



Universitat de Lleida

DEGREE CURRICULUM  
**INDUSTRIAL STRUCTURES II**

Academic year 2014-15

## Subject's general information

<b>Subject name</b>	INDUSTRIAL STRUCTURES II
<b>Code</b>	14364
<b>Semester</b>	1st semester
<b>Typology</b>	Elective
<b>ECTS credits</b>	6
<b>Theoretical credits</b>	0
<b>Practical credits</b>	0
<b>Office and hour of attention</b>	Email de teacher
<b>Department</b>	Agricultural and Forestry Engineering
<b>Modality</b>	Presencial
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.
<b>Degree</b>	Master's Degree in Industrial Engineering
<b>Office and hour of attention</b>	Email de teacher
<b>E-mail addresses</b>	jlampur@eagrof.udl.cat

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## Subject's extra information

Industrial Structures II is an elective subject which is offered during the first semester of the second year. Extends the contents of steel structures developed in Industrial Structures I (unions, horizontal stability, fire safety) using commercial software.

Co-requisites: Industrial Structures I

## Learning objectives

- To determine the actions that must support a structure.
- To generate the decisive combinations of actions.
- To get the critical stresses for the sizing of the structure
- To know the properties of structural steel and the commercial profiles.
- To determine the section properties and classify it.
- To get the strength capacity of a section
- To size a steel structural member according to its stresses.
- To write a technical report on a steel frame.
- To size a steel structure using specific commercial software.
- To check the sizing performed with commercial software using its own tools.
- To propose alternatives to the design of a structure for an industrial building and to choose the most convenient.
- To use technical information written in other languages.
- To express themselves correctly using appropriate technical vocabulary.

## Competences

### General competences set in ORDEN CIN/311/2009 and EPS criteria:

- CG3 Capacity to convey information, ideas, problems and solutions both to a specialised and no specialised public.
- CG4 Capacity to conceive, design and implement projects and/or provide new solutions, using the tools that the engineering offers.
- CG7 To project, calculate and design products, processes, installations and plants.
- CG9 To do research, development and innovation in products, processes and methods.

### Specific competences set in ORDEN CIN/311/2009:

- CE9 Capacity for the design, construction and exploitation of industrial plants.
- CE10 Knowledge on construction, building, installations, infrastructures and urbanism in the field of the industrial engineering.
- CE11 Knowledge and capacities for the calculation and design of structures.

### Cross-disciplinary competences approved by the Plenary Commission of the Degrees of Industrial Engineering, Computer Engineering and Building Engineering, gathered in June 16th, 2008:

- CT1 Appropriate skills in oral and written language.
- CT2 Command of a foreign language.

## Subject contents

### I. Steel structures:

1. Structural safety: Loads and its combination.
2. Structural steel: Steel sections and structural typologies.
3. Section classification and resistance.
4. Members design: Buckling.
5. Corrosion and fatigue.
6. Bolted and welded connections.

### II. Industrial buildings:

7. Industrial buildings.
8. Building envelope: Roof and walls.
9. Purlins.
10. Portal frames.
11. Trusses.
12. Bracing.
13. Moment connections and basements.
14. Fabrication and erection.
15. Fire safety.

## Evaluation

- 10% assignments.
- 25% 1st term exam.
- 25% 2nd term exam.
- 40% class project.

## Bibliography

### Codes:

- Eurocode (AENOR, UNE-EN): EC0 (1990), EC1 (1991), EC3 (1993)
- (Biblioteca / Bases de dades / NORMWEB) i annex nacional ([www.fomento.gob.es](http://www.fomento.gob.es)).
- Basic Documents from CTE: DB SE, DB SE-AE, DB SE-A ([www.codigotecnico.org](http://www.codigotecnico.org)).
- Structural Steel Codel: EAE ([www.fomento.gob.es](http://www.fomento.gob.es)).

### Basic references:

- Monfort. 2006. Estructuras metálicas para edificación. Adaptado al CTE. Ed. UPV.
- Arnedo. 2009. Naves industriales con acero. APTA.

### Additional references:

- Argüelles. 2005. Estructuras de acero. Cálculo. Ed. Bellisco.
- Argüelles. 2007. Estructuras de acero. Uniones y sistemas estructurales. Ed. Bellisco.
- Monfort. 2008. Problemas de estructuras metálicas adaptados al Código Técnico. Ed. UPV.
- ENSIDESA. 1990. Prontuario ENSIDESA.
- Davidson & Owens. 2012. Steel Designers Manual 7<sup>th</sup> edition. Wiley-Blackwell.

**Websites:**

- Cátedra acero: [catedracero.ee.upm.es](http://catedracero.ee.upm.es)
- Asociación para la Promoción Técnica del Acero (APTA): [apta.com.es/index.php](http://apta.com.es/index.php)
- Acces Steel: [www.access-steel.com](http://www.access-steel.com)
- Constructalia: [www.constructalia.com](http://www.constructalia.com)