



Tidings

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Chief Patron

Prof. Laxmidhar Behera
Director, IIT Mandi

Editorial Team

Dr Rajeev Kumar
Dr Jaspreet Kaur Randhawa
Dr Himanshu Pathak
Dr Subhamoy Sen
Dr Sayantan Sarkar
Mr Diwakar Singh
Mr Jitendra Adhikari

Contact

Chairperson
School of Engineering,
IIT Mandi, Kamand
H.P. – 15005, India
Phone: 01905-267138
Fax: 01905-267138
Web: se.iitmandi.ac.in,
E-mail:
chairse@iitmandi.ac.in

SE Faculty Strength

Regular Faculty: 34
Visiting Professor: 1
Visiting Asst. Professor: 1
Adjunct Professor: 1
Distinguished Visit. Prof: 3
Emeritus Professor: 1
Mentor Professors: 2

Present Student Strength

B.Tech.:
(Civil & Mechanical): 111 & 131
M.Tech.:
(Civil, Mechanical, & Material):
42,39, & 21
Ph.D. & M.S.: 94 & 24
Female Students:
PG/UG: 31/48

Publications (as per Scopus)

Till date: 1174
Since August 2021: 40

School Chairperson's Message...

Positive drift towards patents, prototypes and engineering solutions paved a solid platform for expanding our activities in the School of Engineering. In the past 5 years, we have been progressing steadily reaching over 517 research articles, 104 conference papers, 24 patents, 26 book chapters and 3 text books. While Covid-19 made some aberrations in routine life and campus activities, our research never stopped due to the tireless efforts of research scholars and faculty members. At present, we have around 13 teaching and 25 research labs that are organized under 9 different research themes. Thinking of further growth, the road ahead is golden and we should be able to take some of our long awaited plans to make centers of excellence in areas like Natural Hazards and Himalayan Environment considering our locational advantage. It is also high time to consolidate our strengths in areas like AI, Robotics and Product Development to engage and train our engineering students to cutting edge technologies by creating academic programs and well equipped research centers. While we continue to envision future goals and opportunities, let us remember the words of a famous children's book writer (Maurice Sendak), "There must be more to life than having everything" and consciously think how each one of us can excel in our chosen area of interest and at the same time inspire and help others who are far from engineering education and research. To make this happen in our research labs, class rooms, corridors, mess halls and canteens, the immediately needed step is to achieve greater academic and research ambience that is just peaceful but filled with knowledge, creativity and inspiration. Success and rest of the things are bound to happen in all dimensions when we have such ambience. Let us strive to make that experience real without needing to wait long!

Dr. Viswanath Balakrishnan

Technology Developed

- The Hon'ble Governor of H.P, Mr. Rajendra V Arlekar visited IIT Mandi to review landslide risk management technology, developed by **Dr KV Uday** and **Dr. Varun Dutt**
- The Hon'ble Prime Minister, Mr. Narendra Modi reviewed the landslide monitoring and early warning system, developed by **Dr. Varun Dutt** and **Dr KV Uday**

Recent Patent

- Subrata Mondal** and **Dr Rajesh Ghosh**. An ankle prosthesis
- Dr K V Uday**, **Naman C**, **Amudhan M**, **Shishsir A**, **Nidhika K**. Detection unit and there of
- Dr Sunny Zafar** and **Bhupinder Singh**. Method for cladding internal cylindrical/curved surface via microwave.
- Dr Shyam K. Masakapalli**, **Chandrakant Joshi**, **Dr Swati Sharma**. A Method for integrating bioprocessing with pyrolysis for valuable chemicals and carbon from waste biomass
- Dr Jaspreet K. Randhawa**. Single step synthesis of multimodal magnetofluorescent core-shell superparamagnetic iron oxide nanoparticles and fluorescent carbon nanodots.

Placements'22

- Google, Microsoft, Samsung, Adobe, Walmart, PayTm
- Amazon, Indeed, Cashfree, Wipro, C-DAC, and Razorpay, LafargeHolcim, CGI, and Commvault
- Codenation, and Wunderman Thompson
- Axxela Advisory Services, Swiggy, and Addverb Technologies Pvt. Limited
- Impact Guru Technology Ventures Pvt. Ltd.
- L & T Engineering Construction and Contracts
- Beehyv Software Solutions Private Limited
- DE Shaw, Newzera, and Wizikey
- ArcelorMittal Nippon Steel India Ltd
- Suzlon, and Cognizant

New Faculty



Dr. Gajendra Singh (Assistant Professor) holds a Ph.D. from University of Sydney, Australia. His research domain includes experimental fluid mechanics, spray atomization & combustion, drug delivery through dry powder inhalers, laser/optical diagnostics and advance image processing techniques.



