

61% of India faces significant earthquake risk: Indian engineers can build a safer, earthquake-resilient future

Budapest, 24 February 2026 — India's latest seismic zonation map shows that around 61% of the country's land area lies in moderate to high earthquake hazard zones, exposing a large share of the population to serious seismic risk. In the past three decades alone, major earthquakes such as the 1993 Latur and 2001 Bhuj events have killed close to 30,000 people, injured well over 190,000 and destroyed or badly damaged hundreds of thousands of homes, with economic losses amounting to tens of thousands of crore rupees. For a rapidly urbanising country with extensive existing building stock, future civil engineers need deep, practice-oriented seismic knowledge. With 244 years of engineering education behind it and a strong position in international rankings, Budapest University of Technology and Economics (BME) offers Indian students high-level expertise in earthquake engineering that they can later apply in their home country.

India regularly experiences damaging earthquakes, particularly in the Himalayan region and parts of the Indo-Gangetic Plain. The 1993 Latur earthquake caused nearly **10,000 deaths**, injured around **30,000 people** and displaced about **one million residents**, while the 2001 Bhuj earthquake killed around **20,000 people**, injured more than **160,000** and led to the collapse or severe damage of **hundreds of thousands of buildings**. Beyond the human tragedy, these and other disasters have resulted in economic losses amounting to **tens of thousands of crore rupees** in wider economic losses for India over recent decades. The key question for engineers today is how to design, retrofit and manage structures so that they protect people and keep essential services functioning when the next major earthquake strikes.

For **Dr Attila László Joó**, associate professor at BME's Faculty of Civil Engineering and structural expert of Hungary's HUNOR heavy urban search and rescue team, the Indian situation is technically very familiar. *"Whether we work in Central Europe, Türkiye, or look at the Himalayas from a distance, the core questions are the same. How do we make buildings and infrastructure safer in a realistic way?"* he says.

Joó and his colleagues at BME work across the full disaster-management cycle in earthquake engineering. Their research covers numerical simulations and laboratory experiments on structural components. At the same time, they are involved in post-earthquake assessments and cooperation with urban search and rescue teams, which gives them direct insight into how buildings fail and how they can be strengthened in practice.

"This combination of code-level work and field experience is what we bring into our teaching," Joó explains. *"Students learn advanced methods of seismic analysis and structural dynamics, but they also see case studies, photos and measurements from real earthquakes. That makes the theory much more realistic, and it helps them later when they have to make design decisions in their own projects."*

For Indian students who choose to study in Budapest, this means that civil engineering education at BME is directly connected to the seismic challenges they know from home. The university offers English-language bachelor's, master's and doctoral programmes with specialisations in **seismic design, bridges and structural engineering, infrastructure planning** and **water engineering**. Courses are closely linked to ongoing international research projects and standardisation activities.

BME is also a member of the **EELISA European University** alliance, which brings together leading engineering universities across Europe. Through this network, students and staff collaborate on topics such as **digital twins for infrastructure, smart monitoring of bridges and tunnels**, and new methods for assessing and strengthening existing buildings. These projects are directly relevant for fast-growing Indian cities where older buildings and new transport infrastructure share space in regions with significant seismic hazard.

"Earthquake physics is the same everywhere, and the behaviour of structures under seismic loads follows the same principles," Joó adds. *"If young engineers from India gain a deep understanding of*



these principles here in Hungary, they can take this knowledge back and apply it within Indian codes and local conditions, becoming part of the generation that creates safer neighbourhoods and more resilient infrastructure at home.”

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