute has made its mark in research, collaboration, and international linkages established over the past 12 years."

16 local media journalists from the publications including, Doordarshan, News18, PTI, Dainik Jagran, Punjab Kesari, Dainik Hindi Milap, Himachal Dastak, Divya Himachal, Dainik Savera, Jansatta, Aapka Faisla, Ajit Samachar, Dainik Tribune, ETV Bharat, Devbhoomi Mirror, and HP 24X7, attended the event

IIT Mandi researchers develop an anti-bacterial, self-cleaning material for Face Masks and PPE **Equipment - Dr. Amit Jaiswal**

Indian Institute of Technology Mandi researchers have developed a virus-filtering, self-cleaning and antibacterial material that can be used to make face masks and other PPE equipment. This path breaking development of Dr. Amit Jaiswal, Assistant Professor, School of Basic Sciences, IIT Mandi, along with his research scholars, Mr. Praveen Kumar, Mr. Shounak Roy, and Ms. Ankita Sarkar comes at a time in which it has become imperative to develop techniques to stop the second wave of the COVID-19 pandemic in the country. This news got a huge media attention.

**IIT Mandi researchers reveal the structure of NSP1 C-terminal region in isolation, a key protein in the COVID-19 virus in the host cell environment – Dr. Rajanish Giri**

A research team led by Dr. Rajanish Giri, Associate Professor, School of Basic Sciences, IIT Mandi, have discovered an important biomolecular mechanism for the formation of protein clusters/aggregates that are often seen in Alzheimer's disease. They have shown that signal peptide of the Amyloid Precursor Protein (APP) can co-aggregate with Amyloid beta peptide (Aß42). This Aß42, known for the pathogenesis of Alzheimer's disease, a most common form of dementia that slowly destroys memory and other important mental functions.

While proteins are essential for virtually every process within the cell, their disturbed functions due to aggregation and/or misfolding can result in harmful effects. There are more than 50 diseases that are associated with protein aggregation/misfolding. Alzheimer's disease, for example, is linked with the deposition of misfolded peptides called amyloid ß42 (Aß42) in the spaces between nerve cells. Aß42 is a peptide derived from full-length protein Amyloid Precursor Protein (APP).

Researchers from IIT Mandi, IIT Delhi and Yogi Vemana University develop leaf-like catalytic structures for solar-driven production of green hydrogen and ammonia – Dr. Venkata Krishnan

A multi-Institutional team from IIT Mandi, IIT Delhi and Yogi Vemana University have replicated the structure of the leaf in an inorganic catalyst to enable light-induced production of hydrogen and ammonia.

Results of their recent work, led by Dr. Venkata Krishnan, Associate Professor, School of Basic Sciences, IIT Mandi, have been published in the prestigious Journal of Materials Chemistry, in a paper co-authored by his research scholar Mr. Ashish Kumar from IIT Mandi, Dr. Saswata Bhattacharya and Mr. Manish Kumar from IIT Delhi, and Dr. Navakoteswara Rao, and Mr. M.V. Shankar from Yogi Vemana University, Andhra Pradesh.

**IIT Mandi develop Smart Road Monitoring System to prevent Accidents and Enhance Traffic Management – Dr. K. V. Uday**

Students and Faculty Innovators have developed a Smart Road Monitoring System to prevent accidents caused at sharp/ blind turns, causing fatalities and injuries and enhanced traffic management. With a surge in increased traffic, the manual interface becomes a challenge to control and prevent road accidents, and traffic management especially in the hilly terrains.

To address this, Dr. Kala Venkata Uday, Assistant Professor, School of Engineering, IIT Mandi, along with his team of B.Tech. students from the 2016 - 20 batch including, Mr. Naman Chaudhary and Mr. Shishir Asthana from Mechanical Engineering; Mr. Amudhan Muthaiah from Electrical Engineering, and Ms. Nidhika Kadela from Civil Engineering, have developed a monitoring system that can be used for speed detection, vehicle counts, enhanced traffic control and road usage, by employing the Micro-Electro-Mechanical Systems(MEMS) and Internet of Things (IoT) technologies.

The developed system comprises two layers of detection units on each side of the turn and two signalling units to alert the drivers. When a vehicle passes through the two consecutive layers of detection units, the sensing system detects the speed, direction and type of vehicle (two/ four/ multiple wheels). The detected direction confirms if the vehicle is advancing towards the turn, and a corresponding signal (light/ sound/ barrier) is displayed on the other side to alert the drivers of an oncoming vehicle. If the vehicle moves away from the curve, no signal is displayed. The signals are decided based on the speed, direction, gradient of slope and type of vehicle.

**IIT Mandi shows the way to detect disease in Potato Crops using the Photograph of its Leaves – Dr. Srikant Srinivasan**

The research led by Dr. Srikant Srinivasan, Associate Professor, School of Computing and Electrical Engineering, IIT Mandi, in collaboration with the Central Potato Research Institute, Shimla, uses Artificial Intelligence (AI) techniques to highlight the diseased portions of the leaf. They have developed a computational model for automated disease detection in potato crops using photographs of its leaves.

Funded by the Department of Biotechnology, Govt. of India, the results of this research have recently been published in the journal Plant Phenomics, in a paper co-authored by Dr. Srikant Srinivasan, and Dr. Shyam K. Masakapalli along with research scholars, Mr. Joe Johnson, and Ms. Geetanjali Sharma, from IIT Mandi, and Dr. Vijay Kumar Dua, Dr. Sanjeev Sharma, and Dr. Jagdev Sharma, from Central Potato Research Institute, Shimla.

**452 students, including 45 Ph.D. Scholars Graduate at IIT Mandi's Ninth Convocation**

IIT Mandi celebrated its 9$^{th}$ Convocation on 23$^{rd}$ October 2021 online. Padma Shri Prof. Anil Kakodkar, Former Chairman, Atomic Energy Commission of India, Former Secretary, Government of India, and Former Director, Bhabha Atomic Research Centre, graced the occasion as the Chief Guest. Prof. Prem Vrat, Chairman, Board of Governors, IIT Mandi, presided over the Convocation.

# 11. CONSTRUCTION (INFRASTRUCTURE & SERVICES)

## INFRASTRUCTURE

The Construction work of IIT Mandi started in the year 2012. Presently both the campuses i.e. North and South campus are fully functional.

**Arial View of Village Square, North Campus**

The South campus has infrastructure of about 40000 sq. mtr. area. This campus presently provides for 760 students and 57 faculty/staff members. 500-capacity hostel block with a dining hall, 10-2BHK and 45–3BHK apartments are being added to this campus having an area of 22000 sq.mtr. 25–3BHK, 10–2BHK, One hostel block, 350 seater capacity dining hall, 25-3BHK and 10-2BHK shall likely be ready for use by October 2021 and remaining likely by the end of 2021.

In the North Campus, on the other hand, presently have building of 1,43,000 sq. mtr. area. This part of the campus houses around 1,200 students and 133 faculty/staff members. The Sport Complex and Hospital are now fully functional. The remaining 16,000 sq.mtr of construction, which includes one Academic Block, one Hostel Block and one Dining Block are likely to be completed by end of the year 2021/March 2022. During current year despite reduced activities due to COVID – 19 we were able to add to add 12 -3BHK, 4 Academic buildings having an area of 37000sq. mtr to this campus. The Hockey field, Tennis, Basketball, and Volleyball courts shall also be completed by October 2021. Tender for Cycle path connecting the North with the South Campus is being floated and work of Construction shall be starting by end of the year 2021.

Arial View of North Campus

Arial View of South Campus

Auditorium (742 seating) in Village Square

Playground, South Campus

Village Square, North Campus

Arial View of North Campus

# SERVICES

## HEALTH CENTRE

Health Centre, IIT Mandi is situated at North campus, having one extension unit at South campus. It is a non-dieted patient care unit that provide 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 worker /casual labour 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 team of full time Medical Officers, Visiting Specialists, and Para Medical staff.

**The following facilities are available at Health Centre.**

- Routine OPD - taken care by medical officer and visiting consultant.


❖ **Emergency care**-with provision of Multipara monitor, ECG, Nebulization, oxygen concentrator, and central oxygen System and minor surgical room.


❖ **Visiting Consultant** of ENT, Medicine, Obs & Gynae, Pediatrics, and Orthopaedic.

❖ **Dental service & physiotherapy are also fully functional**


❖ **CLINICAL PATHOLOGY LAB:** Trained laboratory staff is 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.


❖ **Further, Dr Lal's Path Lab staff**

is also visiting the health centre on twice a monthly basis to enhance the services of Lab in IIT campus. Health Centre will be coming up in near future with additional facilities like ALS ambulance, a minor OT room, X-ray, and Ayurveda Panchakarma Therapy. All these processes are already in the pipeline.

**ACTIVITIES CARRIED OUT BY MEDICAL TEAM DURING 2020-21**

The whole world is suffering from corona virus pandemic from the last almost two years. IIT Mandi is also not untouched from the effects of COVID 19. Therefore, to contain the spread of COVID 19 in the campus following activities were started in the campus.

- **QUARANTINE CENTRE:** A dedicated Quarantine facilities at B-26 Building in North campus was established with 30 rooms for quarantine and 10 rooms for isolation of COVID positive patients.


Medical Staff kept a telephonic check up on all the patients who were quarantined at B 26 and follow up of COVID positive patients were also done by medical staff with provision of medicines and basic self-monitoring equipments like pulse oximeter, digital thermometer etc. Medical staff also conducted thermal screening of all the people, students arriving at IIT Mandi along with their travel and COVID history.


- **COVID-19 SAMPLING:** Health Centre also taken the initiative to conduct COVID 19 RT-PCR/RAT sampling inside the campus for all visitors, who were entering the campus from within and outside the state with the help of local or district health team.

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Medical team conducted about 60+ sessions of COVID-19 RT-PCR/RAT sampling were inside the campus and testing over 1200+ persons. Total 67 people were found positive, and all were treated successfully inside the campus by doctors and medical staff.

- FOR SYMPTOMATIC CASES, provision of beds with oxygen supply was also setup in the quarantine centre and health centre. Also, for the better management of COVID positive patients three new oxygen concentrator, pulse oximeter, digital thermometers, thermal scanners and multipara monitor were purchased by the health centre, and procurement of special medicines for treatment of covid patient were arranged. Further, to contain the spread of COVID 19, medical screening sessions were started in the campus for screening of all the hostels of both the campuses and about 12-14 sessions were conducted once in a monthly basis.


Monthly mess and canteen visit were also conducted by the health staff for keeping a regular check-up of all the hygiene and sanitation of the area.

- COVID-19 VACCINATION: Vaccination drive was also conducted inside the campus firstly for all the medical staff and later was also started for all the campus residents.

## New Equipment Purchased



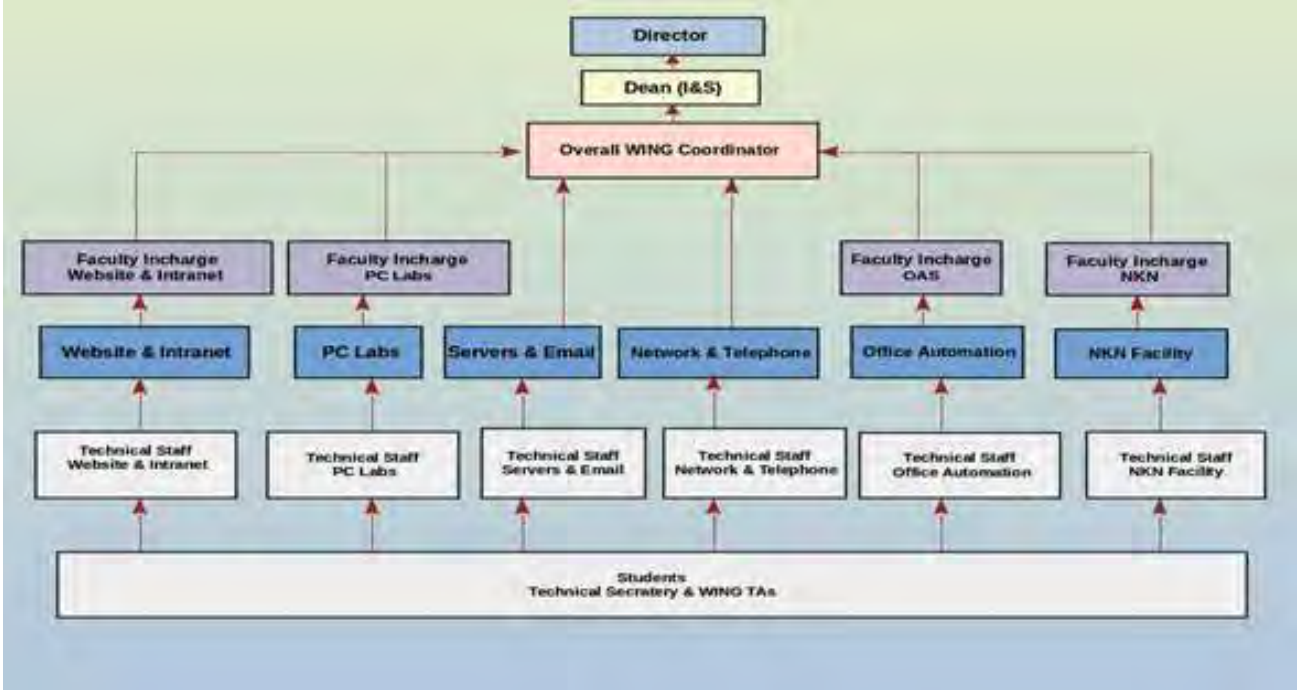


## Web Information and Networks Group (WING)

WING, Website Information and Networks Group, IIT Mandi is a faculty, staff & students group which is involved in the development, management, budgeting, monitoring and maintenance of the institute's websites, networks, software and voice/data communication. WING is responsible for providing the IT infrastructure, implements the governance for the use of network and information systems, and it assists the IIT Mandi community by providing them the functionality they need. It is ensured that the organization's systems, networks, data and applications all connect and function properly. WING has a skilled technical team to deploy and maintain the web applications, services and IT infrastructure like Servers, Networks, and Storage etc.

