

67240 - Electromagnetic Compatibility and Electrical Safety

Syllabus Information

Academic Year: 2020/21

Subject: 67240 - Electromagnetic Compatibility and Electrical Safety

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 622 - Master's in Electronic Engineering

ECTS: 6.0

Year: 1

Semester: First semester

Subject Type: Optional

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as

- Lectures, where the theoretical basis of the course will be explained.
- Practice sessions with representative design problems are analysed and solved by the students.
- Laboratory sessions with representative scenarios of EMI/EMC/SE.

Students are expected to participate actively in the class throughout the semester.

4.2.Learning tasks

The course includes the following learning tasks:

- **A01 Lectures (20 hours).** The main contents of the course will be presented and a set of representative problems will be solved. This activity will take place in the classroom. The materials used in the lectures will be available at the beginning of the course.

- **A02 Practice sessions (10 hours).** In this activity, a set of representative problems will be solved. This activity will take place in the classroom.
- **A03 Lab sessions (15 hours).** Lab exercises are structured in 5 sessions of 3 hours each. Description of the tasks will be available to students at the beginning of the course. Usually, one or two visits to specialized laboratories working in EMI/EMC and safety are scheduled during the course.
- **A06 Guided assignment (4 hours).**
- **A08 Evaluation tests (2 hours).**
- **A06 Course work (36 hours).** Students (alone or in pairs) must solve a problem related to the contents of the course. A practical orientation is encouraged.
- **A07 Study (63 hours).** Time for study, exam preparation and tutorials.

4.3.Syllabus

The course will address the following topics:

Section 1. DESIGN FOR EMI/EMC (**80%**).

Fundamentals. EMI generation and coupling. Earth and ground system. EMI/EMC filtering. Design of printed circuit boards (PCBs) for EMI and Signal Integrity. Shielding. Cables. Transients and protection. EMI/EMC special techniques. EMI/EMC problem sets. EMC tests.

Section 2. ELECTRICAL SAFETY (**20%**).

Electronic risks. Regulations. CE mark. Symbols. Isolation and high voltages. Materials. Fire and temperature risks. Creepage and clearance. Critical components. PCBs. Cables. Mechanical considerations. RF risks. Safety tests. Earthing. EMC and SAFETY.

4.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website.

4.5.Bibliography and recommended resources