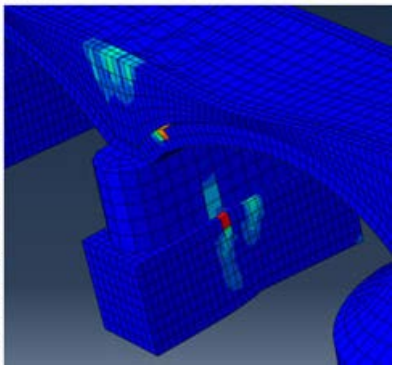
2ND INTERNATIONAL SUMMER SCHOOL

30 September – 3 October 2025
Naples, Italy



UNIVERSITY OF NAPLES FEDERICO II

Department of Structures for Engineering and Architecture

Within the course of the PhD program in *Structural & Geotechnical Engineering and Seismic Risk*

DATES

30 September – 3 October 2025

24 hours (3 CFU)

LOCATION

Department of Structures for Engineering and Architecture
Via Claudio, 21 - 80125 Naples (Italy)
Bulding 7, 1st floor, Multimedia room

CHAIR

Fulvio Parisi
University of Naples Federico II

AUDIENCE

PhD students, postdoctoral researchers, professionals, facility managers

CONTACTS

sarah.distschool2025@gmail.com

DiSt 2023-2027 DIPARTIMENTO DI ECCELLENZA MUR

STRUCTURAL ROBUSTNESS AND RESILIENT INFRASTRUCTURE AGAINST EXTREME HAZARDS SARAH 2025

First announcement

AIM

Civil engineering structures are increasingly subjected to extreme hazards, which are not usually considered in structural design and assessment. On one hand, such hazards have a very low probability of occurrence, and on the other, they are expected to produce huge consequences on people and property. Extreme events include but are not limited to natural events (e.g. landslides, floods, hurricanes), technological events (e.g. impact, fires, explosions), man-made events (e.g. malicious actions, human errors in design, construction or maintenance), deterioration phenomena (e.g. steel corrosion, concrete carbonation), and cascade events (e.g. natural-technological events). Climate change and strong urbanization in some areas have further exacerbated the occurrence of extreme hazards and their impact. This has significantly increased the awareness of governments and standardization bodies to develop guidelines for collapse prevention and provisions in national and international structural codes.

This *Summer School* aims at providing fundamentals of structural robustness, large-displacement inelastic response of structures, disaster risk and resilience of structures and infrastructures, as well as methods for structural design, assessment and retrofitting against extreme hazards.

LECTURERS

José M. Adam (Universidad Politécnica de Valencia, Spain)
André T. Beck (University of São Paulo, Brasil)
Robby Caspeele (Ghent University, Belgium)
Bassam Izzuddin (Imperial College London, UK)
Fulvio Parisi (University of Naples Federico II, Italy)

THEMATIC LECTURERS

Coming soon

REGISTRATION

Registration:
https://forms.gle/gCkPsH4tazeMx8zG6
Registration fees:

- Students/Postdoc: **350 €**
- Professionals: **450 €**

Payment by **Bank transfer** to:
Dip. di Strutture per l'Ingegneria e l'Architettura - IBAN code:
IT81P0623003543000058328001
SWIFT code: **CRPPIT2P549**
Bank: **Credit Agricolè Italia**
Deadline: **15 July 2025**

VENUE

The Summer School will be held in the Multimedia room of the Department of Structures for Engineering and Architecture.

COURSE OUTLINE

Starting from forensic analysis of catastrophic failures in buildings and bridges, the course will move across several issues as follows: progressive and disproportionate collapses of structures; structural and non-structural measures for collapse risk mitigation; definitions of structural robustness; design criteria and detailing rules for structural robustness; guidelines and code provisions at both national and international levels; robustness quantification; modelling of abnormal loads due to extreme events; extreme structural behaviour during experimental tests; nonlinear structural modelling; performance limit states under extreme structural response; simplified and advanced methods for progressive collapse analysis; performance-based robustness design and assessment; scenario-based and probabilistic simulations; component-level and system-level fragility for progressive collapse risk assessment; multi-hazard design and assessment; and relationship between structural robustness and disaster resilience. Besides theoretical lectures, several case studies of structures subjected to notional local damage, specified abnormal loads or retrofitting operations will be discussed. Design classes will allow participants to deeply understand and implement methodologies and tools.

