



Teaching Guide

| Identifying Data | | | | | 2016/17 |
|--------------------------|--|--------|-----------------------|---------|---------|
| Subject (*) | Calidade do Servizo Eléctrico | Code | 770523014 | | |
| Study programme | Mestrado Universitario en Eficiencia e Aproveitamento Enerxético | | | | |
| Descriptors | | | | | |
| Cycle | Period | Year | Type | Credits | |
| Official Master's Degree | 2nd four-month period | First | Optativa | 3 | |
| Language | Spanish | | | | |
| Teaching method | Face-to-face | | | | |
| Prerequisites | | | | | |
| Department | Enxeñaría Industrial | | | | |
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| Lecturers | Menacho Garcia, Carlos Miguel | E-mail | miguel.menacho@udc.es | | |
| Web | https://moodle.udc.es/ | | | | |
| General description | In this subject studies the quality of the electrical service from the point of view of the legislation and rule at present valid. | | | | |

Study programme competences

| Code | Study programme competences |
|------|---|
| A1 | Análise e aplicación de metodoloxías e normativa para unha xestión eficiente da enerxía. |
| B9 | Extraer, interpretar y procesar información, procedente de diferentes fuentes, para su empleo en el estudio y análisis. |
| B13 | Aplicar los conocimientos teóricos a la práctica |
| B15 | Conocer la legislación vigente y reglamentación aplicable al sector de las energías renovables y de la eficiencia energética. |
| C1 | Adquirir la terminología y nomenclatura científico-técnica para exponer argumentos y fundamentar conclusiones. |

Learning outcomes

| Learning outcomes | Study programme competences | | |
|--|-----------------------------|-------------|-----|
| Know the legislation and the at present valid rule on quality of the electrical service. | AJ1 | BC9 BC15 | |
| Know the main types of perturbations and events that affect to the quality of the electrical service, as well as his causes, effects and measures of correction. | | BC13 | CC1 |
| Know the main characteristic of an analyser of power to select the most suitable. | | BC9 | |

Contents

| Topic | Sub-topic |
|--------------------------|--|
| Introduction | Presentation of the subject Previous knowledges |
| Continuity of the supply | Definition Types of interruptions TIEPI NIEPI |



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|--|--|
| Quality of the product | Frequency Overvoltages/Undervoltages Flicker Voltage unbalance Harmonic distortion Interharmonics Noise Interruptions Sags (dips)/Swells Transients |
| Quality of the attention to the consumer | Definition Indexes of individual quality |

| Planning | | | | |
|--------------------------------|---------------|----------------------|-------------------------------|-------------|
| Methodologies / tests | Competencies | Ordinary class hours | Student's personal work hours | Total hours |
| Introductory activities | A1 | 1 | 1 | 2 |
| Guest lecture / keynote speech | A1 B15 C1 | 9 | 9 | 18 |
| Problem solving | B13 | 8 | 8 | 16 |
| Laboratory practice | B13 | 3 | 3 | 6 |
| Supervised projects | B9 C1 | 3 | 15 | 18 |
| Objective test | A1 B15 B13 C1 | 2 | 12 | 14 |
| Personalized attention | | 1 | 0 | 1 |

(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

| Methodologies | |
|--------------------------------|--|
| Methodologies | Description |
| Introductory activities | Presentation of the subject, in big group (GG). |
| Guest lecture / keynote speech | <p>Oral exhibition complemented with the use of audiovisual means and the introduction of motivating questions headed to the students, with the purpose to transmit knowledges and facilitate the learning.</p> <p>It corresponds to the class of theory, in big group (GG).</p> |
| Problem solving | <p>Technician by means of which has to resolve a concrete problematic situation, from the knowledges and procedures that have studied and worked.</p> <p>It corresponds to the class of problems, in average group (GM).</p> |
| Laboratory practice | <p>Methodology that allows that the students apply the knowledges purchased, through the realisation of activities of practical character.</p> <p>It corresponds to the practices of workshop, in small group (GP).</p> |



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|---------------------|---|
| Supervised projects | <p>Methodology designed to promote the autonomous learning of the students, under the tutela of the professor and in a professional stage. It is referred prioritariamente to the learning of the "cómo do the things". It constitutes an option based in the assumption by the students of the responsibility by his own learning.</p> <p>This system of education bases in two basic elements: the independent learning of the students and the follow-up of this learning by the professor.</p> <p>With this methodology pretends that the student can know the characteristics of the analysers of power to be able to select the most adapted of between the commercial offer that offers the market.</p> <p>It is a complementary activity of the practices of workshop, in small group (GP).</p> |
| Objective test | <p>Proof written used for the evaluation of the learning.</p> <p>With the end to value with greater rigour the achievement of the aims, the proof consists of two parts differentiated: questions of multiple answer (items) and resolution of problems.</p> <p>Questions of multiple answer (items): it constitutes an instrument of measure, whose distinctive shot is that it allows to describe the answers given like correct or no; in addition to valuing the knowledges purchased.</p> <p>Resolution of problems: part in which it pretends evaluate conceptual contents, procedimentales and actitudinales.</p> <p>It corresponds to the examination of theory and problems.</p> |

Personalized attention

| Methodologies | Description |
|----------------|--------------------------------------|
| Objective test | Tutorials of review of examinations. |

Assessment

| Methodologies | Competencies | Description | Qualification |
|---------------------|---------------|---|---------------|
| Laboratory practice | B13 | The qualification will be the sum of the corresponding note to the assistance and evaluation of the practices of workshop, that will value between 0 and 5 points, and the note of a final examination (proof of multiple answer), that will value also between 0 and 5 points. | 25 |
| Supervised projects | B9 C1 | The qualification will correspond to the evaluation of the extension and quality of the work presented, that will value between 0 and 10 points. | 25 |
| Objective test | A1 B15 B13 C1 | This proof consists in the resolution of problems and/or items, and will compute between 0 and 10 points. | 50 |

Assessment comments

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| Rating of subject = [objective Proof (theory and problems) * 0'50] [Practices of laboratory * 0'25] [Mentored work * 0'25]. To surpass the matter is necessary to obtain, at least, five points in the note of the matter. |
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Sources of information



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|----------------------|---|
| Basic | - () . Real Decreto 1955/2000, de 1 de diciembre, por el que se regulan las actividades de transporte, distribución, comercialización, suministro y procedimientos de autorización de instalaciones de energía eléctrica. (BOE nº 310, de 27 de diciembre de 2000). Orden ECO/797/2002, de 22 de marzo, por la que se aprueba el procedimiento de medida y control de la continuidad del suministro eléctrico. (BOE nº 89, de 13 de abril de 2002). Norma UNE-EN 50160: 2011, Características de la tensión suministrada por las redes generales de distribución. Norma UNE-EN 61000-4-30: 2015, Compatibilidad Electromagnética (CEM). Parte 4-30: Técnicas de ensayo y de medida. Métodos de medida de la calidad del suministro. |
| Complementary | |

Recommendations

Subjects that it is recommended to have taken before

Eficiencia nos Sistemas Eléctricos/770523013

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.