



GRADUATE STUDY: **TRANSPORT**

SEMESTER (III)

Syllabus

Academic year 2023/2024

Course: Ropeway Transport Technology				
Head of course: Assoc. Prof. Mladen Nikšić , Ph.D. Asst. Prof. Martin Starčević , Ph.D.				
Co-lecturers:				
Semester: III	Course code: 126049	Lectures: 30	Seminars: 15	ECTS credits: 3
Group for lectures: 5 - 8 students			Group for seminar exercises: 5 - 8 Students	

Objective of the course:

- Acquisition and refining of knowledge about ropeway transport technology
- Planning and selection of optimal ropeway system using a set of parameters and criteria
- Defining conditions and criteria for safety exploitation and maintenance of ropeway systems within the legal framework

Learning outcomes:

After the completion of the course the students will be able to:

1. Describe the characteristics and select an optimal model of the ropeway system
2. Specify and explain safety risks during the exploitation and maintenance of ropeway systems
3. How to apply the appropriate model for solving problems regarding exploitation and maintenance of ropeway systems



LECTURES and SEMINARS

Week	Syllabus	Form of classes	Performed by	Lessons	Remark
1.	▪ Historical development of ropeways	L	Mladen Nikšić	2	
	▪ Defining the life cycle of ropeways	S	Mladen Nikšić	1	
2.	▪ Types of ropeway and funicular	L	Mladen Nikšić	2	
	▪ Calculation of deterioration index of ropeways.	S	Mladen Nikšić	1	
3.	▪ Importance and dimension of ropeway transport	L	Mladen Nikšić	2	
	▪ Calculation of ropeway traction characteristics.	S	Mladen Nikšić	1	
4.	▪ Importance of ropeways regarding transport and geographical issues	L	Mladen Nikšić	2	
	▪ Determination of safety features of the ropeway system	S	Mladen Nikšić	1	
5.	▪ The ropeway transport system in the Republic of Croatia and worldwide	L	Martin Starčević	2	
	▪ Ropeway transport condition	S	Martin Starčević	1	



6.	▪ Technical features of ropeways.	L	Martin Starčević	2	
	▪ Headways and running time calculation	S	Martin Starčević	1	
7.	▪ Safety conditions of ropeway transport	L	Mladen Nikšić	2	
	▪ Ropeway service realization process	S	Mladen Nikšić	1	
8.	▪ Ropeway legislation	L	Martin Starčević	2	
	▪ Connections between ropeway and road transport	S	Martin Starčević	1	
9.	▪ Exploitation and maintenance of ropeways and funiculars	L	Mladen Nikšić	2	
	▪ Defining of parking area capacity respecting the ropeway capacity	S	Mladen Nikšić	1	
10.	▪ The technical performance of ropeway	L	Martin Starčević	2	
	▪ Preventive inspection and regular repairs of ropeways	S	Martin Starčević	1	
11.	▪ Infrastructural facilities and installations	L	Martin Starčević	2	



	<ul style="list-style-type: none">Reliability of ropeways	S	Martin Starčević	1	
12.	<ul style="list-style-type: none">Capacity assessment of ropeway line	L	Mladen Nikšić	2	
	<ul style="list-style-type: none">Fault tree analysis (FTA) of the ropeway system	S	Mladen Nikšić	1	
13.	<ul style="list-style-type: none">Compatibility of ropeways and other modes of transport	L	Martin Starčević	2	
	<ul style="list-style-type: none">Fault tree analysis (FTA) of the ropeway system	S	Martin Starčević	1	
14.	<ul style="list-style-type: none">Development of new ropeway systems.	L	Martin Starčević	2	
	<ul style="list-style-type: none">Fault tree analysis (FTA) of the ropeway system	S	Martin Starčević	1	
15.	<ul style="list-style-type: none">Development of new ropeway systems in urban areas	L	Martin Starčević	2	
	<ul style="list-style-type: none">Event tree analysis of ropeway system	S	Martin Starčević	1	

L = Lectures; AE = Auditory Exercises; LE = Laboratory Exercises; S = Seminars





STUDENT OBLIGATIONS AND EXAMS

Conditions for obtaining signatures:

Attendance is mandatory and students are required to attend at least 70% of the classes. In addition, at the end of the course students are required to write and present their seminar paper and to pass written and oral examination.

