240EI026 - Constructions and Industrial Architecture

Coordinating unit: 240 - ETSEIB - Barcelona School of Industrial Engineering
Teaching unit: 758 - EPC - Department of Project and Construction Engineering
Academic year: 2019
Degree: MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2014). (Teaching unit Compulsory)
ECTS credits: 4,5
Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: Pujadas Álvarez, Pablo
Others: Pujadas Álvarez, Pablo
Cuerva Contreras, Eva
Ferré Tafalla, Xavier
Amorós Gabarrón, Francesc
Mallafre Alcocer, Nuria

Degree competences to which the subject contributes

Specific:
CEMEI17. Ability on the design, manufacturing, construction and operation of industrial plants.
CEMEI18. Knowledge about manufacturing, construction, facilities, infrastructures, and urban design in the field of industrial engineering.
CEMEI19. Knowledge and abilities for the calculation and design of structures.

CEECONS2. Apply the adequate knowledge for the design, construction and management of buildings and its surroundings, especially in the field of engineering.

Teaching methodology

The teaching methodology is divided in three parts:
- Face-to-face exposition sessions of the contents (master classes)
- Face-to-face sessions of the practical coursework (practical classes)
- Autonomous work of the study and realization of the exercises and the activities (realization of projects)

In the master classes, the basic concepts of the course are explained. The supporting material is the general reference of the course, which will be complemented during the classes with additional information. The students will have complementary information available in the Digital Campus Atenea. In the sessions of the practical coursework, the Professors will guide the students to the application of the theory concepts to solve exercises, basing especially in the critical reasoning at all times. Exercises derived from real cases will be set, and the students will have to solve it in and outside of the classes, in order to foster the contact and use of the basic necessary tools for the resolution of exercises. The students will previously need to have been working at home to foster the understanding of the exercises presented. The students, in an autonomous way, will have to work the material provided by the Professors and the result of the sessions of the practical workgroup in order to assimilate and fix the concepts. The proposal for implementation of an industrial process will also have to be carried out from the analysis of a real industry of the same category (case study), where the applied knowledge acquired during the course will be reflected

Learning objectives of the subject

The aim of this course is to provide some basic knowledge in the interrelationship between the economic activities,
especially the industrial ones, and its physical environment together with the construction which supports it, the specification of the needs of the implementation and the legal criteria to satisfy and fulfill.

What is to say, that this course aims to provide the student the basic knowledge so that he/she:
- Has the sufficient skills to analyse, define and communicate in a clear way, precise and thorough the requirements which an industrial facility must meet
- Meet the criterion to choose between different possible urbanistic, constructive and technical solutions, that one which is the most suitable and close to its needs
- And finally, so that the student is able to set in a basic way an industrial facility

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours large group:</th>
<th>27h</th>
<th>24.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total learning time: 112h 30m</td>
<td>Hours small group:</td>
<td>13h 30m</td>
<td>12.00%</td>
</tr>
<tr>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
<td></td>
</tr>
<tr>
<td>Self study:</td>
<td>72h</td>
<td>64.00%</td>
<td></td>
</tr>
</tbody>
</table>
# Content

## URBANISM

<table>
<thead>
<tr>
<th>Description:</th>
<th>It aims to provide the theory and practical basic knowledge regarding to planning and urban management, as well as the execution in the urban public areas. Even so, taking into account sustainable criteria and regarding to the environment</th>
</tr>
</thead>
</table>
| Related activities: | - Construction coursework  
- Final exam |
| Specific objectives: | - Regulatory framework of urbanism  
- Interrelation between industry and land  
- Urban planning |

| Learning time: | 27h  
Practical classes: 6h  
Laboratory classes: 4h  
Self study: 17h |

