Course Unit	Electrical and Telecommunications Infrastructures			Field of study	Energy Systems		
Bachelor in	Electrical and Computers Engineering			School	School of Technology and Management		
Academic Year	2022/2023	Year of study	2	Level	1-2	ECTS credits	6.0
Type	Semestral	Semester	1	Code	9112-742-2103-00-22		

Workload (hours)	162	Contact hours	T	TP	PL	TC	S	E	OT	O
			-	30	24	4	2	-	-	-

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Orlando Manuel de Castro Ferreira Soares

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Know electrical wiring materials, apparatus and rules for the conception of electrical installations in buildings;
2. Know sizing and protection rules of wirings;
3. Interpret and execute projects of private and public service electrical installations of various categories;
4. Know the rules for project, installation and management of telecommunication infrastructures in buildings (ITED);
5. Organize, orient and perform, under supervision, installation, maintenance and repair, as well as others, for ITED.

Prerequisites

Before the course unit the learner is expected to be able to:
None.

Course contents

Electrical installations of utilisation; Installations in special locations; Installations in storage and parking spaces; Security protections; Collective installations and entries; Verification of electrical installations; Field work/site visit; Development of electrical installations projects and communication networks and telecommunication infrastructures in buildings; Domotic installations and structural networks.

Course contents (extended version)

1. Electrical installations of utilisation
   - Conception, structures and characteristics of electrical wirings.
   - Equipment and electrical apparatus selection. Electrical board.
   - Feeding, evaluation and power balancing. Energy metering
2. Installations in special locations
   - Installations in toilets, changing rooms, swimming pools, lakes, fountains and saunas
   - Installations in camping, marinas, construction sites, agricultural or livestock establishments
3. Installations in storage and parking locations
   - General electrical wiring
   - Feeding and circuits
4. Protections for security
   - Installations protections for over-currents and electrical shocks
   - Protections for atmospheric over-voltages
5. Collective installations and entries
   - Structure, wirings, boxes and boards
   - Sizing and protections
6. Electrical installations verifications and technicians duties
7. Field work/site visit
8. Organization, interpretation and execution of electrical installation projects
   - Constituent parts of an infrastructures electrical project.
   - Proceedings
   - Written parts (general special Descriptive Memory and Technical Conditions) and drawn parts.
9. Communication networks and telecommunication infrastructures in buildings
   - Prescriptions and technical specifications ITED
   - The ITED project
   - Running tests and report writing and features. The Construction Book.
10. Domotic installations and structural networks
    - Conception and installations of common systems. The EIB system.
    - Conception of solutions for structural wiring

Recommended reading

1. Regras Técnicas das Instalações Eléctricas de Baixa Tensão, Portaria nº 949-A/2006 de 11 de Setembro
2. Manual ITED, ANACOM, 3ª ed. , 2015
3. Textos de apoio, cópias de lições e de acetatos – Silva, Joaquim Tavares, 2009. Instalações Eléctricas e de Comunicações, ESTiG
4. Guia Técnico das Instalações Eléctricas, CERTIEL, 2007.
5. Fichas técnicas, CERTIEL

Teaching and learning methods

Tutoric classes: presentation of concepts related to different content; application of expository and interrogative; resolution of exercises and worksheets; frequent use of catalogs and tables of manufacturers, conducting study visits and technical sessions.

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final, Supplementary, Special)
   - Projects - 60% (Projects developed in classroom and non-classroom classes, with discussion and presentation.)
   - Final Written Exam - 40% (Minimum required values of 7 (on a scale of 20 values) for approval to the unit.)
2. Alternative 2 - (Regular, Student Worker) (Special)
   - Final Written Exam - 100%

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Language of instruction

Portuguese

Electronic validation

Orlando Manuel de Castro Ferreira Soares	José Luís Sousa de Magalhaes Lima	Paulo Alexandre Vara Alves
14-10-2022	16-10-2022	24-10-2022

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