



UNIVERSIDAD
POLITÉCNICA
DE MADRID



LEARNING GUIDE

STRATEGIC VISION OF THE DIGITAL ECOSYSTEM

MÁSTER EN INGENIERÍA DE TELECOMUNICACIÓN

ACADEMIC YEAR	CODE	COURSE	CREDITS	TYPE	SEMESTER
2026-27	93001393	1	3 ECTS	COMPULSORY	SECOND SEMESTER

LANGUAGE	ASSIGNED CENTER
ENGLISH, SPANISH	E.T.S. DE INGENIEROS DE TELECOMUNICACION

ASSIGNED DEPARTMENT
SEÑALES, SISTEMAS Y RADIOCOMUNICACIONES

COORDINATOR
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REQUIRED PREREQUISITES

REQUIRED COURSES

—

RECOMMENDED PRIOR KNOWLEDGE

RECOMMENDED COURSES

—

OTHER RECOMMENDATIONS

—

RESULTS

RD-822/2021

Knowledge

KG1 Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

Skills

HG2 Que los estudiantes sepan aplicar los conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio

Competences

CE16 Capacidad para la elaboración, dirección, coordinación, y gestión técnica y económica de proyectos sobre: sistemas, redes, infraestructuras y servicios de telecomunicación, incluyendo la supervisión y coordinación de los proyectos parciales de su obra aneja; infraestructuras comunes de telecomunicación en edificios o núcleos residenciales, incluyendo los proyectos sobre hogar digital; infraestructuras de telecomunicación en transporte y medio ambiente; con sus correspondientes instalaciones de suministro de energía y evaluación de las emisiones electromagnéticas y compatibilidad electromagnética

CG3 Que los estudiantes sean capaces de integrar conocimientos y enfrentarse a la complejidad de formular juicios a partir de una información que, siendo incompleta o limitada, incluya reflexiones sobre las responsabilidades sociales y éticas vinculadas a la aplicación de sus conocimientos y juicios

CE15 Capacidad para la integración de tecnologías y sistemas propios de la Ingeniería de Telecomunicación, con carácter generalista, y en contextos más amplios y multidisciplinares como por ejemplo en bioingeniería, conversión fotovoltaica, nanotecnología, telemedicina

CG4 Que los estudiantes sepan comunicar sus conclusiones y los conocimientos y razones últimas que las sustentan a públicos especializados y no especializados de un modo claro y sin ambigüedades

CT5 Capacidad para gestionar la información, identificando las fuentes necesarias, los principales tipos de documentos técnicos y científicos, de una manera adecuada y eficiente

CG5 Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo

- CT6** Capacidad para emitir juicios sobre implicaciones económicas, administrativas, sociales, éticas y medioambientales ligadas a la aplicación de sus conocimientos
- CT4** Capacidad para trabajar de forma efectiva como individuo, organizando y planificando su propio trabajo, de forma independiente o como miembro de un equipo
- CT3** Capacidad para adoptar soluciones creativas que satisfagan adecuadamente las diferentes necesidades planteadas
- CT2** Capacidad para dinamizar y liderar equipos de trabajo multidisciplinares
- CT7** Capacidad para trabajar en contextos internacionales

DESCRIPTION

The course 'Strategic Vision of the Digital Ecosystem' (VEDI) aims to provide a holistic view of the technological, socio-economic, and regulatory aspects of the industries in which telecommunication engineers develop their careers.

To understand the key factors driving the future development of the digital ecosystem, we will analyze the strategies of the main stakeholders that take part in digital markets. To create value in the ecosystem, each stakeholder has its own strategic vision, on which it leverages to defend its legitimate interests.

Therefore, there is no single strategic vision for the digital ecosystem. However, we may attempt to build a holistic and agreed vision of the future by analyzing how technologies influence the behavior of all stakeholders, including governments.

In this course, students will practice strategic thinking and will elaborate on their own vision about the future of the digital ecosystem. To help students develop this vision, we will confront the above-mentioned strategic visions of all the stakeholders capable of exercising significant influence on the development of the digital ecosystem.

The methodology of the course combines master classes with case studies to facilitate the acquisition of competencies.

TOPICS

1. UNIT 1. CONTEXT ANALYSIS OF THE DIGITAL SECTOR.

1.1. The digital sector and its ecosystems.

- 1.2. Globalization and geopolitics.
- 1.3. Technology governance models.
- 1.4. Innovation, competitiveness and digital sovereignty.

