DESCRIPTION OF A STUDY COURSE – SYLLABUS

Title of a course	**Railway Vehicles in Railroad Transport**				
Head of course	**Hrvoje Kostelić, Lecturer**				
Study programme	**Specialist professional graduate study Transport**				
Status of a course	Obligatory				
Year of study	2.	**Semester**	III	**ECTS credits**	6
Teaching plan (L + E + S+ Pr)	2+0+2+0				

Goals of a course

Getting acquainted with the types of vehicles in rail transport, and the maintenance of railway vehicles and railway infrastructure.

Conditions for enrolling course

No conditions

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

Outcome 6: Create models of exploitation and maintenance of technical equipment in the transport system.
Outcome 7: Select information technology and software to address specific transport system problems.
Outcome 8: Use methods for optimizing technological processes in railroad transport.

Expected learning outcomes on a level of a course

1. Define the division and characteristics of particular types of railroad vehicles
2. Explain traction vehicle power, driving resistance, train movement equation, basics of train traction theory
3. Explain modern achievements in the control and methodology of maintaining the technical means of the railroad
4. Compare tilting and high-speed trains
5. Explain modelling of locomotive loads in a plane
6. Research and present a selected topic from the field of railroad vehicles

Content of a course

Terms, types and classification of railway vehicles. Hauling vehicles. Diesel hauling vehicles. Electric hauling vehicles. Hauled vehicles. Passenger coaches, goods vans and wagons, special wagons. Railway vehicle braking system. Hauling vehicle output. Driving resistance. Train moving equation. Power consumption determination. Railway technical facilities control and maintenance latest achievements.

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	10%			5%	10%
Outcome 3	20%			10%	20%
Outcome 4		20%		10%	20%
Outcome 5		20%		10%	20%
Outcome 6			20%	10%	20%
Percentage of ECTS	2,4	2,4	1,2		6
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	5%	5%	10%
Outcome 3	15%	5%	20%
Outcome 4	10%	10%	20%
Outcome 5	10%	10%	20%
Outcome 6	15%	5%	20%
Percentage of ECTS	3,6	2,4	6
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. Josip Zavada - Željeznička vozilaivuča vlakova, Zagreb: Fakultet prometnih znanosti, 2004, ISBN 953-6790-88-2.
2. Abramović, Borna - Inženjersko - tehnološki proračuni u željezničkom prometu, Zagreb: Fakultet prometnih znanosti, 2010, ISBN 978-953-243-039-4.
3. Čičak, Mirko: Modeliranje željezničkog prometa, Zagreb: Institut prometa i veza, 2005, ISBN 953-96104-2-7.
4. Žmegač, Davor - Prijevoz robe željeznicom, Biblioteka Labirint, ISBN 953-97700-1-7.

Additional literature

1. Zakon o željeznici, NN 93/14.
2. Razvrstavanje željezničkih pruga, NN 3-14.
3. Pravilnik o željezničkoj infrastrukturi NN 127-05
4. Pravilnik o tehničkim uvjetima za sigurnost željezničkog prometa kojima moraju udovoljavati željezničke pruge NN 128/08