



| Teaching Guide | | | | |
|---------------------|---|--------|--|---------|
| Identifying Data | | | | 2020/21 |
| Subject (*) | FUNDAMENTOS DA ELECTRICIDADE | Code | 730G04012 | |
| Study programme | Grao en enxeñaría en Tecnoloxías Industriais | | | |
| Descriptors | | | | |
| Cycle | Period | Year | Type | Credits |
| Graduate | 1st four-month period | Second | Obligatory | 6 |
| Language | SpanishGalician | | | |
| Teaching method | Hybrid | | | |
| Prerequisites | | | | |
| Department | Enxeñaría Industrial | | | |
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| Lecturers | Menacho Garcia, Carlos Miguel Santome Couto, Emilio | E-mail | miguel.menacho@udc.es emilio.santome@udc.es | |
| Web | moodle.udc.es | | | |
| General description | In this course, the analysis of electrical circuits and a brief introduction to the operation of electric machines is studied. | | | |
| Contingency plan | <p>1. Changes in content</p> <p>The contents are not modified.</p> <p>2. Methodologies</p> <p>All teaching methodologies are maintained, modifying only their face-to-face character.</p> <p>3. Mechanisms for personalized attention to students</p> <p>Tools: Moodle, Teams, email. With the tutoring schedule published.</p> <p>4. Modifications in the evaluation</p> <p>The evaluation methodologies and their weighting are maintained, except for their face-to-face character.</p> <p>5. Modifications of the bibliography or webgraphy.</p> <p>There are no modifications.</p> | | | |

| Study programme competences | |
|-----------------------------|--|
| Code | Study programme competences |
| A10 | CR4 Coñecemento e utilización dos principios de teoría de circuitos e máquinas eléctricas. |
| B2 | CB2 Que os estudantes saiban aplicar os seus coñecementos ao seu traballo ou vocación dunha forma profesional e posúan as competencias que adoitan demostrarse por medio da elaboración e defensa de argumentos e a resolución de problemas dentro da súa área de estudo |
| B3 | CB3 Que os estudantes teñan a capacidade de reunir e interpretar datos relevantes (normalmente dentro da súa área de estudo) para emitiren xuízos que inclúan unha reflexión sobre temas relevantes de índole social, científica ou ética |
| B5 | CB5 Que os estudantes desenvolvan aquelas habilidades de aprendizaxe necesarias para emprenderen estudos posteriores cun alto grao de autonomía |
| B7 | B5 Ser capaz de realizar unha análise crítica, avaliación e síntese de ideas novas e complexas |
| C1 | C3 Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida. |
| C5 | C7 Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida. |



| Learning outcomes | | | |
|--|-----------------------------|----------------------|----------|
| Learning outcomes | Study programme competences | | |
| Know and use the principles of circuit theory and electrical machines. | A10 | B2 B3 B5 B7 | C1 C5 |

| Contents | |
|--|---|
| Topic | Sub-topic |
| Analysis, of DC circuits | Basics Circuit elements Association of elements Waveforms Mesh analysis Nodal analysis Circuit Theorems Transient regime |
| Analysis of AC circuits | Basics Analysis of circuits in sinusoidal steady state Power and energy steady state sinusoidal Theorems steady state sinusoidal Transient regime |
| Analysis three-phase circuits | Overview Balanced and unbalanced three-phase circuits Power in three-phase circuits Measurement of power in three-phase circuits |
| Introduction to the operation of electric machines | Magnetic circuits and energy conversion General principles of electrical machines |

| Planning | | | | |
|---------------------------------|--------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests | Competencies | Ordinary class hours | Student?s personal work hours | Total hours |
| Introductory activities | A10 | 1.5 | 0 | 1.5 |
| Guest lecture / keynote speech | A10 B2 B3 B5 B7 C1 C5 | 24 | 39 | 63 |
| Problem solving | A10 B2 B3 B5 B7 C1 C5 | 22 | 30 | 52 |
| Laboratory practice | A10 B2 B3 B5 B7 C1 C5 | 9 | 13.5 | 22.5 |
| Mixed objective/subjective test | A10 | 2.5 | 7.5 | 10 |
| 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 large group (GG). |



| | |
|---------------------------------|--|
| Guest lecture / keynote speech | <p>Oral presentation complemented the use of media and the introduction of questions aimed at motivating students, in order to impart knowledge and facilitate learning.</p> <p>Corresponds to the kind of theory, large group (GG).</p> |
| Problem solving | <p>Technique by to be solved a particular problem situation, from the knowledge and procedures that have been studied and worked.</p> <p>Corresponds to the class of problems, medium (GM) group.</p> |
| Laboratory practice | <p>Methodology that allows students to apply the knowledge acquired through the completion of practical activities.</p> <p>It is for the workshop exercises, small group (GP).</p> |
| Mixed objective/subjective test | <p>This test consists of the resolution of problems and / or elements, and will be valued among 0 and 10 points.</p> |

