UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

Course guide
310756 - 310756 - Fire Safety in Buildings

Last modified: 18/10/2023

Unit in charge: Barcelona School of Building Construction
Teaching unit: 753 - TA - Department of Architectural Technology.

Degree: BACHELOR'S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2019). (Optional subject).

Academic year: 2023 **ECTS Credits:** 3.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Haurie Ibarra, Laia

Others: Lacasta Palacio, Ana Maria

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:
04 COE. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

TEACHING METHODOLOGY

Different learning methods will be combined:
- Master classes exposing the theoretical concepts
- Practical laboratory work carried out in groups
- Practical work with computer tools, individually or in groups
- Resolution of practical cases in groups
- Autonomous work

LEARNING OBJECTIVES OF THE SUBJECT

Fire safety is a highly relevant issue in buildings, affecting all its phases, from design to construction, use and maintenance. This course aims to introduce this subject by addressing different aspects, starting with the basic concepts of fire and ending with the aspects to be taken into account to comply with the safety requirements in case of fire.

STUDY LOAD

Type	Hours	Percentage
Self study	45,0	60.00
Hours large group	30,0	40.00

Total learning time: 75 h

CONTENTS

Fire and fire spread: basic concepts

Description:
What is fire? Explanation of the fire tetrahedron and the dynamics of fire spread.

Specific objectives:
Get familiar with the physico-chemical phenomena involved in the production of a fire. Understand the mechanisms involved in fire spread.

Related activities:
Practical work in the laboratory and analysis of case studies.

Full-or-part-time: 4h
Theory classes: 2h
Laboratory classes: 2h

Fire behaviour of building materials. Fire reaction and fire resistance.

Description:
Explanation about the concepts of fire reaction and fire resistance, as well as the tests and standards related with each concept. The different families of construction materials and what their role is in case of fire will be analysed.

Specific objectives:
Understand the different concepts that must be taken into account when evaluating materials and / or construction systems. Analyze the influence of the type of material on the evolution of a fire.

Related activities:
Laboratory work

Full-or-part-time: 6h
Theory classes: 4h
Laboratory classes: 2h

Active and passive protection systems

Description:
Description of the different fire protection systems. Both active and passive systems will be covered.

Specific objectives:
Know the different fire protection systems to be able to choose the best system in each case.

Full-or-part-time: 4h
Theory classes: 4h

Fire spread in buildings

Description:
The mechanisms of fire spread will be explained and how different building parameters can contribute to this spread.

Specific objectives:
Understand how fire spread occurs and what aspects influence this spread.

Related activities:
- Analysis of real cases.
- Use of informatic tools.

Full-or-part-time: 8h
Theory classes: 4h
Practical classes: 4h

Fire safety. CTE

Description:
The basic document on fire safety of the building code (CTE) will be analyzed in order to understand what measures to apply to guarantee the greatest fire safety. It will be explained how evacuation plans are carried out in case of fire.

Specific objectives:
Understand the DB SI of the CTE and know how to interpret the measures that must be applied to minimize the risk in case of fire. Understand how evacuation plans work in case of fire.

Related activities:
Case-studies.

Full-or-part-time: 8h
Theory classes: 4h
Practical classes: 4h

GRADING SYSTEM

The final mark will be the sum of the score obtained in each activity according with the following weights:
Laboratory: 15%
Simulation of fire spread deliverable: 15%
Deliverable on evacuation in case of fire: 15%
Conferences and other evaluable activities: 15%
Midterm exam: 15%
Final exam: 25%

BIBLIOGRAPHY

Basic:
- Alvear, Daniel. Modelado y simulación computacional de incendios en la edificación . Madrid : Díaz de Santos, cop. 2007. ISBN 9788479788322.
- Fernández Núñez, Rafael. Protección contra incendios . Madrid : Cie Dossat 2000, cop. 2004. ISBN 848965669X.
- Drysdale, Dougal. An Introduction to fire dynamics . 3rd ed. Chichester : Wiley, 2011. ISBN 9780470319031.