

Program	09TT- Engineering in Telecommunication Technologies and Services
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Course number and name	
Number	95000004
Name	Introduction to Telecommunications Engineering Introducción a la Ingeniería de Telecomunicación
Semester	Y1 - S1

Credits and contact hours	
ECTS Credits	3
Contact hours	30

Coordinator's name	Luis Castejón Martín
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Specific course information		
Description of course content		
<p>The main goal of the course is to provide to students a first and entry level about the world of telecommunications engineering, not only in the technical aspects, but also in the economic and social aspects of digital markets.</p> <p>The course is developed according to a holistic approach, from the concept of science, technology, engineering and innovation, to the concept of signal, systems, networks and services, or value chain and markets.</p>		
List of topics to be covered		
<ol style="list-style-type: none"> 1. The concept of engineering, technology, engineering, innovation and entrepreneurship. 2. Concept of ICT, markets and industry value chain 3. Definitions: Information and Communications. Signals, digitalization, and frequency domain. 4. Electronics and software for engineering telecommunications 5. Basic techniques of telecommunications: modulation, transmission, and switching. 6. Transmission media 7. Fixed and mobile networks. voice and data 8. Broadcasting networks for radio and TV 9. Multiservice broadband networks 10. Information Society and Internet: development and trends 		
Prerequisites or co-requisites		
None		
Course category in the program		
<input checked="" type="checkbox"/> R (required)	<input type="checkbox"/> E (elective)	<input type="checkbox"/> SE (selective elective)

Specific goals for the course

Specific outcomes of instruction

CG2, CG3, CG4, CG7-CG12

Student outcomes addressed by the course

RA1: Basic knowledge of the principles and foundations of the nature of the signals, networks and telecommunications systems and services.
 RA2: Basic knowledge of signal types and amount of information associated with them. Concepts of bandwidth and transmission speed. The analogic and digital worlds.
 RA3: Descriptive knowledge of the basic processes of telecommunication networks: modulations, multiplexes, switching, routing. etc.
 RA4: Knowledge of the main transmission media used in telecommunications networks
 RA5: Current understanding of the state of convergence of telecommunications networks and services. Universal Network: Internet.

Bibliography and supplemental materials

- J.Pierce, A. Noll. "Señales, la ciencia de las telecomunicaciones". Reverté.2002.
- A. Figueiras. "Una panorámica de las telecomunicaciones". Prentice-Hall. 2002.
- Course materials available in the Moodle server of the UPM

Teaching methodology

<u> </u> X <u> </u> lectures	<u> </u> X <u> </u> problem solving sessions	<u> </u> X <u> </u> collaborative actions	<u> </u> <u> </u> laboratory sessions
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Other: The students have to read a recommended piece of news every week, from the IEEE Spectrum, or equivalent, which is discussed later in the classroom.
 The students have to develop in groups a real project about a specific network and service based on copper, fibre, or radio link, calculating the architecture, dimensioning the platform, identifying the pros and contra, and calculating the cost, assessing the best alternative from the different options.