**Webpage:** https://wing.iitmandi.ac.in [Local Portal]
**Email:** wing@iitmandi.ac.in

**WING Organizational Structure**




**WING Services**

- Server, Software and Email Services.
- Network and Telecommunication Services.
- Computer Labs.
- Websites and Intranet Services.
- Office Automation/ERP System.
- NKN and Video Conferencing Services.

**Servers, Software's and Email Services**

WING has deployed various software and web services locally on-campus. Physical Rack Servers are used to host the local as well as the global web portals. E-learning platform, cloud storage, ERP system, centralised authentication, internet access, tally solutions etc. are few services that WING offers to the IIT Mandi community. WING provides personal email accounts with IIT Mandi domain to all the students/staff and faculty. WING is responsible for upkeep the various services offered and managing the backups/restore to avoid service failure losses.

Rack Servers: Mini Cluster, A5

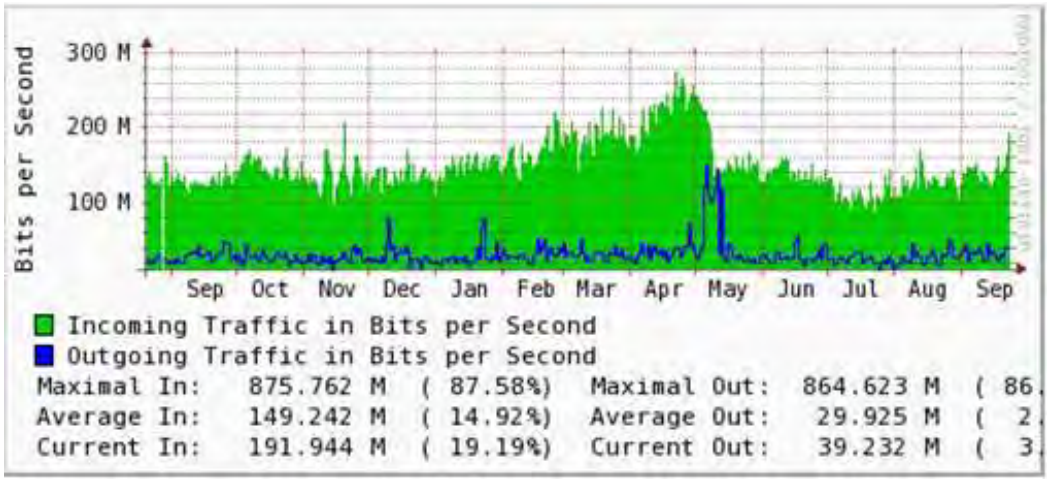
Server Room: South Campus

## Network and Telecommunication Services

WING is responsible for designing and implementing both the physical and wireless networks, maintaining network performance, managing the electronic equipment that activates any network pieces, troubleshooting network problems and researching & integrating new technologies into the network lifecycle. WING takes care of telecommunication system in an organization such as telephone lines, WAN links, NKN VC links etc. Team ensure that these technologies work uninterruptedly.

Switch Panel: Server Room

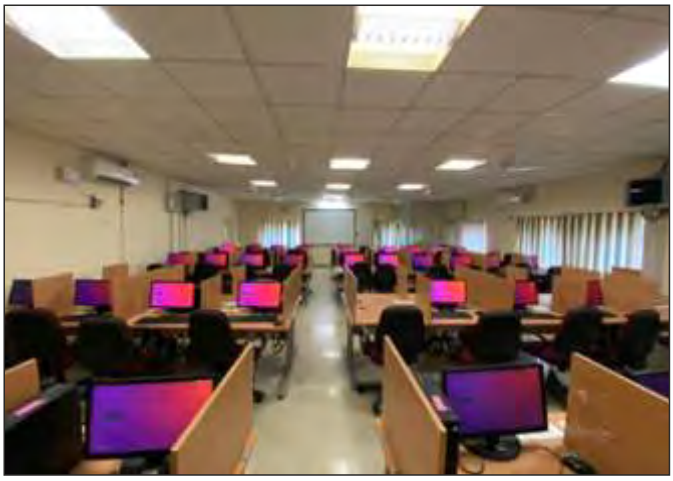
Telephone Exchange: Line Cards




**Network Traffic Monitor: NKN**

## Computer Labs

The computer lab serves as the center for learning and research. WING provides computer lab facilities to the students, faculty and staff for various activities like lab courses, workshops, online exams, placements, online interviews etc. Our computer labs have a total capacity of 200 computers as of now in three separate labs. A lab with 120 computers will be added soon.



**Computer Lab 2: A5 South Campus**

**Computer Lab 1: A5, South Campus**

**Computer Lab 3: A10, North Campus**

**Websites and Intranet Services**

WING manages all the contents of main website and Intranet portal and update them time to time. Web development team coordinate with each section/department to get content to upload and update on the web portals. It also manages databases, design and user interphase of web portals. Team use tools like word press, drupal, laravel etc. to design the web portals as and when needed for events like conferences, workshops, convocation etc.


**Intranet Portal: INSITE**

Office Automation/ERP System

The IIT Mandi has an ERP system named as OAS (Office Automation System) which helps to automate various Academics and Administrative processes of the Institute. The OAS helps various departments/sections to digitize and assist in various processes. The various modules like Academics, Estate, Establishment, SRIC, Hostel, Accounts, Accounts, and Guest House etc are utilized by the Institute to assist Faculty, Students, Staff and Project Staff.

**Some crucial enhancements done in the OAS during 2020-2021 were as follows:**

- Due to the COVID Pandemic situation there was a need for the Institute where the Faculty, Staff, Project Staff, Students can request their return to the Campus from their associated place. This feature has helped the Institute in planning and execution.
- Due to the COVID pandemic there was a need to allow a restricted number of bus seat bookings so that COVID protocols can be followed.
- Due to COVID some students were there at the campus and some at their respective places due to which fees were changed by the Institute. The associated changes were done in the system.
- Provided a feature where bulk photographs of students can be downloaded by the library section for the library ID card.
- Provided the feature to the SRIC section where multiple documents can be uploaded in the Project proposal and Seed grant process.
- The Establishment section can now do the Faculty and Staff joining from the OAS. We have digitized the Faculty and Employee data for this purpose.
- TCF page changes were done as per the virtual classes during the pandemic.
- Given a provision to drop the course and its relevant registrations. Also allotted TAs when the registrations are < 5.

- Provision to the academic office to map TA eligibility and fellowship. The system can now auto map the eligibility based on their DOJ.

**High-Performance Computing (HPC) Facility at IIT Mandi**

IIT Mandi hosts a high-performance computational (HPC) facility with a cluster containing 171 nodes based on Intel Xeon processors that have 3000 processor cores, memory of 12 TB and a 986 TB storage space. In addition, the facility hosts a GPU cluster of 33 Nvidia graphical processing units (GPU) best suited for deep learning and molecular dynamics applications. The nodes are connected to each other through dedicated Gigabit and 10 Gigabit Ethernet. The facility has 400+ registered users from the research community of IIT Mandi working on applications including avalanche dynamics, multiphase flow modelling, engineering, biotechnology, molecular dynamics, and computational chemistry, amongst others.

The facility currently hosts two sub-clusters -- CPUHPC (10.8.1.19) and GPUHPC (10.8.1.20), both running Cent OS 7. The CPUHPC cluster hosts compute nodes optimised for cpu-parallel jobs, whereas the GPUHPC cluster hosts nodes containing high-end Nvidia GPU cards optimised for gpu-intensive parallel jobs. Two file systems are available on the HPC clusters: home and working directory with limits os 10 GB and 2 TB, respectively. Standard libraries are software are installed on the cluster. State-of-the-art containerization is enabled on the clusters for the users to install their own software without depending in the HPC administrators, drastically reducing the waiting time and increasing productivity. Account creation on the cluster is automated through the scripting codes that take care of the approval process, creation of new accounts, and sending of welcome emails. Various queues are available to the users depending on the expected size and runtime of the job. All details are available on the cluster website, available to the college users post-authentication.

**MoU with C-DAC to Establish Supercomputing Facilities**

Indian Institute of Technology (IIT-Mandi) has signed a memorandum of understanding (MoU) with the Centre For Development of Advanced Computing (C-DAC), Pune to establish supercomputing facility worth Rs 17 crore. The memorandum was signed on October 12 at a virtual event in presence of Minister of State Sanjay Dhotre and Director Ajit K Chaturvedi.

A supercomputer is a computer that has very high speed in its operation and higher memory. This supercomputing system can perform assigned tasks, including multiple tasks at very high speeds than any other normal personal computer and in many cases are able to operate at speeds that are millions of times faster than ordinary Pcs.

Addressing the event, Minister Sanjay Dhotre said, “The National Supercomputing Mission is an important initiative of the Government of India. C-DAC along with the IISc, IITs, and, NITs, is playing an eminent role in achieving the goal of Digital India and Atmanirbhar Bharat mission. These MoUs will help in increasing India’s global relevance in the field of Supercomputing. I congratulate C-DAC and partner Institutes for this milestone”.

Further, Director Ajit K Chaturvedi added that this supercomputer will enhance the capability of institute in training the researchers including the faculty and students. This supercomputing system can perform assigned tasks at very high speeds and millions of times faster than ordinary personal computers (Pcs). The facility will be made operational for research and development purposes within next four months.

# IIT-Mandi to have supercomputing facilities, signs MoU with C-DAC

TRIBUNE NEWS SERVICE

MANDI, OCTOBER 12

The Indian Institute of Technology (IIT), Mandi, has signed a memorandum of understanding (MoU) with the Centre for Development of Advanced Computing (C-DAC), Pune, to establish a supercomputing facility of 650 TF compute power for research and development activities at a cost of Rs 17 crore.

Prof Ajit K. Chaturvedi, Director, IIT Mandi, and Dr Hemant Darbari, Director General, C-DAC, India, signed the MoU today during a virtual event in the presence of Sanjay Dhotre, Union Minister of State for Electronics and Information Technology, Education and Communications, and Prof Ashutosh Sharma, Secretary, Department of Science and Technology, Central Government.

Dhotre said, "The National Supercomputing Mission is an important initiative of the Central Government. C-DAC along with the IISc, IITs, and the NITs is playing an eminent role in achieving the goal of Digital India and the Atamnirbhar Bharat mission. The MoU will help in increasing India's global relevance in the field of supercomputing. I congratulate C-DAC and the partner institutes for this milestone".

A supercomputer is a computer that has very high speed in its operation and higher memory. This supercomputing system can perform the assigned tasks, including multiple tasks, at very high speeds than any other normal personal computers and in many cases are able to operate at speeds that are millions of times faster than ordinary PCs.

Ashutosh Sharma said, "In the past five years, our emphasis has shifted from buying hardware and software components of supercomputers to the manufacturing of these components under the Atamnirbhar Bharat mission".

Chaturvedi said, "IITs are pioneers in the field of computer science in the country. With the setting up of this supercomputing facility at the IIT, Mandi, we are looking forward to addressing every area of science and technology. This supercomputer will enhance our capability in training researchers, including the faculty and students of the institute. This MoU with C-DAC is a milestone for the IIT, Mandi".

"The supercomputer will be made operational for research and development purposes for the users at the IIT, Mandi, within the next four months. The Department of Science and Technology (DST) along with the Union Ministry of Electronics and Information Technology (MeitY) is coordinating the project and the Centre for Development of Advanced Computing (C-DAC), Pune, is the implementing agency," he added.

He said that C-DAC, Pune, would instal the supercomputing facility in the IIT, Mandi, with liquid-cooled racks and 200 gigabit Infiniband connectivity.

**WHAT IT IS ALL ABOUT**

A supercomputer is a computer that has very high speed in its operation and higher memory. This supercomputing system can perform the assigned tasks, including multiple tasks, at very high speeds than any other normal personal computers and in many cases are able to operate at speeds that are millions of times faster than ordinary PCs.

सी-डैक से करार • एमओयू पर आईआईटी मंडी के निदेशक प्रो. अजीत के. चतुर्वेदी और सी-डैक के महानिदेशक डॉ. हेमंत दरबारी ने हस्ताक्षर किए

# 17 करोड़ की लागत से स्थापित होगा सुपर कम्प्यूटर केंद्र

## सुपरकम्प्यूटिंग मिशन भारत सरकार की प्रमुख पहलः धोत्रे

## मंडी जिला एसएमसी टीचर्स एसोसिएशन की कमान फिर दुष्यंत शर्मा के हाथ

### निशा को उपाध्यक्ष व नवीन को महासचिव की कमान

**Green Committee**

The mandate of the committee is to ensure proper management and efficient functioning of the "Green Activities" in the Campus. The committee is to make recommendations for purchase of services, equipment, maintenance and other related activities. As well as preparation of strategic planning & logistics for efficient and effective fulfilment of green activities on campus.

The green activities of the campus are categorized into the following subsections and different sub committee's under the Green committee manage each domain.

- Beautification and biodiversity conservation: Landscaping and horticulture, biodiversity monitoring and preservation.
- Waste Management: Waste collection, segregation, processing and disposal. Awareness campaigns.

- Environmental monitoring: Monitoring air and water quality, ground water, land usage.
- Energy efficiency and conservation: Monitoring energy usage, assisting in implementation of green energy technologies on campus.
- Housekeeping: Cleaning & Upkeep of Campus and its buildings.

**Activities carried out during year 2020-21**

- **Plantation drive**

A special plantation drive was organized on 23rd September 2020. Covid warriors, Security guards, housekeeping staff, hospital staff and other staff members associated with the Covid task force were special invitees for the plantation drive. Around 500 saplings of tree species were planted in the year 2020-21

- **Installation of Sanitary Napkin incinerator**

  Three units of sanitary napkin incinerators were installed in B5 Women's hostel in October 2020. After monitoring the usage and suitability of this pilot installation Green committee is to consider the installation of sanitary napkin incinerators in all women's hostels.

