MECHANICS OF MASONRY STRUCTURES

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Program:

- Masonry mechanical behaviour
  - Properties of masonry unit
  - Properties of masonry mortar
  - Properties of unit-mortar interface
  - Uniaxial behaviour of masonry
  - Biaxial behaviour of masonry
- Modelling strategies for the analysis of masonry structures
  - Limit analysis
  - Macro-element based approaches
  - DEM
  - DEM/AEM
- Constitutive laws for masonry at microscale
- Constitutive laws for masonry at macroscale
  - Failure criteria
  - Damage-plasticity models
- Micro to Macro modelling of masonry structures
- Simplified and block-based modelling of masonry structures
  - Rigid-block based approaches
  - Discrete-Macro-element based approaches
- Open issues in macroscale modelling of monumental existing masonry structures
- Case studies

References:

[1.] Mechanics of Masonry Structures (2004) Edited by Maurizio Angelillo, Spinger Nature.

[2.] Numerical Modeling of Masonry and Historical Structures. From Theory to Application (2019) Edited by B. Ghiassi and G. Milani, Elsevier.

[3.] Statics of Historic Masonry Constructions (2018) Edited by Mario Como, Spinger Nature.

Examination and grading:

Implementation of a case study - which makes use of a modelling approach for the analysis of masonry structures. The case study can be proposed by the student or provided by the teachers.

Course details:

The course will be offered in-person (online attendance allowed).