DISCIPLINE RECORD
Academic year 2026/2027

1. Information about the program

University	Constanta Maritime University
Faculty	Navigation and Maritime Transport
Department	Management in Transport
Domain of study	Engineering and Management
Academic level	Master
Study programme/ qualification	Business Administration in Transport

2. Information about discipline

Course title	Infrastructure Planning and Management					
Lecture tenured	Assoc. Prof. Șerban BERESCU PhD					
Application tenured	Assoc. Prof. Șerban BERESCU PhD					
Year of study	VI	Semester	I	Type of examination	E	
Conditions of discipline	Course category: DF – Fundamental subjects, DS – Specialization subjects, DC – Complementary subjects					DS
	Course type: DOB – compulsory subjects; DOP – elective subjects; DFA – optional subjects					DOB

3. The total time estimated

I a) Number of hours per week	4	Course	2	Seminar	2	Laboratory		Project	
I b) Total hours per semester from the curriculum	56	Course	28	Seminar	28	Laboratory		Project	

II Time distribution for the semester:	ore
II a) Study after manual, course support, bibliography and notes	30
II b) Additional documentation in library, specialized electronic platforms	19
II c) Training seminars / labs, homework, essays, portfolios and essays	20
III Tutorial	
IV Examinations	2
V Other activities:	

Total hours of individual study II (a+b+c)	69
Total hours per semester (Ib+II+III+IV+V)	127
Number of credits	5

4. Prerequisites (if necessary)

Curriculum	•
Expected learning outcomes	• Ability to analyse and interpret the structure and functionality of transport infrastructure networks. • Use of strategic planning methods in infrastructure development (master plans, regional development strategies). • Evaluation of infrastructure performance using quantitative and qualitative indicators. • Substantiation of investment decisions in transport infrastructure (financial and economic analysis at both macro and micro level). • Integration of smart infrastructure concepts, digitalization and intelligent network management.

5.Conditions (if necessary)

Progress of the course		• Powerpoint presentation, Lecture and Case studies
Progress of application	Seminar	• Questions and Answers, Case Studies
	Laboratory	•
	Project	•

6.Objectives of discipline (based on the grid of specific skills acquired – no7)

The overall objective of discipline	• **"Infrastructure Planning and Management"** is to equip students of the *Master in Business Administration in Transport* with the knowledge and skills needed to **analyze, plan and manage transport infrastructure systems** in an efficient, sustainable and economically sound manner, by integrating strategic planning tools, performance evaluation, investment decision-making and modern concepts of smart, digitalized infrastructure within multimodal transport networks.
The specific objectives of discipline	• **Develop the ability to analyse and interpret the structure and functionality of transport infrastructure networks** (road, rail, maritime, inland waterway, air and intermodal). • **Familiarise students with methods and tools of strategic planning** used in infrastructure development, including transport master plans and regional development strategies. • **Enable students to evaluate the performance of transport infrastructure** using appropriate quantitative and qualitative indicators (capacity, level of service, accessibility, reliability, safety, sustainability). • **Provide the necessary knowledge to substantiate investment decisions in transport infrastructure**, based on financial and economic analysis at both macro and micro level (cost–benefit analysis, risk and sensitivity analysis). • **Promote the integration of smart infrastructure concepts**, including digitalization, intelligent transport systems (ITS) and data-driven management of infrastructure networks. • **Develop the capacity to assess environmental and social impacts** of infrastructure projects and to integrate sustainability principles into infrastructure planning and management. • **Strengthen students' skills in working with real case studies and projects**, by analysing and designing solutions for improving or developing transport infrastructure in different contexts. • **Improve communication and teamwork abilities** by requiring students to prepare and present infrastructure planning projects and to justify their proposed solutions in front of peers and decision-makers.

