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| Course: Numerical optimization | | |
| Course instructors: Nataša Krejić | | |
| Course type: elective | | |
| Credit points ECTS: 12 | | |
| Prerequisites: - | | |
| Course objectives: Acquiring knowledge on classical methods for unconstrained and constrained optimization problems. | | |
| Learning outcomes: The students will be able to proceed with research work on numerical optimization topics and to apply the methodology on relevant problems from other disciplines. | | |
| Course description (outline): <i>Theoretical classes</i> Unconstrained problems. Оптимизациони проблеми без ограничења. Necessary and sufficient optimality conditions. Line search methods. Trust region methods. Newton type methods. Least squares methods. Constrained optimization problems. Optimality conditions and theoretical foundations of algorithms. Small and middle size problems. Large scale problems. Penalty methods. Lagrange multipliers methods. Sequential Quadratic Programming. <i>Practice classes</i> Implementation of the theoretically analysed methods. | | |
| References: <ol style="list-style-type: none"> 1. Nocedal, J. Wright, S.J., Numerical optimization, Springer, 2006. 2. Bertsekas, D.P. Convex Optimization Methods, Athena Scientific, 2015. 3. Birgin, E.G., Martinez, J.M. Practical Augmented Lagrangian Methods for Constrained Optimization, SIAM 2014. | | |
| Active teaching hours: 5 | Theoretical classes: 5 | Practice classes: |
| Methods of teaching: Theoretical lectures and independent work of students during practical hours. | | |
| Grading structure (100 points) 50 points on pre-exam and 50 points on oral exam | | |