LITERATURE

a) Obligatory literature:

1. Težak, S., Mavrin, I., Jurić, I.: Influence of modern ropeways on the development of mountain tourist centres, *Promet – Traffic – Traffico*, Vol. 17, No. 5, 2005, pp. 245-251
2. Toš, Z.: Analiza utjecaja vanjskih elemenata na pouzdanost žičare "Sljeme" (Analysis of impact of external elements on the Sljeme ropeway reliability), *Suvremeni promet*, Vol. 10, No. 3, 1988, pp. 275-278
3. Machon, P., Dingsdale, A.: Public transport in a socialist capital city: Budapest, *Geography*, Vol. 74, No. 2, 1989, pp. 159-162
4. Težak, S., Toš, Z., Jurić, I.: Reliability Analysis of Operation for Cableways by FTA (Fault Tree Analysis) Method, *Promet-Traffic-Transportation*, Vol. 22, No. 3, 2010, pp. 163-173
5. Težak, S.: Model sustava žičarskog prometa u Sloveniji (Model of the cableway transport system in Slovenia), Ph.D. thesis, University of Zagreb, Faculty of transport and traffic sciences, Zagreb, 2009
6. Doppelmayr, A.: Denkanstöße zur Funktionserfüllung von Einseilumlaufbahnen, Projektierung und Konstruktion im Sicherheitsregelkreissystem, basierend auf der Analyse von Vorfällen, Wolfurt, 1997
7. Ambrish Jha: Ropeways opportunities waiting to be tapped, <http://www.dare.co.in/opportunities/other-business-opportunities/ropeways-opportunities-waiting-to-be-tapped.htm>

b) Recommended literature:

1. Löhr, M-O: Simulation der Stationseinfahrt kuppelbarer Einseilumlaufbahnen, Technische Universität München, München, 2002.
2. Günthner, W, A: Seilbahntechnik, Technische Universität München, München, 1999





METHODOLOGY OF THE IMPLEMENTATION OF THE COURSE PLAN

1. LECTURES

Lectures accompanying material exposed in authorized materials and in the required and supplemental literature, and performed using PowerPoint.

2. SEMINARS

Seminars are performed in a way to include students to research on its own specific subjects.





3. DOCUMENTATION

The attendance list is signed by students prior to every lecture and kept electronic records of presence in lectures.

4. SCORING SYSTEM

Table 1 The scoring system for the monitoring of students and explained credit values in ECTS credits

no	Segment:	Required credits to be achieved:		Remark:	ECTS credits
		Min.	Max.		
1.	Presence in lectures	10	20		1
2.	Seminar paper (mandatory)	10	20		1
3.	Oral exam	10	20		1
Σ	Overall points	30	60	Overall ETCS points	3





Table 2 - Explanation of the credit values in evaluations

CREDITS:	Estimate based on attendance, seminar paper and oral exam	The final score [3 ECTS]:
30 - 37	Sufficient (2)	
38 - 45	Good (3)	
46 - 53	Very good (4)	
54 - 60	Excellent (5)	

CURRICULUM VITAE

Mladen Nikšić was born on July 1, 1964 in Zagreb. In 1994, he graduated from the Faculty of Transport and Traffic Sciences, University of Zagreb and obtained his Master's Degree in Railway Engineering Technology. Since 1995, he has been working as Assistant, currently as Assistant Professor, at the Railway Technical Department, Faculty of Transport and Traffic Sciences, University of Zagreb. In 2003, he completed his scientific postgraduate studies and obtained the title of Magister of Science in the field of Railway Technology. In 2010, he defended his PhD thesis entitled "Maintenance Quality Impact on Rolling Stock Life Cycle" and obtained the title of Doctor of Science. Since July 2013 he is a scientific advisor.

Martin Starčević was born on December 9th 1979, in Zagreb. In 1998 he enrolled at the Faculty of Transport and Traffic Sciences, where he earned the academic title Bachelor of Engineering in 2005. Since 2007, he is an employee of the Faculty of Transport and Traffic Sciences where he defended his doctoral dissertation in 2015 titled: Level Crossings Risk Assessment Model. Since July 2018, he is an assistant professor.