Dr. Shashank Pathak (Assistant Professor) holds a Ph.D. from IIT Delhi. His research areas encompasses protective structures, structural dynamics, vibration control, random vibrations, uncertainty in engineering problems, rock mechanics, earthquake engineering, structural design and analysis



Dr. Tanushree Parsai (Assistant Professor) holds a Ph.D. from IIT Delhi. Her research areas include fate and transformation of emerging contaminant, detection and exposure assessment of microplastics, and risk assessment.

Recently Commenced Projects

- Study for the optimum height of lift for mass concrete in concrete dam structure
PI: Dr. Subhamoy Sen, Co-PI: Dr. Himanshu Pathak
Agency: SJVNL,
Budget: Rs 32,40,000, Duration: 2 years
- Consultancy: Preparation of DPR for landslide mitigation for a site in Mandi district
PI: Dr. KV Uday, Co-PI: Dr. Dericks P Shukla, Dr. Ashutosh Kumar
Agency: PWD-2, Mandi,
Budget: Rs 24,54,400, Duration: 3 months
- Developing a Framework for Landslide Susceptibility and Adaptability in South East Asia (SEAL)
PI: Dr. Ashutosh Kumar
Agency: Natural and Environment Research Council, UKRI, UK
Budget: Rs 7,99,500, Duration: 6 months

National Engineer's Day Celebration

- On the occasion of the National Engineers' Day, Competitions comprising of scientific storytelling, research presentations, posters, and prototype showcasing were organized on the theme "Engineering for Society".
- The occasion was graced by Mr. Sunil Verma, Joint Director (Technical Education), Govt. H.P, and Dr. Hemant Kumar from the Aditya Birla Group. The Director, Prof. A. K. Chaturvedi addressed the students and highlighted the importance of interdisciplinary research
Organizing Committee : **Dr. K. V. Uday, Dr. S. S. Ray, Dr. S. Sen, Dr. S. Sharma and Dr. A. Kumar**



Glimpse of Engineering Day's Celebration

Distinguished Visitors

- Prof. Amitabha Ghosh, IEST Shibpur delivered a lecture (online) on November 15, 2021, hosted by **Dr. Swati Sharma**.

New Courses

- Disaster Risk Management
- Blast Engineering

Continuing Education Activities

- Winter School on Theory and Computation in Vibration organized by **Dr Arpan Gupta** during December 13-17, 2021
- Workshop on Comprehensive Disaster Risk Management organized by **Dr KV Uday** during July 28-30, 2021
- 3. International workshop on Computational Techniques for Smart Materials Modelling and Bio-medical Applications Organized by: **Dr. Himanshu Pathak and Dr. Sunny Zafar** during January 22-30, Jan 2022.
- 4. Short Term Course on Modeling and Simulation of Engineering systems (31 Jan-4 Feb 2022)
- Organized by **Dr Mohammad Talha and Dr Rajeev Kumar** during January 31-February 4, 2022

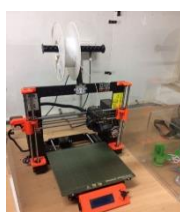
High Impact Papers

- **Korakuti Hanumanthu, Kaustav Sarkar**. "Statistical quantification of the effect of temperature on capillary water absorption in some porous building materials." *Building and Environment* 198 (2021): 107889.
- **Arash Azizi, Ashutosh Kumar, David Toll**. "Coupling cyclic and water retention response of a clayey sand subjected to traffic and environmental cycles." *Geotechnique* (2021)
- **Manjeet Rani, Priyanka Chaudhary, Venkata Krishnan, Sunny Zafar**. "Development of sustainable microwave-based approach to recover glass fibers for wind turbine blades composite waste." *Resources, Conservation & Recycling* 179 (2021): 106107.
- **G.Chanakya, Pradeep Kumar**. "Effects of diffuse and collimated beam radiation on a symmetrical cooling case of natural convection." *Thermal Science and Engineering Progress* 25 (2021): 101006.
- **Swati Sharma, Sandro Zorzi, Viviana Cristiglio, Ralf Schweins, Claudia Mondelli**. "Quantification of Buckminsterfullerene (C60) in non-graphitizing carbon and a microstructural comparison of graphitizing and non-graphitizing carbon via Small Angle Neutron Scattering." *Carbon* 189 (2022): 362-368.

