

<b>Program</b>	<b>09TT- Engineering in Telecommunication Technologies and Services</b>
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<b>Course number and name</b>	
<b>Number</b>	950000880
<b>Name</b>	Electrical Installations Instalaciones eléctricas
<b>Semester</b>	Y3-S5

<b>Credits and contact hours</b>	
<b>ECTS Credits</b>	4.5
<b>Contact hours</b>	45

<b>Coordinator's name</b>	Benito Artaloytia Encinas
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<b>Specific course information</b>	
<b>Description of course content</b>	
<p>A recent sentence of the Spanish Supreme Court of December 21, 2010 recognizes that one of the professional competences assigned to Telecommunications Engineers is "to write and sign projects of low voltage electrical installations". This course: fills up the gap in the current degree program taught in ETSIT-UPM providing the necessary skills to understand and design low voltage electrical installations; is completely project focused: more than half of the time, students are working on practical exercises, calculations and performing computer simulation analysis and design as they will do in their professional life; and is focuses on low voltage electrical installations from the distribution transformer to the final consumers, including protection and circuit breaker devices and a complete description of the current Spanish Regulations covering Spanish electrics.</p>	
<b>List of topics to be covered</b>	
<p>1. Motivation of this course. 2. Power System. 3. Low Voltage (LV) regulatory framework. 4. Symbols, electrical schematics and electrical panels. 5. Introduction to three-phase system. 6. LV distribution installations. 7. Conductors in LV. 8. Short-circuit calculations. 9. Electric wires size calculations in LV. Thermal and voltage drop criteria. 10. Protections. 11. Calculation of link installations. 12. Calculation of Interior facilities. 13. Grounding. 14. Projects of electrical installations in homes and buildings. 15. Design of electric installations in commercial and industry buildings. 16. Verification of electrical installations in LV. 17. Equipment for measurement and control systems.</p>	
<b>Prerequisites or co-requisites</b>	
Not applicable	
<b>Course category in the program</b>	
<input type="checkbox"/> R (required)	<input checked="" type="checkbox"/> E (elective)
<input type="checkbox"/> SE (selective elective)	

**Specific goals for the course**

**Specific outcomes of instruction**

- RA001.- Knowledge of the different parts of a consumer type substation and the electrical installations in buildings. Knowledge of the essential criteria for its design and calculation, including the corresponding protections and other switchgears.
- RA002.- Knowledge of current legislation and rules to be applied in specific electrical installations in domestic, commercial and industrial buildings.
- RA003.- Ability to design the grounding system of simple installation buildings for domestic applications.
- RA004.- Training to perform the necessary calculations leading to the creation of simple technical projects of LV electrical installations.
- RA005.- Awareness about the importance of the design of electrical installations under the safety criteria, emphasizing the importance of the protective devices and determining what are the most appropriate for each part of the installation.

**Student outcomes addressed by the course**

CG02, CG03, CG04, CG05, CG07, CG08, CG09, CG10, CG12, CG13

**Bibliography and supplemental materials**

- Instalaciones eléctricas en baja tensión: diseño, cálculo, dirección, seguridad y montaje. [Colmenar Santos, Antonio](#) / [Hernandez Martin, Juan Luís](#). 2008. Editorial RA-MA.
- Manual de Instalaciones Eléctricas. Diego Carmona Fernández (Universidad de Extremadura) . Editorial Abecedario. 2005.
- CÁLCULO DE INSTALACIONES Y SISTEMAS ELÉCTRICOS. PROYECTOS A TRAVÉS DE SUPUESTOS PRÁCTICOS. Volumen I y II. Diego Carmona Fernández (Universidad de Extremadura). Editorial Abecedario. (2003).
- Instalaciones Eléctricas. A.J. Conejo, L.M. Arroyo, F. Milano y otros. Editorial McGraw-Hill. 2007.
- Manual teórico-práctico Schneider de Instalaciones de Baja Tensión (5 tomos) en [www.schneiderelectric.es](http://www.schneiderelectric.es)
- Instalaciones Eléctricas en Baja Tensión en Edificios de Viviendas. Cálculos Eléctricos y Esquemas Unifilares. Ángel Lagunas Marqués. Editorial Thonson-Paraninfo. Sexta Edición. 2004.
- Instalaciones Eléctricas en Baja Tensión en Comerciales e Industriales. Ángel Lagunas Marqués. Editorial Thonson-Paraninfo. Sexta Edición. 2006.
- Reglamento Eletrotecnico de Baja Tensión. Teoría y Cuestiones Resueltas. Ángel Lagunas Marqués. Editorial Thonson-Paraninfo. 2004.
- Líneas e Instalaciones Eléctricas. Jesús Fraile Mora, Nieves Herrero, J. A. Sánchez, J.R. Wilhelmi .ETSI Caminos, Canales y Puertos, UPM. 2004

**Teaching methodology**

<input checked="" type="checkbox"/> lectures	<input checked="" type="checkbox"/> problem solving sessions	<input checked="" type="checkbox"/> collaborative actions	<input checked="" type="checkbox"/> laboratory sessions
<b>Other:</b>			