

# SOUND AND IMAGE ENGINEERING

## B. Eng.

### SEMESTER 7

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**Year 2015/16**

<b>Course Name:</b>	English for Professional and Academic Communication	<b>Course Code:</b>	595000133
<b>Year:</b>	4	<b>Semester:</b>	7
<b>Credits (ECTS):</b>	6	<b>Credit Hours:</b>	4
<b>Area:</b>	Common UPM Skills	<b>Type:</b>	Basic / Required
<b>Term:</b>	Fall	<b>Language:</b>	English
<b>Prerequisites / Co-requisites:</b>	Introduction to professional and academic communication II Introduction to professional and academic communication I		
<b>Coordinator:</b>	Irina Argüelles		
<b>Bachelor Engineering Program:</b>	Sound and Image Engineering Communications Electronics Engineering Telecommunications Systems Engineering Telematics Engineering		

### Course Contents

1. Cultural diversity and interpersonal relationships
2. Colloquia and meetings. The job interview
3. Understanding of lectures
4. The understanding of academic and professional texts
5. Oral presentations

### ABET Student Outcomes

- (c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) An ability to function on multidisciplinary teams
- (g) An ability to communicate effectively
- (h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) A recognition of the need for, and an ability to engage in life-long learning
- (j) A knowledge of contemporary issues
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### **Study Outcomes (according to the Spanish program definition)**

- CG 02 Ability to search and select information, develop critical thinking and produce and defend arguments within the area.
- CG 03 Ability to express oneself in oral and written form, and to convey information through documents and public presentations.
- CG 05 Ability for teamwork in multidisciplinary environments..
- CG 06 Ability for adaptability, negotiation, conflict resolution and leadership
- CG 12 Ability for interpersonal relationships and work in a national and international context with capacity to express themselves oral and written in English-language form.

### **Specific outcomes of instruction (according to the Spanish program definition)**

- 1.- Elaborate schemes and organize draft texts as reports or essays well structured.
- 2.- Produce texts clear and detailed on various topics as well as defend a point of view on general topics stating the pros and cons of the different options in English language.
- 3.- Organize your ideas and opinions of consistently in an academic work.
- 4.- Understand the main ideas of complex texts in the English language of both concrete and abstract topics, even if they are of a technical nature within their field of specialization.
- 5.- Adequately synthesize information related to their studies.
- 6.- Organize information properly in sentences and paragraphs.
- 7.- Contrasted their ideas with the contributed by other authors.
- 8.- Interact with native speakers of English language with one degree of fluency and spontaneity so that communication is performed effortlessly by any of the partners.

### **Bibliography**

“Cambridge Academic English Upper”, Cambridge.

“Cambridge English for Job-Hunting”, Cambridge.

“Business Vocabulary Builder Intermediate to Upper intermediate”, MacMillan.

“Presenting in English”, Heinle.

“Presentations in English”, MacMillan.

“English for presentations”, Oxford.

“Successful presentations”, Oxford.

**Year 2015/16**

<b>Course Name:</b>	Electroacoustic Systems	<b>Course Code:</b>	595000134
<b>Year:</b>	4	<b>Semester:</b>	7
<b>Credits (ECTS):</b>	6	<b>Credit Hours:</b>	4
<b>Area:</b>	Acoustic Engineering	<b>Type:</b>	Engineering Topic / Required
<b>Term:</b>	Fall	<b>Language:</b>	Spanish
<b>Prerequisites / Co-requisites:</b>		Room Acoustics Acoustic Engineering	
<b>Coordinator:</b>		Jose Luis Sánchez	
<b>Bachelor Engineering Program:</b>		Sound and Image Engineering	

### Course Contents

1. Loudspeakers
2. Crossover Filters for loudspeakers.
3. Microphones
4. Sound Reinforcement Systems

### ABET Student Outcomes

- (a) An ability to apply knowledge of mathematics, science, and engineering
- (b) An ability to design and conduct experiments, as well as to analyze and interpret data
- (c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (d) An ability to function on multidisciplinary teams
- (e) An ability to identify, formulate, and solve engineering problems
- (h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context (j) A knowledge of contemporary issues
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### Study Outcomes (according to the Spanish program definition)

- CE SI04 Ability to carry out acoustic engineering projects on: acoustic isolation and acoustic conditioning, PA installations; specification, analysis and selection of electroacoustic transducers; measurement, analysis and noise and vibration control systems; environmental acoustics; underwater acoustics systems.
- CE TEL09 Ability to understand the mechanisms of electromagnetic and acoustic wave propagation and transmission, as well as corresponding transmitters and

receivers.

- CG 02 Ability to search and select information, develop critical thinking and produce and defend arguments within the area.
- CG 04 Ability to abstract, analyze, and synthesize, and to solve problems.
- CG 10 Ability to handle specifications, rules and regulations and to apply them in the practice of the profession.