## DESIGN AND CONSTRUCTION OF INDUSTRIAL PLANTS

<table>
<thead>
<tr>
<th>Description:</th>
<th>The basis to carry out the floor distribution of the industrial process will be given, explaining the types and basic ways which can present, which are the auxiliary elements of the production system, the general manufacturing services and the staff services. The target is that the student analyses a certain industrial process, making an analysis of the alternatives and the election of the distribution in a final plant</th>
</tr>
</thead>
</table>
| Related activities: | - Construction coursework  
- Final exam |
| Specific objectives: | - Productive diagrams  
- Machine sheets  
- Floor distribution |

| Learning time: | 53h  
Practical classes: 9h  
Laboratory classes: 10h  
Self study: 34h |
240EI026 - Constructions and Industrial Architecture

<table>
<thead>
<tr>
<th>STRUCTURAL ENGINEERING</th>
<th>Learning time: 14h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 5h</td>
</tr>
<tr>
<td></td>
<td>Self study: 9h</td>
</tr>
</tbody>
</table>

**Description:**
Provide some basic knowledge of the geotechnical parameters of the floor and the different typologies of the structural elements which are in contact with the land, the way the student has available the election criteria of the type of structure

**Related activities:**
- Final exam

**Specific objectives:**
- Mechanics of the floor. Foundations
- Types of buildings and industrial plants

<table>
<thead>
<tr>
<th>FIRE PROTECTION ENGINEERING</th>
<th>Learning time: 19h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 7h</td>
</tr>
<tr>
<td></td>
<td>Self study: 12h</td>
</tr>
</tbody>
</table>

**Description:**
Provide the scientific basis of the physical properties of the fire and the combustion and give some basic knowledge of the regulations and codes applicable to the engineering of fire protection

**Related activities:**
- Final exam

**Specific objectives:**
- Regulation workframe
- Passive elements for the fire protection
The evaluation is carried out through several procedures:
(1) a final exam (EF), in which the student has to demonstrate his ability to apply the knowledge learned and develop resolution procedures to short and specific questions;
(2) a course work (TC), in which the student has to present, in groups, a proposal for the implementation of an industrial process based on the analysis of a real industry;
(3) participation and performance in the course (PRC), in which the student's participation in the activities carried out in the classroom is evaluated, punctual deliveries of short and practical exercises, and other activities proposed for the course so that the learning and learning The self-assessment of the knowledge acquired.

\[ N_{\text{final}} = 0.40 \cdot \text{NEF} + 0.45 \cdot \text{NTC} + 0.15 \cdot \text{NPRC} \]

\[ N_{\text{final}} \] – final grade
\[ \text{NEF} \] – final exam grade
\[ \text{NTC} \] – course work grade
\[ \text{NPRC} \] – participation and performance in the course

During the term of spring of the course 2019-2020, and as a consequence of the sanitary crisis owing to the Covid19, the method of qualification will be the following: The final Grade will result from the maximum among: the note obtained with the former formula defined before the crisis and the new proposal, that in addition to NEF, NTC and NPRC, also considers the mark obtained in the self-evaluation tests done via Atenea (NQ).

\[ N_{\text{final}} = \max \{ 0.40 \cdot \text{NEF} + 0.45 \cdot \text{NTC} + 0.15 \cdot \text{NPRC} ; 0.35 \cdot \text{NEF} + 0.40 \cdot \text{NTC} + 0.25 \cdot (0.4 \cdot \text{NPRC} + 0.6 \cdot \text{NQ}) \} \]

\[ N_{\text{final}} \] – final grade
\[ \text{NEF} \] – final exam grade
\[ \text{NTC} \] – course work grade
\[ \text{NPRC} \] – participation and performance in the course
\[ \text{NQ} \] – grade from the self-evaluation tests via Atenea

- No calculators, mobile phones or any other supporting material is allowed when doing the exams
- Reevaluation exam will be only of the theory part (Nef). Only students who had attend the ordinary exam call and failed the course can be tested in the reevaluation exam. Students with a mark of less than 2.0 will be considered as Not Presented. Reevaluation mark will be as maximum 7.0.

**Bibliography**

**Basic:**

**Complementary:**

