

**1. General information****Course:** TELECOMMUNICATIONS INFRASTRUCTURES**Code:** 59654**Type:** CORE COURSE**ECTS credits:** 6**Degree:** 385 - DEGREE IN TELECOMMUNICATIONS TECHNOLOGY ENGINEERING**Academic year:** 2023-24**Center:** 308 - SCHOOL POLYTECHNIC OF CUENCA**Group(s):** 30**Year:** 2**Duration:** C2**Main language:** Spanish**Second language:****Use of additional languages:****English Friendly:** Y**Web site:****Bilingual:** N

Lecturer: RAQUEL CERVIGON ABAD - Group(s): 30				
Building/Office	Department	Phone number	Email	Office hours
E. Politécnica Cuenca (0.05)	INGENIERÍA ELÉCTRICA, ELECTRÓNICA, AUTOMÁTICA Y COMUNICACIONES	926054049	raquel.cervigon@uclm.es	The office hours will be available in Secretaría Virtual
Lecturer: ESTEFANIA PRIOR CANO - Group(s): 30				
Building/Office	Department	Phone number	Email	Office hours
2.11	INGENIERÍA ELÉCTRICA, ELECTRÓNICA, AUTOMÁTICA Y COMUNICACIONES		Estefania.PriorCano@uclm.es	The office hours will be available in Secretaría Virtual

**2. Pre-Requisites**

There are no specified enrollment restrictions with other subjects of the curriculum. It should be advisable to have studied "Communications", "Communication Networks (I and II)" or "Transmission Media" modules. It assumes familiarity with communication systems terminology and data transmission protocols.

**3. Justification in the curriculum, relation to other subjects and to the profession**

To integrate the knowledge acquired in the basic and the common telecommunication modules. The aim is to train the student as a professional capable of designing, supervising, monitoring construction and approving telecommunication facilities in single-family residence, as well as in neighborhood and / or larger communities (municipalities, industrial estates, etc.) . In all cases, you are prepared to carry out the tasks described above, where the knowledge of more practical and economical aspects are as important as the purely technical ones.

**4. Degree competences achieved in this course****Course competences**

Code	Description
E06	The ability to independently acquire new knowledge and techniques suitable for the design, development or operation of telecommunication systems and services.
E07	The ability to use communication and computer applications (office automation, databases, advanced calculation, project management, visualisation, etc.) to support the development and operation of telecommunication and electronic networks, services and applications.
E10	The ability to assess the advantages and disadvantages of different technological alternatives for deploying or implementing communications systems, from the viewpoint of signal space, disturbances and noise, and analogue and digital modulation systems.
E11	The ability to conceive, deploy, organise and manage telecommunication networks, systems, services and infrastructures in residential (home, city and digital communities), business or institutional contexts, being in charge of their start-up and continuous improvement, as well as being aware of their economic and social impact.
E20	Knowledge of the regulation and standards of telecommunications at national, European and international levels.
G02	Correct, oral and written, communication skills.
G03	Ethical commitment and professional ethics.
G05	Knowledge, understanding and ability to apply the necessary legislation during the development of the profession of Technical Telecommunications Engineer and being able to easily deal with specifications, regulations and mandatory regulations
G09	Being able to easily handle specifications, regulations and mandatory regulations
G11	Knowing and applying basic elements of economics and human resources management, organisation and planning of projects, as well as legislation, regulation and standardisation in telecommunications

**5. Objectives or Learning Outcomes****Course learning outcomes**

## Description

Ability to manage, design, analyze and implement analog and digital TV and radio signal distribution networks (SMATV).

Ability to manage, design, analyze and dimension fixed and broadband access networks in residential areas.

Ability to carry out, manage and direct common telecommunications infrastructures projects

Analysis, synthesis and compression of technical documentation and mastery of specific vocabulary.

Knowledge of the regulations and policies that regulate telecommunications at national, European and international levels.  
 Knowledge of the main technologies used in home automation applications.  
 Correct use of oral and written expression to convey ideas, technologies, results, etc.  
 Knowledge of Spanish regulations regarding common telecommunications infrastructures.  
 Use of ICT to achieve the specific objectives set in the subject.