COURSE SCHEDULE

Day 1 | September 30th, 2025

- 9:00 – 9:30 Registration of participants
- 9:30 – 10:00 **Fulvio Parisi**: *Opening of the Summer School*
  Welcome to the University of Naples Federico II
  Presentation of Lecturers
  Summer School organization and lectures
  Extreme Hazards, Structural Robustness, and Disaster Resilience
- 10:00 – 10:30 Coffee break
- 10:30 – 12:00 **Robby Caspeele:** *Structural robustness and reliability in codes and guidelines*
- 12:00 – 13:30 **Fulvio Parisi:** *Progressive collapse and extreme resisting mechanisms under abnormal loads: disasters and experimental evidence*
- 13:30 – 15:00 Lunch break
- 15:00 – 16:30 **Robby Caspeele:** *Experimental assessment of membrane action in concrete elements through large-scale testing*
- 16:30 – 17:00 Coffee break
- 17:00 – 18:30 **Fulvio Parisi:** *Computational strategies and alternate load path analysis for robustness assessment*

Day 2 | October 1st, 2025

- 9:30 – 11:00 **Fulvio Parisi:** *Scenario-based robustness assessment of buildings and bridges*
- 11:00 – 11:30 Coffee break
- 11:30 – 13:00 **André Beck:** *Methodologies for reliability-based and risk-based design optimization*
- 13:00 – 14:30 Lunch break
- 14:30 – 16:00 **André Beck:** *Optimal redundancy allocation in structural systems: some fundamental results*
- 16:00 – 16:30 Coffee break
- 16:30 – 18:00 **André Beck:** *Risk-based cost-benefit analysis of structural strengthening systems to mitigate disproportionate collapse*
- 19:30 – **Social dinner**

Day 3 | October 2nd, 2025

- 9:30 – 11:00 **Visit to the experimental facilities** of the Department of *Structures for Engineering and Architecture*
- 11:00 – 11:30 Coffee break
- 11:30 – 13:00 **José Adam:** *Fuse-based segmentation method for robustness design of concrete buildings*
- 13:00 – 14:30 Lunch break
- 14:30 – 16:00 **Bassam Izzuddin:** *Simplified robustness assessment framework for multi-storey buildings with application to steel-composite buildings*
- 16:00 – 16:30 Coffee break
- 16:30 – 18:00 **Bassam Izzuddin:** *Tying force method: shortcomings of existing approach and recent developments*

PARTNERS

Day 4 | October 3rd, 2025

- 9:30 – 11:00 **Bassam Izzuddin:** *Exercises on simplified robustness framework and tying force method for multi-storey buildings*
- 11:00 – 11:30 Coffee break
- 11:30 – 13:00 **José Adam:** *Evidence from full-scale testing of concrete frame buildings*
- 13:00 – 14:30 Lunch break
- 14:30 – 16:00 **Hybrid-mode session and debate on specific topics**
- 16:00 – 16:30 Coffee break
- 16:30 – 18:00 **José Adam:** *Exercises and debate on monitoring systems for local failure detection of steel truss bridge, sub-assembly and concrete building to prevent progressive collapse*
- 18:00 – 18:30 **Final exam** (only for PhD students who need a certificate by the coordinator of the PhD programme)
- 18:30 – Closure of the Summer School

DETAILS

Please periodically check the dedicated webpage, also through this QRcode

ADMINISTRATIVE STAFF

Dott.ssa Immacolata Diez - immacolata.diez@unina.it
Dott.ssa Valeria Peluso - valeria.peluso@unina.it

SOCIAL EVENTS

Coming soon

ACCOMODATION

Check availability in the **Fuorigrotta** area or in **town center**, preferably close to Metro lines 2 and 6 stations.

Since the end of September is still high season in Naples, participants are encouraged to explore accommodation options as soon as possible.