ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA

DEA-OPT-438 Aerospace Electronics

SEMESTER: Spring

CREDITS: 3 ECTS (2 hrs. per week, theory or lab)

LANGUAGE: English

DEGREES: IEM, ITL, SAPIENS program

Course overview

This course provides an overview of the electronic systems and equipment found in spacecraft developments such as power, data handling, and instrumentation. The course also intends as well to provide an overview on cost impacts derived from design and development activities. A visit to SENER facilities is included, to provide an overview of the development facilities (assembly and testing) but as well to have a working day on a true environment with dedicated engineering support from experts in the area.

Prerequisites

Fundamentals of digital and analog electronics. Research capabilities.

Course contents

Theory:

1. Introduction to Space Market.
2. Introduction to main electrical S/C subsystems and equipments:
   - Power subsystem
   - Data handling subsystem
3. Introduction to electronics equipment development.
4. Design of electronic equipment for space applications:
   - Specifications and requirement management
   - Parts selection
   - Design and dependability analysis
5. Documentation (product outcome) of an electronic equipment.

Laboratory:

Two industry sessions are scheduled (6 hours)

P1. Visit to SENER facilities – Design process review and consolidation (senior experts consultancy)

P2. Visit to SENER facilities – Presentations regarding space market and how to build a space mission

Textbook

- Space Mission Analysis and Design. James R. Wertz & Wiley J. Larson – Third Edition

Grading

- Mid-term exam accounts for 30% of the final grade.
- Individual contribution in class based on individual homework accounts for 10%
- Individual Project report or research paper accounts for 30%
- Team work presentation accounts for 30%