Universitat de Lleida

DEGREE CURRICULUM

INDUSTRIAL STRUCTURES I

Academic year 2015-16

2015-16

Subject's general information

Subject name	INDUSTRIAL STRUCTURES I
Code	14528
Semester	2nd semester
Typology	Compulsory
ECTS credits	6
Groups	No
Theoretical credits	3
Practical credits	3
Office and hour of attention	Send an email to arrange a meeting
Department	Enginyeria Agroforestal
Teaching load distribution between lectures and independent student work	40% lectures 60% independent student work
Modality	Presencial
Important information on data processing	Consult this link for more information.
Language	Catalan/Spanish
Degree	Master's Degree in Industrial Engineering
Office and hour of attention	Send an email to arrange a meeting
E-mail addresses	jlampur@eagrof.udl.cat

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Subject's extra information

This subject belongs to the module "Facilities, plants and complementary constructions".

Advices:

Refresh your knoledge on Stregth of Materials.

Learning objectives

GENERAL PURPOSE OF THE SUBJECT

Provide students with the **knowledge** and **techniques**, **tools**, **skills** and **abilities** needed to effectively perform **the professional activities** developed in the **construction** of a building and / or **management** and **administration** in the industrial sector, both phases the **design** and **implementation**.

The achievement of this overall objective is summarised as:

- **Start student orientation** towards the design and selection of the best solution to every construction problem that confronts, supported by a methodology.
- **Develop and conduct design** of building elements, at a basic level.
- **To know the different options** which require the implementation of an engineering project through a good understanding of the basic building blocks.
- **The technical capacity** to formulate projects in engineering, and their planning and program.
- **Establish solid bases** in the subjects treated, because if the fundamentals have been assimilated properly, the student will be greatly facilitated the development of their careers**.**

Competences

Basic competences set in Royal decree 861/2010 and Order CIN/311/2009:

- CB2 To be able to apply the knowledge gained and to solve problems in new environments in wider contexts (or multidisciplinary) related with the area of study.

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

- CG1 Capacity of planning and organizing the personal work.
- CG4 Capacity to conceive, design and implement projects and/or provide new solutions, using the tools that the engineering offers.
- CG5 To be motivated for the quality and the steady improvement.
- CG6 To have suitable knowledge of the scientific and technological issues of: mathematical, analytical and numerical methods in engineering, electrical engineering, energetic engineering, chemical engineering, mechanical engineering, mechanics of continuous means, industrial electronics, automation, manufacture, material, quantitative methods of management, industrial computing, urbanism, infrastructures, etc.
- 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.
- CE13 Knowledge on methods and techniques of transportation and industrial maintenance services.

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

- CT3 Mastering ICT's.

Subject contents

Lessons	Practices
Technical Unit I ENVIRONMENT	
L0 Introduction and objectives	P0 The Spanish Building Technical Code (CTE)
L01 Program	
L1 The materials and construction industry	
L2 General properties of materials	
Technical Unit II KNOWLEDGE OF MATERIALS	
L3 Rheological behavior of the materials	P1 Reminderresistance materials.Exercises
L4 Rocks: Classification, properties, obtaining	
L5 Use of the rocks under construction	
L6 Useof aggregates in construction	P2 Exercises applicationto granular layers
L7 Gypsum and lime	
L8 Cements	
L9 Concrete	P3 Beams of reinforced concrete
L10 Precastconcrete	P4 Design of rain network
Technical Unit III BUILDING ELEMENTS	
L11 Slabs	P5 The project of a floor slab.
L12 Covers	P6 Design of a cover
L13 Enclosure walls	P7 Design of a small building
L14 Retaining walls	P8 Retaining Wall Project
L15 Foundations	P9 Foundation Project
Technical Unit IV APPLICATION TO THE DESIGN OF LIGHTBUILDINGS	
L16 Calculation process of a small structure	P10 CTE sharescalculation as
L17 Industrial buildings	P11 Design of a Industrial building.
Technical Unit V PROJECT PHASES	
L18 The preliminary study (PS)	P12 Development of the PS application
L19 The Preliminary or Basic Project (PB)	P13 Development of the PB application
L20 Project Detail (PD)	P14 Development of the PD application
L21 Execution	
Technical Unit VI PROJECT MANAGEMENT	
L22 The Project Management	
L23 Planning,Programming and Project Control	P15 Programming Techniques and Control: Problems