- **Other routine maintenance activities**
  - Housekeeping activities and waste management: Cleanliness of academic and residential areas, Collection of waste from house to house by our housekeeping staff and their disposal. The associated challenges of segregation and new ways to adopt for better management are iteratively looked into. Committee planned to test a pilot model of waste management which is anticipated to kick off in 2021-22.
  - Beautification and Biodiversity activities: Maintenance of green areas, lawns and plants by our horticulture staff and gardeners.

**"Catch the Rain" National water mission's campaign as "Jal shakti abhiyan" in the campus**

To redress the water scarcity situation in the campus following steps are being taken for rain water harvesting and its conservation:

- Construction of soak pits for water conversion and recharge of ground water.
- Providing earthen gaps in the storm water drain at every 10 meters interval to recharge the ground water table.
- Mass plantation drives along the roads and pathways of the campus.
- Grey water from kitchens & bathrooms after the treatment in Sewage treatment plant and ultra filtration is being used for irrigation purposes of garden areas in the campus.

- **Utilization of treated sewage water from STPs for arboriculture and having planning double piping system for utilizing this treated water for flushing systems.**

## Horticulture

The IIT Mandi is situated at Kamand Valley which lies about 18 km from the Mandi city, an unexplored lush green beautiful valley. The area is enriched with floral wealth, important species of trees found in the area are Pine (Pinus roxburghii), Mulberry (Morus alba), Willow Tree (Salix alba), Blue Jacaranda (Jacaranda mimosifolia), Tosh (Silver Oak), Walnut (Juglans regia), Gulmohar (Delonix regia), Chinar (Plananus orientalis), Toona (Toona ciliate), Deodar (Cedrus deodara), Cypress Plant (Cupressus sempervirens), Brass (Rhodendron lepidotum) etc.

Besides this, there are lot of medicinal plants and IIT Mandi also maintained the Botanical Garden contained following main species Senna (Cassia tora), Nerium (Nerium Indicum), Cockscomb (Celosia argentea), Peach (Prunus Persica), Plum (Prunus Domestica) etc.

IIT Mandi also organize the plantation drive towards creating awareness among students and the IIT fraternity to understand the importance of plants about mitigating the effects of pollution and saving environment.

## Campus Housekeeping & Waste Management

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 in the campus. The door to door waste collection system is in place to avoid aforesaid issues.

There is complete ban on using any kind of toxic cleaning chemicals in the campus. The manpower is being trained to follow up the processes and their safety aspects too. We are having an effective waste management plan, below are few benefits of robust waste management plan:

- Protecting the environment
- Preserving human health
- Minimizing unsightly waste
- Reducing natural resource consumption




**Sewage Treatment Plants**

We have well equipped three Sewage Treatment Plant with total capacity of about 600 KLD (450KLD + 75KLD + 75KLD) based on SBR/MBBR processes. The solid waste & treated water coming out is being used as manure & irrigation purpose respectively.

## Children Playground

There are 3 no's children playground facilities on the campus (2 no's in South campus and 1 number in North campus). Photographs of facilities along with area details are as follows:

## North campus

Total area of the Children's playground facility at the North campus is around 297sqm.

## South campus

**Total area of this playground facility is around 855sqm. Near C-6 block South campus**

**Total area of this playground facility is around 128 sqm.**

## Botanical and Medicinal Plant Garden

IIT Mandi is committed towards building a Green Campus. Based on the Eco-management plan the Green Panel of the institute recognized that establishing a Botanical Garden would help in achieving the commitment. The Botanical Garden was started in July 2015 with complete support from IIT Mandi with the following main objectives.

- Study of flora of Kamand region.
- Establish a Botanical Garden with collection of local flora.
- Develop and maintain Herbarium.
- In-situ conservation, collection and maintenance of medicinal plants.
- Documentation, digitization and dissemination of the related information.
- Undertake R&D in the related area (Phytochemical profiling of selected plants, understanding the local edible plants, Bioengineering plants etc).


**Botanical Garden of IIT Mandi located between North and South Campus**

**Activities in 2020-21**

- Maintenance of the Botanical and medicinal plant garden on regular basis. Involves as irrigation, mulching, maintaining the trees etc.
- Conservation and documentation/digitization of the flora of Kamand region
- About ~200 plant species in multiple copies exist and growing well
- For beautification purposes, the rose garden with 65 different varieties is being maintained. Initiated Biofencing with duranta which will be visible in few years time.
- More species added to our existing herbarium – Physical as well as e-herbarium (https://research.iitmandi.ac.in/botanical/herbarium.php)
- Seasonal plantation of various herbs and regular maintenance activities.
- Collection and drying of the herbs for Research work
- Supported with the technology of herbal infusion to EWOK. Planning ahead to formalize the transfer the technology.
- The Medicinal Plant Lab, IIT Mandi advised and supported EWOK in the formation of Three Farmer Producer Companies with NABARD grant
- The Medicinal Plant Lab, IIT Mandi successfully completed research cum outreach project with Himalaya Drug Company (now Himalaya well ness company). The project received further extension
- The Medicinal Plant Lab, IIT Mandi completed a DST funded WOS(B) project which led to promoting essential oil crops by local farmers.
- Water supply to the Botanical Garden was facilitated by the Deanery
- In previous years outreach activities like Botanical Garden visits by several school and college students of Mandi district hosted. Due to Covid no exposure visits were held this year. We anticipate as the situation improve; outreach activities will resume.


**Botanical Garden IIT Mandi: a) Local communities visiting Garden b) Kiwi fruits from pomological section c) Water source installed d) a small pond with water lily e) Experimental tea plantation**

**Herbarium of selected plants of Kamand flora**

**Nursery development and maintenance for conservation and promotion of medicinal plant project**

**Medicinal Plant Lab supported farmers in cultivation of Tagetes and production of essential oil**

## Library Inauguration

**Inauguration of Central Library by Hon'ble C.M. Shri Jai Ram Thakur**

Indian Institute of Technology Mandi celebrated its 12th Foundation Day on 24th February 2021. Hon'ble Chief Minister of Himachal Pradesh, Shri Jai Ram Thakur graced the occasion as the Chief Guest in the esteemed presence of Shri Ram Swaroop Sharma, Member of Lok Sabha, and Shri Jawahar Thakur, Member Legislative Assembly of Himachal Pradesh. Hon'ble Chief Minister also inaugurated Central Library at North Campus. The event was attended by the faculty and staff of IIT Mandi. During the event, the Institute's Archives team presented a slideshow of photographs of the evolution of the institute since 2009.

**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 Kilometer 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) and a smaller semi-furnished guest house with three rooms (Uhl guest house) are 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 88 rooms including Suites, Double Bed & twin bed rooms. South campus has Manirang & Uhl 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**

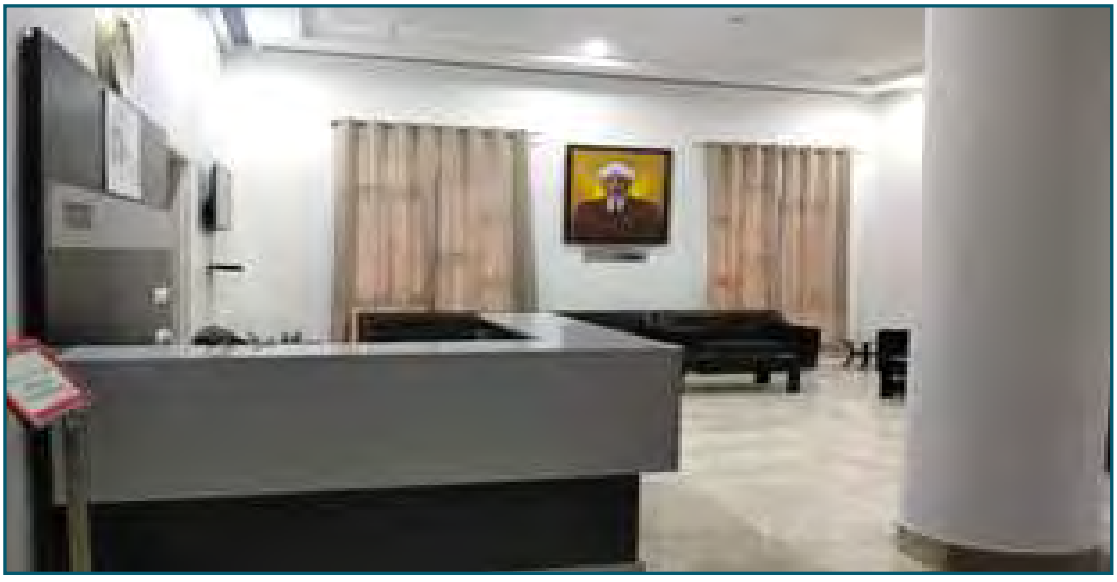
C. V. Raman guest house has a state of the art conference room facility. The conference room can accommodate up to 32 persons and has various facilities such as overhead projector, Wi-Fi with audio-visual connectivity for video-conferencing.

**Logistics**

Guest house is also managing logistic services for the guest visiting IIT-Mandi campus. Fleet of 3 dedicated cars stay ready round the clock to provide travel assistance to our esteemed guests. Apart from institute cars, assistance in taxi booking services is also provided for our guests, faculty & staff, as and when required.

**Honourable guests at C. V. Raman Guest House**

- Shree Bandaru Dattatreya - (Governor Himachal Pradesh 2019-2021)
- Shree Jairam Thakur - (Honorable Chief minister- Himachal Pradesh)
- Ms. Tessy Thomas- (Director General of Aeronautical Systems and the former Project Director for Agni-IV missile in DRDO)
- Mr. Subodh Bhargava- (Independent Director Chairman at Tata Communications Ltd)
- Prof. Ashok Jhunjhunwala-(Institute Professor at Indian Institute of Technology, Madras)



**Reception & Lobby**

**Mind Tree IIT Mandi Campus School**

It is spread over lush green sprawling locales surrounded by sylvan mountains. With the strong and committed team, the school started its journey in March 2017. School has risen to new horizons and is affiliated to CBSE. School provides quality education to the students along with nurturing the spirit of competition among the students. The school's priority is not only providing text book knowledge but also overall development of students.

With the COVID -19 pandemic, we all are living through a worldwide crisis unexpected closure of academic institutions brought down reading, learning motives to stagnation. During Covid times, our committed team of teachers and other staff united themselves to provide online education to the students. Students of all the classes were given lectures and demonstrations through different online platforms so that their studies should not suffer during lockdown times. Regular tests, assignments and assessments were also taken to regulate the progress of the students.

Apart from regular studies different events and celebrations of festivals and days were also organized online like Environment Day, Yoga Day, Teacher's Day, Rakshabandhan, Independence Day, Hindi Diwas etc.

The main aim of these activities was to give a sense of oneness and classroom feeling to the students. From time to time students were indulged in various types of activities like quiz, painting, model making so that their overall progress and overall development can be taken care of.


**Glimpses of Online Activities**


**FACILITIES IN THE SCHOOL**


Library

Physics Lab

Math Lab

Chemistry Lab

Computer Lab

Biology Lab

School Staff

## Daycare

The daycare facilities are housed in safe and pleasant units with infrastructure available for feeding, sleeping and conducting various indoor and outdoor activities. Division into four sections, i.e. Infants (below 1 year), toddlers (1-3 years), pre-schoolers (3-4 years) and schoolers (above 5 years), help in providing specific care as required. For instance, the infant & toddler sections are provided with separate cribs for sleeping and high chairs for feeding. The pre-schoolers and schoolers are provided help with homework and sleeping facilities after school hours.

Located in South and North campuses, these facilities provide a fun filled learning environment for children of IIT Mandi's students and employees. Parents can leave their children confidently in the care of experienced and caring staff appointed after a selection process. The teachers and care givers tend to the specific needs of infants and children upto 10 years. The tots are kept engaged in age appropriate schedules that cater to their overall development. Parents can avail of the facilities either part time or full-time.



## Facilities

The infrastructure includes facilities to cater to the varying needs of the various age groups of children. The Infants (below 1 year) and Toddlers (1-3 years) sections are provided with separate cribs for sleeping. The comfortable cribs adhere to safety norms for the young ones. Mealtimes are made safe and convenient with high chairs and booster seats that allow them to explore their food while being fed! The Pre-schoolers (3-4 years) and Schoolers (5 years and above) are provided comfortable cots for afternoon naps. A study room provides them with a quiet environment to complete any homework or additional study activities. The same room then turns into a noisy playroom when the creative minds get busy with their fantasy plays. Toys appropriate for the various sections are available for use.

**Support Staff:** Daycare facilities are supported by full-time dedicated and trained staff. The list of support staff is given below:

**Anjana Chandel**
Teacher

**Jaya Kumari**
Care Taker

**Meena Kumari**
Care Taker

**Asha Kumari**
Care Taker

**Meena Kumari**
Care Taker

## Enrolled Kids

At present, total 24 kids are enrolled in daycare and availing the facility. A brief statistics of the enrolled kids are given below:

| Sr No. | Age Group | No. of Kids |
|---|---|---|
| 1 | Infants (below 1 year) | 3 |
| 2 | Toddlers (1 -3 years) | 7 |
| 3 | Pre-schoolers (3-4 years) | 8 |
| 4 | Schoolers (5 years and above) | 6 |

## Online Maintenance Helpdesk

In order to streamline support requests and better serve you, we utilize a support ticket system. Every support request is assigned a unique ticket number which you can use to track the progress and responses online. For your reference, we provide complete archives and history of all your support requests. A valid email address is required to submit a ticket.

| Maintenance Work Carried out during 2020-21 (Civil & Electrical tickets of South campus and North campus) | | | | | | |
|---|---|---|---|---|---|---|
| Campus | Number of complaint recorded during the period i.e 01/04/2020 to 30/09/2021 | Complaint resolved during the period i.e 01/04/2020 to 30/09/2021 | Balance complaint | Remarks | | |
| | | | | IIT General Complaint | CPWD | NBCC |
| Civil tickets South Campus | 1442 | 1402 | 40 | 29 | 11 | |
| Electrical ticket South campus | 985 | 924 | 61 | 61 | | |
| Electrical ticket North campus | 794 | 715 | 79 | 72 | | 7 |
| Civil tickets North Campus & LP1 | 1914 | 1742 | 172 | 109 | 54 | 9 |
| Total | **5135** | **4783** | **352** | **271** | **65** | **9** |

## Transport Facilities

Indian Institute of Technology Mandi situated in Kamand valley of district Mandi (H.P.). The Institute is offering transport facilities to its students, faculty and staff members on very nominal charges. The Institute shuttle buses are plying between both the campuses (North & South campus of IIT Mandi) and the transport facilities are also available from Mandi Town to IIT Mandi campus.

