

Detailed Bio-data

Dr. Kuldeep Yadav has recently joined as an Assistant Professor in the Department of Mechanical Engineering, MANIT Bhopal. Prior to this, he served as a Postdoctoral Fellow in the Department of Mechanical Engineering at IIT Gandhinagar. He earned his Ph.D. in Experimental Solid Mechanics from the Department of Applied Mechanics, IIT Delhi (2024), where his research focused on the Mechanical Characterization and Shock Response of Aluminium 2014-T6 and Additively Manufactured Composites. He completed his M.Tech. in Applied Mechanics from MNNIT Allahabad (2017) with a dissertation on the Oblique Ballistic Impact Response of Plain-woven Kevlar Fabric.

With a strong academic record, GATE qualifications, and MHRD fellowships, Dr. Yadav has established a solid foundation in experimental solid mechanics, finite element analysis, and advanced composite research. At IIT Delhi, he led the design and fabrication of experimental facilities, including a tensile Split-Hopkinson Pressure Bar (SHPB) and a double-stage shock tube. His research encompasses material characterization of aluminium alloys under quasi-static and dynamic loading, and extensive studies on FDM-printed composites reinforced with continuous carbon and Kevlar fibers.

His expertise spans interlaminar fracture behaviour, impact analysis, and shock loading investigations, supported by numerical simulations in ABAQUS (VUMAT). During his M.Tech. at MNNIT, he contributed significantly to the ballistic and shock response modelling of Kevlar fabrics. Skilled in CAD (CATIA, SolidWorks), FEA (ABAQUS), and high-speed imaging systems, Dr. Yadav effectively integrates experimental design, numerical modelling, and programming in his research.

He has also pioneered the integration of Digital Image Correlation (DIC) with Background Oriented Schlieren (BOS) techniques for dynamic visualization and analysis of shock effects on deformable structures. In defense and aerospace contexts, his investigations into ballistic impacts, delamination, void effects, and reinforcement mechanisms have provided new insights. His work on hybrid composite configurations and sandwich structures demonstrates a strong ability to engineer tailored materials for energy absorption and damage resistance. Overall, Dr. Yadav's research is marked by a robust experimental foundation enhanced by advanced numerical modelling.