Students Achievements

- **Charu Chauhan**, working under the supervision of **Dr. KV Uday** has been selected for Best Paper award for the paper "Study of Erosion Process in Laboratory Flume Experiments" in Indian Geotechnical Conference 2021.
- **Rahul Dogra**, working under the supervision of **Dr. Ashutosh Kumar**, awarded DAAD Scholarship to work at Technical University Darmstadt, Darmstadt, Germany From September 2021- March 2022.
- **Dr. Saurav Sharma**, completed his PhD under the supervision of **Prof. Rajeev Kumar and Dr. Mohammad Talha**, awarded with Humboldt fellowship.

Recently Developed Facilities



Concrete Pan Mixer Metal cutting saw 3D printer Impact of Jet Apparatus



Free and Forced Vortex Setup Fume hood Pitot Tube Orifice and Mouthpiece Setup WP4C Unit

Faculty Achievements/Outreach

- **Dr Arpan Gupta** was Keynote Speaker at International Conference on Advancements in Design and Tribology (ICADT-2021) from 17-18 Dec 2021 at SVNIT Surat and Keynote Speaker at 5th International Conference on Mathematical Techniques in Engineering Applications (ICMTEA2021), 3-4 Dec, 2021.
- **Dr Sandip Kumar Saha** has presented 2 talks 1. Repair and Retrofitting for Enhancing Seismic Performance of RC Structures in an one week, e-Faculty Development Program on Deterioration, Diagnosis and Rehabilitation of RC Structures at B.I.T. Sindri, Jharkhand. 2. Base-Isolation for Liquid Storage Tanks in an online, AICTE sponsored ATAL FDP on Earthquake Resistant Design and Construction Practices, at University Institute of Technology (UIT), Bhopal. He also participated as one of the five Indian delegates in a UKIERI-DST Partnership Development Workshop organized at University of Wolverhampton, Wolverhampton, UK and presented a talk on Understanding the Behaviour of Buildings in Hilly Regions under Multiple Hazards."
- **Dr Kaustav Sarkar** delivered 3 expert lectures 1. "Potential of pine needles for use as fibre reinforcement for cementitious systems" in the online AICTE sponsored short term programme on Energy Efficient and Innovative Building Construction Practices, organized by the NITTR Chandigarh. 2. "Simulation of moisture transport in concrete" in the online AICTE sponsored short term course on Programming in Finite Element Method and its application to practical problems using ABAQUS, at NITTR Chandigarh. 3. "Modelling of hydraulic diffusivity by inverse analysis" in the online FDP on Deterioration, Diagnosis and Rehabilitation of RC structures, at BIT Sindri. Additionally, he gives a keynote lecture on "Moisture transport in concrete - experimentation and simulation" in the online national conference BITCON at Bhilai Institute of Technology Durg (C.G.). He also served as a reviewer for "Harmonized Guidelines and Space Standards for Barrier Free Environment for Persons with Disability and Elderly Persons 2016" under the Department of Empowerment of Persons with Disabilities (DEPwD), GoI.
- **Dr Rajesh Ghosh** has been selected for Editorial Board Member of BMC Musculoskeletal Disorders.
- **Dr K V Uday** delivered expert talk for TC-106 Unsaturated Soil Mechanics for preconference workshop at IGC 2021
- **Dr Ashutosh Kumar** delivered 3 talks 1. "Understanding the impact of changing climatic conditions on Transportation Infrastructure" at RAEEATG 2021 organized by NIT Agartala. 2. "Earthquake Resilient Foundation System and Seismic Performance of Heritage Structures" at AICTE Sponsored online FDP on Disaster Resilient Infrastructure by Himachal Pradesh University Shimla, HP. 3. "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, HP.
- **Dr Sunny Zafar** delivered talk on Manufacturing of polymer composites using microwave energy during Online ATAL Faculty Development Program organized by NIT Meghalaya
- **Dr Himanshu Pathak** was invited as speaker in AICTE sponsored ATAL Faculty Development Program on Advances in Numerical Methods for Engineering Structures: Fundamentals towards Applications at IIT Ropar.
- **Dr Parmod Kumar** delivered an online talk on towards understanding the characteristics of film boiling heat transfer over curved surfaces at G.H. Rasoni Institute of Engineering & Technology, Nagpur.
- **Dr Mohammad Talha** delivered an Invited talk at the Dept. of Mech. Engineering, Glocal University, Saharanpur, UP on 10 December 2021: Title of Talk: Modelling and Analysis of Blocked Coronary Artery.
- **Dr Swati Sharma** was invited as speaker in FDP workshop on Processing of Novel Materials for Defense and Aerospace Applications hosted by IIT Tirupati and gave plenary talk in Carbon-MEMS International Workshop 2021.
- **Dr Rajeev Kumar** delivered 2 expert lectures 1. "Introduction to Finite Element Method" in the online AICTE sponsored Training and Learning Academy FDP on Advances in Numerical Methods for Engineering Structures: Fundamentals toward Applications at IIT Ropar. 2. "FEM for Vibration Analysis" in the online AICTE sponsored workshop on Finite Element Analysis with ANSYS and MATLAB at NIT. Hamirpur