The Institute vehicle schedule is regularly updated on the website for the information of the all. IIT Mandi is also providing advance online seat booking facility to its community. Presently Institute is providing transport facility from morning 07:00 am to 10:00 pm and at present 7 no. of buses (30 seater) and 1 Van (12 seater) is operational.



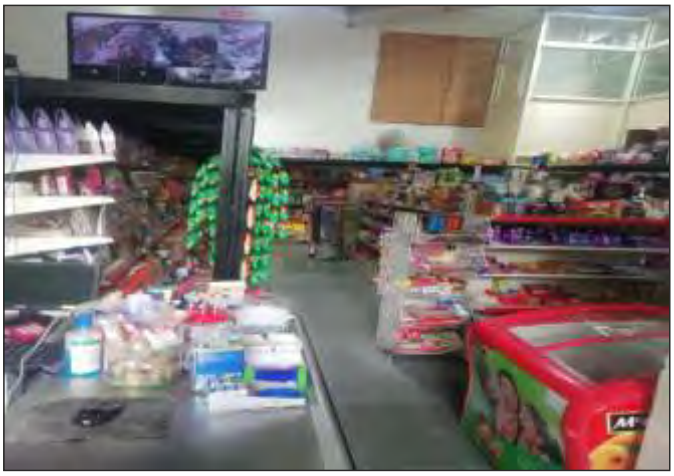
## Commercial Establishments

Currently, 7 nos. of commercial establishments are running in the Institute, which includes canteen, provision store, super market, vegetable & fruit stall & stationer shop. The services are available on both the campuses. As the infrastructure is developing on the campus, few more shops are coming up and the same will be allotted to start news services/facilities on the campus.

**Griffon Canteen, South Campus**

**Provision Store & Stationery Shop, South Campus**

**Super Market, North Campus**



**Super Market, North Campus**


**Vegetable & Fruit Stall, North Campus**

**Vegetable & Fruit Stall, North Campus**

**Water supply scheme of IIT Mandi (0.50 MLD Capacity)**

**WTP Stage-1**

WTP stage-1 is established near Kamand Bridge on UHL River which is passing along the Reyagadi road. From UHL River, suction pipe of dia 6-inch lift water through 7.5HP mono submersible pumps to raw water tank-1 of capacity 1,00,000 litres. 40HPSubmersible pumps lift water through G.I. pipe of dia 6" from raw water tank-1 to raw water tank-2 (Stage-2) of capacity 3, 35,000 litres.

**WTP Stage-2**

WTP stage-2 is established in Gharpa area (LP-6) of South Campus of IIT Mandi. Water flow under gravity from Raw water tank-2(Stage-2) of Capacity 3,35,000 to Pre-Settling tank, then to flocullator, then to settling tank and then through Slow sand filter bed. After all these filtration processes water gets collected in Clear Water tank of capacity 3,35,000 litres. Water from clear water tank gets lifted by 100HP Submersible pumps from clear water tank to Main overhead storage tank of capacity of 3, 35,000 litres.

**Main OHT**

In OHT tank chlorination of water is being carried out. From here water is being supplied under gravity though 3-inch G.I line to North Campus OHT tank of capacity 3,50,000 litres and South Campus OHT tank of capacity 1,00,000 litres. The water supply of the both campus regulates through gravity line from OHT tanks of both the campuses.

**Electrical Power Supply System**

The main source for the Power supply of IIT Mandi is Himachal Pradesh State Electricity Board. IIT Mandi is getting the power supply From HPSEBL through 33 kV HT transmission line from Nandli Substation near to the campus. Further, Inst. has in house 33/11 kV Receiving Substation (RSS) at North campus. The total connected load of IIT Mandi campus is 10.90 MW. For catering, this load Inst. has 2X5 MVA power transformers installed at RSS.

**Power transformers at RSS**

33 kV supply is steeped down to 11 kV and distributed to the different 11/0.415 kV Sub-stations installed at North and South campuses.

Indoor 11/0.415 kV (800 kVA) Transformer

Indoor LT distribution panel

Presently, Inst. is being fed through the Nandli substation, but in near future for getting uninterrupted power supply to our campus two more sources have been planned and taken up with HPSEBL. The following alternate lines works are under progress:

- 33 kV HT Line from Pandoh to Nandli Substation. This will be the dedicated feeder to IIT Mandi campus.
- 33 kV feeder from Kullu to Nandli Substation. The power can be transferred on this line in the event of failure of dedicated feeder.

| **Dean, Infrastructure and Services** | |
|---|---|
|  | Dr. Bharat Singh Rajpurohit (w.e.f. 22.01.2021)<br>A-7 Building, Room No.200, First Floor, South Campus<br>Phone: 267278; Email ID: deaninfra@iitmandi.ac.in<br><br>Prof. S.C. Jain, Emeritus Professor (upto 21.01.2021) |
| **Associate Dean, Infrastructure and Services** | |
|  | Dr. Kaustav Sarkar<br>A-10 Building, Room No.402, North Campus<br>Phone: 267901; Email: srkr@iitmandi.ac.in |
| **Faculty In-charge (Electrical)** | |
|  | Dr. Narsa Reddy<br>A-6 Building, Room No.21, South Campus<br>Phone: 267225; Email: tummuru@iitmandi.ac.in |
| **Faculty In-charge (Civil)** | |
|  | Dr. Sandeep Saha<br>A10 Building, Room No. 408, North Campus<br>Phone: 267907; Email ID: sandip_saha@iitmandi.ac.in |
| **Office Infrastructure and Services** | |
|  | Ms. Monika<br>Sr. Superintendent<br>A-7 Building, Room No.200, First Floor, South Campus<br>Phone: 267278; Email: monika@iitmandi.ac.in<br>Assists the Dean (Infrastructure & Services) by coordinating the entire work related to Dean Infrastructure & Services. |

| | |
|---|---|
|  | Mr. Ankush Sharma<br>Office Assistant<br>A-7 Building, Room No.200, First Floor, South Campus<br>Phone: 267278; Email: ankushoa@iitmandi.ac.in<br>Assists the Dean (Infrastructure & Services) by coordinating the entire work related to Dean Infrastructure & Services. |
| | **Infrastructure Team** |
|  | Mr. Sunil Kapoor<br>Superintending Engineer<br>Construction Wing, South Campus<br>Phone: 267020; Email: sunil@iitmandi.ac.in<br>Monitoring the Construction & Maintenance work for both the campuses. Monitoring the Construction work carried out by CPWD & NBCC. Preparing the different information's required by Ministry of Education and HEFA. Organising and managing the CRM,B&WC& Construction Planning committee meetings. Looking after the land issues. Planning of new requirement.<br>Any other work assigned by Dean (I&S) and Associate Dean (I). |
|  | Er. Puneet Kr. Sharma<br>AE(Civil)<br>Construction Wing, South Campus<br>Phone: 267240; Email: puneetsharma@iitmandi.ac.in<br>Looking after the new construction & maintenance work, Horticulture work, tendering work, water supply scheme and operating different civil services of South Campus and responsibilities related to Estate Office.<br>Any other work assigned by SE.<br>Assisted by Er. Navish Sharma, Tech. Astt. (C) and Er. Atul Sen, Tech. Astt. (C).. |
|  | Er. Siddharth Jamwal<br>AE(Civil)<br>Construction Wing, South Campus<br>Phone: 267295; Email: siddharth@iitmandi.ac.in<br>Looking after the new construction & maintenance work, tendering work of Hostel, Dining & Academic buildings in North Campus and Horticulture work of entire North Campus.<br>Any other work assigned by SE.<br>Assisted by Er. Mandheer Bali, JE (C) and Er. Jitender Kashyap, Tech. Astt. (C) |
|  | Er. Vikas Chaudhary<br>AE(Civil)<br>A-7 Building, Room No.200, First Floor, South Campus<br>Phone: 267028; Email: vikas_kumar@iitmandi.ac.in<br>Looking after the new construction, maintenance work & tendering work of Faculty Housing building in North Campus & LP-1 area.<br>Any other work assigned by SE.<br>Assisted by Er. Deendayal, JE (C) and Er. Jitender Kashyap, Tech. Astt. (C) |
|  | Er. Neeraj Chauhan<br>AE(Electrical)<br>Construction Wing<br>Phone: 267127;Email: neerajchauhan@iitmandi.ac.in<br>Looking after the maintenance of Academic, Hostel, Faculty block, ESS/Street Lighting/Outside Lighting, Fire Fighting, STP issues, Transformer/DG etc<br>Any other work assigned by SE.<br>Assisted by Er. Chirag, JE (E) and Er. Yaspal Thakur , Technical Assistant (E) |
|  | Mr. Daulat Ram<br>Field Supervisor (Land Acquisition)<br>Construction Wing<br>Phone: 7018163487<br>Looking after the Land related matters |

# आइआइटी में ढाई हजार छात्रों को मिलेगी सुविधा

आइआइटी मंडी में बना आधुनिक सुविधा से लैस इनडोर स्टेडियम ● जागरण

**जागरण संवाददाता, मंडी :** भारतीय प्रौद्योगिकी संस्थान (आइआइटी) मंडी ने 10 साल में 510 एकड़ में शानदार कैंपस तैयार कर एक मिसाल पेश की है। ऊहल नदी के किनारे हिमालय की शांत वादियों में कम समय में इतना बड़ा कैंपस तैयार करना पहाड़ जैसी चुनौती था। आज संस्थान के पास अत्याधुनिक आधारभूत ढांचा उपलब्ध है।

संस्थान का बिल्डअप एरिया 1.15 लाख वर्ग मीटर है। इसमें 1300 विद्यार्थियों, 112 शिक्षकों और स्टाफ के 61 सदस्यों के लिए आवासीय व्यवस्था है। इसके अतिरिक्त अत्याधुनिक प्रयोगशालाएं, पुस्तकालय, खेल सुविधाएं, अन्य गतिविधियों और पढ़ाई से जुड़ी अतिरिक्त गतिविधियों के लिए पर्याप्त स्थान है। इसमें 750 सीटों का ऑडिटोरियम भी है जो इस इलाके में अभूतपूर्व है। संस्थान 2021 तक 2.16 लाख वर्ग मीटर निर्माण का लक्ष्य पूरा करने की दिशा में अग्रसर है। इससे आने वाले समय में 2580 विद्यार्थियों और 270 शिक्षकों और स्टाफ के सदस्यों के लिए आवासीय व्यवस्था सुनिश्चित होगी।

डीन (इंफ्रास्ट्रक्चर एवं सर्विसेज) प्रो. एससी जैन का कहना है यहां जो कैंपस बन रहा है उसका देश के सबसे खूबसूरत कैंपसों में नाम होगा। उन्होंने बताया कि निर्माण एवं मरम्मत प्रभाग निर्माण कार्य की प्रगति पर नजर रखने के लिए वेब आधारित प्रोजेक्ट मैनेजमेंट टूल का लाभ लेता है। इसका विकास संस्थान के विद्यार्थियों ने ओपन सोर्स प्लेटफॉर्म के साथ किया है। शिक्षा ब्लॉक के अंदर 30 से 300 विद्यार्थियों के लिए बड़े क्लासरूम हैं। संस्थान का एक मुख्य पुस्तकालय है जिसमें 18,948 पुस्तकें हैं और एक सेटेलाइट लाइब्रेरी है जो पूरी तरह स्वचालित है। विद्यार्थियों, शिक्षकों और स्टाफ के लिए 20,000 ऑनलाइन संसाधन हैं। गेस्ट हाउस में देश-विदेश के आगंतुकों के लिए 88 कमरे हैं।

## STATUS OF FILLING UP OF BACKLOG VACANCIES IN TABULAR FORMAT 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 to fill the backlog vacancies in a mission mode within a period of one year starting from 05.09.2021 and to:

i. Include a separate chapter in the annual reports,

ii. Include an agenda item in every FC/BoG meeting and

iii. Submit a monthly report to Secretary (HE) on the status of action taken.

The Dean (Faculty) and Member-BoG intimated the Committee that the Institute is making all efforts to fill backlog vacancies. The Institute Standing Committee has decided to advertise faculty positions every six months in addition to standing advertisement.

