Regional Risk and Resilience Analysis
Emerging needs, engineering tools and interdisciplinary considerations

Civil structures and infrastructure provide vital services that support and enable societal functions. Therefore, ensuring their reliability and prompt recovery is critical for the public's well-being and economic prosperity. However, the consequences of past disasters around the world have raised concerns about the vulnerability of civil structures and infrastructure and have highlighted the significance of risk mitigation and management. The maintenance, repair, or replacement of existing vulnerable, deficient, and deteriorating structures and infrastructure represents a significant investment. To wisely invest the limited funding, it is crucial to use advanced risk analysis tools in the decision-making process. This short course discusses a general formulation for regional risk and resilience analysis. The course explains how to conduct a regional risk and resilience analysis considering multiple hazards and different infrastructure, as well as the effects of deterioration and interdependencies among infrastructure. The course also shows how the physical damage to structures and infrastructure can be cascaded to predict the likelihood and duration of business interruption. The course includes examples of regional risk and resilience analysis considering a hypothetical earthquake in the New Madrid seismic zone in the USA.