7. Expected learning outcomes:

No.	Knowledge	Skills	Responsibility and autonomy
1	The student understands techniques for financial risk assessment.	The student analyzes internal organizational processes.	The graduate independently proposes risk mitigation strategies.
2	The student is aware of trends and innovations in the transport sector.	The student conducts qualitative and quantitative market research.	The graduate leads initiatives to improve the quality of transport services.
3	The student masters ICT solutions applicable to business problems.	The student advises on strategic business decisions based on data analysis.	The graduate assumes responsibility for implementing ICT innovations.
4	The student comprehends organizational behavior and needs analysis.	The student builds and maintains effective business relationships.	The graduate identifies and reports previously undetected organizational needs.
5	The student knows the principles of financial performance evaluation.	The student accurately interprets complex financial statements.	The graduate manages financial risk with autonomy.
6	The student analyzes external factors impacting the business environment.	The student performs SWOT and PESTEL analyses.	The graduate recommends innovations in current business practices.

7	The student understands quality assurance standards in transport services.	The student ensures compliance with quality and safety metrics.	The graduate is responsible for continuous service quality improvement.
8	The student has knowledge of project management methodologies.	The student applies modern economic and decision-making techniques.	The graduate initiates and manages projects with minimal supervision.
9	The student is knowledgeable about ethical principles in engineering management.	The student communicates technical information clearly to diverse audiences.	The graduate promotes ethical and social responsibility in professional practice.
10	The student masters techniques for data acquisition and processing.	The student evaluates business performance through financial indicators.	The graduate takes responsibility for continuous professional development.

8. Competences covered by the discipline, according to the diploma supplement

Professional competences	• Provides advice on efficiency improvements • Analyzes external factors affecting companies • Adapts to changing situations • Exercises results-oriented leadership towards colleagues • Assesses financial viability • Ensure project management • Ensures continuous training for audits • Focuses on innovation in current practices • Plans transport operations
Transversal competences	• Create risk reports • Seek innovation in current practices • Propose ICT solutions to business problems

9.Contents

Course	Nr. hours	Teaching methods	Obs.
• C1 Introduction to infrastructure in transport	2	Powerpoint Presentation / Lecture	
• C2 Planning in transport infrastructure	2	Powerpoint Presentation / Lecture	
• C3 Transport programming and budgeting	2	Powerpoint Presentation / Lecture	
• C4 Infrastructure strategies in transport	2	Powerpoint Presentation / Lecture	
• C5 Infrastructure planning concepts	2	Powerpoint Presentation / Lecture	
• C6 Planning of major infrastructure projects	2	Powerpoint Presentation / Lecture	
• C7 Financial analysis of transport infrastructure	2	Powerpoint Presentation / Lecture	
• C8 Economic analysis of transport infrastructure	2	Powerpoint Presentation / Lecture	
• C9 Aspects of planning in transport infrastructure	2	Powerpoint Presentation / Lecture	
• C10 Public involvement in infrastructure projects	2	Powerpoint Presentation / Lecture	
• C11 Introduction to infrastructure management	2	Powerpoint Presentation / Lecture	
• C12 Role of human resources in management systems	2	Powerpoint Presentation / Lecture	
• C13 Assets management process	2	Powerpoint Presentation / Lecture	
• C14 Optimization and decission making for infrastructure management	2	Powerpoint Presentation / Lecture	

Bibliography

- Rodrigue J.-P., Comtois C., Slack B. *The Geography of Transport Systems.* Taylor & Francis; Abingdon, UK: 2016.
- Liu J., Mooney H., Hull V., Davis S.J., Gaskell J., Hertel T., Lubchenco J., Seto K.C., Gleick P., Kremen C., et al. Systems integration for global sustainability. *Science.* 2015
- Chen Z., Haynes K.E. *Socioeconomic Environmental Policies and Evaluations in Regional Science.* Springer; Berlin, Germany: 2017
- Doyle M.W., Havlick D.G. Infrastructure and the environment. *Annu. Rev. Environ. Resour.* 2009
- Tasic I., Porter R.J. Modeling spatial relationships between multimodal transportation infrastructure and traffic safety outcomes in urban environments. *Saf. Sci.* 2016
- Camp J., Abkowitz M., Hornberger G., Benneyworth L., Banks J.C. Climate change and freight-transportation infrastructure: Current challenges for adaptation. *J. Infrastruct. Syst.* 2013