He further informed about many faculty interviews which have been recently held and the interviews scheduled in near future. The current status of Faculty recruitment is given below:

| | |
|---|---|
| Sanctioned positions (10:1 Student: Faculty ratio) | 186 |
| Faculty in position on regular pay scale | 113 |
| Vacancy | 73 |

## 12. BOARD OF GOVERNORS

| | |
|---|---|
|  | **Chairperson** (w.e.f. 27.10.2020)<br>**Prof. Prem Vrat**<br>Chairperson, BoG IIT(ISM) Dhanbad<br>Retired Professor, IIT Delhi & Founding Director, IIT Roorkee<br>1240, Sector-A, Pocket-A<br>Vasant Kunj, New Delhi-110070 |
|  | **Chairperson** (upto 26.10.2020)<br>**Shri. Subodh Bhargava**<br>Former Chairman, TATA Communications Limited<br>Villa 69, the Palm Springs<br>Golf Course Road, Sector – 54<br>Gurgaon – 122 002, Haryana |

| | |
|---|---|
| **Members**<br><br>**Prof. Ajit K. Chaturvedi** (w.e.f. 01.07.2020)<br>**Prof. T. A. Gonsalves** (upto 30.06.2020)<br>Director, IIT Mandi (Ex-officio)<br>Indian Institute of Technology Mandi<br>Mandi – 175 075 (H.P.) | **The Chief Secretary/ Secretary (TE)**<br>(Ex-officio)<br>Government of Himachal Pradesh<br>Shimla – 171 002 |
| **The Additional Secretary(TE)/**<br>**Joint Secretary**(Ex-officio)<br>MoE, Government of India<br>Shastri Bhawan,<br>New Delhi- 110 001 | **Shri Kishan Chandra Sharma**<br>Site Head & Sr. Vice President<br>Manufacturing, LUPIN Pharma Limited<br>198 - 202, New Industrial Area No. 2<br>Mandideep – 642 046, Distt, Raisen (M.P.) |
| **Dr. Pradeep Kumar Agrawal**<br>**Scientist, Directorate of Special Projects**<br>D.R.D.O. Hyderabad<br>H.No. 16-142, Green Rich Avenue<br>Badangpet Nagar Panchyat<br>Hyderabad- 500 058 | **Shri Hemant Sood**<br>**Managing Director & Promoter**<br>(Financial Services group)<br>Findoc Financial Services Group<br>5th Flr, Kartar Bhawan, Near PAU, Gate No.1<br>Ferozpur Road, Ludhiana-141 001 (Punjab) |
| **Prof. S. C. Jain**<br>Emeritus Professor<br>School of Engineering<br>Indian Institute of Technology Mandi<br>Mandi – 175 075 (H.P.) | **Dr. Subrata Ghosh** (upto 18.01.2021)<br>Associate Professor<br>School of Basic Sciences<br>Indian Institute of Technology Mandi<br>Mandi – 175 075 (H.P.) |
| **Prof. Prem Felix Siril** (w.e.f. 19.01.2021)<br>Professor<br>School of Basic Sciences<br>Indian Institute of Technology Mandi<br>Mandi – 175 075 (H.P.) | **Secretary**<br>**Shri K. K. Bajre**<br>Registrar (Ex-officio)<br>Indian Institute of Technology Mandi<br>Mandi – 175 075 (H.P.) |

*During this year, meetings of the Board of Governors were held on 23.06.2020, 27.08.2020, 20.11.2020, and 31.03.2021.*

## 13. FINANCE COMMITTEE

| | |
|---|---|
| **Chairperson** (Ex-officio)<br><br>**Prof. Prem Vrat** (w.e.f. 27.10.2020)<br>Chairperson, BoG IIT(ISM) Dhanbad<br>Retired Professor, IIT Delhi &<br>Founding Director, IIT Roorkee<br>1240, Sector-A, Pocket-A<br>Vasant Kunj, New Delhi-110070<br><br>**Shri Subodh Bhargava** (upto 26.10.2020)<br>Former Chairman, TATA Communications Limited<br>Villa 69, the Palm Springs<br>Golf Course Road, Sector – 54<br>Gurgaon – 122002, Haryana | |
| **Members**<br><br>**Prof. Ajit K. Chaturvedi** (w.e.f. 01.07.2020)<br>**Prof. T. A. Gonsalves** (upto 30.06.2020)<br>Director, IIT Mandi (Ex-officio)<br>Indian Institute of Technology Mandi<br>Mandi – 175 075, (H.P.) | **The Addl. Secretary/Bureau Head(T.E.)**<br>(Ex-officio)<br>MoE, Government of India<br>Shastri Bhawan,<br>New Delhi-110 001 |

| | |
|---|---|
| **The Joint Secretary & Finance Advisor**<br>(Ex-officio)<br>MoE, Government of India<br>Shastri Bhawan,<br>New Delhi – 110 001 | **Prof. Ashok Gupta**<br>Professor<br>Department of Civil Engineering<br>IIT Delhi, Hauz Khas<br>New Delhi – 110 016 |
| **Prof. P. Sriram**<br>Registrar I/c, Dean (Admin) & Head<br>Dept. of Aerospace Engineering<br>Indian Institute of Technology Madras<br>Chennai - 600 036 | **Dr. Vishal Singh Chauhan**<br>**Dean (F & A)** (Ex-officio)<br>Indian Institute of Technology Mandi<br>Kamand – 175 075,(H.P.) |
| **Secretary**<br>**Shri K. K. Bajre**<br>Registrar (Ex-officio)<br>Indian Institute of Technology Mandi<br>Kamand – 175 075, (H.P.) | |

**During this year meetings of the Finance Committee were held 23.06.2020, 20.11.2020 and 31.03.2021.*

## 14. BUILDING & WORKS COMMITTEE

| | |
|---|---|
| **Chairman** (Ex-officio)<br>**Prof. Ajit K. Chaturvedi** (w.e.f. 01.07.2020)<br>**Prof. T. A. Gonsalves** (upto 30.06.2020)<br>Director<br>Indian Institute of Technology Mandi<br>Kamand – 175 075, (H.P.) | **Dean (I&S)** (Ex-officio)<br>Indian Institute of Technology Mandi<br>Kamand – 175075, Himachal Pradesh |
| **Member**<br><br>**Prof. B. Bhattacharjee**<br>Professor<br>Department of Civil Engineering<br>Indian Institute of Technology Delhi<br>Hauz Khas, New Delhi - 110 016 | <br><br>**Er. A.K. Jain**<br>Senior Consultant, IIT Mandi &<br>Special DG, CPWD (retired)<br>Mandi – 175 075, Himachal Pradesh |
| **Er. K. N. Rai** (w.e.f. 01.01.2021)<br>Former Chief Executive<br>Civil Works, DRDO (Retired)<br>New Delhi<br><br>**Er. Niranjan Singh** (upto 31.12.2020)<br>Chief Engineer (Civil), CPWD (retired)<br>A-3/202, Nirmal Chhaya Towers<br>V.I.P Road, Zirakpur<br>Distt. SAS Nagar, Mohali (PB)- 140 603 | **Member Secretary**<br>**Er. Sunil Kapoor**<br>Superintending Engineer (Ex-officio)<br>Indian Institute of Technology Mandi<br>Kamand Campus, VPO Kamand<br>Distt. Mandi – 175 075, (H. P) |

**During this year meetings of the B & W Committee were held on 16.06.2020, 23.10.2020 and 19.03.2021*

# 15. SENATE

| | |
|---|---|
| **Chairman**<br><br>**Prof. Ajit K. Chaturvedi** (w.e.f. 01.07.2020)<br>**Prof. T. A. Gonsalves** (upto 30.06.2020)<br>Director, IIT Mandi (Ex- officio) | |
| **Institute Members**<br><br>Prof. Ramesh Oruganti, Adjunct Professor, SCEE, IIT Mandi<br>Prof. Kenneth E. Gonsalves, Visiting Distinguished Professor, SBS, IIT Mandi<br>Prof. Rajan Kapur, Adjunct Professor, SCEE, IIT Mandi<br>Prof. Subrata Ray, Distinguished Visiting Professor, SE, IIT Mandi<br>Prof. Yvonne Dittrich, Adjunct Professor, SCEE, IIT Mandi<br>Prof. Ajit Padmakar Annachattre, Visiting Professor, SE, IIT Mandi<br>Prof. Ing. Balthasar Novak, Adjunct Professor, SE, IIT Mandi<br>Prof. Tarun Kant, Visiting Distinguished Professor (SE), IIT Mandi<br>Prof. Sumant Nigam, Visiting Distinguished Professor (SE), IIT Mandi<br>Prof. B.D. Chaudhary, Emeritus Professor, SCEE, IIT Mandi<br>Prof. S. C. Jain, Emeritus Professor, SE & Dean (I&S), IIT Mandi<br>Prof. Subrata Ghosh, Professor, SBS, IIT Mandi<br>Prof. Prem Felix Siril, Professor, SBS & Dean (Faculty), IIT Mandi<br>Prof. Suman Kalyan Pal, Professor & Chairperson (SBS), IIT Mandi<br>Prof. Chayan K. Nandi, Professor, SBS, IIT Mandi<br>Prof. Pradeep C. Parameswaran, Professor, SBS & Dean (Academics), IIT Mandi<br>Dr. Vishal Singh Chauhan, Dean (F&A), IIT Mandi<br>Dr. Venkata Krishnan, Dean (SRIC & IR), IIT Mandi<br>Dr. Manoj Thakur, Dean (Students), IIT Mandi<br>Dr. Samar Agnihotri, Chairperson (SCEE), IIT Mandi<br>Dr. Viswanath Balakrishnan, Chairperson (SE), IIT Mandi<br>Dr. Suman Sigroha, Chairperson (SHSS), PFG – HSS Courses, IIT Mandi<br>Dr. Rik Rani Koner, Co-ordinator, AMRC, IIT Mandi<br>Dr. Prosenjit Mondal, Co-ordinator, BioX Centre, IIT Mandi<br>Dr. Satinder K. Sharma, Co-ordinator, C4DFED, IIT Mandi<br>Dr. Rajeev Kumar, Associate Professor (SE), IIT Mandi<br>Dr. Aditi Halder, Associate Professor (SBS), IIT Mandi<br>Dr. Srikant Srinivasan, Associate Professor (SCEE), IIT Mandi<br>Dr. Sunny Zafar, Assistant Professor (SE), IIT Mandi<br>Dr. Qaiser Jahan, Assistant Professor (SBS), IIT Mandi<br>Dr. Gopi Shrikanth Reddy, Assistant Professor (SCEE), IIT Mandi<br>Dr. Puran Singh, Assistant Professor (SHSS), IIT Mandi<br>Dr. Astrid Kiehn, Chair, Library Advisory Committee (LAC), IIT Mandi<br>Mr. Naresh Singh Bhandari, Deputy Librarian, IIT Mandi<br>Dr. Nadeem Akhtar, M/s Arista Networks<br>Dr. Amit Jaiswal, Chief Warden, IIT Mandi<br>Shri K. K. Bajre, Registrar & Secretary, Senate, IIT Mandi<br>All other Faculty members, IIT Mandi (Invitee)<br>Student Research Affairs Secretary, IIT Mandi (Special Invitee)<br>Student General Secretary, IIT Mandi (Special Invitee)<br>Student Academic Affairs Secretary, IIT Mandi (Special Invitee) | |
| **Outside Members**<br><br>Prof. Sunil R. Kale<br>Professor | Prof. N. Sathyamurthy<br>Former Director, IISER, Mohali &<br>Honorary Professor |

| | |
|---|---|
| Deptt. of Mechanical Engg., IIT Delhi | Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru |
| Prof. Rowena Robinson<br>Professor, SHSS, IIT Bombay | Dr. Nadeem Akhtar<br>M/s. Arista Networks |

**During this year meetings of the Senate were held on 29.05.2020, 15.07.2020, 02.09.2020, 05.11.2020, 11.12.2020, and 03.02.2021.*

## 16. ACADEMIC OFFICIALS AS ON 31.03.2021

### DIRECTOR

**Prof. Ajit K. Chaturvedi** (w.e.f. 01.07.2020)
**Prof. Timothy A. Gonsalves** (upto 30.06.2020)

### DEANS

**Prof. Prem Felix Siril** (w.e.f. 19.01.2021)
**Prof. B. D. Chaudhary** (upto 18.01.2021)
Dean (Faculty)

**Dr. Bharat S. Rajpurohit** (w.e.f. 22.01.2021)
**Prof. S.C. Jain** (upto 21.01.2021)
Dean (Infrastructure and Services)

**Dr. Manoj Thakur**
Dean (Students)

**Dr. Vishal Singh Chauhan**
Dean (Finance & Accounts)

**Dr.Pradeep C. Parameswaran**
Dean (Academics)

**Dr. Venkata Krishnan**
Dean (SRIC & IR)

### ASSOCIATE DEANS

**Dr. Anil K. Sao**
Associate Dean (Courses)

**Dr. Devika Sethi**
Associate Dean (International Relations)

**Dr. Vishal Singh Chauhan**
Associate Dean (Finance & Accounts)

**Dr. Rahul Vaish**
Associate Dean (Research)

**Dr. Arnav Bhavsar**
Associate Dean (SRIC)

**Dr.Tulika P. Srivastava**
Associate Dean (Faculty)

**Dr. Kaustav Sarkar**
Associate Dean (Infrastructure)

### CHAIRPERSONS

**Dr. Samar Agnihotri** (w.e.f. 18.05.2020)
**Dr. Bharat S. Rajpurohit** (upto 17.05.2020)
School of Computing and Electrical Engineering

