1. BASIC INFORMATION

Course	***Circuits theory***
Degree program	Bachelor's Degree in Industrial Systems Engineering
School	School of Architecture, Engineering, Science and Computing
Year	2
ECTS	6
Credit type	Mandatory
Language(s)	English
Delivery mode	Face to face
Semester	S1
Academic year	25-26
Coordinating professor	María José Terrón

2. PRESENTATION

In this course, the basics of circuit theory are acquired. You will learn to analyze electrical circuits (calculation of voltage, current and power in its entirety) in both DC and AC. Also, there will be a brief introduction to electrical machines and in particular the single-phase transformer.

It seeks to answer such fundamentals questions for the graduate as the acquired knowledge tailored to the needs of today's society demands and train them with the precise skills for a convenient and competitive practice. So, you will be able to work as a competent engineer and be able to choose the adequate component and make electrical projects.

3. LEARNING OUTCOMES

Skills

SK3: Knowledge and Use of the Principles of Theory of Electrical Circuits and Machines

- Apply the basics of circuit theory
- Analyze the operation of direct current circuits
- Analyze the operation of alternating current circuits

Competences

CP14: Integrate analysis with critical thinking in a process of evaluating different ideas or professional possibilities and their potential for error, based on evidence and objective data that lead to effective and valid decision-making.

4. CONTENT

- Fundamental concepts and magnitudes of the electrical circuit
- Circuit analysis methods
- DC systems
- AC systems

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master class
- Problem based learning
- Workshop-based learning
- Simulation environments

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
Master classes	10
Practical seminars	20
Problem solving	34
Written reports and essays	6
Workshop and/or laboratories activities	10
Autonomous study	60
Debates and panel discussions	5
Face-to-face assessment test	5
TOTAL	**150**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight min. %	Weight max.%
Face-to-face assessment test	50	60
Written reports and essays	10	20
Case/problem	20	30
Performance evaluation	5	5

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Campus-based mode:

Assessable activities	Deadline
Activity 1: *Applicative activities, solving exercises and problems*.	Weeks 1-16
Activity 2: Laboratory practice or implementation projects.	Students will have thee dates in the calendar of the virtual campus
Activity 3: Intermediate Written tests.	Weeks 6, 9,12
Activity 4: Searching information Work and Project	Weeks 12-17
Activity 5: *Final exam*	Weeks 17-18

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAPHY

The main reference work for this subject is:

- Nilsson, J. W., & Riedel, S. (2010). *Electric circuits*. Prentice Hall Press.

The recommended Bibliography is:

- Fundamentals of electric circuits / Charles K. Alexander, Matthew N.O. Sadiku, Alexander, Charles K., Boston: McGraw-Hill, cop. 2007
- Schaum's outline of theory and problems of electric circuits / Mahmood Nahvi, Joseph A. Edminister, New York: McGraw-Hill, c2003.
- Problemas resueltos de circuitos eléctricos [Libro electrónico] / Victoriano López Rodríguez; Madrid: Universidad Nacional de Educación a Distancia, 2012.
- Fundamentos teóricos para analizar circuitos [Libro electrónico] / Susana Fernández de Ávila, Rafael Hidalgo García
- Introducción al análisis de circuitos, Robert L. Boylestad; Pearson Educación, 2011 (disponible en libro electrónico)
- Circuitos eléctricos (E-book); James W. Nilsson; Pearson Educación, 2009
- Principios de Circuitos Eléctricos (E-book); Thomas L. Floyd; Pearson Educación, 2007

- J. R. COGDELL, Fundamentos de circuitos eléctricos, Ed. Prentice Hall
- JESÚS FRAILE MORA, máquinas eléctricas, Colegio de Ingenieros de Caminos. Madrid 1992. ISBN: 84-7493-143-6.
- M. CORTES CHERTA, curso moderno de máquinas eléctricas rotativas, Editores técnica asociados, Tomo ll, V y lV, Barcelona 1989.
- JOHN J. GRAINGER, WILLIAM D. STEVENSON JR., análisis de sistema de potencia, Mc Grawhill.
- Teaching notes in the virtual campus.

10. EDUCATIONAL GUIDANCE, DIVERSITY AND INCLUSION UNIT

From the Educational Guidance, Diversity and Inclusion Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:

orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.