- Müller D.B., Liu G., Løvik A.N., Modaresi R., Pauliuk S., Steinhoff F.S., Brattebø H. Carbon emissions of infrastructure development. *Environ. Sci. Technol.* 2013
- Cohen J.P. The broader effects of transportation infrastructure: Spatial econometrics and productivity approaches. *Transp. Res. Part E Logist. Transp. Rev.* 2010
- Correia A.G., Winter M.G., Puppala A.J. A review of sustainable approaches in transport infrastructure geotechnics. *Transp. Geotech.* 2016
- Durango-Cohen P.L., Sarutipand P. Capturing interdependencies and heterogeneity in the management of multifacility transportation infrastructure systems. *J. Infrastruct. Syst.* 2007
- Grimsey D., Lewis M.K. Evaluating the risks of public private partnerships for infrastructure projects. *Int. J. Proj. Manag.* 2002
- Flyvbjerg B. What you should know about megaprojects and why: An overview. *Proj. Manag. J.* 2014
- Flyvbjerg B. *The Oxford Handbook of Megaproject Management.* Oxford University Press; Oxford, UK: 2017
- Lakshmanan T.R. The broader economic consequences of transport infrastructure investments. *J. Transp. Geogr.* 2011

Selective bibliography

- Course notes available on the platform campus.cmu-edu.eu
- Hudson, W. R., Haas, R., & Uddin, W. (2015). *Infrastructure Management: Integrating Design, Construction, Maintenance, Rehabilitation, and Renovation*.
  – Introducere solidă în managementul infrastructurii, cu accent pe ciclul de viață.
- Grigg, N. (2019). *Infrastructure Asset Management*. Wiley.
  – Axat pe managementul activelor de infrastructură (inventar, condiție, nivel de serviciu, planuri de investiții).
- Li, Z. (2019). *Transportation Asset Management: Methodology and Applications*. CRC Press.
  – Detaliază metodologii cantitative și calitative pentru managementul activelor de transport, prioritizare, modelare a performanței. Taylor & Francis+2Routledge+2
- AASHTO (2020). *Transportation Asset Management Guide – A Focus on Implementation*, 2nd ed.
  – Ghid practic, foarte utilizat de agențiile de transport, pentru implementarea proceselor de asset management. Federal Highway Administration+1
- Open Textbook: *Fundamentals of Infrastructure Management*.
  – Manual gratuit care acoperă concepte generale de management de infrastructură și exemple pe drumuri. Open Education
- Siminică, M., & colab. (sau alte surse românești de management / managementul resurselor umane) – pentru C12 (Rolul resurselor umane) poți folosi un manual standard de Managementul resurselor umane + articole specifice despre HR în sectorul transporturilor.

Application (Seminar / laboratory / project)	Nr. hours	Teaching methods
• Transport programming and budgeting	4	Questions / Answers & Case studies
• Financial analysis of transport infrastructure	4	Questions / Answers & Case studies
• Economic analysis of transport infrastructure	4	Questions / Answers & Case studies
• Aspects of planning in transport infrastructure	4	Questions / Answers & Case studies
• Role of human resources in management systems	4	Questions / Answers & Case studies
• Assets management process	4	Questions / Answers & Case studies
• Optimization and decission making for infrastructure management	4	Questions / Answers & Case studies

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- Liu J., Mooney H., Hull V., Davis S.J., Gaskell J., Hertel T., Lubchenco J., Seto K.C., Gleick P., Kremen C., et al. Systems integration for global sustainability. *Science.* 2015
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- Seminar notes available on the platform campus.cmu-edu.eu
- Hudson, W. R., Haas, R., & Uddin, W. (2015). *Infrastructure Management: Integrating Design, Construction, Maintenance, Rehabilitation, and Renovation*.
  – Introducere solidă în managementul infrastructurii, cu accent pe ciclul de viață.
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Additional Notes

