Insegnamento: Theory and design of steel constructions

Modulo /i:

CFU: 9	**SSD: ICAR 09**
Ore di lezione: 42	**Ore di esercitazione:**

LAUREA MAGISTRALE IN INGEGNERIA STRUTTURALE E GEOTECNICA - Anno di corso: I o II

Obiettivi formativi:

1. To introduce to students the theory and application of analysis and design of steel structures.
2. To prepare students to design steel structures against both gravity and seismic loadings.
3. To prepare students for the effective use of the standard formulas, tables, design aids and computer software in the design and analysis of steel members.

Contenuti:

This course aims to introduce the behaviour and design of steel structural members according to the limit states design concept under both gravity and seismic loading. The behaviour and design of tension members, compression members, laterally restrained and unrestrained beams, beam-columns and design of connections will be discussed. In addition, the seismic design principles and capacity design criteria for the main steel structural typologies will be covered. Students are expected to obtain basic knowledge about the design and failure mode of steel structural members after finished this course.

Docente: Mario D'Aniello

Codice: 30332	**Semestre: I**

Prerequisiti / Propedeuticità:

Metodo didattico: Frontal lectures, seminars, tutoring

Materiale didattico :

Slides of the course. In addition, the following documents are recommended:

- Landolfo, R. 2013. Assessment of EC8 provisions for seismic design of steel structures. Technical Committee 13—Seismic Design, No 131/2013. ECCS—European Convention for Constructional Steelwork.
- Elghazouli, A.Y. 2010. Assessment of European seismic design procedures for steel framed structures, Bulletin of Earthquake Engineering, 8:65-89.
- EN 1993-1-1:2005 - Eurocode 3: Design of Steel Structures – Part 1-1: general rules and rules for buildings. CEN.
- EN 1998-1:2005. Eurocode 8: Design of structures for earthquake resistance. Part 1: General rules, seismic actions and rules for buildings. CEN.
- Mazzolani, F.M., and Piluso, V. 1996. Theory and Design of Seismic Resistant Steel Frames, E & FN Spon, an imprint of Chapman & Hall, London.
- Ahmed Y. Elghazouli. 2009. Seismic Design of Buildings to Eurocode 8. Spon Press
- Michel Bruneau , Chia-Ming Uang , Rafael Sabelli . 2011. Ductile Design of Steel Structures, 2nd Edition Hardcover . McGrawHill. ISBN-13: 978-0071623957

Modalità di esame:

Students have to carry out an individual project to practice on the seismic design and analysis of steel frames.

Final Examination will cover the theoretical aspects described within the course and the discussion of the individual project.