340035 - SIEK-N9O10 - Electronic Systems

Coordinating unit: 340 - EPSEVG - Vilanova i la Geltrú School of Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering
Academic year: 2019
Degree: BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Jaume Miret
Others: Miguel Castilla
Luís García de Vicuña
Mariano López
Jaume Miret

Opening hours
Timetable: Office hours vary each semester according to professor availability. Check on the EPSEVG web site for more information.

Prior skills
Autonomous learning and taking initiative in problem solvings are necessary skills in this course

Requirements
Students registering in this subject are expected to have the subjects "Equacions Diferencials", "Calcul Avançat" and "Sistemes Elèctrics" from previous semesters passed

Degree competences to which the subject contributes
Specific:
1. CE11. Knowledge of electronical fundamentals.
9. CE32. Ability to analize electrical circuits in all possible regimes.

Teaching methodology
Basic and theoretical concepts of electronics are provided by means of class lectures and by means of examples in the form of exercises. As for the lab, students will consolidate the main technical concepts by prototyping electronic circuits.

Learning objectives of the subject
The aim of this subject is to provide the fundamental knowledge and to show the basics of industrial electronics. It will describe the most important technologies of electronic devices and systems available and it will explain the basic methodologies to analyze electronic systems.
### Study load

| Total learning time: 150h | Hours large group: 45h 30.00% | Hours medium group: 0h 0.00% | Hours small group: 15h 10.00% | Guided activities: 0h 0.00% | Self study: 90h 60.00% |
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**Related activities:**
- Class sessions include examples in the form of exercises
- Lab activities (4 sessions)
- Self study (35 hores)
- Evaluation sessions (80 min)

**Specific objectives:**
Knowing and learning how to apply the basic electrical rules so that the behaviour of electronic circuits can be analized and studied

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<th>Module 2 - Passive systems analysis with RLC</th>
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**Related activities:**
- Class sessions include examples in the form of exercises
- Lab activities (3 sessions)
- Self study (30 hores)
- Evaluation Sessions (70 min)

**Specific objectives:**
Know and use the basic mathematical tools to solve circuits with memory elements
### Module 3 - Circuits with semiconductor elements

**Learning time:** 19h  
Theory classes: 6h  
Guided activities: 1h  
Self study: 12h

**Description:**  
P-N union, circuits with diodes, rectifiers  
Zener diode, regulation and limiting voltage circuits  
LED diode, photo-diode and opto-coupler  
The transistor, amplifiers, commutation circuits and voltage regulators  
The operational amplifier, comparers, active filters  
Introduction to the digital world, microcontrollers

**Related activities:**  
- Class sessions include examples in the form of exercises  
- Self study (24 hours)  
- Evaluation sessions (60 min)

**Specific objectives:**  
Know and analyze circuits with the basic electronic components electronic: diodes, transistors and operational amplifiers

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### Planning of activities

| **LAB - Lab Activities** | **Hours:** 18h  
Self study: 6h  
Guided activities: 12h |
|--------------------------|------------------------------------------------|

| **NP1 - First Midterm Exam** | **Hours:** 56h  
Guided activities: 2h  
Theory classes: 18h  
Self study: 36h |
|-----------------------------|------------------------------------------------|

| **NP2 - 2nd Midterm Exam** | **Hours:** 47h 50m  
Guided activities: 1h 30m  
Theory classes: 14h 20m  
Self study: 32h |
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Qualification system

Knowledge of students about electronics will be evaluated through written exams and lab activities. Theoretical concepts correspond to the 80%-weight of student evaluation. As for the lab, the weight is 20%.

The evaluation of theoretical concepts consists of two individual written exams: one midterm (Nex1 weighed 40%) and a second midterm exam (Nex2 weighed 40%). In examination Nex2 it will be possible to re-evaluate Nex1.

If the final mark of this course is higher or equal to 3, the theoretical exams will be repeated (re-evaluation). In this case, the value of the final mark will be limited to 5.

Bibliography

Basic:


