UNIVERSITY OF NIŠ

Course Unit Descriptor	Faculty	Faculty of Mechanical Engineering

GENERAL INFORMATION			
Study Program	Traffic engineering, transport and logistics		
Study Module (if applicable)	-		
Course Title	Operations research		
Level of Study	☐Bachelor	☒ Master's	☐ Doctoral
Type of Course	☒ Obligatory	☐ Elective	
Semester	☒ Autumn	☐ Spring	
Year of Study	I		
Number of ECTS Allocated	7		
Name of Lecturer/Lecturers	Predrag M. Rajković, 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)

This course aims to provide students with a basic theoretical and practical knowledge in the field of applied mathematics such as mathematical programming, stochastic models, and simulation. It's designed to provide a broad and basic education in the techniques and modelling concepts needed to analyze and design complex systems. The course prepares students for professional employment as logistics analyst or management consultant.

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

Mathematical basics - convex sets and functions. Goal function, constraints and feasible solution. Heuristic solution. Linear Programming. Dual problems. Graphical method. Simplex method. Transportation Problem. Network problems. Integer programming. Nonlinear programming. Unconstrained problems. Method of Lagrange's multipliers. Khun-Tucker theorem. Linearization. Penalty functions. Steepest descent (gradient) method. Newton's method. Dynamic Programming. The problem of resource allocation. Network planning. Analysis of time by CPM and PERT methods. Cost analysis. Modelling of stochastic systems and processes. Processes Markov. Queuing theory. Basics of simulation. Monte Carlo methods. Exercises, examples and applications in different models and systems.

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			