Development plan

Time (Weeks)	Description:	Face to face activities	HTP (2) (Hours)	Self work activities	HTNP (3) (Hours)
1	L0 , L1 i P0	Face to face	2GG		2
1	L1	Face to face	1GG		2
1	L2	Face to face	1GG		4
2	L3 i P1	Face to face	2GG		3
2	L4 , L5, L6 i P2	Face to face	2GG	Activities 1 i 2	3

3	L7 i L8	Face to face	2GG		
4	L9, L10, P3 i P4	Face to face	4GG	Activities 3 i 4	13
5	L11	Face to face	2 GG		5
6	L12 i P5 i P6	Face to face	4 GG	Activities 5 i 6	5
7	L13 i P7	Face to face	2GG	Activity 7	3
7	L14 i P8	Face to face	2GG	Activity 8	8
8	L15 i P9	Face to face	2GG		
9	Assessment I: UT I ,UT2 i UT III	EEI (1)	3GG		
10	L16 i P10	Face to face	4GG	Activity 9	6
11	L17 i P11	Face to face	4GG	Activity 10	12
11	P11	Face to face	3GG		8
12	L18, L19, P12 i P13	Face to face	4GG		2
13	Holidays				
14	L20, L21 i P14	Face to face	4GG		3
15	L22 i L23 i P15	Face to face	4GG	Activity 11	11
16	Assessment II: UT IV, V i VI	EEI(1)	4GG		
19	Assessment (Retest assessment I and II)	EEI(1)			
		TOTALS	**60**		**90**

Evaluation

Goals	Assessment activities	Criteria	%	Date	C/NC (1)	I/T (2)	Remarks
Subjects 1-15	PA1 Exam (*) PA2 Activities 1-9		35% 15%	Week 9	C C	I I	Activities should be delivered on time
Subjects 16-23	PA3 Exam (*) PA4 Activities10-11		35% 15%	Week 17	C C	I I	Activities should be delivered on time
Retest 1-23	PA5 Exam	(**)		Week 19	C	I	

(1) Compulsory / Not compulsory

(2) Individual / Team

(*) The exam includes a Test (30%) + Short Problems whithout documentation (35%) + Problem with documentation (35%)

(**) You need a mark of 4 over 10 in this exam to take into account the mark of the PA2 i PA4 activities. If this condition is satisfied the final mark will be computed as follows:

- 70% PA5 exam
- 30% Activities PA2 and PA4

Bibliography

Resources:

In **RECURSOS** from **CAMPUS VIRTUAL** (Sakai) you will found the slides, the practices and the solved problems. Also the activities to be developed by the students directed towards self-study and self-assessment.

References:

- **Codigo Técnico de la Edificación (CTE) http://www.codigotecnico.org**
- **Instrucción hormigón estructural EH-08. Ministeriode fomento**
- ***ARGÜELLES, R. et al. (1999). "Estructuras de Acero". Ed. Bellisco.***
- ***JIMÉNEZ MONTOYA, P.: GARCÍAMESEGUER, A.: MORAN, F. - - Hormigón armado - Gustavo Gili. Barcelona***
- ***CONSTRUCCION DE ESTRUCTURAS. HORMIGON ARMADO, ADAPTADO A LAS INSTRUCCIONES EHE, EFHE, NCSE-02 Y CTE?***
- ***LOZANO APOLO, G.; LOZANO MARTINEZ-LUENGAS, A. (1999). "Forjados. Cursode Diseño, Cálculo, Construcción y Patología de forjados según EHE, EF-96 yEA-95". Ed. Consultores técnicos de la Construcción.***