



Tidings

A biannual newsletter published by the
School of Engineering,
Indian Institute of Technology Mandi
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Present strength

Regular faculty: 26
Visiting professors: 1
Adjunct professors: 1
Mentor professors: 2
Ph.D.: 50
M.Tech./M.S.:13/20
B.Tech. CE/ME: 51/141

Publications (as per Scopus)

Till date: 536
Since July 2016: 47

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Placements '16-17

VISITORS: ISRO, BPCL, Mahindra & Mahindra, ITC, Hyundai, L&T Ltd., L&T ECC, TCS Research, Arrelic, Fresenius Kabi, Capital Dynamics, KnT Research, Hero Motocorp, Axiom, Cognizant, Capgemini.

OFFEERS (till date): B.Tech: 62.5%; M.Tech: 66.67%

Chairperson's Message

Greetings!!

It gives me immense pleasure to present 3rd issue of biannual newsletter "TIDINGS" which disseminates information related to the school of engineering (SE), IIT Mandi. As of Now SE offers B.Tech in Mechanical and Civil Engineering, M.Tech in Energy Engineering with specialization in Materials, M.Tech in Mechanical Engineering with specialization in Energy Systems, MS and PhD in various fields of mechanical, civil and materials science & engineering. Talented faculty members are available in all the fields of mechanical and civil engineering.

During last six months, few faculty members visited to various TU9-German universities under TU9-IIT Mandi research stay program, I congratulate them. I would like to thank all my colleagues for their continuous contribution in teaching, research and institute building.

Dr. Rajeev Kumar

Low Cost instrument for Studying Thermoelectric Properties



Under the leadership of Dr. S. K. Pandey the focus of Thermoelectric Materials Laboratory is to develop simple and low-cost instruments for studying the thermoelectric properties of various materials. Recently, they have successfully fabricated (i) Semi-automated high temperature Seebeck coefficient measurement setup and (ii) Python based fully-automated high temperature Z-meter. The first setup is useful in measuring the Seebeck coefficient of metallic, semiconductor and insulating materials in the temperature range 300 - 620 K. The overall cost of the setup is ~3 Lakh INR. The second setup is capable of simultaneously measuring the temperature dependent Seebeck coefficient, thermal conductivity, and electrical resistivity of various type of materials. It automatically collects the temperature dependent ZT parameter in the temperature range 300 - 650 K during the measurement. The measurement under the vacuum level of $\sim 10^{-5}$ mbar allows to minimize the convective heat loss. The overall cost of this setup is ~7 Lakh INR.

New Faculty Members



Dr. Gaurav Bhutani obtained a Ph.D. in Engineering and a Diploma of the Imperial College from Imperial College London. His research is focused on understanding the effect of poly-dispersity on the hydrodynamics of multiphase flows. He is interested in applying these techniques to model flows in human body, snow avalanches and process industries.



Dr. Sandip Kumar Saha holds a Ph.D. from IIT Delhi. His research interests include performance based earthquake engineering, seismic protection techniques, seismic loss estimation, and design for resilient civil infrastructure. Before joining IIT Mandi, he was working as postdoctoral fellow in the University of Canterbury, New Zealand.



Dr. Maheshreddy Gade holds a Ph.D from IIT Madras. His research interests include wave propagation in elastic half-space, rotational seismology, earthquake source modeling, earthquake data analysis, seismic hazard and vulnerability analysis.



Dr. Shantanu Patra holds a Ph.D. from IIT Delhi and successfully completed his postdoctoral research from University of Dundee, UK. His research interest includes reinforced soil structures, stability of slopes, and sustainable development in Himalayan regions. He was previously working at National Institute of Technology Rourkela, Odisha.

Workshop on "Bioengineering measures to control landslides and geo-environmental issues" held on 7th - 9th February, 2017



Speakers: Prof. C. Ghosh & Dr. A. K. Gupta (NIDM, New Delhi), Dr. K.V. Uday; Dr. S. Patra; Dr. D.P. Shukla; Dr. S.K. Masakapalli; Dr. K. Sarkar (IIT Mandi).

