

(B) Course information in english

General course information:

Course title:	Design and Operation of Railway Transportation Systems	Course code:	ΣY1112	
Credits:	6	Work load (hours):	130	
Course level:	Undergraduate	p	Graduate	--
Course type:	Mandatory	--	Selective	p
Course category:	Basic	--	Orientation	p
Semester:	9 th	Hours per week:	4	
Course objectives (capabilities pursued and learning results):				
The objective of the course is to provide knowledge about railway transportation systems and particularly in the scientific areas of railway vehicles guidance, wheel rail interaction, railway track elements, infrastructure and design, railway facilities, rolling stock, technical and commercial railway operators, railway safety, and the European policy in rail transport.				
Prerequisites:				
<ul style="list-style-type: none">• Elements of Structural Analysis• Elements of Soil Mechanics• Elements of Road Construction Engineering				

Instructor's data:

Name:	Panagiotis Lemonakis
Level:	Teaching Staff
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Other tutors:	-

Specific course information:

Week No.	Course contents	Hours	
		Course attendance	Preparation
1	Railway and its capabilities. The railway transport system and its historical evolution.	4	1
2	Railway guidance principles. Power vehicles, diesel and electric traction.	4	1
3	Wheel rail interaction.	4	1
4	Railway track elements.	4	1
5	Railway track infrastructure.	4	1
6	Railway track design.	4	1
7	Technical railway track projects. Railway tunnels, railway bridges, embankments, trenches, draining, noise barriers and fences.	4	1
8	Railway facilities. Traffic signaling, railway electrification system, railway level crossings, railway lines, switches and crossings.	4	1
9	Rolling stock. Design, construction and operation of rolling stock. Derailment of railway vehicles.	4	1
10	High-speed trains. Tilting trains. Urban and suburban railway systems. Rack railway.	4	1
11	Elements of technical railway operators. Train traffic management and traffic capacity.	4	1
12	Elements of commercial rail operators. Railway stations, organization and management of passenger and freight rail transport, mixed train traffic control, and the effects in the design and operation of railway transport systems.	4	1
13	Railway safety. European policy in rail transport. Interoperability technical specifications.	4	1
14	Course Review	4	3

Additional hours for:			
Class project	Examinations	Preparation for examinations	Educational visit
40	3	15	-

Suggested literature:

- Railway Transportation Systems: Infrastructure, Rolling Stock, Exploitation, Pyrgidis C., Ziti Publications, 2009 (in Greek).
- Actions on Railway Tracks, Giannakos K., Papazisis Publishers, 2002, (in Greek).
- Railway Management and Engineering, 4th Edition, Profillidis, V.A., Ashgate-Publishing Group, Aldershot Brookfield USA, Hong Kong, Singapore, Sydney, 2014.
- Railway Engineering, 2nd Edition, Profillidis, V.A., Ashgate-Publishing Group, Aldershot Brookfield USA, Hong Kong, Singapore, Sydney, 2000.
- Modern Railway Track, 2nd Edition, C. Esveld, MRT-Productions, The Netherlands, 2001.
- Railway Engineering, Satish Chandra, M.M. Agarwal, Oxford University Press, 2007.

Teaching method (*select and describe if necessary - weight*):

Teaching	β	80%
Seminars	--%
Demonstrations	--%
Laboratory	--%
Exercises	β	20%
Visits at facilities	--%
Other (<i>describe</i>):	--%
Total		100%

Evaluation method (<i>select</i>)- weight:				
	<u>written</u>	<u>%</u>	<u>Oral</u>	<u>%</u>
Homework	--		--	
Class project	p	10	p	10
Interim examination	--		--	
Final examinations	p	80	--	
Other (<i>describe</i>):	--		--	