## 6. Units / Contents

### Unit 1: Methodology, planning and management of telecommunication projects.

**Unit 1.1** Certifications and PMP philosophy

**Unit 1.2** Design, constitution, planning, budget, monitoring, closing and dissemination of the project

### Unit 2: Introduction to telecommunication systems.

**Unit 2.1** Regulatory organizations of telecommunications

**Unit 2.2** Telecommunication policy and regulations at the national, european and international levels

**Unit 2.3** Telecommunication systems and services

**Unit 2.4** Guided transmission media

**Unit 2.5** Unguided transmission media

**Unit 2.6** Practice: development of digital technology strategy

### Unit 3: Common digital telecommunication infrastructures, metropolitan and digital communities.

**Unit 3.1** Definition and current regulations in common telecommunication infrastructures

**Unit 3.2** Enclosures, pipelines and distribution networks

### Unit 4: Ethics and professional deontology.

**Unit 4.1** The role of the Telecommunications Technical Engineer in the digital society

### Unit 5: Economic and social impact of telecommunication systems.

**Unit 5.1** Current situation of operators and companies in the ICT sector

**Unit 5.2** Future market trends and their implications

## 7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	E10 E11 E20 G02 G09	1	25	N	-	Theoretical lectures and/or guided activities.
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	E10 E11 E20 G02 G05 G09	0.51	12.75	N	-	The teacher will show some demonstrations and problem solving techniques to illustrate some parts of the course.
Laboratory practice or sessions [ON-SITE]	Guided or supervised work	E06 E07 E10 E11 E20 G02 G03 G05 G09 G11	0.6	15	Y	N	The students will carry on practical work according to the provided instructions. Their work will be monitored in-situ and may modulate the marks obtained in the practical part. This activity cannot be recovered.
Practicum and practical activities report writing or preparation [OFF-SITE]	Self-study	E06 E07 E10 E11 E20 G02 G03 G05 G09 G11	1.45	36.25	Y	Y	The students should hand out a report of each practical activity according to the conditions provided. An oral defense of the work should be necessary. These activities can be recovered by repeating with a compulsory oral defense. Plagiarism or copying will be punished with a mark of 0 point to all the people involved.
Group tutoring sessions [ON-SITE]	Group tutoring sessions	E06 E07 E10 E11 E20 G02 G03 G05 G09 G11	0.05	1.25	N	-	Group attention to the students.
Study and Exam Preparation [OFF-SITE]	Self-study	E06 E07 E10 E11 E20 G02 G03 G05 G09 G11	1.95	48.75	N	-	Self-study.
Individual tutoring sessions [ON-SITE]	Self-study	E06 E07 E10 E11 E20 G02 G03 G05 G09 G11	0.05	1.25	N	-	Personal attention to the students.
Final test [ON-SITE]	Assessment tests	E06 E07 E10 E11 E20 G02 G03 G05 G09 G11	0.1	2.5	Y	Y	Final exam. This could be recovered in the fixed session of the extraordinary call.
Other on-site activities [ON-SITE]	Assessment tests	E06 E07 E10 E11 E20 G02 G03 G05 G09 G11	0.09	2.25	Y	N	Proposed activities and test evaluation to prepare theoretical concepts. These activities can be recovered in the extraordinary call.
Writing of reports or projects [OFF-SITE]	Self-study	E06 E07 E10 E11 E20 G02 G03 G05 G09 G11	0.2	5	Y	N	Autonomous work by the student to prepare the exercises and problems part of the course.
<b>Total:</b>			<b>6</b>	<b>150</b>			
<b>Total credits of in-class work: 2.4</b>			<b>Total class time hours: 60</b>				
<b>Total credits of out of class work: 3.6</b>			<b>Total hours of out of class work: 90</b>				

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

## 8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Test	50.00%	60.00%	Written test of each of the blocks of the subject
Laboratory sessions	40.00%	40.00%	Both the reports delivered and the presentation and oral defense of them will be taken into account.
Other methods of assessment	10.00%	0.00%	Presentations and proposed activities.
<b>Total:</b>	<b>100.00%</b>	<b>100.00%</b>	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

### Evaluation criteria for the final exam:

#### Continuous assessment:

The weightings indicated in the section on 'evaluation system' will be applied. It is necessary to obtain a mark equal to or higher than 4 points in all the compulsory tests taken in order to be able to average out the rest of the assessment activities. The average of all the assessment activities must be equal or higher than 5 points to consider the subject as passed.

The student who passes the laboratory (more than 5 points) will have his grade maintained during the following course, unless he voluntarily decides to repeat it. In case of not passing the subject in the following course, the student will have to do the laboratory practices again.

#### Non-continuous evaluation:

By default, all students take continuous assessment. If a student cannot or does not want to take the continuous assessment, he/she must inform the lecturer in order to change to non-continuous assessment. This change must be made as soon as possible and never after having taken 50% or more of the continuous assessment tests, at which point this change can no longer be made. Likewise, this change cannot be made after the end of the class period.

### Specifications for the resit/retake exam:

The student may make up the written tests by means of an exam on the date set by the Studies Sub-direction. The resolution of the laboratory practices will be recoverable with a specific recovery procedure after the closing of the ordinary call. The weighting will be 40% laboratory and 60% written test.

### Specifications for the second resit / retake exam:

If the student has passed the laboratory during the previous course, the rest of the training activities will be evaluated by means of an exam on the date set by the subdirectorate of studies. The weighting will be 40% laboratory and 60% written test. If the student has not passed the laboratory part, the specific procedure of recovery will be indicated, being the weighting of 40 % laboratory and 60% written test.