**Dr. Viswanath Balakrishnan**
School of Engineering

**Prof. Suman K. Pal** (w.e.f. 11.01.2021)
**Dr. Syed Abbas** (upto 10.01.2021)
School of Basic Sciences

**Dr. Suman Sigroha**
School of Humanities and Social Sciences

# 17. ADMINISTRATIVE OFFICIALS AS ON 31.03.2021

| 17.1 List of Non-Teaching Staff (Deputation + Permanent + Contract Against Pay Scale) | | |
|---|---|---|
| **Sr. No.** | **Name** | **Designation** |
| **GROUP 'A'** | | |
| 1 | Mr. K. K. Bajre | Registrar (On Deputation) |
| 2 | Er. Sunil Kapoor | Superintending Engineer |
| 3 | Mr. Naresh Singh Bhandari | Deputy Librarian |
| 4 | Mr. Suresh Kumar Rohilla | Assistant Registrar (Stores & Purchase) |
| 5 | Mr. Vivek Tiwari | Assistant Registrar (Academics) |
| 6 | Mr. Parminder Jit | Assistant Registrar (SRIC & IR) |
| 7 | Ms. Shelika | Assistant Registrar (Staff Admin. & Recruit.) |
| 8 | Dr. Chander Singh | Medical Officer |
| **GROUP 'B'** | | |
| 9 | Ms. Monika Kashyap | Senior Superintendent |
| 10 | Mr. Anuj Kumar Dubey | Senior Superintendent |
| 11 | Mr. Hardeep Singh | Security Officer |
| 12 | Ms. Chandan Sharma | Superintendent |
| 13 | Mr. Puneet Kumar | Assistant Engineer (Civil) |
| 14 | Mr. Siddharth Jamwal | Assistant Engineer (Civil) |
| 15 | Mr. Vikas Kumar Chaudhary | Assistant Engineer (Civil) |
| 16 | Mr. Neeraj Chauhan | Assistant Engineer (Electrical) |
| 17 | Mr. Abhijeet Tiwari | Assistant Library Information Officer |
| 18 | Mr. Vinod Kumar | Senior Library Information Assistant |
| 19 | Ms. Sonali Malhotra | Senior Library Information Assistant |
| 20 | Mr. Jitendra Namdev | Senior Library Information Assistant |
| 21 | Mr. Lalit Kumar | Junior Technical Superintendent |
| 22 | Mr. Hardeep Kumar Singh | Junior Technical Superintendent |
| 23 | Mr. Rakesh Kumar | Junior Technical Superintendent |
| 24 | Mr. Ramesh Kumar | Junior Superintendent (Accounts) |
| 25 | Mr. Kaul Singh | Physical Training Instructor |
| 26 | Mr. Pawan Kumar | Junior Superintendent |
| 27 | Ms. Lishma Anand | Junior Superintendent |
| 28 | Mr. Pavin S. Samuel | Junior Superintendent |

| | | |
|---|---|---|
| 29 | Mr. Dnyaneshwar A. Gudadhe | Junior Superintendent |
| 30 | Ms. Sushma Kumari | Junior Superintendent |
| 31 | Mr. Hira Singh Negi | Deputy Security Officer (Joined IIT Mandi on 01.03.2021) |
| **GROUP 'C'** | | |
| 32 | Ms. Suchetna Shachi | Senior Assistant |
| 33 | Mr. Sunil | Senior Assistant |
| 34 | Mr. Sushil Kumar Pal | Senior Assistant |
| 35 | Mr. Amit Sharma | Senior Lab. Assistant |
| 36 | Mr. Ankush Kapil | Senior Lab. Assistant |
| 37 | Mr. Sanjay Kumar | Junior Accountant |
| 38 | Mr. Girish Pal | Junior Accountant |
| 39 | Mr. Vikram Jeet | Junior Accountant |
| 40 | Mr. Desh Raj | Junior Lab. Assistant |
| 41 | Mr. Dinesh Thakur | Junior Lab. Assistant |
| 42 | Mr. Tarun Verma | Junior Lab. Assistant |
| 43 | Mr. Gopal | Junior Lab. Assistant (Technical) |
| 44 | Mr. Dashmesh Singh | Junior Lab. Assistant (Technical) |
| 45 | Mr. Lakhmi Chand Yadav | Junior Lab. Assistant (Medical) |
| 46 | Mr. Aditya | Junior Assistant |
| 47 | Mr. Prakash Singh Negi | Junior Assistant |
| 48 | Mr. Anil Kumar | Junior Assistant |
| 49 | Mr. Nishant Kumar | Junior Assistant |
| 50 | Mr. Kuldeep | Junior Assistant |
| 51 | Mr. Prateek | Junior Assistant |
| 52 | Mr. Anoop Kumar | Junior Assistant |
| 53 | Mr. Vishal Parmar | Junior Assistant |
| 54 | Ms. Nalini Singh Gill | Junior Assistant |
| 55 | Mr. Sameem Khan | Junior Assistant |
| 56 | Mr. Veomesh Rawat | Junior Assistant |
| 57 | Mr. Shyam Singh | Driver |
| 58 | Mr. Manoj Kumar | Junior Attendant |
| 59 | Mr. Leela Dhar | Junior Attendant (Multi Skilled) |

| 17.2 LIST OF CONTRACT EMPLOYEES (On Consolidated Emoluments) As on 31.03.2021 | | |
|---|---|---|
| **Sr. No.** | **Name** | **Designation** |
| 1 | Mr. J. R. Sharma | Consultant (Finance & Accounts Officer) |
| 2 | Mr. C. L. Sharma | Consultant [Deputy Registrar (Audit & Legal)] |
| 3 | Er. Anil Kumar Jain | Senior Consultant (Part-Time) |
| 4 | Dr. Shib Nath Jha | Principal Sports Officer |
| 5 | Dr. Purnima K. Bajre | Counselor (Part-Time) (Relieved on 03.12.2020) |
| 6 | Mr. Ashish Srivastava | Manager (Guest House) |
| 7 | Mr. Mandheer Bali | Junior Engineer (Civil) |
| 8 | Mr. Deen Dyal | Junior Engineer (Civil) |
| 9 | Mr. Daulat Ram | Field Supervisor (Land Records) |
| 10 | Ms. Nimisha N.B. | Career & Placement Executive |
| 11 | Ms. Ishita Mahanty Nandi | Project Scientist |
| 12 | Ms. Debashrita Roy Chowdhury | Web Content Developer |
| 13 | Dr. Milan Behl | Medical Officer (Ayurveda) |
| 14 | Dr. O. P. Mahendru | Medical Officer |

## 18. Student Leadership – 2020-21

| | |
|---|---|
| Mr. Sachit Yadav | General Secretary |
| Mr. Tushar Tyagi | Cultural Secretary |
| Mr. Akash Maurya | Sports Secretary |
| Mr. Vipul Sharma | Technical Secretary |
| Ms. Sikha Chaudhary | Literary Secretary |
| Md. Tarique Asad Rizwee | Hostel Affairs Secretary |
| Mr. Arnav Prasad | Academic Secretary |
| Mr. Pawan Kumar Mandal | Research Secretary |

Students Admitted in the Institute During the Year 2020-21

## 19. PH.D. SCHOLARS – 2020 BATCH

| Sr. NO. | ROLL NO. | NAME | SCHOOL |
|---|---|---|---|
| 1 | D20001 | Kanika Chauhan | SHSS |
| 2 | D20004 | Snehamoy Patra | SCEE |
| 3 | D20005 | Souvik Saha | SCEE |
| 4 | D20007 | Pankaj Kumar Behera | SCEE |
| 5 | D20008 | Anuranjan Jha | SCEE |
| 6 | D20009 | Kanak Rashmi | SCEE |
| 7 | D20011 | Akshay Gaur | SE |
| 8 | D20012 | Mahipal Kulariya | SE |
| 9 | D20013 | Madhu Sudan | SE |
| 10 | D20014 | Abhiparna Dasgupta | SE |
| 11 | D20015 | Sonu Kumar | SE |
| 12 | D20016 | Ayishe Sanyal | SE |
| 13 | D20017 | Kishan Dwivedi | SE |
| 14 | D20021 | Prajnadipta Panda | SBS |
| 15 | D20022 | Portia D Singh | SBS |
| 16 | D20023 | Shilpa Thakur | SBS |
| 17 | D20024 | Rashmi | SBS |
| 18 | D20025 | Alehegn Eskemech | SBS |
| 19 | D20026 | Addisalem Abebe | SBS |
| 20 | D20031 | Akhil Bhardwaj | SBS |
| 21 | D20032 | Aastha Gupta | SBS |
| 22 | D20033 | Arti Yadav | SBS |
| 23 | D20034 | Lavakumar Addepalli | SBS |
| 24 | D20035 | Ashish Soni | SBS |
| 25 | D20037 | Ankit Kashyap | SBS |
| 26 | D20038 | Tahir Ahmad | SBS |
| 27 | D20039 | Ritriban Chakraborty | SHSS |
| 28 | D20040 | Shahyar Husain | SHSS |
| 29 | D20041 | Debalina Roy | SHSS |
| 30 | D20042 | Viliebeinuo Medom | SHSS |
| 31 | D20043 | Sujeet Kumar | SCEE |
| 32 | D20044 | Apuroop Kumar Bhattaram | SCEE |
| 33 | D20045 | Akhilesh Kumar | SCEE |
| 34 | D20046 | Lalitendu Sekhar Barik | SCEE |
| 35 | D20047 | Md Irshad Ansari | SCEE |
| 36 | D20048 | Siddhant Kumar | SCEE |
| 37 | D20049 | Subhajit Dey | SCEE |
| 38 | D20050 | Anant Kumar Singh | SCEE |
| 39 | D20051 | Acharya Satya Murti | SCEE |
| 40 | D20052 | Ashutosh Shah | SCEE |
| 41 | D20054 | Vinit Srivastava | SCEE |
| 42 | D20055 | Chirag Porwal | SE |
| 43 | D20056 | Yadu Chandran | SE |
| 44 | D20058 | Vidhate Akshay Santosh | SE |

| | | | |
|---|---|---|---|
| 45 | D20059 | Karan Narula | SE |
| 46 | D20060 | Saurabh Patel | SE |
| 47 | D20061 | Ipshita Priyadarsini Pradhan | SE |
| 48 | D20062 | Priyanka Gupta | SE |
| 49 | D20063 | Manjeet Rani | SE |
| 50 | D20064 | Sandeep Kushawah | SBS |
| 51 | D20065 | Neelam Budania | SBS |
| 52 | D20066 | Nasaru Khan | SBS |
| 53 | D20067 | Harsh Gupta | SBS |
| 54 | D20068 | Ishita Ghorai | SBS |
| 55 | D20069 | Gautham Varma K | SBS |
| 56 | D20070 | Bhim Kumar | SBS |
| 57 | D20071 | Satpute Ganesh Ashok | SBS |
| 58 | D20072 | Shahin Ansari | SBS |
| 59 | D20073 | Kajal Mittal | SBS |
| 60 | D20074 | Md Shamshad Hussain Ansari | SBS |
| 61 | D20075 | Shraddha Salwahan | SBS |
| 62 | D20076 | Aparna Bhardwaj | SBS |
| 63 | D20077 | Pritam Mukherjee | SBS |
| 64 | D20078 | Abdul Salam | SBS |
| 65 | D20079 | Arijit Ghosh | SBS |
| 66 | D20080 | Mayank Mahajan | SBS |
| 67 | D20081 | Pooja | SBS |
| 68 | D20082 | Ankita Dhiman | SBS |
| 69 | D20083 | Sapkal Goraksha Trimbak | SBS |
| 70 | D20084 | Patidar Pratyusha Rameshchandra | SBS |
| 71 | D20085 | Vasu Nagpal | SBS |
| 72 | D20086 | Praveen Kumar | SCEE |
| 73 | ERPD2001 | Pallavi Saha | SCEE |
| 74 | ERPD2002 | Aishwaya Kumari | SCEE |
| 75 | PTD2002 | Gulshan Kumar Dubey | SCEE |
| 76 | PTD2003 | Yogesh Rohilla | SCEE |
| 77 | PTD2004 | Pankaj Verma | SCEE |
| 78 | PTD2005 | Ved Prakash | SCEE |
| 79 | PTD2006 | Anil Pundir | SE |
| 80 | PTD2007 | Anjali Pathania | SHSS |

## 20. MS SCHOLARS - 2020 BATCH

| Sr. NO. | ROLL NO. | NAME | SCHOOL |
|---|---|---|---|
| 1 | S20003 | Adarsh Prakash Pandey | SCEE |
| 2 | S20005 | M S Gayathree | SCEE |
| 3 | S20006 | Shweta Sanjay Godse | SCEE |
| 4 | S20007 | Aditya Anand | SCEE |
| 5 | S20009 | Fiza Parveen | SCEE |
| 6 | S20011 | Sushovan Jena | SCEE |
| 7 | S20012 | Meetesh Kalpesh Mehta | SCEE |
| 8 | S20013 | Md Arshad Jamal | SCEE |
| 9 | S20014 | Shikha Sharma | SE |
| 10 | S20015 | Chiranjiv Kumar Pandey | SE |
| 11 | S20016 | Pappu Kumar | SE |
| 12 | S20017 | Nilotpal Kalita | SE |
| 13 | S20018 | Swaroop Sonawane | SE |
| 14 | S20019 | Aqif Khursheed Bhat | SE |
| 15 | S20020 | Tuba Fatima | SE |
| 16 | S20021 | Javed Ahamad | SE |

## 21. B.TECH. STUDENTS – 2020 BATCH

### 21.1 B.TECH. – M.TECH. INTEGRATED DUAL DEGREE IN BIO-ENGINEERING

| Sr. NO. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | B20001 | Aditya Prakash |
| 2 | B20003 | Akshita Garg |
| 3 | B20004 | Aviral Garg |
| 4 | B20005 | Ayush Nigam |
| 5 | B20007 | Dippin |
| 6 | B20009 | Gadhvi Mihirkumar Ranjitbhai |
| 7 | B20010 | Jain Hiya Sudhir |
| 8 | B20011 | Jangam Tharun |
| 9 | B20013 | Khushi Ladha |
| 10 | B20015 | Md Sufi Hussain |
| 11 | B20016 | Parul Goyal |
| 12 | B20018 | Ravneet Kaur |
| 13 | B20020 | Sarthak Singh |
| 14 | B20021 | Shubham Prakash |
| 15 | B20023 | Sudhir Kumar |
| 16 | B20024 | Sushant Manhas |

