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| **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 | ☐ Group tutorials | ☐ Individual tutorials |
| ☒ Laboratory work | ☐ Project work | ☐ Seminar |
| ☐ Distance learning | ☐ Blended learning | ☐ 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** |