

TELECOMMUNICATIONS SYSTEMS ENGINEERING B. Eng.

SEMESTER 7

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Year 2015/16

Course Name:	English for Professional and Academic Communication	Course Code:	595000333
Year:	4	Semester:	7
Credits (ECTS):	6	Credit Hours:	4
Area:	Common UPM Skills	Type:	Basic / Required
Term:	Fall	Language:	English
Prerequisites / Co-requisites:	Introduction to professional and academic communication II Introduction to professional and academic communication I		
Coordinator:	Irina Argüelles		
Bachelor Engineering Program:	Telecommunication Systems Engineering Communications Electronics Engineering Sound and Image 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 Skilled to searching and selecting information, critical reasoning and writing and defending the reasoning within the defined 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

Course Name:	Radiocommunication Systems	Course Code:	595000334
Year:	4	Semester:	7
Credits (ECTS):	6	Credit Hours:	4
Area:	Telecommunication Systems and Technologies	Type:	Engineering Topic / Required
Term:	Fall	Language:	Spanish
Prerequisites / Co-requisites:	Telecommunication Systems Digital Signal Processing Communication Theory		
Coordinator:	Rafael Herradón		
Bachelor Engineering Program:	Telecommunication Systems Engineering		

Course Contents

1. Introduction to Radiocommunication Systems
2. Radiowave Propagation
3. Radio Links
4. Satellite Communication
5. Radio Broadcasting
6. Mobile Communications

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
- (e) An ability to identify, formulate, and solve engineering problems
- (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)

- CE ST02 Ability to apply techniques on which telecommunication networks, services and applications are based, whether in fixed or mobile environments, personal, local or long distance areas, with different bandwidths, including telephony, radio broadcasting, television and data, from the point of view of transmission systems.
- CE ST04 Ability to select radiofrequency, microwave, radio broadcasting, radio link and radio localization circuits, subsystems and systems.
- CE ST05 Ability to select aerials, equipment and transmission systems for guided and non-guided wave propagation, through electromagnetic, radiofrequency or optical channels. Ability to manage the associated radio electric space and frequency allocation.
- 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 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 09 Ability to analyze and assess the social and environmental impact of technical solutions..
- CG 10 Ability to handle specifications, rules and regulations and to apply them in the practice of the profession.
- CG 13 Learning skills with a high degree of autonomy.

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

- 1.- Analyze the design parameters of radiocommunication systems.
- 2.- Calculate the losses of propagation, signal levels, link balance and determination of the quality of radiocommunication systems.
- 3.- Selection and characterization of systems and subsystems, parameters of design and planning of radiocommunication systems, (broadcasting, wireless and mobile communications, and satellite communications radio).
- 4.- Use of laboratory and field instrumentation to perform the different measures that allow to characterize a telecommunication system.
- 5.- Allocation and management of the radio spectrum.
- 6.- Design, plan and manage radiocommunication systems.

Bibliography

- Hernando Rábanos, J.M, y otros. Transmisión por radio (7ª Edición). Editorial Universitaria Ramón Areces, 2013
- MARAL, Gerard Satellite Communications Systems: Systems, Techniques and Technology, 5th Edition. Edit: John Wiley 2009
- Hernando Rábanos, JM. Comunicaciones móviles (2ª Ed.). Editorial Universitaria Ramón Areces, 2004

Year 2015/16

Course Name:	Antennas and Electromagnetic Compatibility	Course Code:	595000335
Year:	4	Semester:	7
Credits (ECTS):	4,5	Credit Hours:	3
Area:	Applied Electromagnetism	Type:	Engineering Topic / Required
Term:	Fall	Language:	Spanish
Prerequisites / Co-requisites:		Communication Theory Wave Transmission and Propagation	
Coordinator:		Florentino Jiménez	
Bachelor Engineering Program:		Telecommunication Systems Engineering	

Course Contents

1. Elements of a power converter
2. Linear power supply.
3. Switching power converters
4. Power in telecommunication and computing equipment solutions

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 identify, formulate, and solve engineering problems
- (d) An understanding of professional and ethical responsibility
- (e) The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (f) A recognition of the need for, and an ability to engage in life-long learning
- (g) A knowledge of contemporary issues
- (h) 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 04 Ability to abstract, analyze, and synthesize, and to solve problems.
- CG 13 Learning skills with a high degree of autonomy.
- CE TEL12 Ability to use different energy sources and especially solar photovoltaic and

thermal, as well as the foundations of the electrotechnics and power electronics

CE ST05 Capacity for the selection of aerials, equipment and systems of transmission, wave propagation guided and non-guided by electromagnetic, radiofrequency or optical ways and related radio electric space management and assignment of frequencies.

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

- 1.- Know the relationships between topology, control and function of the electrical power converter circuits in power converting applications in telecommunication and computing.
- 2.- Understand the characteristics of performance, limitations and applications of power electronics.
- 3.- Apply the techniques of linear regulation to power electronic systems.
- 4.- Use analysis techniques of the electronic circuits of electrical energy conversion in switching.
- 5.- Select appropriate topologies for commutated converters applied to power electronic equipment.
- 6.- Learn practical solutions of circuits or power systems, by selecting the appropriate ones in a project of power supply of telecom/computing equipment.
- 7.- Develop design solutions based on switching converters.
- 8.- Select components, according to power electronic converters design specifications.
- 9.- Introducing photovoltaic systems.

Bibliography

POWER ELECTRONICS: A FIRST COURSE. Ned Mohan. Editorial: John Wiley. 2012.

POWER ELECTRONICS: CONVERTERS,APPLICATIONS AND DESIGN. (Third Edition). Ned Mohan, Tore M. Undeland, William P. Robbins. Editorial: John Wiley. 2003.

ELECTRÓNICA DE POTENCIA. Daniel W. Hart. Editorial: Prentice-Hall. 2001.

DESIGN WITH OPERATIONAL AMPLIFIERS AND ANALOG INTEGRATED CIRCUITS. (Third Edition). Sergio Franco. Editorial: McGraw-Hill. 2002.