## 21.2 CIVIL ENGINEERING

| Sr.NO. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | B20026 | Aadarsh Kumar Meena |
| 2 | B20027 | Akash Kumar |
| 3 | B20028 | Anand Vishwakarma |
| 4 | B20029 | Anisha Sharma |
| 5 | B20030 | Antriksh Mehta |
| 6 | B20031 | Aryan Tyagi |
| 7 | B20032 | Bachu Poojitha |
| 8 | B20033 | Batti Lal Meena |
| 9 | B20034 | Bhagirath Ram |
| 10 | B20035 | Bhavika Singh |
| 11 | B20037 | Brinda Puri |
| 12 | B20038 | Chepuri Lalithambica |
| 13 | B20039 | Deepak Gupta |
| 14 | B20040 | Deepak Gupta |
| 15 | B20041 | Deepak Ranwa |
| 16 | B20042 | Gaurav Kumar Kanava |
| 17 | B20043 | Harsh Arya |
| 18 | B20044 | Harsh Bhati |
| 19 | B20045 | Harsh Kumar |
| 20 | B20046 | Harsh Saboo |
| 21 | B20047 | Jaideep Singh |
| 22 | B20048 | Jainam Vastupal Bafna |
| 23 | B20049 | Kaustubh Srivastava |
| 24 | B20050 | Kunal Singh |
| 25 | B20051 | Lakshay Bhankhar |
| 26 | B20053 | Mohit Kumar Meena |
| 27 | B20054 | Nalin Agarwal |
| 28 | B20055 | Nelakantam Samyuktha |
| 29 | B20056 | Nikhil Ujjwal |
| 30 | B20057 | Patel Foram Paresh |
| 31 | B20058 | Punit Daga |
| 32 | B20059 | Rahul Yadav |
| 33 | B20060 | Rajshree Tejal Singh Munda |
| 34 | B20061 | Rakshit |
| 35 | B20062 | Ravina Chirania |
| 36 | B20063 | Rishabh Maheshwari |
| 37 | B20064 | Rishav |
| 38 | B20065 | Santosh Gurjar |
| 39 | B20066 | Satyam Saroj |
| 40 | B20067 | Shubham |
| 41 | B20068 | Sonal |
| 42 | B20069 | Udit Kumar |
| 43 | B20070 | Ujjawal |
| 44 | B20071 | Ujjwal Shaw |
| 45 | B20073 | Vivek Prajapat |
| 46 | B20074 | Yashwant Singariya |

## 21.3 COMPUTER SCIENCE & ENGINEERING

| Sr. NO. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | B20075 | Abhay Gupta |
| 2 | B20076 | Aditya Maheshwari |
| 3 | B20077 | Aditya Sood |
| 4 | B20078 | Akshat Raj Anand |
| 5 | B20079 | Amit Maindola |
| 6 | B20080 | Amrendra Kumar |
| 7 | B20081 | Aniket Sukhija |
| 8 | B20082 | Archana Krishna Nayak |
| 9 | B20083 | Arman |
| 10 | B20084 | Arpit Singh |
| 11 | B20085 | Aryansh Singla |
| 12 | B20086 | Ashutosh Purohit |
| 13 | B20087 | Ashutosh Sharma |
| 14 | B20088 | Avni Mittal |
| 15 | B20089 | Ayush Dobal |
| 16 | B20090 | Bharat Kumar |
| 17 | B20091 | Dekarla Akhil |
| 18 | B20093 | Dev Prajapat |
| 19 | B20094 | Devansh Agrawal |
| 20 | B20095 | Dharme Pranav Shaligram |
| 21 | B20096 | Dipesh Sharma |
| 22 | B20097 | Diya Ashish |
| 23 | B20098 | Garvit Verma |
| 24 | B20099 | Gaurav Guleria |
| 25 | B20100 | Gokul Goyal |
| 26 | B20101 | Gutthula Pavani Sri Satvika |
| 27 | B20102 | Harikrit Khatait |
| 28 | B20103 | Harshit Krishna |
| 29 | B20104 | Himakshi Gupta |
| 30 | B20105 | Isha Sukhija |
| 31 | B20106 | Kamble Pratik Kashinath |
| 32 | B20107 | Kamlesh |
| 33 | B20108 | Kanchan Purushottam Padvi |
| 34 | B20109 | Kanishak Garg |
| 35 | B20110 | Karan Baraik |
| 36 | B20111 | Komal |
| 37 | B20112 | Kuldeep Jain Dugar |
| 38 | B20113 | Lavish Sachdeva |

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|---|---|---|
| 39 | B20114 | Meenal Patidar |
| 40 | B20115 | Neha Kumari |
| 41 | B20116 | Nikhil Dhumale |
| 42 | B20117 | Nilesh Rewasiya |
| 43 | B20118 | Param Meena |
| 44 | B20119 | Pulipati Sreesha |
| 45 | B20121 | Pushkar Patel |
| 46 | B20122 | Pushpendra Kumar |
| 47 | B20123 | Rajat Bansal |
| 48 | B20124 | Rajeev Kumar |
| 49 | B20125 | Rehan Saiyad |
| 50 | B20126 | Rijul Jain |
| 51 | B20127 | Ritam Chakraborty |
| 52 | B20128 | Rustam Narayan |
| 53 | B20129 | Sachin Mahawar |
| 54 | B20130 | Sanditi Goutham Reddy |
| 55 | B20131 | Sanjeet Choudhary |
| 56 | B20132 | Saransh Bansal |
| 57 | B20133 | Shailesh Gajanan Rathod |
| 58 | B20134 | Shivam Kumar |
| 59 | B20135 | Shivam Middha |
| 60 | B20136 | Shruti Jain |
| 61 | B20137 | Siddharth Yadav |
| 62 | B20138 | Titiksha Behal |
| 63 | B20139 | Ujjawal Khadanga |
| 64 | B20140 | Vaibhav |
| 65 | B20141 | Varinder Singh |
| 66 | B20142 | Vinayak Sachan |
| 67 | B20143 | Vishwas Garg |

## 21.4 DATA SCIENCE & ENGINEERING

| Sr. NO. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | B20144 | Abhay Singh Raihal |
| 2 | B20145 | Aditi Sharma |
| 3 | B20146 | Akansha Gautam |
| 4 | B20147 | Akshar Singh |
| 5 | B20148 | Ankit Kumar |
| 6 | B20149 | Arjun Mehra |
| 7 | B20150 | Awantika Deora |
| 8 | B20151 | Ayush Kumar Agrawal |
| 9 | B20152 | Chaetenya Sharma |
| 10 | B20153 | Girish Geadhar |

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|---|---|---|
| 11 | B20154 | Gurkanwal Singh |
| 12 | B20155 | Jahanvi Chaudhary |
| 13 | B20156 | Mayank Bansal |
| 14 | B20157 | Md. Arif |
| 15 | B20158 | P V Jayanth |
| 16 | B20159 | Palak Sharma |
| 17 | B20160 | Pallav Varshney |
| 18 | B20161 | Parth Joshi |
| 19 | B20162 | Pavitra Jain |
| 20 | B20163 | Piyush Verma |
| 21 | B20164 | Prateek Raj |
| 22 | B20165 | Prateeksha Pal |
| 23 | B20166 | Ridam Nama |
| 24 | B20167 | Saurav Kumar |
| 25 | B20168 | Shubham Shukla |
| 26 | B20169 | Sonam Chauhan |
| 27 | B20170 | Sourav Kumar Samant |
| 28 | B20171 | Vision Aggarwal |
| 29 | B20172 | Vivek Jaiswal |
| 30 | B20173 | Yash Bhotmagey |

## 21.5 ELECTRICAL ENGINEERING

| Sr. NO. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | B20174 | Aashutosh Ucholiya |
| 2 | B20175 | Aayushmaan Jha |
| 3 | B20176 | Abhay Vijayvargiya |
| 4 | B20177 | Abhigya |
| 5 | B20178 | Abhishek Kharyal |
| 6 | B20179 | Ajeet Kumar |
| 7 | B20180 | Amit |
| 8 | B20181 | Ankit Pal Singh |
| 9 | B20183 | Anurag Maurya |
| 10 | B20184 | Arun Patwa |
| 11 | B20185 | Aryaka Neeraj Choudhary |
| 12 | B20186 | Aryan Apte |
| 13 | B20187 | Aryan Tiwari |
| 14 | B20188 | Aryaveer Gupta |
| 15 | B20189 | Ayush Garg |
| 16 | B20190 | Bhanu Jindal |
| 17 | B20191 | Deepak Kumar |
| 18 | B20193 | Dhananjay Kumar |
| 19 | B20194 | Dikshika Singh |
| 20 | B20195 | G.K.V.Snigdha |
| 21 | B20196 | Gabani Romit Ghanshyambhai |
| 22 | B20197 | Gaurav Kumar |
| 23 | B20198 | Gautam Dhulipala |

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|---|---|---|
| 24 | B20199 | Gayatri Shridhar Kapse |
| 25 | B20200 | Geetanshu Arsiya |
| 26 | B20201 | Gurram Dharma Teja |
| 27 | B20202 | Harish Choudhary |
| 28 | B20203 | Harsh Kumar Verma |
| 29 | B20204 | Jayanta Kumar M |
| 30 | B20205 | Kamal Singh |
| 31 | B20206 | Kanishk Shrivastava |
| 32 | B20207 | Kanishk Singla |
| 33 | B20208 | Khushboo |
| 34 | B20209 | Kshatriya Om Prashant |
| 35 | B20210 | Maddala Lakshmi Venkata Dheeraj |
| 36 | B20211 | Madhur Jajoo |
| 37 | B20212 | Manne Nandhini |
| 38 | B20213 | Mayank Kakkar |
| 39 | B20214 | Milan Soni |
| 40 | B20215 | Mohit Verma |
| 41 | B20216 | Monendra Mukesh Meena |
| 42 | B20217 | Monika Meena |
| 43 | B20218 | Narmit Kumar |
| 44 | B20219 | Nikhil |
| 45 | B20220 | Payal Kumari Sah |
| 46 | B20221 | Pradeep Meena |
| 47 | B20222 | Prakash Mandloi |
| 48 | B20223 | Prashant Chaudhary |
| 49 | B20224 | Pratigya Baghel |
| 50 | B20225 | Ramay Maheshwari |
| 51 | B20226 | Rupesh Kumar Yadav |
| 52 | B20227 | Sahil Singh Rathore |
| 53 | B20228 | Saksham Kumar |
| 54 | B20229 | Shalu |
| 55 | B20230 | Shashwat Singh |
| 56 | B20231 | Shivam Raj |
| 57 | B20232 | Shri Janani Senthil |
| 58 | B20233 | Sonu Meena |
| 59 | B20234 | Sweety Agarwal |
| 60 | B20235 | Utkarsh Gupta |
| 61 | B20236 | Vansh Kodesia |
| 62 | B20237 | Vanshaj Vijay Nathani |
| 63 | B20238 | Vikas Dangi |
| 64 | B20239 | Vishal Sharma |
| 65 | B20240 | Yash Gupta |
| 66 | B20241 | Yash Sharma |
| 67 | B20242 | Yerramsetti Leela Chaitanya |

## 21.6 ENGINEERING PHYSICS

| Sr. NO. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | B20243 | Akash Anand |
| 2 | B20244 | Aringi Vinay Chaitanya |
| 3 | B20245 | Arkadeep Ghosh |
| 4 | B20246 | Ashutosh Sharma |
| 5 | B20247 | Avanindra Kumar |
| 6 | B20248 | Kanjariya Hirwa Hasmukhbhai |
| 7 | B20249 | Khushi Baghel |
| 8 | B20250 | Kishita |
| 9 | B20251 | Kushagra Sharma |
| 10 | B20252 | Kushagra Srivastav |
| 11 | B20253 | Nikita Rana |
| 12 | B20255 | Nishita Tayal |
| 13 | B20256 | P Mahesh Reddy |
| 14 | B20257 | Prachee Mathur |
| 15 | B20258 | Pranav R Iyengar |
| 16 | B20259 | Pushkar Bohara |
| 17 | B20260 | Raghvendra Pathak |
| 18 | B20261 | Rajat Verma |
| 19 | B20262 | Ravi Suthar |
| 20 | B20263 | Ritu Shukla |
| 21 | B20264 | Rohan |
| 22 | B20265 | Sahil Kumar |
| 23 | B20266 | Shardul Ashish Mahajan |
| 24 | B20267 | Shiorn Jijoe |
| 25 | B20268 | Sudhanshu Rai |
| 26 | B20269 | Vishwas Saini |

## 21.7 MECHANICAL ENGINEERING

| Sr. NO. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | B20270 | Aachman Gandhi |
| 2 | B20271 | Abhinav Kumar |
| 3 | B20272 | Aditi Singh |
| 4 | B20273 | Akshit Jharwal |
| 5 | B20274 | Alok Raj Sidhaarth |
| 6 | B20276 | Ananthram V |
| 7 | B20277 | Anjali Meena |
| 8 | B20278 | Ankit Kumar Verma |
| 9 | B20279 | Aryan Ali |
| 10 | B20280 | Aryan Vashistha |
| 11 | B20281 | Ashwini Kumar |
| 12 | B20282 | Atharva Vidulkar |
| 13 | B20283 | Boligarla Nishritha |
| 14 | B20284 | Chandresh Soni |
| 15 | B20285 | Dev Haral |

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|---|---|---|
| 16 | B20286 | Dishti Oberai |
| 17 | B20287 | Harshit Agarwar |
| 18 | B20288 | Hemant Bansal |
| 19 | B20289 | Hemant Chauhan |
| 20 | B20290 | Himani |
| 21 | B20291 | Hrishabh Nayal |
| 22 | B20292 | Ishaan Gupta |
| 23 | B20293 | Kanak Dubey |
| 24 | B20294 | Kishan Sharma |
| 25 | B20295 | Kumar Kirsh |
| 26 | B20296 | Kushagra Agrawal |
| 27 | B20297 | Laxman Prasad |
| 28 | B20298 | Manav Sharma |
| 29 | B20299 | Mayank Bhayal |
| 30 | B20300 | Mehul Jain |
| 31 | B20301 | Mohd Azam |
| 32 | B20302 | Murtaza Mehdi Hasan |
| 33 | B20303 | Navdeep Kaur |
| 34 | B20304 | Nishant Kapoor |
| 35 | B20305 | Pranjal Sharma |
| 36 | B20306 | Prashun Pandey |
| 37 | B20307 | Priyanka Kumari |
| 38 | B20308 | Punish Kumar |
| 39 | B20309 | Rachit Goel |
| 40 | B20310 | Rahul |
| 41 | B20311 | Rajat Dawra |
| 42 | B20312 | Rajneesh Chaudhary |
| 43 | B20313 | Ravi Ranjan |
| 44 | B20314 | Rohan Bharti |
| 45 | B20315 | Sahil |
| 46 | B20316 | Saraf Maitri Himanshu |
| 47 | B20317 | Sarthak Saptami Kumar Jha |
| 48 | B20318 | Shashwat Gupta |
| 49 | B20319 | Shashwat Sharma |
| 50 | B20320 | Shruti Kirti Madhesia |
| 51 | B20321 | Subham |
| 52 | B20322 | Sweta |
| 53 | B20323 | Talla Hruday Kumar |
| 54 | B20324 | Tarun Soni |
| 55 | B20325 | Vastav Bansal |
| 56 | B20327 | Yash Malhotra |
| 57 | B20328 | Yuvraj Aseri |

