



## Course guides

### 820242 - EAVEIA - Audio and Video Electronics

**Last modified:** 19/06/2020

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

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

**Academic year:** 2020    **ECTS Credits:** 6.0    **Languages:** Catalan, English, Spanish

#### LECTURER

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**Coordinating lecturer:** HERMINIO MARTINEZ GARCIA.

**Others:** HERMINIO MARTINEZ GARCIA y otros a determinar.

#### PRIOR SKILLS

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Please, see Spanish or Catalan version.

#### REQUIREMENTS

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Please, see Spanish or Catalan version.

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**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

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

**Total learning time:** 150 h

## CONTENTS

### 1.- Linear Regulators and Voltage References.

**Description:**

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**Specific objectives:**

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**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.

**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

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Please, see Spanish or Catalan version.

## EXAMINATION RULES.

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Please, see Spanish or Catalan version.

## BIBLIOGRAPHY

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### Basic:

- Self, Douglas. Small signal audio design. Oxford: Elsevier, 2010. ISBN 9780240521770.
- 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.
- 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

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### Hyperlink:

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