



## Course guide

# 820125 - IEBAT1EE - Low and High Voltage Electrical Installations I

Last modified: 14/06/2023

**Unit in charge:** Barcelona East School of Engineering  
**Teaching unit:** 709 - DEE - Department of Electrical Engineering.

**Degree:** BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Compulsory subject).

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

### LECTURER

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**Coordinating lecturer:** JUAN MORÓN ROMERA

**Others:** Primer quadrimestre:  
JUAN MORÓN ROMERA - Grup: M11, Grup: M12, Grup: M13

Segon quadrimestre:  
EDORTA LÓPEZ URZAINQUI - Grup: T11, Grup: T12, Grup: T13  
JUAN MORÓN ROMERA - Grup: T11, Grup: T12, Grup: T13

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

4. Carry out calculations for the design of low and medium voltage electrical installations.
- CEELE-22. Carry out calculations for the design of high voltage electrical installations.

**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. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

### TEACHING METHODOLOGY

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Magistral classes for theory sessions, individual and group work, and project based learning.

### LEARNING OBJECTIVES OF THE SUBJECT

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- To show how design low voltage electrical installations.
- To show the use of Standards and Regulations for electrical installations.
- To show the main elements of an installation (functionality, characteristics of operation, main applications)
- To show how draw an electrical diagram and its simbols.
- To analyze the causes of faults, its effects and protection methods.
- To show methodology for design, sizing and optimization the elements for a low voltage electrical installation.



## STUDY LOAD

Type	Hours	Percentage
Hours large group	45,0	30.00
Self study	90,0	60.00
Hours small group	15,0	10.00

**Total learning time:** 150 h

## CONTENTS

### Unit 1. Low Voltage Electrical Installations: Generalities

**Full-or-part-time:** 6h

Theory classes: 3h

Self study : 3h

### Unit 2. Interior installations for houses

**Full-or-part-time:** 22h

Theory classes: 3h

Laboratory classes: 2h

Self study : 17h

### Unit 3. Industrial Automation: Fundamentals

**Full-or-part-time:** 17h

Theory classes: 4h 30m

Laboratory classes: 4h

Self study : 8h 30m

### Unit 4. Electrical power and Energy

**Full-or-part-time:** 14h

Theory classes: 3h

Laboratory classes: 1h

Self study : 10h

### Unit 5. Grid connection: Regulations.

**Full-or-part-time:** 21h

Theory classes: 4h 30m

Self study : 16h 30m



#### Unit 6. Conductor Sizing

**Full-or-part-time:** 9h  
Theory classes: 4h 30m  
Self study : 4h 30m

#### Unit 7. Power Quality

**Full-or-part-time:** 3h  
Theory classes: 1h 30m  
Self study : 1h 30m

#### Unit 8. Protection elements

**Full-or-part-time:** 16h  
Theory classes: 6h  
Laboratory classes: 2h  
Self study : 8h

#### Unit 9. Ground connection

**Full-or-part-time:** 13h  
Theory classes: 4h 30m  
Laboratory classes: 2h  
Self study : 6h 30m

#### Unit 10. Interior or Load installations

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

#### Unit 11. Shortcircuit analysis

**Full-or-part-time:** 9h  
Theory classes: 4h 30m  
Self study : 4h 30m

### GRADING SYSTEM

Middle term exam: 20%  
Class exercises: 10%  
Homework: 15%  
Laboratory work: 15%  
No proof of reassessment.  
Self Study: 10%  
Final test: 30%



## EXAMINATION RULES.

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Timetable established by school

## BIBLIOGRAPHY

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### Basic:

- Schmelcher, Theodor; Guillén, Jorge. Manual de baja tensión : indicaciones para la selección de aparatos de maniobra, instalaciones y distribuciones. Berlin; Munich: Siemens-Aktiengesellschaft, [Abt. Verl.], 1984. ISBN 3800913976.
- Espanya. Reglamento electrotécnico para baja tensión e instrucciones técnicas complementarias. 3ª ed. Madrid: Liteam, cop. 2002. ISBN 8495596318.

## RESOURCES

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### Audiovisual material:

- Atenea