



Universitat de Lleida

DEGREE CURRICULUM
**ELECTRICAL ENGINEERING
BASICS**

Coordination: PALACIN ROCA, JORGE

Academic year 2023-24

Subject's general information

Subject name	ELECTRICAL ENGINEERING BASICS			
Code	102116			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Automation and Industrial Electronic Engineering	2	COMPULSORY	Attendance-based
	Bachelor's Degree in Energy and Sustainability Engineering	2	COMPULSORY	Attendance-based
	Bachelor's Degree in Mechanical Engineering	2	COMPULSORY	Attendance-based
	Common branch in industrial engineering programs - Lleida	2	COMPULSORY	Attendance-based
	Double bachelor's degree: Degree in Mechanical Engineering and Degree in Energy and Sustainability Engineering	2	COMPULSORY	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRALAB	PRAULA	TEORIA
	Number of credits	0.4	2.6	3
	Number of groups	10	5	2
Coordination	PALACIN ROCA, JORGE			
Department	INDUSTRIAL AND BUILDING ENGINEERING			
Teaching load distribution between lectures and independent student work	6 ECTS = 60h of lectures + 90h of autonomous work			
Important information on data processing	Consult this link for more information.			
Language	Catalan			

ELECTRICAL ENGINEERING BASICS 2023-24

Distribution of credits

Lectures: 3 Credits

Laboratory work: 3 Credits at the laboratory -1.01 of the EPS (also known as laboratory L5)

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BITRIÀ RIBES, RICARD	ricard.bitria@udl.cat	3,2	
CLOTET BELLMUNT, EDUARD	eduard.clotet@udl.cat	4,2	
PALACIN ROCA, JORGE	jordi.palacin@udl.cat	15,6	Tuesday, from 12 to 13 and from 16 to 17 At the laboratory 2.04 of the EPS

Subject's extra information

The subject combines theoretical concepts and practical experimental learning:

- The practical work will be developed individually at the laboratory -1.01.
- The subject has lecture notes.
- The laboratory work is based on a practical notebook.
- The notifications and events related to the subject will be made through messages from the virtual campus.

Learning objectives

Recognize the fundamental elements that are part of an electrical circuit.

Contrast the mathematical models of each element, as well as its physical behavior as a real element.

Select how to analyze any linear electrical circuit, using the most appropriate analysis method.

Develop the necessary skills to analyze and solve problems in the field of Electrical Engineering.

Develop the necessary skills to interpret relevant data in the field of Electrical Engineering.

Outline the basic principles of electromagnetism and its application in a transformer.

Competences

EPS1. Capacity to solve problems and prepare and defense arguments inside the area of studies.

EPS7. Capacity to work in situations with a lack of information and/or under pressure.

GEEIA10. Knowledge and use of the principles of circuit theory and electrical machines.

Subject contents

Untranslated:

Tema 1. Conceptos eléctricos básicos

Tema 2. Sistemas de Corriente Continua

Tema 3. Equivalents Thévenin y Norton

Tema 5. Métodos de resolución de circuitos

Tema 6. Potencia eléctrica en Corriente Continua

Tema 7. Efecto del Voltaje de alimentación

Tema 8. La Bobina y el Condensador

Tema 10. Sistemas de Corriente Alterna

Tema 11. Potencia en corriente alterna

Tema 12. Compensación de potencia reactiva

Tema 13. Circuitos de trifásica

Tema 18.1. El transformador

Methodology

Lectures.

Laboratory sessions at the laboratory -1.01 of the EPS (also known as L5).

Development plan

Weekly work organized in theory sessions combined with individual laboratory work (untranslated):

Fonaments d'Enginyeria Elèctrica (FEE) 2023-2024		
Dia	Activitat	Tasca
13/09	Pràctiques	No n'hi ha
18/09	Teoria	Presentació de l'assignatura (10-15 min) Tema 1: Conceptes Elèctrics Bàsics (repàs de conceptes)
20/09	Pràctiques	No n'hi ha
25/09	Teoria	Tema 2: Sistemes de Corrent Continu
27/09	Pràctiques	Inici de les sessions de pràctiques per grups PRA 2: Sistemes de Corrent Continu
02/10	Teoria	Tema 3: Equivalents Thévenin i Norton
04/10	Pràctiques	PRA 3: Thévenin i Norton
09/10	Teoria	Tema 3: Equivalents Thévenin i Norton (2a part)
11/10	Pràctiques	PRA 3: Thévenin i Norton (2a part)
16/10	Teoria	Tema 5: Mètodes de Resolució
18/10	Pràctiques	PRA 5: Mètodes de Resolució