Personalized attention

| Methodologies | Description |
|---------------------------------|--|
| Mixed objective/subjective test | <p>Tutorials review.</p> <p>In the case of part-time students, they will have exam sessions before each continuous assessment exam. In addition, they will be given a collection of objective tests and problems to solve throughout the course.</p> |

Assessment

| Methodologies | Competencies | Description | Qualification |
|---------------------------------|-----------------------|---|---------------|
| Mixed objective/subjective test | A10 | <p>This test consists of the resolution of problems and /or ítems, and will be valued among 10 points.</p> <p>In laboratory practices:</p> <p>In the January exam, the grade will be the sum of the grade corresponding to the attendance and evaluation of the workshop practices, which will be assessed between 0 and 5 points, and the final exam grade (mixed test), which will also be assessed between 0 and 5 points. .</p> <p>In the July session, the grade will coincide with the corresponding final exam (mixed test), which will be assessed between 0 and 10 points.</p> | 70 |
| Laboratory practice | A10 B2 B3 B5 B7 C1 C5 | <p>In the January announcement, the grade will be the sum of the amount of the assistance and assessment practices workshop note, which is valued between 0 and 5 points, and the note of a final exam (multiple choice test), which was also assessed from 0 to 5 points.</p> <p>In the July, qualifying match corresponding note final exam (multiple choice test), which is valued between 0 and 10 points.</p> | 30 |

Assessment comments



To pass the subject it is necessary to approve the part of theory and problems and the part of laboratory practices. The subject will also be approved if it reaches a mark of more than or equal to 3'5 points in the note of laboratory practices, compensate with the part of theory and problems. The final grade is the sum of the (theory and problems note) * 0'80 and the (laboratory practice note) * 0'20. In the presentation of the subject (first day of class) may indicate additional activities whose assessment will add to the note of the objective test of the part of theory and problems. In any case, the note of this part can not be more than 10 points.

In the case of part-time students, a periodic and continuous evaluation will be made, with objective tests and problems, after imparting each topic of the subject. At the second opportunity, all subjects will enter the exam. Attendance at theory and problem classes is not mandatory (100% waiver), although you will be offered full flexibility to assist the group of your choice; however, attendance at the workshop practice class is necessarily mandatory (0% waiver), although you will also be offered full assistance flexibility.

Sources of information

| | |
|----------------------|--|
| Basic | <ul style="list-style-type: none"> - Paul, C.R. (2001). Fundamentals of electric circuits analysis. USA: John Willey and Sons - Alexander, C.K. y Sadiku, M.N.O. (2013). Fundamentos de circuitos eléctricos. Méjico: McGraw-Hill - Sánchez Barrios, P. et al. (2007). Teoría de circuitos: problemas y pruebas objetivas orientadas al aprendizaje.. Madrid: Pearson/Prentice Hall - Humet, L., Alabern, X. y García, A. (1997). Tests de Electrotecnia. Fundamentos de circuitos. Barcelona: Marcombo - Eguiluz Morán, L.I. et al. (2001). Pruebas objetivas de circuitos eléctricos. Barañáin (Navarra): EUNSA - Eguiluz Morán, L.I. y Sánchez Barrios, P. (1989). Pruebas de examen de teoría de circuitos. Santander: Universidad de Cantabria - Parra, V. et al. (1976). Unidades didácticas de teoría de circuitos (2 vols.). Madrid: UNED - Fraile Mora, J. (2008). Máquinas eléctricas. Madrid: McGraw-Hill - Eguiluz Morán, L.I. (1986). Pruebas objetivas de ingeniería eléctrica. Madrid: Alhambra - Fraile Mora, J. (2012). Circuitos eléctricos. Madrid: Pearson |
| Complementary | |

Recommendations

Subjects that it is recommended to have taken before

Calculus /730G03001
 Linear Algebra/730G03006
 Physics II/730G03009

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Fundamentals of Electronic Circuits/730G03016
 Installations for Industrial Plants/730G03031

Other comments

