**Course description**

|  |  |  |  |
| --- | --- | --- | --- |
| **Generic information** | | | |
| Head of Course | PhD Svjetlana Hess | | |
| Course | Quantitative Methods in Transport | | |
| Study Programme | Technology and Organization of Transport | | |
| Type of Course | Mandatory | | |
| Year of Study | 2. |  | |
| Estimated Student Workload and Methods of Instruction | ECTS coefficient of Student Workload | | 6 |
| Number of Hours (L+E+S) | | 45+30+0 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. GENERAL COURSE DESCRIPTION** | | | | | | | | | | | | |
| *1.1. Course Objectives* | | | | | | | | | | | | |
| The main objective of this course is to empower the student to apply quantitative methods in the field of transport technology, by adopting techniques for obtaining solutions (manually and using a software package). The acquired knowledge should be applied to real transport processes and the results should be comprehensively analyzed for optimal and efficient decision-making. | | | | | | | | | | | | |
| *1.2. Prerequisites for Course Registration* | | | | | | | | | | | | |
| - | | | | | | | | | | | | |
| *1.3. Expected Learning Outcomes* | | | | | | | | | | | | |
| 1. To describe and interpret fundamental theoretical principles of the methods applicable to transport 2. To define a specific problem in transport and to determine the decision criterion 3. To collect data and set up a model, to choose the appropriate method for solving the problem and find the optimal solution of a particular practical problem in transport 4. To solve the real transport problem by applying the appropriate method 5. To choose the optimal solution considering the criteria and limitations set, also to interpret the optimal and possible alternative solutions 6. To solve the transportation problem using a software package | | | | | | | | | | | | |
| *1.4. Course Outline* | | | | | | | | | | | | |
| The theoretical background of quantitative methods in transportation. Maximum, minimum and mixed constraint problems (Graphical Method and Simplex Method). Northwest Corner Method, Least Cost Method, Vogel Method. Stepping Stone Method. Assignment problems in transport, Hungarian method. Emphasis is placed on solving techniques (manually and using a software package) and examples of applying quantitative methods in optimization the specific practical problems in transportation, where quantification and optimization of transport services is required. | | | | | | | | | | | | |
| *1.5. Modes of*  *Instruction* | | Lectures  Seminars and workshops  Exercises  E-learning  Field work | | | | | Practical work  Multimedia and Network  Laboratory  Mentorship  Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | |
| *1.6. Comments* | |  | | | | | | | | | | |
| *1.7. Student Obligations* | | | | | | | | | | | | |
| Colloquia and assignments, continuous assessment during classes and final exam. | | | | | | | | | | | | |
| *1.8. Assessment1 of Learning Outcomes* | | | | | | | | | | | | |
| Course attendance | 2.5 | Class participation | | 0.5 | Seminar paper | | |  | Experiment | | |  |
| Written exam | 1 | Oral exam | |  | Essay | | |  | Research | | |  |
| Project |  | Continuous Assessment | | 2 | Presentation | | |  | Practical work | | |  |
| Portfolio |  |  | |  |  | | |  |  | | |  |
| *1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam* | | | | | | | | | | | | |
| *Evaluation procedure*: 70% of the grade through exams for students' continuous monitoring/assessment and 30% of the grade through final exam as follows:   * continuous assessment through 2 exams and 4 test assignments * final exam (written): checking the understanding of total acquired knowledge in the field of quantitative methods and their application to specific transport or logistics problems.   *Valuation examples*:   1. write the theoretical background for one of the quantitative methods applicable to transport technology 2. define an arbitrary transport problem and determine the appropriate criterion 3. design a practical problem, describe how to collect the data, set up a model, and identify the appropriate method for solving the problem and finding the optimal solution 4. solve the transport problem using the appropriate quantitative method 5. interpret the solution, compare the results obtained and choose the optimal solution considering criteria and limitations set 6. solve a practical transport problem using a software package | | | | | | | | | | | | |
| *1.10. Main Reading* | | |  | | | | | | |  | | |
| * Brajdić, I., Matematički modeli i metode poslovnog odlučivanja, Fakultet za menadžment u turizmu i ugostiteljstvu, Opatija, 2013. * Barković, D., Operacijska istraživanja, Ekonomski fakultet, Osijek, 2001. * Zenzerović, Z., Operacijska istraživanja, Zbirka zadataka, Fakultet za pomorstvo i saobraćaj, Rijeka, 1983 | | | | | | | | | | | | |
| *1.11. Recommended Reading* | | |  | | | | | | |  | | |
| * Pašagić, H., Matematičke metode u prometu, Fakultet prometnih znanosti, Zagreb, 2003. * Babić, Z., Linearno programiranje, Ekonomski fakultet u Splitu, Split, 2010. * Lukač, Z., Neralić, L., Operacijska istraživanja, Element, Zagreb, 2012. * Kalpić, D., Mornar, V., Operacijska istraživanja, Fakultet elektrotehnike i računarstva, Zagreb, 1996. | | | | | | | | | | | | |
| *1.12. Number of Main Reading Examples* | | |  | | | | | | |  | | |
| *Title* | | | *Number of examples* | | | | | | | *Number of students* | | |
| Barković, D., Operacijska istraživanja, Ekonomski fakultet, Osijek, 2001. | | | | | | 5 | | | | | 55 | |
| Brajdić, I., Matematički modeli i metode poslovnog odlučivanja, Fakultet za menadžment u turizmu i ugostiteljstvu, Opatija, 2013. | | | | | | 5 | | | | | 55 | |
| *1.13. Quality Assurance* | | | | | | | | | | | | |
| The studying quality is monitored following the ISO 9001 system, as well as European standards and guidelines for quality assurance, carried out at the Faculty of Maritime Studies, University of Rijeka. Analysis of exam passing is done once a year, and once a semester a survey is conducted among students. | | | | | | | | | | | | |

1 **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.