2. UNIT 2. THE TELECOMMUNICATIONS SECTOR.

- 2.1. The evolution of the telecommunications sector.
- 2.2. The telecommunications market.
- 2.3. Sectoral regulation.
- 2.4. Challenges of the electronic communications services.

3. UNIT 3. THE INTERNET ECOSYSTEM.

- 3.1. The advent of the network of networks.
- 3.2. The Internet value chain and its economics.
- 3.3. Economics of Internet platforms
- 3.4. Internet Governance and Regulation

4. UNIT 4. THE DATA ECONOMY

- 4.1. Measuring the data economy
- 4.2. Technology challenges
- 4.3. Data and artificial intelligence regulation
- 4.4. Digital transformation

ACTIVITIES



Assessment activity



Learning activity

 UNIT 1. MASTER CLASS				WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E																	
FORMAT	TOTAL DURATION	LOCATION	GROUP																		
In person	01h 55m	Classroom (scheduled)	Normal																		
TOPICS																					
T1																					
METHODOLOGY																					
Lecture																					

 Pre-activity quiz				WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E															
FORMAT	TOTAL DURATION	LOCATION	ASSESSMENT	WEIGHT	MINIMUM GRADE														
In person	00h 05m	Other	Progressive	5%	0														
TOPICS																			
T1 T2 T3 T4																			
METHODOLOGY																			
Online exam																			
ASSESSED OUTCOMES																			
CG5 KG1 CT2 CT3 CT5 HG2																			

 Case 1.1				WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E																	
FORMAT	TOTAL DURATION	LOCATION	GROUP																		
In person	01h 55m	Classroom (scheduled)	Normal																		
TOPICS																					
T1																					
METHODOLOGY																					
Lecture																					

 Unit 2. MASTER CLASS				WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E																	
FORMAT	TOTAL DURATION	LOCATION	GROUP																		
In person	01h 55m	Classroom (scheduled)	Normal																		
TOPICS																					
T2																					
METHODOLOGY																					
Lecture																					

 Case 2.1			WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E															
FORMAT In person	TOTAL DURATION 01h 55m	LOCATION Classroom (scheduled)	GROUP Normal															
TOPICS T2																		
METHODOLOGY Lecture																		

 Debate on the future of telecoms			WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E															
FORMAT In person	TOTAL DURATION 02h 20m	LOCATION Classroom (scheduled)	ASSESSMENT Progressive, Global	WEIGHT 6.67%	MINIMUM GRADE 5 Non-rec.													
RECOVERABLE No	JUSTIFICATION This activity assesses transversal competences that can only be observed through active participation in the debate, such as the ability to formulate judgments, argue effectively, work as part of a team, and interact with other students in real time.																	
TOPICS T2																		
METHODOLOGY Oral exam																		
ASSESSED OUTCOMES KG1 HG2 CG3 CE16 CE15 CT7 CT6 CT4 CT5 CT2 CT3 CG5 CG4																		

 Unit 3. MASTER CLASS			WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E															
FORMAT In person	TOTAL DURATION 01h 55m	LOCATION Classroom (scheduled)	GROUP Normal															
TOPICS T3																		
METHODOLOGY Lecture																		

 Case 3.1			WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E															
FORMAT	TOTAL DURATION	LOCATION	GROUP															
In person	01h 55m	Classroom (scheduled)	Normal															
TOPICS																		
T3																		
METHODOLOGY																		
Lecture																		

 Case 3.2			WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E															
FORMAT	TOTAL DURATION	LOCATION	GROUP															
In person	01h 55m	Classroom (scheduled)	Normal															
TOPICS																		
T3																		
METHODOLOGY																		
Lecture																		

— × × Debate on the future of the internet ecosystem			WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E															
FORMAT	TOTAL DURATION	LOCATION	ASSESSMENT	WEIGHT	MINIMUM GRADE													
In person	02h 20m	Classroom (scheduled)	Progressive, Global	6.67%	5 Non-rec.													
RECOVERABLE	JUSTIFICATION																	
No	This activity assesses transversal skills that can only be observed through active participation in the debate, such as the ability to formulate judgments, argue effectively, work as part of a team, and interact with other students in real time.																	
TOPICS																		
T3																		
METHODOLOGY																		
Oral exam																		
ASSESSED OUTCOMES																		
KG1 HG2 CG3 CG4 CG5 CT3 CT2 CT4 CT5 CT6 CT7 CE15 CE16																		

