

Tentative title: Seismic assessment and qualification of nonstructural elements

Duration: 3 hours

Proponent lecturers: Gennaro Magliulo (Associate professor at DIST), Danilo D'Angela (RTDA at DIST) & Orsola Coppola (Researcher at ITC-CNR)

Potential date: July-September 2025

Language: English

Participation mode: In-person and online

Technical-scientific context: The seismic performance of nonstructural elements, such as equipment and architectural components, has become a key focus in earthquake engineering due to their impact on building functionality and safety. Past earthquakes have shown that damage to nonstructural elements can lead to high repair costs and operational disruptions, especially in critical facilities. Recent research has advanced the methods for assessing and qualifying these components under seismic loads, using testing protocols, simulations, and updated codes. However, many questions remain about their dynamic behavior and interactions with structural systems, making this a crucial area of ongoing study.

Contents: The seminar will provide an overview of seismic assessment and qualification of nonstructural elements, covering key concepts, testing methods, and regulatory frameworks. It will highlight significant research contributions, case studies, and ongoing experimental and numerical studies ongoing at DIST and ITC-CNR on improving the seismic performance of nonstructural components and on seismic qualification documentation and procedures. Participants will gain a clear understanding of current practices and future research directions aimed at enhancing resilience through better design, assessment, and qualification of nonstructural elements.

Targeted audience: PhD students, researchers, and practitioners operating in the field of design and assessment of engineering structures, infrastructures, and nonstructural elements.

Main references from the proponents

- **Coppola, O.**, Aiello, C., Bonati, A., Caterino, N., Nuzzo, I., Occhiuzzi, A., 2020. Quasi-static and dynamic tests for the seismic assessment of an innovative cladding system, in: Proceedings of the 17th World Conference on Earthquake Engineering (17WCEE). Sendai, Japan.
- **Coppola, O.**, De Luca, G., Franco, A., Bonati, A., 2023. Experimental tests for seismic assessment of ventilated façades. *Procedia Struct. Integr.* 44, 758–765. <https://doi.org/10.1016/j.prostr.2023.01.099>
- **D'Angela, D.**, **Magliulo, G.**, Di Salvatore, C., Zito, M., 2024. Seismic assessment and qualification of acceleration-sensitive nonstructural elements through shake table testing: reliability of testing protocols and reliability-targeted safety factors. *Eng. Struct.* <https://doi.org/10.1016/j.engstruct.2023.117271>
- **D'Angela, D.**, Zito, M., Di Salvatore, C., Toscano, G., Magliulo, G., 2022. Seismic Assessment of Acceleration-Sensitive Nonstructural Elements: Reliability of Existing Shake Table Protocols and Novel Perspectives, in: Proceedings of the Fifth International Workshop on the Seismic Performance of Non-Structural Elements (SPONSE). ATC-SPONSE, Stanford CA.
- **Magliulo, G.**, **D'Angela, D.**, Lopez, P., Manfredi, G., 2021. Nonstructural Seismic Loss Analysis of Traditional and Innovative Partition Systems Housed in Code-conforming RC Frame Buildings. *J. Earthq. Eng.* 1–28. <https://doi.org/10.1080/13632469.2021.1983488>
- **Magliulo, G.**, Pentangelo, V., Maddaloni, G., Capozzi, V., Petrone, C., Lopez, P., Talamonti, R., Manfredi, G., 2012. Shake table tests for seismic assessment of suspended continuous ceilings. *Bull. Earthq. Eng.* 10, 1819–1832. <https://doi.org/10.1007/s10518-012-9383-6>
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- **Coppola, O.**, **Magliulo, G.**, University of Naples “Federico II”, Italy, Di Maio, E., University of Naples “Federico II”, Italy, 2016. Mechanical Characterization of a New Lightweight Material for Nonstructural Components. pp. 1005–1012. <https://doi.org/10.18552/2016/SCMT4S285>
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