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COURSE: STEEL AND WOOD CONSTRUCTION

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ACADEMIC YEAR: 2019-2020

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TYPE OF EDUCATIONAL ACTIVITY: Characteristic

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TEACHER: PROF. FELICE CARLO PONZO (3CFU) – PROF. ANTONIO DI CESARE (3CFU)

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Language: ITA/ENG

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ECTS: 6

n. of hours:  
32 (lessons)  
22 (tutorials and practice)

Campus: Potenza  
School of Engineering  
Program:

Semester: I°

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#### EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course aims at deepening the knowledge on design, analysis, implementation and control of structures in civil and industrial applications, in particular those made of steel, mixed concrete - steel, timber and glue laminated timber, considering standard actions and exceptional ones (fire, earthquake etc..).

The main skills gained by students will be:

- Knowledge and understanding capacity: understanding of the spatial behaviour of the structures, with particular reference to the steel and wooden structures;
  - Capacity of applying knowledge and understanding: the student have to demonstrate their capacity in managing complex phenomena related to the particular type of the considered materials and to be able of designing 3-dimensional steel and wooden structures by using also complex designing tools;
  - Autonomy of judgment: The student must be able to independently evaluate the design optimal solutions according to the characteristics of the materials considered and to the design objectives. He must also to know the main methodologies for assessing the safety for the analyzed structures.
  - Communicative Skills: The student must show the ability to easily explain to non expert persons the operating principles of steel and wood structures, as well as the ability to submit an elaborate (project, thesis, Etc ...) by properly using the technical-scientific language.
  - Learning Skills: Depending on the information acquired during the frontal lessons, the student must be able to continuously and autonomously update their knowledge by consulting texts and technical / scientific publications of the disciplinary field of expertise in order to acquire the ability to follow in-depth Courses, Specialized Seminars and Masters.
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#### PRE-REQUIREMENTS

The students must know and assimilate the contents of the following exams: "Strength of Materials" and "Reinforced Concrete Structures".

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#### SYLLABUS

The course provides basic knowledge and specialized information on techniques for the design and production of civil and industrial steel structures and mixed concrete-steel structures, even in seismic area, and basic knowledge on the behaviour of the timber and glue laminated timber structures. In particular the main topics considered are:

- With regard to the steel structures: structural systems, multi-storey buildings, single-storey buildings, the structural reliability, calculation models, the semi-probabilistic method, the material, forms and types of structural steels, resistance criteria, loads and actions, verification methods, welded joints, bolted joints, general principles for resistance of structural elements, imperfections, links, resistance of structural elements, stability of structural elements, fire resistance, normative references, design of a steel building in seismic area.
  - With regard to the timber structures: Mechanics of timber and glue laminated timber structures, glues laminated timber elements production technology, static-constructive patterns, connections and joints,
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normative references, tutorials.

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#### TEACHING METHODS

The course is organized as following:

- Theoretical lessons (32 hours);
  - Tutorials in classroom and in laboratory (22 hours);
  - Technical visits.
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#### EVALUATION METHODS

The main goal of the examination is to verify the learning level reached by the student with reference to the educational expected goals.

The exam is divided in two parts held on the same day.

- Discussion of a project work drawn up in the classroom during tutorials, regarding the design and verification of a multi-story or industrial building and its details. The test is passed with a score higher than 18/30;
  - Oral examination aimed at evaluating the capacity of the student of connecting and comparing the different topics covered in the course. The test is passed with a score higher than 18/30;
  - The final vote is provided by the average of the two previous partial votes.
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#### TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- "STRUTTURE IN ACCIAIO" di G. Ballio – F.M. Mazzolani; ISEDI – Arnoldo Mondadori Editore
  - "PROGETTO E VERIFICA DELLE STRUTTURE IN ACCIAIO", C. Bernuzzi, Hoepli
  - "COLLEGAMENTI SALDATI" Costa, Daddi, Mazzolani, Cisia.
  - "I COLLEGAMENTI CHIODATI, BULLONATI E SALDATI", V. Perrone, Hevelius Edizioni.
  - Normative: CNR UNI 10011, D.M. 14 gennaio 2008 (Norme tecniche per le costruzioni)
  - "TECNICA DELLE COSTRUZIONI IN LEGNO", Giordano G., Hoepli, MI
  - "PROGETTAZIONE E CALCOLO DELLE STRUTTURE IN LEGNO LAMELLARE" De Angelis, Dei.
  - "COSTRUIRE CON IL LEGNO", Davoli P., Hoepli
  - D.M. 14 gennaio 2008 (Norme tecniche per le costruzioni)
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Notes supplied by the Prof. Ponzo are available on the course website:

<http://web.unibas.it/ponzo/index.php/11-didattica/4-costruzioni-in-acciaio-e-legno>.

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#### INTERACTION WITH STUDENTS

During the first lesson the Professor, after describing the goals of the course, the program and the evaluation methods, provides to the students the website where they can find the on-line educational material and the recommended books. At the same time, he collects the list of the students, complete of all significant information (i.e. name, surname, email, badge number and so on..).

Office hours: Tuesdays from 15:00 to 17:00.

In any case the professor is always contactable through the following email: [felice.ponzo@unibas.it](mailto:felice.ponzo@unibas.it)

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#### EXAMINATION SESSIONS (FORECAST)<sup>1</sup>

Examination sessions will be fixed all months

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SEMINARS BY EXTERNAL EXPERTS    YES     NO

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#### FURTHER INFORMATION

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<sup>1</sup> Subject to possible changes: check the web site of the Teacher or the Department/School for updates.