## 22. M.Sc. (CHEMISTRY)

| Sr. NO. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | V20001 | Koustav Kundu |
| 2 | V20002 | Susovon Ghosh |
| 3 | V20003 | Anjali Saini |
| 4 | V20004 | Jatin Saxena |
| 5 | V20005 | Swapnil Verma |
| 6 | V20006 | Mainao Juli Basumatary |
| 7 | V20007 | Ajay Kumar |
| 8 | V20008 | Megha Garg |
| 9 | V20009 | Rishabh Goswami |
| 10 | V20010 | Muskan Kaur |
| 11 | V20011 | Samiksha |
| 12 | V20012 | Aman Yadav |
| 13 | V20013 | Mohit |
| 14 | V20014 | Aanchal Hurmade |
| 15 | V20015 | Amit Kumar Nayak |
| 16 | V20016 | Sourav Mandal |
| 17 | V20017 | Masrakul Alam |
| 18 | V20018 | Piyush Rana |
| 19 | V20019 | Balendu Bisht |
| 20 | V20020 | Sameer Sekhar Mohanty |
| 21 | V20021 | Ushma Gangwar |
| 22 | V20022 | Sayani Chanda |
| 23 | V20023 | Kamlesh Kumari |
| 24 | V20024 | Lalnunenga |
| 25 | V20025 | Chhaya Thadhani |
| 26 | V20026 | Ritesh Kumar Bag |
| 27 | V20027 | Mratyunjay Singh Jadaun |
| 28 | V20028 | Rohit Yadav |
| 29 | V20029 | Vijendra Singh |
| 30 | V20030 | Subhartha Sarkar |
| 31 | V20031 | Ambika |
| 32 | V20032 | Sourav |
| 33 | V20033 | Ritunjoy Baruah |
| 34 | V20034 | Arun Singh |
| 35 | V20035 | Abhishek Sahu |
| 36 | V20036 | Snehasis Moni |
| 37 | V20037 | Bikash Raut |
| 38 | V20038 | Shobhit Panwar |
| 39 | V20039 | Gayatri |
| 40 | V20040 | Aman |
| 41 | V20041 | Vaibhav Sachdeva |
| 42 | V20042 | Fayaz Ahmad |

## 23. M.Sc. (APPLIED MATHEMATICS)

| Sr. No. | Roll No. | Student Name |
|---|---|---|
| 1 | V20043 | Naman Karol |
| 2 | V20044 | Adarsh Subhash Narendulwar |
| 3 | V20045 | Manoj |
| 4 | V20046 | Sahil Sharma |
| 5 | V20047 | Varuun A Deshpande |
| 6 | V20048 | Tarun Kumar |
| 7 | V20049 | Payal Sharma |
| 8 | V20050 | Ashim Majumdar |
| 9 | V20051 | Pankaj Sahu |
| 10 | V20052 | Rajgor Milapkumar Khushalchandra |
| 11 | V20053 | Ritu |
| 12 | V20054 | Abhishek |
| 13 | V20055 | Pratishtha Wadhwa |
| 14 | V20056 | Saheb Mondal |
| 15 | V20057 | Manoj Kumar |
| 16 | V20058 | Thacker Soniya Laxmidas |
| 17 | V20059 | Iftikhar Bashir Gojri |
| 18 | V20060 | Feroz Ahmad Khan |
| 19 | V20061 | Vikas Kalsia |
| 20 | V20062 | Raja Kannavjiya |
| 21 | V20063 | Hement Kumar |
| 22 | V20064 | Angha Agarwal |
| 23 | V20065 | Mahesh Kumar Sheshma |
| 24 | V20066 | Nitin |
| 25 | V20067 | Deepak Sahu |
| 26 | V20068 | Piyush Kumar Dixit |
| 27 | V20069 | Satnam Singh |
| 28 | V20070 | Sushil Prajapat |
| 29 | V20071 | Vikas Rajpal |
| 30 | V20072 | Kartikay Sharma |
| 31 | V20073 | Khriesavinyu Terhuja |
| 32 | V20074 | Komal Kumar |
| 33 | V20075 | Ajay |
| 34 | V20076 | Reshma |
| 35 | V20077 | Surjit Kumar |
| 36 | V20078 | Narender Kumar |
| 37 | V20079 | Zafar Hossain |
| 38 | V20080 | Bhawna |

## 24. M.Sc. (PHYSICS)

| Sr. NO. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | V20081 | Aamil Saifi |
| 2 | V20082 | Anannya Mukherjee |
| 3 | V20083 | Diksha Prajapati |
| 4 | V20084 | Sushil |
| 5 | V20085 | Yogin Jitendrabhai Bhimani |
| 6 | V20086 | Anjali |
| 7 | V20087 | Shubhanshu Karoliya |
| 8 | V20088 | Anshu Tyagi |
| 9 | V20089 | Aruna |
| 10 | V20090 | Rohit Gupta |
| 11 | V20091 | Sandhya A K |
| 12 | V20092 | Nalinikanta Pradhan |
| 13 | V20093 | Sandeep Patel |
| 14 | V20094 | Afra Navas |
| 15 | V20095 | Gunjan |
| 16 | V20096 | Manshi Rani |
| 17 | V20097 | Biswarup Biswas |
| 18 | V20098 | Arun Pandiyan |
| 19 | V20099 | Nitin Kumar |
| 20 | V20100 | Pankaj Kumar |
| 21 | V20101 | Ankush Kamal |
| 22 | V20102 | Anayat Ullah |
| 23 | V20103 | Sankalp Sharma |
| 24 | V20104 | Arnab Prakash Dey |
| 25 | V20105 | Sreeshyam V A |
| 26 | V20106 | Sahil Kumar |
| 27 | V20107 | Shad Mohamed A K |
| 28 | V20108 | Vinod Kumar |
| 29 | V20109 | Liza Helen K |

## 25. M.Tech. (STRUCTURAL ENGINEERING)

| Sr. No. | Roll No. | Student Name |
|---|---|---|
| 1 | T20001 | Samrul Hoda |
| 2 | T20002 | Vageesh Kumar Dixit |
| 3 | T20003 | Harshit Nayak |
| 4 | T20004 | Kola Rajkumar |
| 5 | T20005 | Rahul Dogra |
| 6 | T20006 | Rishabh Sharma |
| 7 | T20007 | Suraj |
| 8 | T20008 | Sanjeev Roy |
| 9 | T20009 | Armaan Khan |
| 10 | T20010 | Sheriff Chadha |
| 11 | T20011 | Akshit Negi |
| 12 | T20012 | Ammar Ahmed |
| 13 | T20013 | Prachi Verma |
| 14 | T20014 | Rahul Kumar |
| 15 | T20015 | Aditya Mahajan |

### 26. M.Tech. (Mechanical Engineering with Specialization in Energy Systems)

| Sr. No. | Roll No. | Student Name |
|---|---|---|
| 1 | T20071 | Sharad Pardhe |
| 2 | T20072 | Nitin Kumar Pathak |
| 3 | T20073 | Vinay Kumar |
| 4 | T20074 | Mukesh Kumawat |
| 5 | T20075 | Harshit Mundra |
| 6 | T20076 | Rahul Gupta |
| 7 | T20077 | Sanjay Kumar Yadav |
| 8 | T20078 | Naveen Kumar |
| 9 | T20080 | Anjani Kumar Sagar |
| 10 | T20081 | Sachin Verma |
| 11 | T20083 | Varnit Kapoor |
| 12 | T20084 | Mridul Agarwal |
| 13 | T20085 | Sunil Kumar |
| 14 | T20086 | Maitrayo Brahmachari |

### 27. M.Tech. (Energy Engineering with Specialization in Materials)

| Sr. No. | Roll No. | Student Name |
|---|---|---|
| 1 | T20031 | Naresh Sharma |
| 2 | T20032 | Vineet Kumar |
| 3 | T20033 | Manish Kumar |
| 4 | T20034 | Gaurav Khattri |
| 5 | T20035 | Rushikesh Shirish Jadhav |
| 6 | T20036 | Jitendra Choudhary |
| 7 | T20037 | Dhruv Paul |
| 8 | T20038 | Shivam Dubey |
| 9 | T20039 | Manish Mishra |
| 10 | T20040 | Shiv Shankar Tiwari |
| 11 | T20041 | Rahul Raj |
| 12 | T20042 | Shubham Rodwal |
| 13 | T20043 | Sairaj Amrut Salunke |
| 14 | T20044 | Shashyabh Ray |
| 15 | T20045 | Prem Kumar |

### 28. M.Tech. in VLSI

| Sr. No. | Roll No. | Student Name |
|---|---|---|
| 1 | T20251 | Md. Mushfiqur Rahman Chowdhury |
| 2 | T20252 | Swetank Tripathi |
| 3 | T20253 | Animesh Bhatt |
| 4 | T20254 | Kushagra Nainwal |
| 5 | T20255 | Sayal Chawda |
| 6 | T20256 | Divya Agrawal |
| 7 | T20258 | Bharath Mohan |
| 8 | T20241 | Pritiksha Chand |

| | | |
|---|---|---|
| 9 | T20242 | Abhishek Padam |
| 10 | T20243 | Panasa Srikanth |
| 11 | T20244 | Balram Patidar |
| 12 | T20245 | Vishnu Kumar Sharma |
| 13 | T20246 | Chaitanya Anand |
| 14 | T20247 | Deepank |
| 15 | T20248 | Ashkand Kumar |
| 16 | T20249 | Meghvern Pathak |
| 17 | T20250 | Nishanth Kumar V |
| 18 | T20288 | Lalit |

### 29. M.Tech. (POWER ELECTRONICS AND DRIVES)

| Sr. No. | Roll No. | Student Name |
|---|---|---|
| 1 | T20201 | Tuhin Mitra |
| 2 | T20202 | Kuldeep Singh |
| 3 | T20203 | Shubham Kumar |
| 4 | T20204 | Diwakar Sinha |
| 5 | T20205 | Suraj S |
| 6 | T20207 | Amit Singh |
| 7 | T20208 | Ankit Kumar Ranjan |
| 8 | T20209 | Hitesh Kumar Fulwariya |
| 9 | T20210 | Hetal Sharma |
| 10 | T20211 | Soumya Ranjan Nayak |
| 11 | T20213 | Deepak |
| 12 | T20214 | Chirag Gupta |
| 13 | T20215 | Chandan Kumar Mahto |
| 14 | T20216 | Sivaji Ganesh Velicheti |
| 15 | T20217 | Venkata Aditya Duggaraju |
| 16 | T20218 | Vivek Singh |
| 17 | T20219 | Andemachugari Venkata Mahesh |
| 18 | T20220 | Mahendra Kumar |
| 19 | T20221 | Vivek Kumar |

### 30. M.Tech. (COMMUNICATION AND SIGNAL PROCESSING)

| Sr .No. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | T20289 | Ratnesh Kumar Kumar |
| 2 | T20282 | Shruti Singh |
| 3 | T20283 | Vineet Kumar Mishra |
| 4 | T20287 | Vasudevarao Lenka |

### 31. M.Tech. (BIOTECHNOLOGY)

| Sr .No. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | T20401 | Deepali Bisht |
| 2 | T20402 | Himanshu Sharma |
| 3 | T20403 | Riya Nager |

| | | |
|---|---|---|
| 4 | T20404 | Chandan Kumar Pradhan |
| 5 | T20405 | Arpita Prasad |
| 6 | T20406 | Prerna Verma |
| 7 | T20407 | Aniket Sen |
| 8 | T20408 | Ashutosh Joshi |
| 9 | T20409 | Ritika Jain |
| 10 | T20410 | Sheetal Pal |
| 11 | T20411 | Ujjawal Sharan |
| 12 | T20412 | Iram Parveen Shamim Ahmed Ansari |
| 13 | T20413 | Snehlata Rao |
| 14 | T20414 | Vishali Dhiman |
| 15 | T20415 | Shimpy Nigam |
| 16 | T20416 | Nistha Saini |

### 32. M.A (Development Studies)

| Sr .No. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | A20001 | Akash Sharma |
| 2 | A20002 | Akshit Sirohi |
| 3 | A20003 | Arvind Venkatesh Iyer |
| 4 | A20004 | Anagha Tv |
| 5 | A20005 | Daimond Narzary |
| 6 | A20006 | Nihirika Batra |
| 7 | A20007 | Gautam Mishra |
| 8 | A20008 | Himani Singh |
| 9 | A20010 | Jasmeet Singh  Bindra |
| 10 | A20011 | Keshav Tadia |
| 11 | A20012 | Kuldip Kailas Meshram |
| 12 | A20013 | Neena Sreekumar S |
| 13 | A20017 | Vikas Gautam Shinde |

### 33. I-Ph.D. (Physics)

| Sr .No. | ROLL NO. | STUDENT NAME |
|---|---|---|
| 1 | DI20027 | Aditya Singh |
| 2 | DI20028 | Prakash Pandey |
| 3 | DI20029 | Jogendra |
| 4 | DI20030 | Aksa Thomas |

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