Course guide
295906 - EFOC - Fire Engineering

Unit in charge: Barcelona East School of Engineering
Teaching unit: 713 - EQ - Department of Chemical Engineering.

Degree: BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2023     ECTS Credits: 6.0     Languages: Catalan

LECTURER

Coordinating lecturer: Pastor Ferrer, Elsa
Others: Segon quadrimestre:
ALBA ÁGUEDA COSTAFREDA - T10
ELSA PASTOR FERRER - T10

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

The main objective of this subject is to provide the students with the basic knowledge on Fire Engineering (or fire protection engineering) to analyse, design and implement adequate fire safety measures in structures, industries and at the wildland-urban interface.

We work on fundamental aspects of combustion and fire dynamics (fuels characterization, materials, fire chemistry, ignition, flames propagation, etc.), we present (theoretically and practically) the available tools and software for fire simulation, we describe the main measures for active and passive fire protection and we establish the basis to perform fire safety projects under either a prescriptive and a performance based approach. At the end of the course we give a brief introduction on fire investigations and forensics.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>60,0</td>
<td>40.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
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Total learning time: 150 h
### 3. Introduction to Fire Engineering

**Description:**
Fire Engineering and related areas. Types of fire: industrial, buildings and wildland fires.

**Full-or-part-time:** 7h 30m  
Theory classes: 7h 30m

### 3. Fundamentals on combustion and fire dynamics

**Description:**

**Full-or-part-time:** 25h  
Theory classes: 25h

### 3. Tools for compartment fires simulation

**Description:**
Compartment fire dynamics. Types of models: empirical, quasi-physical, zone models, CFD models. Simulation exercises.

**Full-or-part-time:** 8h 45m  
Theory classes: 8h 45m

### 4. Fire protection

**Description:**

**Full-or-part-time:** 42h 30m  
Theory classes: 42h 30m

### 5. Bases for fire protection design measures and strategies

**Description:**
Prescriptive and performance-based design. Legislation. Design projects of supression, ventilation and evacuation systems.

**Full-or-part-time:** 37h 30m  
Theory classes: 37h 30m

### 6. Fire investigation

**Description:**
Methodos for forensic analysis. Ignition sources. Fire patterns and vestiges. Professional activities involving fire investigation. Study cases.

**Full-or-part-time:** 28h 45m  
Theory classes: 28h 45m
BIBLIOGRAPHY

Basic:

Complementary: