



Dr. Vishal Panwar

Assistant Professor

Department of Mechanical Engineering

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 Google Scholar:

<https://scholar.google.com/citations?user=EG566gwAAAAJ&hl=en>

RESEARCH INTEREST

Thermoelectric materials and devices; Functional oxide semiconductors (ZnO); Dopant and grain-boundary engineering; Nanostructured ceramics for energy applications; Prototype-relevant thermoelectric materials, Ceramic Materials.

EDUCATION

Ph.D. (Metallurgical & Materials Engineering) 2026

Indian Institute of Technology (IIT), Roorkee

Thesis: *Unravelling the Role of Multiscale Defects in Tailoring Thermoelectric Properties of Zinc Oxide.*

M.Tech (Metallurgical & Materials Engineering) 2018

Indian Institute of Technology (IIT), Roorkee

Dissertation: *Low-temperature wet-chemical synthesis of copper oxide nanostructures.*

B.Tech (Mechanical Engineering) 2015

Dr. A. P. J. Abdul Kalam Technical University, Lucknow, Uttar Pradesh, India.

RESEARCH EXPERIENCE

Doctoral Researcher

- Investigated **charge and phonon transport mechanisms** through controlled dopant segregation and microstructural engineering in ZnO-based thermoelectric materials.

- Synthesized and characterized **Al- and Mg-doped ZnO–PMMA composites** for thermoelectric applications.
- Performed advanced materials characterization using **XRD, FESEM/TEM, XPS, and BET surface area analysis**

Master's Thesis (M.Tech)

- Developed **CuO nanostructures with tunable morphologies** via **temperature-controlled wet-chemical synthesis**.
- Investigated **growth mechanisms and structural evolution** using **FESEM and HRTEM**.
- Performed **adhesive bonding analysis** using **nanoindentation**

PUBLICATIONS (JOURNALS) & BOOK CHAPTER

- **Vishal Panwar**, Kshitij Kumar Sharma, Abhishek Tewari, *“Sintering Behavior and Thermoelectric Properties of Al- and Mg-Doped ZnO: Effect of Grain Boundary Segregation,”* International Journal of Applied Ceramic Technology, 23(2), e70168 (2026).
- **Vishal Panwar**, Navya Yadav, Sriharitha Rowthu, Abhishek Tewari, *“Atomistic modeling and experimental study of dopant segregation induced morphology transition in ZnO nanoparticles,”* Journal of the American Ceramic Society, 108(9), e20636 (2025).
- Devanand Chelot, Vijay Lakshmi Mishra, **Vishal Panwar**, Abhishek Tewari, Priyank Upadhyaya, *“Effect of chemical exposure on multi-piece GFRP sandwich pipes for sewage rehabilitation,”* Polymer Bulletin, 83(1), 1 (2026).
- Gurjinder Kaur, Mohini Tiwari, **Vishal Panwar**, Tishant Chandrakar, Shubham Kumar, Indranil Lahiri, *“Temperature and time dependent morphological evolution of solution phase synthesized copper oxide nanostructures,”* Journal of Materials Science, 59(38), 17897-17910 (2024).

BOOK CHAPTER

- **Vishal Panwar**, Atif Suhail, Indranil Lahiri, “*Large-Scale Applications of Triboelectric, Piezoelectric, and Pyroelectric Nanogenerators*”, Nanogenerators, CRC Press, 335-360 (2022).

CONFERENCE PRESENTATION

- **Vishal Panwar** and Abhishek Tewari "[*Exploring the Effect of Doping on Thermoelectric Performance of ZnO*](#)," AMPCO 2022, IIT Roorkee, India, October 17-19, 2022.
- **Vishal Panwar** and Abhishek Tewari "[*Synthesis and Characterization of Al-doped ZnO for Thermoelectric Application*](#)," CerAP 2024, IIT Roorkee, India, March 11–12, 2024.
- **Vishal Panwar**, Gurjinder Kaur, Narasimha Vinod Pulagara, Indranil Lahiri "[*Growth of Copper Oxide Nanostructure at various Temperatures By Wet Chemical Method*](#)," NMD-ATM, BITS Pilani K K Birla, Goa Campus, India, November 11-14, 2017.

ACADEMIC EXPERIENCE

Assistant Professor, Department of Mechanical Engineering, Gurukula Kangri University (GKU) | 2026–Present

Teaching Assistant (TA), IIT Roorkee (Ph.D. & M.Tech.)

Assisted in teaching **B.Tech. and M.Tech. courses** in:

- **Engineering Ceramics**
- **Tribology**
- **Nanomaterials and Advanced Characterization**
- **Tutorial classes and problem-solving sessions**

Guided students in:

- **Laboratory experiments and instrumentation handling**
- **Data analysis, interpretation, and report writing**

Academic responsibilities:

- Assignment and lab evaluation
- Examination invigilation duties
- Supporting course coordination

LABORATORY & INSTRUMENTATION EXPERTISE

Laboratory Experience:

- Nanomaterials Laboratory
- Ceramics Lab
- Materials Characterization Labs
- Heat Treatment Labs

Instrumentation Skills:

- X-Ray Diffraction (XRD)
- Spark Plasma Sintering (SPS)
- Ball Milling
- Centrifuge Machine

TECHNICAL SKILLS AND EXPERTISE

- **Materials synthesis:** sol–gel, coprecipitation, SPS sintering.
- **Characterization:** XRD, FESEM/TEM, EDX, XPS, and BET surface analysis.
- **Data analysis and scientific reporting:** Origin, MS Excel, manuscript, and report preparation.

CONFERENCE & EVENT ORGANIZATION

Organizing Team Member:

- AMPCO 2022
- CerAP 2024

Role: Technical session coordination

Event management

Participant handling

LEADERSHIP & EXTRACURRICULAR ACTIVITIES

- Organized **Yoga Camps in the hostel**, promoting health and wellness
- Coordinated **cultural festivals and student activities**
- Managed **multi-purpose student engagement events**