Indigenous facility development: Determining the Erosion Potential of Soil

Geo-Hazard Studies Lab IIT Mandi

Dr K V Uday

Soil erosion is a serious global environmental problem as it leads to land degradation and increase the susceptibility of land to landslide. The erosion potential of soil is dependent on various factors and thereby adopting any mitigation should be evaluated based on propensity of erosion. With this in view an indigenous facility has been developed in Geo-Hazard and Geotechnical Engineering Laboratory, IIT Mandi.

The erosion potential of soil facility (EPSF) can be adopted to check the Cost effectiveness, Environment friendly, Sustainability aspects of erosion mitigation options. The developed in these facilities comprises of (1) Flume box: Mimic the actual field conditions, (2) Rainfall simulator for different range of intensity and duration (3) Image acquisition and analysis tool for evaluating erosion in soils digitally

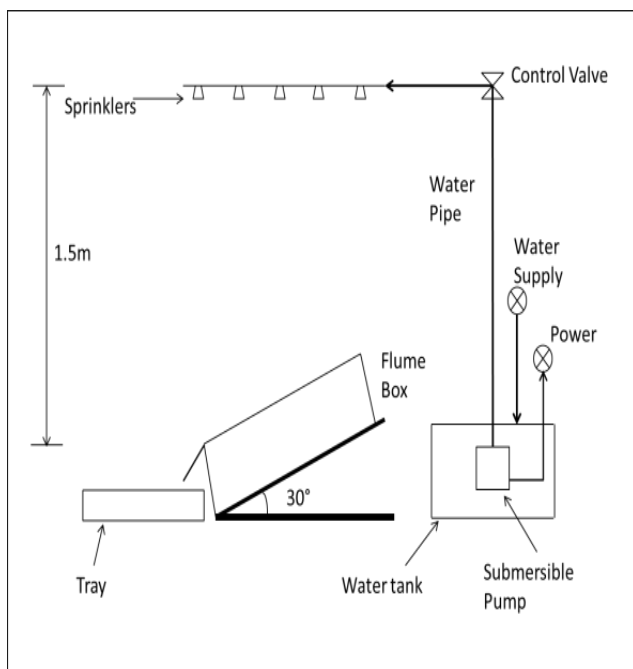


Fig 1: Schematic diagram of EPSF

The EPSF has been adopted in a study on 'Evaluating the applicability of vegetation and fibres for erosion prevention by means of erosion study'.

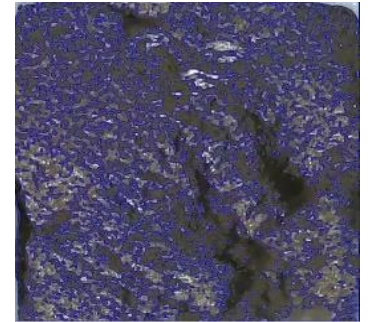
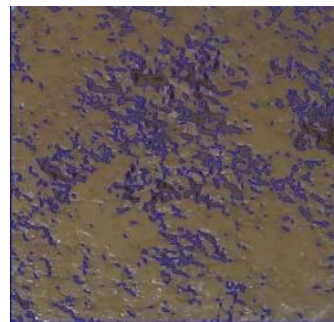
The study highlights the potential of soil for erosion on slopes and effectiveness of fibre and vegetation as a mitigation measure. The outcome of studies projected vegetation roots dominating the fibres effect on erosion prevention. While, the bare soil exhibited rill erosion on high intensity rainfall, natural fibres reduced the rill to sheet erosion and the plant roots further reduced the propensity of erosion on slopes.



(a) rill erosion



(b) sheet erosion



Contour Image for characterising the (a) rill and (b) sheet erosion profile

Dr Arnav V Bhavsar from School of computing and electrical engineering added his expertise of image analysis which has been proven to be effective. A straight reduction in the efforts and errors of conventional experimentation involving sediment collection and characterization has been observed. The research scholar Ms Charu Chauhan has received 'Best Paper' presentation for the work at Indian Geotechnical Conference in Dec., 2022 held online by NIT Trichy

The future of instrumentation is indigenous technology and sustainability is nature-based solutions