- Students may take photographs or make audio-video recordings in classrooms where teaching activities are conducted **only with the consent of the instructor** and **under the conditions established by the instructor**.
- Upon entering the classroom, students are kindly requested to **switch their mobile phones to silent mode** and **refrain from using them during classes**.
- All materials received by students, either directly or through postings on the platform *campus.cmu-edu.eu*, are subject to **national and international copyright legislation**. These materials may be used by students **solely for educational purposes**. Any other use or posting on publicly accessible websites without the consent of the copyright holder may be punished in accordance with **Law no. 8/1996 on copyright and related rights** and the **Berne Convention**.

10. The corroboration of contents of discipline with expectations epistemic community representatives, professional associations and representative employers in the corresponding program

- At the level of the **epistemic and academic community**, the discipline reflects current research directions and good practices in transport infrastructure planning, integrating topics such as strategic and operational planning of transport networks, multi-criteria decision-making, cost–benefit analysis, project financing and public–private partnerships, transport infrastructure asset management, sustainability and resilience of infrastructure systems.
- In relation to **professional associations** (in transport, logistics, infrastructure management, project management), the discipline addresses competencies considered essential for graduates: the ability to understand and apply infrastructure planning methodologies, to perform economic and financial evaluation of projects, to use modern tools for infrastructure asset management, to integrate sustainability, safety and social responsibility into decision-making processes, and to communicate effectively with public authorities, operators, investors and communities.
- From the perspective of representative employers (public authorities responsible for transport infrastructure, transport operators, logistics companies, consulting and engineering firms, project developers and financial institutions), the discipline responds to the need for specialists capable of:
- analysing and planning transport infrastructure at network and project level;
- participating in the preparation and evaluation of infrastructure investment programs;
- contributing to the management of infrastructure assets throughout their life cycle;

- supporting decision-making processes through rigorous economic, financial and risk analyses;
- working in interdisciplinary teams and interacting with stakeholders, including in public consultation processes.

11.Examination

Type of activity	Examination Criteria	Methods of examination	Percentage of final grade
Course	• Level of assimilation of speciality language and communiucations capability • Fulfilment and correctness of speciality objectives • Logical coherence, fluency, expresivity and verbal reasoning • Capability of operating using specialty aquired knowledge in complex intelectual activities	Written examination	80%
Seminar	• Capability of practical application in different scenarios of the aquired knowledge • Analysing capability, own interpretation, originality, creativity	Evaluation during classes	20%
Laboratory	-		
Project	-		

Minimum performance standards

- Understanding of the specific terminology used into infrastructure planning and management process
- Practical application of the infrastructure planning and management

Grading Requirements

Minimum score required: 50 points: 50-54->nota 5; 55-64-> nota 6; 65-74-> nota 7; 75-84-> nota 8; 85-94-> nota 9; 95-100-> nota 10

Additional Notes

- A midterm exam may be organized during the semester.
- If a student participates in conferences (student, local, national, or international) or competitions (national or international) related to the subject of this course, they may receive additional points or equivalence for certain assignments, papers, and/or attendance, depending on the results obtained.
- During written examinations, students are not allowed to use mobile phones or any other electronic devices, except for simple scientific calculators.

Minimum performance standards

- Basic understanding of key concepts
- Elementary application of planning tools and methods
- Introductory financial and economic analysis skills
- Awareness of stakeholders and public involvement
- Basic understanding of infrastructure management and asset management
- Introductory decision-making and optimisation notions
- Minimum requirements in course activities and assessment

Date of completion	Signature of lecture tenured	Signature of application tenured
22.09.2025	Assoc. Prof. Șerban BERESCU PhD	Assoc. Prof. Șerban BERESCU PhD

Date of approval in the department	Signature of Director of Department
26.09.2025	Lecturer Ana Cornelia OLTEANU PhD

Date of approval in the faculty council	Signature of Dean
29.09.2025	Associated Professor Nicoleta ACOMI EngD