 Unit 4. MASTER CLASS			WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E												
FORMAT In person	TOTAL DURATION 01h 55m	LOCATION Classroom (scheduled)	GROUP Normal												
TOPICS T4															
METHODOLOGY Lecture															

 Case 4.1			WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E												
FORMAT In person	TOTAL DURATION 01h 55m	LOCATION Classroom (scheduled)	GROUP Normal												
TOPICS T4															
METHODOLOGY Lecture															

 Debate on the future of AI			WEEKS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 E												
FORMAT In person	TOTAL DURATION 02h 20m	LOCATION Classroom (scheduled)	ASSESSMENT Progressive, Global	WEIGHT 6.67%	MINIMUM GRADE 5 Non-rec.										
RECOVERABLE No	JUSTIFICATION This activity assesses transversal skills that can only be observed through active participation in the debate, such as the ability to formulate judgments, argue effectively, work as part of a team, and interact with other students in real time.														
TOPICS T4															
METHODOLOGY Oral exam															
ASSESSED OUTCOMES KG1 CG3 HG2 CG4 CG5 CT2 CT3 CT5 CT4 CT6 CT7 CE15 CE16															

Exam Unit 1, 2, 3 and 4		WEEKS														
FORMAT	TOTAL DURATION	LOCATION	ASSESSMENT	WEIGHT	MINIMUM GRADE											
In person	01h 00m	Other	Progressive, Global	70%	4											
METHODOLOGY																
Written exam																
ASSESSED OUTCOMES																
HG2 CG3 CG4 CT4 CT5 CT3 CT7 CE15 CE16 CT6 KG1																

Exam of weekly assignments		WEEKS														
FORMAT	TOTAL DURATION	LOCATION	ASSESSMENT	WEIGHT	MINIMUM GRADE											
In person	45h 00m	Other	Global, Retake (Extraordinary)	10%	5											
TOPICS																
T1 T2 T3 T4																
METHODOLOGY																
Other assessment																
ASSESSED OUTCOMES																
KG1 HG2 CG5 CT2 CT3 CT5																

Debate		WEEKS														
FORMAT	TOTAL DURATION	LOCATION	ASSESSMENT	WEIGHT	MINIMUM GRADE											
In person	02h 20m	Other	Retake (Extraordinary)	20%	5											
TOPICS																
T1 T2 T3 T4																
METHODOLOGY																
Work in group																
ASSESSED OUTCOMES																
KG1 HG2 CG3 CG4 CG5 CT2 CT3 CT4 CT5 CT6 CT7 CE15 CE16																



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Extraordinary Examination

WEEKS

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

E

FORMAT

In person

TOTAL DURATION

01h 00m

LOCATION

Other

ASSESSMENT

Retake (Extraordinary)

WEIGHT

70%

MINIMUM GRADE

5

METHODOLOGY

Written exam

ASSESSED OUTCOMES

HG2

CG3

CG4

CT4

CT5

CT7

CE15

CE16

KG1

Case 2.2

WEEKS

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

E

FORMAT

In-person

TOTAL DURATION

01h 55m

LOCATION

Classroom (scheduled)

GROUP

Normal

TOPICS

T2

METHODOLOGY

Lecture

Current Affairs News Analysis

WEEKS

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

E

FORMAT

In-person

TOTAL DURATION

03h 00m

LOCATION

Classroom (scheduled)

ASSESSMENT

Progressive

WEIGHT

5%

MINIMUM GRADE

5

TOPICS

T1

T2

T3

T4

METHODOLOGY

Individual presentation

Individual work

ASSESSED OUTCOMES

KG1

HG2

CG3

CG4

CG5

CT3

CT2

CT4

CT5

CT7

CT6

CE15

CE16

WEEKLY SCHEDULE

Assessment activity

Learning activity

•

 Week with activity

E

 Exam period

Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	E
UNIT 1. MASTER CLASS	•															
Pre-activity quiz		•	•	•	•		•	•	•		•	•				

Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	E
 Case 1.1		•														
 Unit 2. MASTER CLASS			•													
 Case 2.1				•												
 Debate on the future of telecoms						•										
 Unit 3. MASTER CLASS							•									
 Case 3.1								•								
 Case 3.2									•							
 Debate on the future of the internet ecosystem										•						
 Unit 4. MASTER CLASS											•					
 Case 4.1												•				
 Debate on the future of AI													•			
 Exam Unit 1, 2, 3 and 4																•
 Exam of weekly assignments																•
 Debate																•
 Extraordinary Examination																•
 Case 2.2					•											
 Current Affairs News Analysis		•	•	•	•		•	•	•		•	•				

ASSESSMENT CRITERIA

General criteria

Warning

The faculty may require a complementary oral evaluation of any student's assignment to validate that it has been carried out by the student without Artificial Intelligence systems.