### **Specific outcomes of instruction (according to the Spanish program definition)**

- 1.- Know the operation and handling of microphones and microphone systems.
- 2.- Know analyze and design systems with speakers and microphones.
- 3.- Ability to analyze the sound field of a venue.
- 4.- Understand and design acoustic assemblies used in speakers.
- 5.- Learn to interpret the technical characteristics of the speakers and microphones commercial models.
- 6.- Learn to measure and characterize professional microphones and speakers.
- 7.- Learn to choose and design crossover filters used in speakers.
- 8.- Know how to address sound projects in open and closed spaces.
- 9.- Knowledge of the techniques of distribution and grouping of speakers used in sound reinforcement systems.
- 10.- Knowledge of the techniques of amplification used in sound reinforcement .
- 11.- Knowledge and use of the signal processing techniques used in sound reinforcement.
- 12.- Familiarization with the facilities and existing types of sound reinforcement systems.
- 13.- Knowledge of basic acoustic theories related to sound reinforcement in spaces, open or closed.
- 14.- Use of the simulation techniques of the sound field.

### **Bibliography**

Sánchez Bote, J. L., Micrófonos, Dpto. Publicaciones EUITT, Madrid, 2002.

Gómez Alfageme, J. J., Altavoces de Radiación Directa, Dpto. Publicaciones EUITT, Madrid, 2002

Sánchez Bote, J. L., Altavoces: Características, Filtros de Cruce y Bocinas, Dpto. Publicaciones. EUITT, Madrid, 2006

Sánchez Bote, J. L., Sistemas de refuerzo sonoro, Dpto. Publicaciones ETSIST, Madrid, 2013.

**Year 2015/16**

<b>Course Name:</b>	Audiovisual Content Distribution	<b>Course Code:</b>	595000135
<b>Year:</b>	4	<b>Semester:</b>	7
<b>Credits (ECTS):</b>	4,5	<b>Credit Hours:</b>	3
<b>Area:</b>	Video Engineering	<b>Type:</b>	Engineering Topic / Required
<b>Term:</b>	Fall	<b>Language:</b>	Spanish
<b>Prerequisites / Co-requisites:</b>	Sound and Image Fundamentals Communication Theory Audiovisual Systems Audio and Video Technology		
<b>Coordinator:</b>	José Luis Rodríguez		
<b>Bachelor Engineering Program:</b>	Sound and Image Engineering		

### Course Contents

1. Broadcast of audiovisual content headers
2. Encapsulated video and audio for broadcast
3. Added services, interactivity and conditional access
4. Broadcasting and audiovisual distribution on television networks
5. Broadcasting and audiovisual distribution for generic data networks
6. Broadcasting and audiovisual distribution on independent media

### ABET Student Outcomes

- (b) An ability to design and conduct experiments, as well as to analyze and interpret data
- (c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (d) An ability to function on multidisciplinary teams
- (d) An ability to function on multidisciplinary teams
- (e) An ability to identify, formulate, and solve engineering problems
- (f) An understanding of professional and ethical responsibility
- (g) An ability to communicate effectively
- (h) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (j) A knowledge of contemporary issues
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### Study Outcomes (according to the Spanish program definition)

CE SI01 Ability to build, utilize and manage telecommunication services and

	applications for the purpose of acquiring, treating analogically and digitally, encoding, transporting, representing, processing, storing, reproducing, managing and presenting audiovisual services and multimedia information.
CE SI02	Ability to analyze, specify, implement and support television, audio and video systems, equipment, headers and facilities, both in fixed and mobile environments.
CE SI05	Ability to create, encode, manage, broadcast and distribute multimedia content, taking into account usability and accessibility criteria for audiovisual, broadcast and interactive services.
CE SI06	Ability to carry out professional projects in the specific field of telecommunication technologies in which competences attained in the program have to be synthesized and integrated.
CE TEL01	Ability to independently learn new knowledge and skills adequate for the design, development or utilization of telecommunication systems and services.
CE TEL04	Ability to analyze and specify the fundamental parameters of a communication system.
CE TEL14	Ability to difference the concepts of access networks and transport, switching nets of circuits and packages, fixed and mobile networks, distributed systems and net applications, services of voice, data, audio, video, and multimedia and interactive systems.
CE TEL16	Knowledge of telecommunication legislation and regulations at the National, European and International levels.
CG 02	Ability to search and select information, develop critical thinking and produce and defend arguments within the area.
CG 04	Ability to abstract, analyze, and synthesize, and to solve problems.
CG 05	Ability for teamwork in multidisciplinary environments..
CG 11	Skills for the use of Information and Communication Technologies.
CG 13	Learning skills with a high degree of autonomy..

### **Specific outcomes of instruction (according to the Spanish program definition)**

- 1.- Ability to understand the different formats of the video signal, to the various resolutions used in initial format, uncompressed.
- 2.- Ability to specify and analyze the systems of video broadcasting on generic data networks, such as Internet, and specific networks; as well as the associated regulations.
- 3.- Ability to analyze and understand the structure of the different systems of organization and encapsulated video and multimedia information for broadcast and distribution.
- 4.- Ability to understand the relationship between the video signal and other, such as audio and different types of data which are handled together.
- 5.- Ability to understand the process of compressing video signals and auxiliary signals.
- 6.- Ability to analyze and understand the various services added to video streams such as conditional access elements and elements of interactivity
- 7.- Ability to understand and analyze the authorship of freelance broadcast video media to the end user.

### **Bibliography**

Rodríguez Vázquez, Jose Luis. Distribución de TV. Publicaciones ETSIST. 2014.