<table>
<tr><td>NAZIV PREDMETA</td><td colspan="5">Optimization</td></tr>
<tr><td>Code</td><td>PMM922</td><td>Year of study</td><td colspan="3">2.</td></tr>
<tr><td>Course teacher</td><td>Milica Klaričić Bakula</td><td>Credits (ECTS)</td><td colspan="3">5,0</td></tr>
<tr><td rowspan="2">Teaching assoc.</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>P</td><td>S</td><td>V</td><td>T</td></tr>
<tr><td>30</td><td>15</td><td></td><td></td></tr>
<tr><td>Status of the course</td><td>Compulsory</td><td>Percentage of application of e-learning</td><td colspan="3">30</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">Optimization is the art of optimal decision making under constraints. Convex optimization refers to a set of problems that can be formulated using convex functions and sets; countless problems from science, engineering and statistics can be cast as convex optimization problems and solved using efficient algorithms.
The main goal of this course is to develop the skills and background needed to recognize, formulate and solve convex optimization problems. The course is intended as an introduction to convex optimization, focusing on the theory, the modelling techniques, and the algorithm analysis and design.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Entry competences: Linear algebra. Numerical linear algebra (basics).</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">Upon successful completion of this course students will be able to:
- recognize and formulate convex optimization problems as they arise in practice
- know a range of algorithms for solving linear, quadratic and geometric programming problems, and evaluate their performance
- understand the theoretical foundations and be able to use it to characterize optimal solutions to optimization problems
- appreciate the role of convex optimization in approximation and fitting, statistic and geometry.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">- Overview and examples of optimization problems (2)
- Convex sets (2)
- Convex functions (2)
- Convex optimization problems (4)
- Duality (4)
- Unconstrained minimization (6)
- Equality constrained minimization (2)
- Interior-point methods (4)
- Applications (4)</td></tr>
<tr><td>Format of instruction</td><td colspan="5">Lectures and seminars.</td></tr>
<tr><td>Student responsibilities</td><td colspan="5">Attending classes, doing homework assignments. Writing and presenting seminars.</td></tr>
<tr><td>Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS</td><td colspan="5">Attending classes, doing homework assignments: 2 ECTS.
Seminars: 1.5 ECTS.
Final oral exam: 1.5 ECTS.</td></tr>
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value of the course)	
Grading and evaluating student work in class and at the final exam	Seminars will be evaluated throughout the semester. Final oral exam.
Required literature (available in the library and via other media)	1. S. Boyd and L. Vandenberghe, Convex Optimization, Cambridge University Press, 2004.
Optional literature (at the time of submission of the study programme proposal)	1. J. Nocedal and S.J.Wright, Numerical Optimization, Springer, 2006. 2. A. Ben-Tal and A. Nemirovski. Lectures on Modern Convex Optimization. 2013.
Quality assurance methods that ensure the acquisition of the exit competences	Summary feedback for the whole class after the exam. Anonymous student survey.
Other (as the proposer wishes to add)	