Recently Commenced Projects

- **Modelling of hydraulic diffusivity and its application in the FE simulation of moisture transport in concrete for assessing corrosion risk**
PI: Dr. K. Sarkar; Budget: INR 53 lakhs
Sponsor: SERB; Duration: 3 years
- **Development of nanostructured wear resistant microwave clads to minimize slurry erosion in hydro turbines**
PI: Dr. S. Zafar; Budget: INR 53 lakhs
Sponsor: DST; Duration: 3 years
- **Improving the bio engineering strategies to achieve soil stabilization**
PI: Dr. K.V. Uday; Budget: INR 51.33 lakhs
Sponsor: DST; Duration: 3 years
- **Stability analysis of reinforced soil wall under seismic loads - a novel approach.**
PI: Dr. S. Patra; Budget: INR 40.34 lakhs
Sponsor: DST; Duration: 3 years
- **Investigations of fluid and granular jet impact with erosion**
PI: Dr. D.V. Patil; Budget: INR 29.16 lakhs
Sponsor: DST; Duration: 3 years
- **Investigation of phase change nano composites for high strain rate resistant armor applications**
PI: Dr. V. Balakrishnan; Budget: INR 26.9 lakhs
Sponsor: DRDO; Duration: 3 years
- **Search of new semiconducting heusler alloys for high temperature thermoelectric applications**
PI: Dr. S.K. Pandey; Budget: INR 20 lakhs
Sponsor: DST; Duration: 3 years
- **Design and failure analysis of cemented acetabular prosthesis**
PI: Dr. Rajesh Ghosh; Budget: INR 13.6 lakhs
Sponsor: DST; Duration: 3 years
- **Design and fabrication of a wind driven rain simulator for assessing the performance of cement based wall coatings**
PI: Dr. K. Sarkar; Budget: INR 12 lakhs
Sponsor: Birla White; Duration: 1 year
- **Imperfection sensitivity analysis of functionally graded structures featuring parameter uncertainties.**
PI: Dr. Mohd. Talha; Budget: INR 10.5 lakhs
Sponsor: DRDO; Duration: 2 years
- **Parametric study on pullout resistance of model micropiles**
PI: Dr. K.V. Uday; Budget: INR 10 lakhs
Sponsor: SASE; Duration: 2 years

Achievements & Outreach Made by Faculty

Dr. R. Vaish joined Editorial Board of Energy Technology journal.

Dr. R. Kumar visited Karlsruhe Institute of Technology, Karlsruhe, Germany under the BMBF scheme (December 2016 - March 2017).

Dr. S. Zafar gave an invited talk on "Microwaves in Material Processing" at NIT Kurukshetra (Oct 17, 2016).

Dr. M. Talha visited Institute of Mechanics, KIT Germany for possible research collaborations under IIT Mandi-TU9 faculty exchange programme (7-13 Dec, 2016).

Dr. D.V. Patil was invited as a resource person at a workshop on CFD organized by DYPIEMR, Pune and Savitribai Phule Pune University, Pune. He delivered lectures on Discrete Simulation of Fluid Dynamics. Participation: 50 Faculty (Dec 9, 2016).

Dr. S. Patra received IGS-Delhi Chapter YGE Award for the Best Paper on "Computational Geomechanics" (Dec 12, 2016).

Dr. D.V. Patil "visited Motilal Nehru National Institute of Technology, Allahabad, for conference gathering on FMFP-2016 and presentation of research. (15-17 Dec, 2016).

Dr. A. Gupta visited IIT Kanpur for collaboration with research group in Vibration and Acoustics (21-25 Dec, 2016).

Dr. D.V. Patil received reviewer recognition from Scientific Reports - Nature, Journal of Computational Physics and Computers & Fluids.

Dr. R. Kumar, Dr. A. Dhar & Dr. D.V. Patil advised HRTC for Electric Bus trials from Manali to Rohtang Pass.

Dr. S. Zafar gave an invited talk on "How applied research can contribute in make in India" at IIT Roorkee (Jan 4, 2017).

Dr. D.V. Patil gave an invited talk on "Review of Particle based Methods for Combustion Simulations" in International Conference on Sustainability, Energy and Environmental Challenges organized at CIAB, Mohali (26-28 Feb, 2017).

Dr. P. Kumar delivered a lecture on "A Noble Approach for the Clean Energy Generation: Solar Updraft Tower" in International Conference on Sustainability, Energy and Environmental Challenges organized at CIAB, Mohali (26-28 Feb, 2017).

Student Achievements

Mr. Vishrut Shah successfully defended MS Thesis "Numerical and Experimental study of Bistable Piezoelectric Energy Harvester" under the supervision of Dr. Mohd. Talha and Dr. Rajeev Kumar and got admitted in Queens University, Ontario, Canada for Ph.D.

Mr. Sanjay Singh Tomar received the award of appreciation for "Best paper in design engineering" for his research paper entitled "Vibration response of finite element modeled FGM plate in thermal environment" during an International conference on recent advances in Mechanical Engineering held at DTU, Delhi (14-15 Oct, 2016).

Mr. Saurabh Singh and Mr. Ashutosh Patel have developed low cost instruments for measuring the temperature dependent Seebeck coefficient and thermal conductivity of various materials. These works have been published in following journals:

- Rev. Sci. Instrum. 88, 015107 (2017)
- Measurement 102, 26 (2017)
- Instrum. Sci. Technol. 45, 366 (2017)



New Courses

Introduction to Heterogeneous Computing
Mechanics for Energy Systems
Manufacturing for Energy Systems
Mechanics of Composite Materials