ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

43000536 - Infrastructure Financing

DEGREE PROGRAMME

04AI - Doble Master Universitario En Iccp Y En Sistemas De Ingenieria Civil

ACADEMIC YEAR & SEMESTER

2023/24 - Semester 2

Index

Learning guide

1. Description

1.1. Subject details

Name of the subject	43000536 - Infrastructure Financing
No of credits	4.5 ECTS
Type	Optional
Academic year ot the programme	Second year
Semester of tuition	Semester 4
Tuition period	February-June
Tuition languages	English
Degree programme	04AI - Doble Master Universitario en Iccp y en Sistemas de Ingenieria Civil
Centre	04 - Escuela Tecnica Superior De Ingenieros De Caminos, Canales Y Puertos
Academic year	2023-24

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Juan Gomez Sanchez	TRANSyT	juan.gomez.sanchez@upm.es	M - 09:30 - 12:30 Tu - 09:30 - 12:30
Jose Manuel Vassallo Magro (Subject coordinator)	TRANSyT	josemanuel.vassallo@upm.es	M - 08:30 - 10:30 Tu - 08:30 - 10:30
Natalia Sobrino Vazquez	TRANSyT	natalia.sobrino@upm.es	Tu - 09:30 - 12:30 Th - 09:30 - 12:30

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

3. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

The subject - recommended (passed), are not defined.

3.2. Other recommended learning outcomes

- Basic knowledge on civil engineering, economics, finance, business management and accounting.

4. Skills and learning outcomes *

4.1. Skills to be learned

MSICCE-A06 - Conocimiento del marco de regulación de los sistemas de ingeniería civil

4.2. Learning outcomes

RA1 - Formula y resuelve problemas matemáticos y numéricos avanzados de ingeniería civil, identificando sus diferentes componentes científicos y técnicos y seleccionando y acoplando con eficacia los métodos de resolución.

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

5. Brief description of the subject and syllabus

5.1. Brief description of the subject

The objectives of the course are:

- To know in detail the key challenges of financing infrastructure and public services related to civil engineering systems from the:
- Public sector point of view
- Private sector point of view
- To understand the budgetary constraints borne by many governments to promote infrastructure
- To know the role of the EU in financing large-scale infrastructure in Europe.
- To get familiar with sophisticated procurement mechanisms (specially PPPs)
- To understand how to manage the most important risks in PPP projects
- To get basic knowledge of the theory of finance
- To learn to design project finance deals
- To interact with professional people involved in real life projects through: Professional sessions, Group work.

5.2. Syllabus

1. Unit 1. Infrastructure, public services and market economy

2. Unit 2. Infrastructure financing mechanisms

3. Unit 3. Infrastructure and public deficit

4. Unit 4. Revenue, prices, fees and subsidies

5. Unit 5. EU funding and TEN-T

6. Unit 6. Concept and main characteristics of PPPs

7. Unit 7. Risk allocation

8. Unit 8. Financial evaluation of projects

9. Unit 9. Project finance

10. Unit 10. Private financing sources

11. Unit 11. Business strategy in PPP projects

6. Schedule

6.1. Subject schedule*

Week	Classroom activities	Laboratory activities	Distant / On-line	Assessment activities
1	**Units 1 and 2** Duration: 03:00 Lecture			
2	**Unit 2** Duration: 01:00 Lecture		**Professional session with external expert** Duration: 02:00 Cooperative activities	
3	**Units 3 and 4** Duration: 02:00 Lecture **Practical Assignments (Unit 3)** Duration: 01:00 Problem-solving class			
4	**Units 4 and 5** Duration: 03:00 Lecture			
5	**Units 5 and 6** Duration: 03:00 Lecture			
6	**Units 6 and 7** Duration: 03:00 Lecture			
7	**Unit 7** Duration: 01:00 Lecture		**Professional session with external expert** Duration: 02:00 Cooperative activities	
8	**Unit 7** Duration: 03:00 Lecture			
9	**Unit 8** Duration: 03:00 Lecture			
10	**Unit 8** Duration: 01:00 Lecture **Unit 9** Duration: 01:00 Lecture	**Modelling Project Finance** Duration: 02:00 Problem-solving class		
11	**Unit 9** Duration: 01:00 Lecture	**Modelling Project Finance** Duration: 02:00 Problem-solving class		

12	**Unit 9** Duration: 01:00 Lecture	**Modelling Project Finance** Duration: 02:00 Problem-solving class		
13	**Unit 10** Duration: 01:00 Lecture		**Professional session with external expert** Duration: 02:00 Cooperative activities	
14	**Unit 10** Duration: 01:00 Lecture		**Professional session with external expert** Duration: 02:00 Cooperative activities	
15	**Unit 11** Duration: 01:00 Lecture		**Professional session with external expert** Duration: 02:00 Cooperative activities	
16				**Final Exam (on-site or on-line)** Problem-solving test Final examination Presential Duration: 02:00 **Final Exam (on-site or on-line)** Problem-solving test Continuous assessment Presential Duration: 02:00
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Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

