ROSE School | Earthquake Engineering

Bridge Structures

Lecturer: **G.M. Calvi**
Date: 19/11/2026 – 18/12/2026
Credits: 6 ECTS (CFU)

Course Description

The objective of the course is twofold. Firstly, to equip students with a thorough understanding of design process of bridges, starting from conceptual design to detailed design of bridge components. Then, also to help students understand the load flow mechanism of various applied loads, such as truck load, impact, horizontal braking/centrifugal forces, wind and seismic loads on bridges.

Topics

- Historical background of bridges and types.
- Review of principles reinforced concrete and prestressed concrete, steel-concrete composite structures.
- Design process.
- Construction methods.
- Review of applicable design codes.
- Structural analysis tools.
- Seismic performance and retrofit technologies.
- Investigation of bridge collapses and damages.

Learning Outcomes

The students are expected to be able to understand the load-carrying capacity of various types of bridges, learning the structural responses to different kinds of loads. They should be able to design standard short and medium span bridges, with confidence using existing codes of practice at the end of the course.