



Course: Special structures and design of fire-resistant structures		Teaching Language: Italian	
SSD (Subject Areas): CEAR-07/A			CREDITS: 9
Course year: II		Type of Educational Activity: B	
Teaching Methods: In-person			
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Module 1 (Special structures): General information on steel-concrete composite structures. Composite slabs. Composite beams. Composite columns. Framed structures. Methods for structural analysis. Checks at the ultimate and serviceability limit states. Ductility and classification of sections. Plate theory. The static of pipes and cylindrical tanks. References to the membrane and flexure theory of shells and vaults. Module 2 (Design of fire-resistant structures): General aspects about the safety check of structures in case of fire (prescriptive and performance based approaches). Thermo-mechanical properties of materials as a function of temperature. National and European regulatory framework. Definition of fire models. Thermo-mechanical analysis of structures subjected to fire, as normal and prestressed reinforced concrete, steel and steel-concrete composite members and structures. The students will design a steel-concrete composite structure in ordinary conditions and in case of fire.			
Objectives: Module 1 provides the general fundamentals for the calculation and design of specific structural types: steel and concrete composite structures; two-dimensional structures (e.g. plates); liquid containment structures and cylindrical tanks, with brief references to the vaults and shells. Module 2 provides the general design concepts and operational methods for the design and calculation of fire-resistant structures.			
Propaedeuticities: None			
Is a propaedeuticity for: None			
Types of examinations and other tests: Oral exam and project discussion.			