	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	Construction optimization of transportation machines and vehicles
Level of Study	☐ Bachelor ☒ Master's ☐ Doctoral
Type of Course	☐ Obligatory ☒ Elective
Semester	☐ Autumn ☒ Spring
Year of Study	I
Number of ECTS Allocated	6
Name of Lecturer/Lecturers	Miomir Lj. Jovanović
Teaching Mode	☒ Lectures ☐ Group tutorials ☐ Individual tutorials ☒ Laboratory work ☒ Project work ☒ Seminar (Colloquium) ☐ Distance learning ☐ Blended learning ☐ Other

Purpose and Overview (max. 5 sentences)

Students gain practical knowledge and computer skills to generate special - optimal properties of objects in the traffic and transport technology. These are models of optimal design, lightweight construction models, FEM analysis of the technical characteristics of the product. They meet the modern computer tools for optimization models, standards and techniques for generating of products. The outcome is the creation of specialist, high-quality, with the ability of efficiently design using computer technology.

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

Theoretical basics of optimization and classification methods of mathematical programming. Tasks of optimal design of mechanical structures and Software basis of engineering realization. Technical project to optimize the geometry of the structure. Optimizing method of Formal search, Optimization methods of differential programming, Optimization gradient methods (Fletcher-Reeves), Optimization methods of flexible polyhedron (Nelder-Meed). Optimization of continual structures using the Method of sensitivity. Optimization of sequential quadratic programming. Examples. Practical Laboratory exercises. Creating computer models of objects. Working in small teams.
Colloquia: First - Optimization of Lattice (Solid) structure using FEM and successive iterative method (1), Second - Optimization of Continuous structures with Formal search method (2), Third - Optimization of the structure using the Method of sensitivity (3). Alternatively Creation of a homework in the field of the optimal modeling.

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	(Three Colloquiums) 60
Practical Teaching	5	Final (oral) Examination	Max. 30
Three (3) teaching Colloquia (projects)	60	Overall Sum	100