* The schedule is based on an a priori planning of the subject; it might be modified during the academic year, especially considering the COVID19 evolution.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
16	Final Exam (on-site or on-line)	Problem-solving test	Face-to-face	02:00	60%	3.5 / 10	MSICCE-A06

7.1.2. Global examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
16	Final Exam (on-site or on-line)	Problem-solving test	Face-to-face	02:00	100%	5 / 10	MSICCE-A06

7.1.3. Referred (re-sit) examination

No se ha definido la evaluación extraordinaria.

7.2. Assessment criteria

Evaluation through Continuous Assessment

EM1. Attendance and participation in class 10%

Description: The student participation during the lectures, assignments and professional sessions (either face to face or on-line) will be assessed in both a quantitative and a qualitative way.

Evaluation criteria: The teacher will grade the students on the basis of their participation and interest.

Place and period: In class, throughout the course.

EM2. Reading tests and take-home assignments 20%

Description: Reading tests and take-home assignments about theoretical or practical aspects will be required over the course.

Evaluation criteria: Each assignment will be graded from 0 to 10. The final grade will be the arithmetic mean of all exercises done during the course.

Place and period: throughout the course.

EM3. Group work 20%

Description: This work consists of producing a report about a subject related to the contents of the course in groups of around five students. the students will have to make a presentation of the report to a jury.

Evaluation criteria: The paper and the presentation will be graded from 0 to 10 on the basis on the quality of the report and the presentation, as well as the effort of the members of the group.

Place and period: throughout the course.

EM4. Final exam 60%

Description: The final exam will include both theoretical questions and practical exercises related to the topics taught throughout the course.

Evaluation criteria: The exam will be graded from 0 to 10.

Place and period: To be determined by the Head of Studies.

If the exam is to be taken online, the operational details of the computer requirements, how to get the exercises to the students and how to submit their answers will be clearly set out in the examination note, which will be available in Moodle well in advance.

Result of the evaluation through continuous assessment

The final grade will be the highest of the following:

- EM1 (15%), PE2 (15%), EM3 (20%) and EM4 (60%), provided that the student got at least 3.5 points out of 10 in EM4. The grade cannot be higher than 10.

- EM4 (100%), this is the grade obtained by the student in the final exam only method described afterwards.

The student will pass the subject if the final grade is equal to or higher than 5.

Those students who got a grade lower than 5 in the ?continuous assessment procedure? will not pass, but they will have another opportunity in the ?extraordinary exam?, which will have similar characteristics as the evaluation ?final exam only?.

Evaluation through Final exam only

Description: The exam will be the same final exam done by the students under continuous assessment (EM4).

Evaluation criteria: Each exercise will be graded from 0 to 10.

Place and period: To be determined by the Head of Studies.

If the exam is to be taken online, the operational details of the computer requirements, how to get the exercises to the students and how to submit their answers will be clearly set out in the Examination Note, which will be available in Moodle well in advance.

Result of the evaluation through final exam only.

The final grade will be the one obtained by the student in the final exam.

The subject will be passed if the final grade is equal to or higher than 5.

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
Book 1	Bibliography	Izquierdo, R. y Vassallo, J.M. (2004) Nuevos sistemas de gestión y financiación de Infraestructuras de transporte. Colección Seinor 35. Colegio de Ingenieros de Caminos, Canales y Puertos.

Book 2	Bibliography	Vassallo, J.M. e Izquierdo, R. (2010). Iniciativa pública y participación privada: conceptos y experiencia en América y España. CAF. Banco de Desarrollo de América Latina.
Book 3	Bibliography	Vassallo, J.M. (2015). Asociación Público Privada en América Latina: Aprendiendo de la Experiencia. CAF. Banco de Desarrollo de América Latina.
Book 4	Bibliography	Finnerty, J.D (1996) Project Financing: Asset-based Financial Engineering. John Wiley and Sons, Inc., New York.
Book 5	Bibliography	Gómez-Ibáñez, J.A. (2003). Regulating Infrastructure. Monopoly, Contracts, and Discretion. Harvard University Press. Cambridge, Massachusetts.
Book 6	Bibliography	Yescombe, E.R. (2007) Public-Private Partnerships: Principles of Policy and Finance. Butterworth-Heinemann, Oxford (UK)
Book 7	Bibliography	Tirachini, A., Hörcher, D., & Verhoef, E. (Eds.). (2023). Handbook on Transport Pricing and Financing. Cheltenham, UK: Edward Elgar Publishing.

9. Other information

9.1. Other information about the subject

The course analyses sustainable development goals 8, 9, 10 and 12.