23/10	Teoria	Tema 6: Potència Elèctrica DC Tema 7: Voltatge d'Alimentació (veure vídeo d'utilització de l'Scope a RECURSOS)
25/10	Pràctiques	PRA 6: Potència Elèctrica DC PRA 7: Voltatge d'Alimentació
30/10	Teoria	Tema 8: Bobina i Condensador
01/11	Pràctiques	Festiu – No hi ha pràctiques
EXAMEN PARCIAL 1 (12.00-14.00) 2 h		
13/11	Teoria	Tema 10: Corrent Altern
15/11	Pràctiques	Revisió de l'Examen Parcial 1 PRA 10: Corrent Altern
20/11	Teoria	Tema 11: Potència en Corrent Altern
22/11	Pràctiques	PRA 11 i 12: Potència en Corrent Altern
27/11	Teoria	Tema 12: Compensació de Reactiva
29/11	Pràctiques	PRA 11 i 12: Potència en Corrent Altern
04/12	Teoria	Tema 13: Circuits Trifàsics (1)
06/12 FESTIU	Pràctiques	FESTIU
11/12	Teoria	Tema 13: Circuits trifàsics (2)
13/12	Pràctiques	PRA 13: Circuits trifàsics
18/12	Teoria	Tema 18.1: El transformador
20/12	Pràctiques	PRA 18.1: El transformador
EXAMEN PARCIAL 2 (9.00-11.00) 2h		
XX/01	12:00 14:00	Revisió de l'Examen Parcial 2 Aula -1.01 EPS
XX/01	17:00 18:00	Revisió de l'Examen Parcial 2 Aula -1.01 EPS
EXAMEN DE RECUPERACIÓ del PARCIAL 1 i del PARCIAL 2 (12.00-14.00) 2h		
XX/02	12:00 14:00	Revisió de l'examen de recuperació Aula per determinar
XX/02	17:00 18:00	Revisió de l'examen de recuperació Aula per determinar

Evaluation

The course is developed in the form of continuous assessment and the evaluation has three blocks: two midterm exams and laboratory work:

P1: Written exam of the subject taught in the first part of the subject (First Midterm), with a maximum duration of two hours and a weight of 4.0 points in the final grade.

P2: Written exam of the subject taught in the second part of the course (Second Midterm), with a maximum duration of two hours and a weight of 5.0 points in the final grade.

PRA: Average grade of the laboratory work carried out during the course, with a weight of 1.0 points in the final

grade.

- In the laboratory sessions of the course a practice notebook will be used, which will be available in pdf format in the virtual campus of the course and in printed format in the copy shop.
- Each week there will be a practical session in the laboratory.
- Each student must attend the group assigned to him/her (the assignments will be available in the virtual campus of the course).
- In order to be able to carry out the laboratory work, the student must bring the printed practice notebook. Failure to bring it printed implies a grade of 0.0 points in the practical session.
- In each practical session the practical notebook must be manually filled in with the measurements and calculations made.
- The work done in each laboratory session will be evaluated at the end of the session with a grade between 0.0 and 1.0 (the effort made will be valued more than the amount of work done).
- The practice notebook used during the course must be handed in bound on the day of the Second Midterm exam to the teachers of the course. Failure to submit it will result in an average grade of 0.0.
- Repeating students can choose to do the laboratory work or to present a written work in which they develop an invented problem of each topic of the course. The alternative work must be handed in bound on the day of the Second Midterm exam (at the latest) and will be evaluated with a grade between 0.0 and 1.0 (if the work includes all the topics of the course and the problems are worked, the grade will be 1.0).

The grade for the course will be directly = $P1 + P2 + PRA$

None of the three blocks require a minimum grade to pass the course.

In case the grade of the subject is lower than 5.0 or to improve the grade of the subject, there is a recovery exam that will consist of two independent statements equivalent to the two midterm exams taken during the course:

RECP1: Written exam of the subject taught in the first part of the course (First Midterm) and a weight of 4.0 points.

RECP2: Written exam of the subject taught in the second part of the course (Second Midterm) and a weight of 5.0 points.

The final grade of the course will be = $\max(P1, RECP1) + \max(P2, RECP2) + PRA$

For the special cases of students who have to take an alternative evaluation (must be requested with justification at the secretary's office at the beginning of each course):

E: Written exam of the whole subject, taken on the same day as the exam of the Second Midterm and with a weight of 10.0 points.

In case the grade of the exam is lower than 5.0, there is a recovery exam taken on the same day as the recovery exam of the subject:

R: Written exam of the whole subject, taken on the same day as the recovery exam and weighing 10.0 points.

The final grade of the subject in case of alternative evaluation will be = $\max(E, R)$

Bibliography

Basic Bibliography

- Lecture notes of the subject

- Practical notebook of the subject

Additional Bibliography

- Circuitos Eléctricos. James W. Nilsson, Susan A. Riedel. Pearson, Prentice Hall
- Máquinas Eléctricas. Stephen J. Chapman. Mc Graw Hill
- Circuitos Eléctricos. Problemas y ejercicios resueltos. Julio Usaola. Prentice Hall.
- Análisis de Circuitos en Ingeniería. William H.Hayt, Jack E. Kemmerly y Steven M.-Durbin. Prentice Hall
- Electrotecnia. Pablo Alcalde. Thomson Paraninfo.
- Máquinas Eléctricas- Jesús Fraile Mora. Mc Graw Hill.