## 9. Assignments, course calendar and important dates

### Not related to the syllabus/contents

Hours	hours
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	36.25
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	48.75
Individual tutoring sessions [PRESENCIAL][Self-study]	1.25
Final test [PRESENCIAL][Assessment tests]	2.5
Other on-site activities [PRESENCIAL][Assessment tests]	2.25
Writing of reports or projects [AUTÓNOMA][Self-study]	5
<b>General comments about the planning:</b> Units will be taught consecutively along the real calendar of the term in which the course is placed. The planning of the course could slightly change to be adapted to the appropriate progress of the class. During the beginning of the term, the weekly planning will be published in virtual campus.	
<b>Unit 1 (de 5): Methodology, planning and management of telecommunication projects.</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Laboratory practice or sessions [PRESENCIAL][Guided or supervised work]	2
<b>Unit 2 (de 5): Introduction to telecommunication systems.</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	16.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	9
Laboratory practice or sessions [PRESENCIAL][Guided or supervised work]	13
<b>Unit 3 (de 5): Common digital telecommunication infrastructures, metropolitan and digital communities.</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.75
<b>Unit 4 (de 5): Ethics and professional deontology.</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	1
<b>Unit 5 (de 5): Economic and social impact of telecommunication systems.</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	2
<b>Global activity</b>	
<b>Activities</b>	<b>hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	25

Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	12.75
Laboratory practice or sessions [PRESENCIAL][Guided or supervised work]	15
Individual tutoring sessions [PRESENCIAL][Self-study]	1.25
Group tutoring sessions [PRESENCIAL][Group tutoring sessions]	1.25
Study and Exam Preparation [AUTÓNOMA][Self-study]	48.75
Final test [PRESENCIAL][Assessment tests]	2.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	36.25
Other on-site activities [PRESENCIAL][Assessment tests]	2.25
Writing of reports or projects [AUTÓNOMA][Self-study]	5
<b>Total horas:</b>	<b>150</b>

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Gildo Seisedos	Smart Cities La transformación digital de las ciudades <a href="https://iot.telefonica.com/libroblanco-smart-cities/media/libro-blanco-smart-cities-esp-2015.pdf">https://iot.telefonica.com/libroblanco-smart-cities/media/libro-blanco-smart-cities-esp-2015.pdf</a>	Centro de Innovación del Sector Público de PwC e IE Business School			2015	
Observatorio Nacional de las Telecomunicaciones y de la Sociedad de la Información	ESTUDIO Y GUÍA METODOLÓGICA SOBRE CIUDADES INTELIGENTES <a href="http://www.ontsi.red.es/ontsi/es/estudios-informes/estudio-y-gu%C3%AD-metodol%C3%B3gica-sobre-ciudades-inteligentes">http://www.ontsi.red.es/ontsi/es/estudios-informes/estudio-y-gu%C3%AD-metodol%C3%B3gica-sobre-ciudades-inteligentes</a>	Ministerio de Industria, Energía y Turismo			2015	
Telecomunicaciones y Sociedad de la Información	Legislación consolidada de telecomunicaciones por materias <a href="http://www.minetur.gob.es/telecomunicaciones/es-ES/Legislacion/Paginas/Legislacion.aspx">http://www.minetur.gob.es/telecomunicaciones/es-ES/Legislacion/Paginas/Legislacion.aspx</a>	Ministerio de Industria, Energía y Turismo			2016	
Colegio Oficial Ingenieros Telecomunicación	NORMATIVA DE LAS INFRAESTRUCTURAS COMUNES DE TELECOMUNICACIONES <a href="http://www.coit.es/pub/ficheros/20110712_LIBRO_ICT_COIT.pdf">http://www.coit.es/pub/ficheros/20110712_LIBRO_ICT_COIT.pdf</a>	COIT			2011	
Estudio del impacto de las tecnologías y las comunicaciones en el desarrollo sostenible	Estudio del impacto de las tecnologías y las comunicaciones en el desarrollo sostenible <a href="http://ametic.es/es/publicaciones/estudio-del-impacto-de-las-tic-en-el-desarrollo-sostenible">http://ametic.es/es/publicaciones/estudio-del-impacto-de-las-tic-en-el-desarrollo-sostenible</a>	AMETIC			2009	
Juan Manuel Millán Esteller	Técnicas y procesos en infraestructuras de telecomunicaciones	Paraninfo			2018	
Emilio Félix Molero	INFRAESTRUCTURAS COMUNES DE TELECOMUNICACIÓN EN VIVIENDAS Y EDIFICIOS	S.A. MCGRAW-HILL / INTERAMERICANA DE ESPAÑA		9788448192518	2014	