

CERTIFICATION OF ELECTRICAL INSTALLATIONS

Code: 322017

Main Scientific Area: Automation, energy and cyber-physical systems

Lecturer: Marta Filipa da Silva Alves

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 30h Total Workload: 54h

ECTS: 3,0

Objectives

1. Equip students with the skills needed for the development of electrical installations certification process, in the various fields of design, implementation and operation. 2. Understand Regulations and Standards applicable to the Low and Medium Voltage Electrical Industry Sector (RTIEBT, NP) 3. Health, Safety and Health at Work (HSST): to know the legislation HSST; identify types of risks; know the risks of contact with the electrical current; learn practical measures of protection against direct and indirect contacts; apply rules of prevention; know and use personal protective equipment (PPE); Identify safety signs; properly handle tools and measuring devices;

Learning Outcomes

Know how to recognize an electrical installation executed according to R.T.I.E.BT. Recognize execution and design faults in an electrical installation. Know how to distinguish the differences between executions in RSIUEE and RTIEBT Identify materials that can not and can be used in a variety of locations. Measure security parameters of an installation. Insulation resistance. Continuity tests; Test for differences.

Course Contents

1. Electrical Design: Formal, Organizational and Other Aspects
2. Business Conditions for Connection to BT Networks.
3. Regulation and standards applicable to low voltage electrical projects. The Technical Rules of the Low Voltage Electrical Installations (RTIEBT).
4. Power supply installations for the use of electricity from the BT Distribution Network
5. Collective Installations of Buildings and Entrances
6. Electrical Boards and BT Hardware
7. Security in Electrical Installations: TT system; TN system; IT system;
8. Protection against lightning and surges in buildings and use facilities
9. Verification and testing of electrical installations
- 9.1. Origin of the installation

- 9.2. Measuring land values
- 9.3. Continuity tests of protective conductors and main and supplementary equipotential bonds.
- 9.4. Measurement of insulation resistance 5/12
- 9.5. IP and IK of equipment and External Influences
- 9.6. Permissible current on the premises
- 9.7. Volumes and regulatory IP codes
- 9.8. Conductor and Cable Verification
- 9.9. Safety against electric shock
- 10. Concepts and definitions
 - 10.1. Verification, Visual Inspection and Testing
 - 10.2. Facilities Verification
 - 10.3. Initial verification
 - 10.4. Visual inspection
 - 10.5. Carrying out the practical tests on installations
 - 10.6. Protection by automatic power cut.
 - 10.7. Measurement of the impedance of the defect mesh. Measurement method of voltage drops.
 - 10.8. DR Differential Testing.
- 11. Hygiene and safety in electrical installations
 - 11.1. Electrical Risks
 - 11.2. Legislation applicable

Recommended Bibliography

Install Express, Eng^o L. M. Vilela Pinto (Ed. Certiel, 2004) MG CALC, Eng^o L.M.Vilela Pinto (Ed. Merlin Gerin)
Regras Técnicas das Instalações Eléctricas de baixa Tensão, Imprensa Nacional-Casa da Moeda, 2006. RTIEBT-
Regras Técnicas das Instalações Eléctricas de Baixa Tensão, 1^a Edição Anotada, Certiel / DGGE, 2006 Instalações
Eléctricas de Baixa Tensão - Projecto, Execução e Exploração: Origem e Interpretação das RTIEBT e Principais
Diferenças Face ao 740/74, DGEG /, Constantino Vital Sopa Soares; Certiel, 2006. Guia Técnico das Instalações
Eléctricas, J. Lima Morais, J. M. Gomes Pereira (Ed. Certiel, 2006) 6/1

Instalações Eléctricas de Baixa Tensão - Projecto, Execução e Exploração, Constantino Soares, DGEG - CERTIEL,

2006; Electrical Installation Guide 2010, Schneider Electric, 2010; 6. VILELA PINTO, L.M. ColectivPro : técnica e certificação das instalações eléctricas . Lisboa : Schneider Electric Portugal , 2007. 7. VILELA PINTO, L.M. ç HabitatPro : técnica e certificação das instalações eléctricas . Lisboa : Schneider Electric Portugal , 2006

Learning and Teaching Methods

Os conteúdos programáticos estão interligados com os objectivos da UC, através de exemplos analisados nas aulas teórico-práticas. Com a visualização de esquemas e montagens, os alunos terão a percepção da forma de interpretar uma montagem para procederem à sua execução. Os trabalhos práticos realizados nas aulas práticas, são fundamentais para que os alunos ganhem sensibilidade para a utilização do material bem como para o seu pleno funcionamento. Existe pelo menos um trabalho prático por cada conteúdo.

Assessment Methods

he learning is done through practical work. The practical experience of certification of materials based on the scheme to be carried out is the method used to make a direct acquisition of the programmatic contents. Through the visualization in context "work", it will also be possible to acquire knowledge inherent to electrical installations. Observation of facilities (well and poorly executed) recognize your positive and negative comments. Execution of electrical installations in order to comply with the RTIEBT, with a view to certification. Elaboration of written work (report) of the colleague's installation