

DESCRIPTION OF A STUDY COURSE – SYLLABUS

Title of a course	Quantitative Methods in Transport				
Head of course	MSc Mirta Mataija, Lecturer				
Study programme	Specialist professional graduate study Transport				
Status of a course	Obligatory				
Year of study	1.	Semester	II	ECTS credits	8
Teaching plan (L + E + S+ Pr)	2+0+2+0				
Goals of a course					
The aim of the course is to introduce and teach students how to use mathematical modeling methods in traffic, and to use algorithms to solve and optimize some traffic problems.					
Conditions for enrolling course					
No conditions					
Learning outcomes on a level of a study programme which includes course					
Outcome 1: Apply traffic models and methods when designing a traffic plan. Outcome 3: Apply economic solutions to transport systems while respecting the fundamental financial, marketing, ethical, management and other economic principles. Outcome 9: Use methods for optimizing technological processes in road/ railroad transport.					
Expected learning outcomes on a level of a course					
<ol style="list-style-type: none"> 1. Explain the stages of mathematical modelling. 2. Apply elements of graph theory and mathematical modelling when creating transport network models. 3. Apply appropriate algorithms to the analysis and optimization of the transport network. 4. Apply CPM and PERT network planning methods to time analysis and project structure analysis. 					
Content of a course					
Basic quantitative methods in transport sciences and possibilities of their application. Mathematical models and optimizing methods: introduction, basic phases in mathematical modelling, models building, motivation problems. Theory of graphs: introduction and basic terms, matrices in theory of graphs, application of theory of graphs on some traffic regulating problems. Transport network: definition and basic terms, transport problem in the network, network simplex method, maximum flow through transport network, problem of the shortest way, optimization on the network. Network planning: networks with the activities on the arches and networks with the activities at intersections, structure planning, time analysis by means of CPM method and the basic idea of Pert method.					
Teaching modes	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> auditory exercises <input checked="" type="checkbox"/> seminars and workshops <input type="checkbox"/> distance learning <input type="checkbox"/> field classes		<input checked="" type="checkbox"/> individual assignments <input type="checkbox"/> multimedia and network <input type="checkbox"/> laboratory <input type="checkbox"/> supervisor's work <input type="checkbox"/> other _____		
Comments					
Students' obligations					
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	Written exam	Oral exam	Home assignment	Project making	Threshold	Max
Outcome 1	10				5	10
Outcome 2		15	5		10	20
Outcome 3		20	10		15	30
Outcome 4		10		30	20	40
Percentage of ECTS	0,6	2,7	0,9	1,8		
Total	10%	45%	15%	30%	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	10	20
Outcome 3	10	20	30
Outcome 4	15	25	40
Percentage of ECTS	2,4	3,6	
Total	40%	60%	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. Pašagić Husein: Matematičko modeliranje i teorija grafova, Fakultet prometnih znanosti, Zagreb 1998.
2. Pašagić Husein: Matematičke metode u prometu, Fakultet prometnih znanosti, Zagreb, 2003.

Additional literature

