

Course guide

820242 - EAVEIA - Audio and Video Electronics

Last modified: 31/01/2025

Unit in charge: Barcelona East School of Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering.

Degree: BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).

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

LECTURER

Coordinating lecturer: HERMINIO MARTINEZ GARCIA.

Others: HERMINIO MARTINEZ GARCIA y otros a determinar.

PRIOR SKILLS

Please, see Spanish or Catalan version.

REQUIREMENTS

Please, see Spanish or Catalan version.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Summarise information and undertake self-directed learning activities.
2. Design analogue, digital and power systems.
3. Understand the fundamentals and applications of analogue electronics.

Transversal:

4. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
5. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

TEACHING METHODOLOGY

Please, see Spanish or Catalan version.

LEARNING OBJECTIVES OF THE SUBJECT

The subject 'Audio and Video Electronics' (EAV-EIA - 820242), which is presented as an elective for the degree of Bachelor of Engineering in Industrial Electronics and Automation, is the logical continuation of related subjects studied in the aforementioned degree. However, it focuses on practical applications in the field of the Electronics Engineering for audio and video.

the main objective of EAV-EIA is to present students the modern electronic techniques typically used in the areas of video and audio for linear signal processing in low and high power, The course focuses mainly on specific analog integrated circuits, bipolar transistors (BJT), and field-effect transistors (MOSFET).

EAV-EIA also go into detail about different topics of analog techniques that have not been studied in other courses of the degree.

EAV-EIA students have to obtain a technical-scientific basis to not only analyze, but also design, synthesize, simulate and implement physically electronic structures based on these devices for applications in audio and video equipment.

STUDY LOAD

Type	Hours	Percentage
Hours large group	45,0	30.00
Hours small group	15,0	10.00
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

1.- Linear Regulators and Voltage References.

Description:

Please, see the Spanish or Catalan version of the contents in order to see the detailed course syllabus.

Specific objectives:

-

Full-or-part-time: 19h 30m

Theory classes: 6h 30m

Laboratory classes: 3h

Self study : 10h

2.- Transistors as Basic Amplifier Devices in Audio, Video and Communication Electronics.

Full-or-part-time: 18h

Theory classes: 6h

Laboratory classes: 2h

Self study : 10h

3.- Output Stages for Power Amplifiers in Audio, Video and Communication Electronics.

Full-or-part-time: 16h

Theory classes: 4h

Laboratory classes: 2h

Self study : 10h

4.- Monolithic IC Integrated Power Amplifiers.

Full-or-part-time: 9h 30m

Theory classes: 2h 30m

Laboratory classes: 2h

Self study : 5h

5.- Frequency Response of Amplifier Stages for Audio, Video and Communications.

Full-or-part-time: 15h

Theory classes: 3h

Laboratory classes: 2h

Self study : 10h

6.- Power Stages Introduction for Radiofrequency Systems.

Description:

Please, see the Spanish or Catalan version.

Full-or-part-time: 8h

Theory classes: 3h

Self study : 5h

7.- Thermal Considerations in Power Semiconductor Devices.

Full-or-part-time: 13h

Theory classes: 3h

Self study : 10h

8.- Technological Alternatives to the VFOA in Analog Signal Processing for Audio, Video and Communications. Other Linear Integrated Circuits.

Full-or-part-time: 17h

Theory classes: 5h

Laboratory classes: 2h

Self study : 10h

9.- Active Continuous-Time Filtering Structures for Audio, Video and Communications.

Full-or-part-time: 18h

Theory classes: 6h

Laboratory classes: 2h

Self study : 10h

10.- Basics of Television.

Full-or-part-time: 8h

Theory classes: 3h

Self study : 5h



11.- Basics of Cellular Telephony.

Full-or-part-time: 8h

Theory classes: 3h

Self study : 5h

GRADING SYSTEM

Please, see Spanish or Catalan version.

EXAMINATION RULES.

Please, see Spanish or Catalan version.

BIBLIOGRAPHY

Basic:

- Duncan, Ben. High performance audio power amplifiers for music performance and reproduction. Oxford: Newnes, 1996. ISBN 0750626291.
- Self, Douglas. Audio power amplifier design handbook. 5th ed. Oxford: Elsevier / Focal Press, 2009. ISBN 9780240521626.
- Self, Douglas. Small signal audio design. Oxford: Elsevier, 2010. ISBN 9780240521770.
- Todorovic, Aleksandar Louis. Television technology demystified : a non-technical guide. Oxford: Elsevier, 2006. ISBN 9780240806846.

Complementary:

- Franco, Sergio. Diseño con amplificadores operacionales y circuitos integrados analógicos. México [etc.]: McGraw-Hill, cop. 2005. ISBN 9701045955.
- Malik, Norbert R. Circuitos electrónicos : análisis, diseño y simulación. Madrid [etc.]: Prentice Hall, cop. 1996. ISBN 8489660034.

RESOURCES

Hyperlink:

- Moodle ATENEA: <http://atenea.upc.edu/moodle/>