Course guide
820126 - IEBAT2EE - Low and High Voltage Electrical Installations II

Last modified: 04/06/2026

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: 2026 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: JORGE EL MARIACHET CARREÑO

Others:

Primer quadrimestre:
JORGE EL MARIACHET CARREÑO - Grup: T11, Grup: T12
EDORTA LÓPEZ URZAINQUI - Grup: T11, Grup: T12

Segon quadrimestre:
JORGE EL MARIACHET CARREÑO - Grup: M11, Grup: M12, Grup: M13
INTI RUMIÑAHUI TOALOMBO CHICAIZA - Grup: M11, Grup: M12, Grup: M13
JORDI VILANOVA RODRIGUEZ - Grup: M11, Grup: M12, Grup: M13

REQUIREMENTS

INSTAL·LACIONS ELÈCTRIQUES DE BAIXA I ALTA TENSIÓ I - Prerequisit

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Carry out calculations for the design of high voltage electrical installations.
2. Carry out calculations for the design of low and medium voltage electrical installations.

Transversal:
4. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

TEACHING METHODOLOGY

The subject uses the expository methodology, individual work, group work and project-based learning.
The expository sessions may consist of theoretical explanations accompanied by illustrative examples.
In the practical work sessions in the classroom, the teacher will guide students in the analysis, approach and choice of solutions, promoting critical thinking, feasibility and sustainability.
Students, independently, must study to assimilate the concepts and solve the proposed exercises.
In project-based work carried out in teams, students must implement specific solutions (at the teacher's suggestion or their own), including the needs to be met, alternatives studied, justification of the solution adopted and calculations.

LEARNING OBJECTIVES OF THE SUBJECT

The subject aims to:
· Introduce the aspects to be considered in the realization of medium and high voltage electrical installations.
· Present the regulations and standards that are specific to its subject.
· Present the basic switchgear used (Functions, main characteristics and main applications).
· Present the electrical symbology, topology and basic diagrams of these installations.
· Present and analyze the defects and disturbances, the effects and the protection methods.
· Present the criteria and calculation methods for the dimensioning and selection of the different elements that make up the installation.
· Know the basic architecture of the High Voltage electrical network and its subsystems

STUDY LOAD

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

Total learning time: 150 h

CONTENTS

Unit 1. Electrical Installation for High Voltage: Generalities.

Full-or-part-time: 12h
Theory classes: 3h
Self study : 9h

Unit 2. Electrical Calculations Techniques.

Full-or-part-time: 35h
Theory classes: 12h
Laboratory classes: 4h
Self study : 19h

Unit 3. Main elements for HV installations

Full-or-part-time: 21h
Theory classes: 9h
Self study : 12h

Unit 4. Protective Relays

Full-or-part-time: 15h
Theory classes: 6h
Self study : 9h

Unit 5. Ground installation

Full-or-part-time: 19h
Theory classes: 4h 30m
Laboratory classes: 4h
Self study : 10h 30m

Unit 6. Distribution Installation

Full-or-part-time: 25h
Theory classes: 4h 30m
Laboratory classes: 3h
Self study : 17h 30m

Unit 7. Substation Installation

Full-or-part-time: 23h
Theory classes: 6h
Laboratory classes: 4h
Self study : 13h

GRADING SYSTEM

Any academic fraud, plagiarism or use or possession of unauthorised means in an assessment activity leads to a mark of zero (0) for the affected test or assignment. Furthermore, in accordance with the University's regulations, if disciplinary proceedings are initiated the subject is recorded as "Pending Assessment" until a decision is reached. These incidents are managed in accordance with the **Action Framework for Academic Integrity in Assessment at the UPC**.

Assessment Methodology: This subject follows a continuous assessment methodology that consists of 4 independent assessment acts, each with a percentage weight equal to or greater than 16.66%.
The subject does not have a reassessment test.
Assessment instruments:
1. Continuous Assessment Tests (PAC) (30%): Completion of multiple-choice or T/F questionnaires, with possible penalty for incorrect answers.
2. Partial Controls (30%): Written tests (minimum 2) on solving problems in the design, calculation and dimensioning of electrical installations, with or without multiple-choice questions. If there are multiple-choice questions, incorrect questions may be penalized.
3. Activities (20%): Deliverables of exercises, problems or challenges, carried out in teams, may require in-person attendance
4. Laboratory practices (20%): Evaluation of the work carried out in the laboratory and of the technical reports derived from the practical sessions.

EXAMINATION RULES.

PAC: They can be done within the scheduled time or asynchronously online.
Controls: Face-to-face, within the scheduled time, only a non-programmable calculator is allowed. Other documentation, to be determined on the day of the test.
Activities: Deliverable, in groups of minimum 3, maximum 4 members. Can be online or on paper.
Laboratory Practices: Depending on the type of practice, to be determined by the Laboratory teacher.

BIBLIOGRAPHY

Basic:
- Enríquez Harper, Gilberto. Elementos de diseño de subestaciones eléctricas. 2a ed. México [etc.]: Limusa, cop. 2004. ISBN 9789681862220.