UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	Faculty of Mechanical Engineering

GENERAL INFORMATION			
Study Program	Mechanical Engineering		
Study Module (if applicable)	-		
Course Title	Transportation networks		
Level of Study	☒Bachelor	☐ Master's	☐ Doctoral
Type of Course	☐ Obligatory	☒ Elective	
Semester	☐ Autumn	☒ Spring	
Year of Study	IV		
Number of ECTS Allocated	6		
Name of Lecturer/Lecturers	Goran S. Petrović		
Teaching Mode	☒ Lectures ☒ Laboratory work ☐ Distance learning	☐ Group tutorials ☐ Project work ☐ Blended learning	☐ Individual tutorials ☐ Seminar ☐ Other

Purpose and Overview (max. 5 sentences)

The aim of the course is to training students for modern methods and algorithms in the analysis and modelling of transport and logistics networks. After completion of the subject the students are able to solve the different real transportation problems.

Syllabus (brief outline and summary of topics, max. 10 sentences)

1) Basic terms of transport and logistics networks and presentation of the network in the form of a graph and the matrix forms; 2) Flows on the network. The intensities of flows of transport network; 3) Optimal routes in the transport and logistics networks. Defining the optimal route in the network. Travelling Salesman Problem. Mathematical formulation of the travelling salesman problem; 4) Heuristic and metaheuristic algorithms combinatorial optimization of the network. Genetic algorithms as a global optimization method; 5) Problem routing means of transport. Conventional routing problem. Routing problem with time constraints and capacity. Routing problem with time windows; 6) Location problems. Classification and basic assumptions of the theory locations. Methods for solving location problems; 7) Stochastic network. Networks of queues. Equations local and global balance. Multidimensional Markov processes.

Language of Instruction

☒Serbian (complete course) ☐ English (complete course) ☐ Other _____ (complete course)

☒Serbian with English mentoring ☐Serbian with other mentoring _____

Assessment Methods and Criteria

Pre exam Duties	Points	Final Exam	Points
Activity During Lectures	5	Written Examination	60 (depending on Teaching Colloquia)
Practical Teaching	5	Oral Examination	30
Teaching Colloquia	60	Overall Sum	100
*Final examination mark is formed in accordance with the Institutional documents			