# Course guide
# 310728 - 310728 - Electromechanical Installations

**Last modified:** 05/10/2023

**Unit in charge:** Barcelona School of Building Construction
**Teaching unit:** 758 - EPC - Department of Project and Construction Engineering.

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

**Academic year:** 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

## LECTURER

**Coordinating lecturer:** Tarragona Roig, Joan

**Others:** Dolcet Butsems, David
Guerrero Pérez, Adrián
Torra Guarch, Oriol

## DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

**Transversal:**
1. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
2. ENTREPRENEURSHIP AND INNOVATION - Level 2. Taking initiatives that give rise to opportunities and to new products and solutions, doing so with a vision of process implementation and market understanding, and involving others in projects that have to be carried out.

## TEACHING METHODOLOGY

The teaching methodology is divided into three parts:
• Face-to-face for content presentation.
• Face-to-face for practical work (exercises and problems).
• Autonomous work.
In the content presentation sessions, the lecturer will present the theoretical bases of the subject, concepts, methods and illustrative results with examples to facilitate general understanding.
In the face-to-face practical work sessions, the lecturer will guide the student in the application of the theoretical concepts for problem solving, promoting at all times critical reasoning. Students will have to solve exercises during the face-to-face sessions and at home.
Students, must work autonomously the material provided by the lecturer and the result of the work-problem sessions to assimilate and fix the concepts. The lecturers will provide a study plan and follow-up of activities (through Atena).

## LEARNING OBJECTIVES OF THE SUBJECT

The course aims at providing the capacity to design electrical and HVAC (heating, Ventilation and Air Conditioning) systems for buildings, considering their use, the applicable regulations and the suitability and energy efficiency of their systems.

## STUDY LOAD

| Type | Hours | Percentage |
|---|---|---|
| Self study | 90,0 | 60.00 |
| Hours large group | 30,0 | 20.00 |
| Hours medium group | 24,0 | 16.00 |
| Hours small group | 6,0 | 4.00 |

**Total learning time:** 150 h

## CONTENTS

### Module 1. Electrical systems

**Description:**
- Introduction to building systems.
- Regulations.
- Initial concepts.
- Electric distribution networks.
- Third category transformation centers.
- Power and consumption of the equipment (household appliances, elevators, lights, etc.).
- Low Voltage network.
- Parameters of a Low Voltage systems.
- Defects in electrical systems.
- Electrical systems protections.
- Grounding network.
- Telecommunications systems.
- Electrical systems sizing.

**Related activities:**
Electrical Systems project. Low voltatge systems part.
Practicum exercicis.

**Full-or-part-time:** 3h 36m
Theory classes: 1h 12m
Practical classes: 0h 36m
Self study : 1h 48m

**Module 2: Lighting systems**

**Description:**
• Regulations.
• Initial concepts.
• Elements of lighting systems.
• Types of lighting.
• Energy efficiency of lighting systems.
• Lighting systems sizing.

**Related activities:**
Electrical Systems project. Lighting systems part.
Practicum exercicis.

**Full-or-part-time:** 20h
Theory classes: 6h
Practical classes: 4h
Self study : 10h

**Module 3. Photovoltaic systems**

**Description:**
• Regulations.
• Initial concepts.
• Elements of photovoltaic systems.
• Types of photovoltaic systems.
• Energy efficency of photovoltaic systems.
• Photovoltaic systems sizing.

**Related activities:**
Electrical Systems project. Photovolitaic systems part.
Practicum exercicis.

**Full-or-part-time:** 20h
Theory classes: 6h
Practical classes: 4h
Self study : 10h

**Module 4: HVAC systems**

**Description:**
• Regulations.
• Initial concepts.
• Thermal comfort.
• Elements of HVAC (Heating, Ventilation and Air Conditioning) systems.
• HVAC types.
• Thermal production equipment.
• Thermal distribution equipment.
• Regulation and control.
• Energy efficiency in HVAC systems.
• Ventilation sizing.
• Heating and air conditioning sizing.

**Related activities:**
HVAC systems project. HVAC systems part.
Practicum exercicis.

**Full-or-part-time:** 48h
Theory classes: 14h
Practical classes: 10h
Self study : 24h

## GRADING SYSTEM

- Mid-term exam, weight: 30%
- Final exam, weight: 30%
- Group project, weight: 30%
- Follow-up of the project in practice sessions, weight: 10%

Reassessment
The student who has obtained a final grade of failure with a numerical grade between 3.5 and 4.9 will have the option of appearing for a single reassessment exam, which will include all the contents and will be carried out in the period established in effect. If you pass this exam, the final grade of the subject will be passed (5.0)
Students who meet any of the following conditions will not be able to take the reassessment exam:
i) has already passed the subject
ii) your final grade is below 3.5 (includes the NP case, which is 0 NP)

## BIBLIOGRAPHY

**Basic:**
- RITE (Reglament d'instal·lacions tèrmiques en edifici) i les seves instruccions tècniques).
- REBT (Reglament Electrotècnic de Baixa Tensió) i les seves instruccions tècniques).
- CTE-DB-HE (Codi Tècnic de l'Edificació - Document Bàsic - Estalvi d'Energia).

## RESOURCES

**Other resources:**
Class handouts.