DESCRIPTION OF A STUDY COURSE – SYLLABUS

Title of a course	**Railroad Transport Infrastructure**				
Head of course	**Hrvoje Kostelić, Lecturer**				
Study programme	**Professional undergraduate study Railroad Transport**				
Status of a course	Obligatory				
Year of study	3.	**Semester**	V	**ECTS credits**	3
Teaching plan (L + E + S+ Pr)	1+0+1+0				

Goals of a course

Introduce students to the elements of railway infrastructure and the organization of the railway system in the Republic of Croatia.

Conditions for enrolling course

No conditions

Learning outcomes on a level of a study programme which includes course

Outcome 2: Apply legislation in the field of railroad transport.
Outcome 3: Use standards that cover the subject area when designing transport projects and implementing technological and service processes in the field of railroad transport.
Outcome 5: Evaluate railroad transport safety factors.
Outcome 6: Distinguish between entities and their powers in the field of railroad transport.
Outcome 8: Recommend effective solutions for railroad transport system planning based on sustainable development principles.
Outcome 12: Participate in the development of professional projects in railroad transport.
Outcome 14: Independently present professional content on oral, written and graphical basis using the usual tools in Croatian and/or foreign language.

Expected learning outcomes on a level of a course

1. Describe the terminology and legislation in the field of railroad transport and railroad infrastructure
2. Recommend the basic elements for the design of a railroad route project.
3. Explain the basic elements of the upper course of railroads.
4. Explain the basic elements of railroad structures.
5. Analyse railroad stations and railroad station facilities, and other official facilities
6. Research and present a selected topic from the field of railroad transport and railroad infrastructure

Content of a course

General principles of railway route designing. Route constructive elements and railway route designing. Calculation of the track bed structure (Schram, Winkler, V.M.E., Zimmerman, Jeahn). Categorization of railways. Elements of the track bed structure. Rails (function and production). Sleepers (role and manufacture). Gauge ballast bed. Gauge equipment. Gauges. Switches. Crossings. Turntables and gearings. Track substructure elements. Building along the rail. Rail basic construction. Supporting and coating walls. Water drainage. Rail draining and protective ditches. Subbase layer. Slopes. Land-slides. Drainage. Culverts. Tunnels. Galleries. Bridges. Categorization f bridges. Railway stations (equipment; classification and types of railway stations and other official places where railway transport takes place). Rail protection – biological-technical protection, eco-protection. Protection structures (windbreaks, snowbreaks). Protection of environment against noise caused by trains. Biological protection.

Teaching modes	☒ lectures ☐ auditory exercises ☒ seminars and workshops ☐ distance learning ☐ field classes	☒ individual assignments ☐ multimedia and network ☐ laboratory ☐ supervisor's work ☐ other _____
Comments		

Students' obligations

Fulfil obligations in accordance with the Rules of Study and Rules on the assessment of students.

Grading, evaluation and monitoring of students' work continuously during lectures and exams

Grading is based upon evaluation of course's learning outcomes' adoption. Grading is performed continuously during lectures and/or during exam, in compliance with the provisions of Regulation on the assessment of students.

Continuous check-up:

Outcomes	Pre-exam I	Pre-exam 2	Seminar work	Threshold	Max
Outcome 1	10%			5%	10%
Outcome 2	15%			7,5%	15%
Outcome 3	15%			7,5%	15%
Outcome 4		20%		10%	20%
Outcome 5		20%		10%	20%
Outcome 6			20%	10%	20%
Percentage of ECTS	1,2	1,2	0,6		3
Total	40%	40%	20%	50 %	100 %

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

Exam term:

Outcomes	Written exam	Oral exam	Max
Outcome 1	5%	5%	10%
Outcome 2	10%	5%	15%
Outcome 3	10%	5%	15%
Outcome 4	10%	10%	20%
Outcome 5	10%	10%	20%
Outcome 6	15%	5%	20%
Percentage of ECTS	1,8	1,2	3
Total	60%	40%	100 %

A student has passed the exam if he has acquired a percentage of credits for each learning outcome higher or equal to defined threshold.

Grading:

A student has passed the exam if he has acquired at least 50% of anticipated credits of a specific learning outcome. If a student has passed learning outcomes of all courses, the accomplished credits (percentages) of all passed learning outcomes are being added, while the final grade is defined upon following table:

Range of credits (percentages)	Numerical grade	ECTS grade
90,00 – 100,00	Excellent (5)	A
75,00 – 89,99	Very good (4)	B
60,00 – 74,99	Good (3)	C
50,00 – 59,99	Sufficient (2)	D
0,00 – 49,99	Insufficient (1)	F

Obligatory literature

1. Kostelić, H.:Infrastruktura željezničkog prometa,Skripta za int.uporabu, Veleučilište Rijeka 2007.
2. Stipetić, A.: Gornji ustroj željezničkog kolosijeka, FPZ Zagreb, 2008.
3. Stipetić, A.: Infrastruktura željezničkog prometa, FPZ Zagreb, 1999.
4. Stipetić, A.: Željeznički kolodvori, FPZ Zagreb, 1995.
5. Stipetić, A.: Kolodvori i kolodvorska postrojenja, FPZ Zagreb, 2002.

Additional literature
1. Prister, G.: Pollak, B.: Željeznice – gornji ustroj i specijalne željeznice, FGZ Zagreb 1988. 2. Marušić, D.: Projektiranje i građenje željezničkih pruga, GF Split, 1994. 3. Zakon o željeznici, NN 93/14. 4. Razvrstavanje željezničkih pruga, NN 3-14. 5. Pravilnik o željezničkoj infrastrukturi 6. Pravilnik o tehničkim uvjetima za sigurnost željezničkog prometa kojima moraju udovoljavati željezničke pruge NN 128/08