

Course guide

220023 - CEL - Electronic Circuits

Last modified: 02/04/2024

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering.

Degree: BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: David González Díez,

Others: Antonio Miguel López Martínez
Suñe Socias, Víctor Manuel
Juan Antonio Gallardo

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CE17-GRETA. GrETA/GrEVA - An adequate understanding of the following, as applied to engineering: fundamental elements of the various types of aircraft; functional elements of air navigation systems and related electrical and electronic installations; the basics of the design and construction of airports and their various elements

CE13-GRETA. GrETA/GrEVA - An understanding of the uniqueness of airports in terms of infrastructure, structures and operation

CE17-GREVA. (ENG) Coneixement adequat i aplicat a l'enginyeria de: els elements fonamentals dels diversos tipus d'aeronaus; els elements funcionals del sistema de navegació aèria i les instal·lacions elèctriques i electròniques associades; els fonaments del disseny i construcció d'aeroports i els seus diversos elements.

TEACHING METHODOLOGY

The teaching methodology combines three activities:

- Theoretical lessons
- Laboratory practices
- Development of a project.

LEARNING OBJECTIVES OF THE SUBJECT

Introduce the basic electronic components, and lay down the fundamentals of analog and digital systems. This knowledge is necessary in order to face the study of sensors and communication equipment of the airplane in posterior subjects.

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	46,0	30.67
Hours small group	14,0	9.33

Total learning time: 150 h



CONTENTS

MODULE 1: Basic electronic devices

Description:

Full-or-part-time: 17h

Theory classes: 6h

Laboratory classes: 1h

Self study : 10h

MODULE 2: Operational amplifier: linear and non-linear applications.

Description:

Specific objectives:

Related activities:

Full-or-part-time: 27h

Theory classes: 10h

Practical classes: 2h

Self study : 15h

MODULE 3: Digital electronic

Description:

Specific objectives:

Related activities:

Full-or-part-time: 28h

Theory classes: 10h

Laboratory classes: 3h

Self study : 15h

MODULE 4: Introduction to microprocessor

Description:

Specific objectives:

Related activities:

Full-or-part-time: 46h

Theory classes: 12h

Laboratory classes: 4h

Self study : 30h



MODULE 5: Power electronic

Description:

Specific objectives:

Related activities:

Full-or-part-time: 32h

Theory classes: 8h

Laboratory classes: 4h

Self study : 20h

ACTIVITIES

ACTIVITY 1: THEORY AND PROBLEMS

Full-or-part-time: 52h

Theory classes: 42h

Self study: 10h

ACTIVITY 2: LABORATORY

Full-or-part-time: 16h

Laboratory classes: 6h

Self study: 10h

ACTIVITY 3: MIDTERM EXAM

Full-or-part-time: 22h

Theory classes: 2h

Self study: 20h

ACTIVITY 4: PROJECT

Full-or-part-time: 33h

Laboratory classes: 8h

Self study: 25h

ACTIVITY 5: FINAL EXAM

Description:

Specific objectives:

Material:

Delivery:

Full-or-part-time: 27h

Theory classes: 2h

Self study: 25h

GRADING SYSTEM

Laboratory practices: 15%

First exam: 35%

Second exam: 30%

Proposed project: 20%

In order to recover an unsatisfactory mark of the first exam, the following procedure will be used. There will be a voluntary exam of 2 points that will be scheduled with the final exam. The mark obtained in this exam will be added to that obtained in the first exam. This additional exam is open to all students in the subject. The highest mark of the subject is 10.

BIBLIOGRAPHY

Basic:

- Mancini, R.; Carter, B. Op amps for everyone [on line]. 3rd ed. Newnes/Elsevier, 2009 [Consultation: 20/09/2022]. Available on: <https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9781856175050/op-amps-for-everyone>. ISBN 9781856175050.

- Margolis, Michael. Arduino cookbook [on line]. 2nd ed. Beijing, China: O'Reilly, 2011 [Consultation: 10/06/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=827264>. ISBN 1449321186.

- Coughlin, R. F.; Driscoll, F. F. Amplificadores operacionales y circuitos integrados lineales. 3ª ed. México: Prentice Hall, 1999. ISBN 9701702670.

- Floyd, T. L. Fundamentos de sistemas digitales [on line]. 11ª ed. Madrid: Pearson Educación, 2016 [Consultation: 19/09/2022]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6120.

- Wakerly, J. F. Digital design: principles and practices. 4th ed. Upper Saddle River: Prentice Hall, 2006. ISBN 0131863894.

Complementary:

- Rashid, M.H.; Navarro, R.; El Filali, B. Electrónica de potencia [on line]. 4a ed. México: Pearson, 2015 [Consultation: 17/06/2022]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6191. ISBN 9786073233255.

- Franco, S. Diseño con amplificadores operacionales y circuitos integrados analógicos. México: McGraw-Hill, 2005. ISBN 9701045955.

- Brown, S. D.; Vranesic, Z. Fundamentos de lógica digital con diseño VHDL. 2ª ed. México: McGraw-Hill, 2006. ISBN 9701056094.