



MADAN BHANDARI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Sustainable and Resilient Infrastructure (SRI) Program



Academic Programs

- PhD and Master of Applied Science

Research Objective

- Promotion of rural tourism for local economic development through sustainable and resilient infrastructure development including homestays, teahouses, trails and trekking routes, and related services.

Research Topics for the 2025 Intake

- **Sustainable and resilient (re)construction of stone masonry buildings.**
 - Numerical and experimental investigation of structural behavior of stone masonry structures with enhanced mortar mixtures.
 - Material characterization of stone masonry structures with variations in stone and mortar composition.
 - Advancement of 3D Applied Element Method for numerical analysis of heterogeneous stone masonry structures.
 - Computational molecular-level study for enhancing mud mortar bonding properties.
 - Optimization of mortar mix design for improved bonding and load-bearing capacity in masonry structure.
- **Retrofitting of masonry structures:**
 - Structural health monitoring and seismic vulnerability assessment of masonry buildings.

- Experimental and numerical study on the retrofitting of masonry structures using bamboo.
- Vibration-based structural health monitoring and LIDAR Point Cloud Analysis of heritage structures.
- Retrofitting of masonry structures using fiber-reinforced paint.
- Numerical modeling and component-level evaluation for cost-effective retrofitting techniques.
- **Bamboo and timber as sustainable and resilient construction materials:**
 - Experimental evaluation of traditional bamboo jointing techniques in Nepal.
 - Machine Learning-based modeling of the relationship between geometric and mechanical properties of *Bambusa nutans* and *Bambusa balcooa*.
 - Evaluation of geometrical and mechanical characterization of *Bambusa vulgaris* and *bambusa arundinacea*.
 - Evaluation of mechanical performance of laminated bamboo boards for structural applications.
 - Life Cycle Assessment (LCA) of bamboo-based building structures.
 - Evaluation of mechanical characterization of common Nepali timbers.
 - Analysis of structural performance of tradition timber joint connections.
- **Risk resilient planning of rural settlements for tourism promotion:**
 - Risk-sensitive land use planning with multi-hazard risk assessment (earthquake, flood, fire, and landslides).
 - Integration of indigenous knowledge and digital technologies for risk-resilient rural tourism infrastructure planning including homestay buildings, trails and trekking routes, and related services.
 - Socio-economic impact of rural tourism on local communities.

Eligibility

- **Admission to PhD Program:** Master's degree in engineering, architecture, urban planning or related field with a minimum GPA of 3.0 or equivalent.
- **Admission to MAS Program:** Bachelor's degree in engineering, economics, social science, or related field with a minimum GPA of 2.75 or equivalent.

Contact

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