If the faculty confirms the use of AI systems or the non-originality of the work (plagiarism), the student will automatically fail the evaluation with the result of FAIL (0 points).

Assessment criteria for the regular exam period. Progressive assessment

Assessment criteria

All students will be assessed by progressive evaluation throughout the semester.

The assessment under progressive evaluation will be as follows:

- Exam: 70%
- Debate: 20%
- Quizzes: 5%
- Analysis of current affairs news: 5%

20% of the final grade for this activity will be based on four debate sessions focused on three major topics: telecommunications, the Internet, and artificial intelligence. Working groups will be formed at the beginning of the course and will remain the same throughout the four sessions. Each group will be assigned a specific role in each activity. Within each group, every student will address a different topic related to that role. Students must prepare their part **individually** before the debate and collaborate with their team to jointly defend the assigned role. A brief support guide will be provided to assist with preparation. In addition, all sources used in preparing for the debate must be documented and submitted before the student's participation.

Quizzes will be conducted through Moodle during the first five minutes of class. They will only be graded if the student attends the corresponding session.

Activities

- Pre-activity quiz (5%)
- Debate on the future of telecoms (6.67%)
- Debate on the future of the internet ecosystem (6.67%)
- Debate on the future of AI (6.67%)

- Exam Unit 1, 2, 3 and 4 (70%)
- Current Affairs News Analysis (5%)

Assessment criteria for the regular exam period. Global assessment

Assessment criteria

Global examination

For students who have not followed the progressive evaluation, the global assessment will be carried out as follows:

- Written Exam: 70%
- Debate (oral assessment): 20%
- Written exam of weekly assignments: 10%

Debate activities are NON-RECOVERABLE and must be completed during the scheduled weeks (6, 10, and 13).

Activities

- Debate on the future of telecoms (6.67%)
- Debate on the future of the internet ecosystem (6.67%)
- Debate on the future of AI (6.67%)
- Exam Unit 1, 2, 3 and 4 (70%)
- Exam of weekly assignments (10%)

Assessment criteria for the retake (extraordinary) exam period

Assessment criteria

Extraordinary examination

The assessment under progressive evaluation will be as follows:

- Exam: 70%
- Debate: 20%
- Case's review: 10%

The evaluation will assess whether students have acquired all the course competencies. Therefore, the final assessment will take into account all the evaluation methods used during progressive assessment. Quizzes will be conducted via Moodle during the first and last five minutes of each class. Students who have already been assessed during the regular examination period and have passed the coursework evaluation may choose to retain that portion of their grade. Likewise, students who took the in-class quizzes during the regular period may opt to replace the review exam for the case studies with that activity.

Activities

- Exam of weekly assignments (10%)
- Debate (20%)
- Extraordinary Examination (70%)

RESOURCES

Web

Apuntes de clase y presentaciones del profesor

Bibliography

Tema 1 - Libros (I)

Tema 1 - Libros (II)

Tema I - Libros (III)

Web

Tema 1 - Recursos

Bibliography

Tema 2 - Artículos (I)

Tema 2 - Artículos (II)

Tema 2 - Artículos (III)

Web

Tema 2 - Recursos

Bibliography



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Tema 3 - Libros(I)

Tema 3 - Libros (II)

Tema 3 - Libros

Tema 3 - Libros (III)

Tema 3 - Libros (IV)

Tema 3 - Informes

Tema 3 - Artículos

Tema 4 - Libros (I)

Tema 4 - Libros (II)

Tema 4 - Libros (III)

Tema 4 - Informes

Tema 4 - Artículos

Tema 4 - Artículo (II)

Tema 4 - Libros (IV)



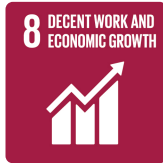
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SUSTAINABLE DEVELOPMENT GOALS



Gender Equality



Decent Work and Economic Growth



Industry, Innovation and
Infrastructure



Peace, Justice and Strong Institutions



Partnerships for the Goals