

Course guide

820125 - IEBAT1EE - Low and High Voltage Electrical Installations I

Last modified: 02/10/2025

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: 2025 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: JORGE EL MARIACHET CARREÑO

Others: Primer quadrimestre:
 JORGE EL MARIACHET CARREÑO - Grup: M11, Grup: M12, Grup: M13
 JORDI VILANOVA RODRIGUEZ - Grup: M11, Grup: M12, Grup: M13

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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

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

LEARNING OBJECTIVES OF THE SUBJECT

- 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 symbols.
- 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

Description:

Electrification levels. Points of use, number and characteristics of circuits. Basic circuits. Switchgear.

Related activities:

Lab Practice: 1. The Electrical Panel

Activity 1: Electrical Installation in a Standard Home

Full-or-part-time: 12h

Theory classes: 3h

Laboratory classes: 2h

Self study : 7h

Unit 3. Industrial Automation: Fundamentals

Description:

Basic diagrams. Power devices. Command and control equipment.

Full-or-part-time: 15h 30m

Theory classes: 3h

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

Description:

Criteria for: I_{max} , voltage drop, and short-circuit currents. Conductor protection coordination.

Full-or-part-time: 20h 30m

Theory classes: 6h

Self study : 14h 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%
Homework: 20%
Laboratory work: 15%
Self Study: 15%
Final test: 30%
No proof of reassessment.

EXAMINATION RULES.

Timetable established by school

BIBLIOGRAPHY

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

Audiovisual material:

- Atenea