Tárgytematika / Course Description

Nonlinear optimization

GKNM_MSTA037

Tárgyfelelős neve / Teacher's name: Hajba Tamás

Félév / Semester: 2020/21/1

Beszámolási forma / Assesment: Vizsga

Tárgy heti óraszáma / Teaching hours(week): 2/2/0

Tárgy féléves óraszáma / Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

To familiarize the students with the theory of nonlinear optimization (optimality criteria, basic methods and their convergence properties) and its application (currently used most efficient softwares, application areas).

TANTÁRGY TARTALMA / DESCRIPTION

1 Mathematical Background and Main Optimality Conditions
2 Gradient Methods
3 Newton's Method
4 Quasi-Newton Methods
5 Nonderivative Methods
6 Optimization over a Convex Set
7 Lagrange Multiplier Theory
8 Lagrange Multiplier Methods I. - Penalty and SQP Methods
9 Lagrange Multiplier Methods II. - Interior Point and Lagrangian Methods
10 Multiobjective Optimization
11 Optimal Control Problems

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESMENT'S METHOD

Homework assignment: maximum 40 points. Instructors signature: minimum 20 points is required.
Oral online exam: maximum 60 points. Calculation of the final grade: the points of the homework assignments and the points of the exam are summed up.
0-50 points: fail
51-62 points: satisfactory
63-74 points: average
75-86 points: good
87-100 points: excellent

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

D.P. Bertsekas. Nonlinear Programming. Athena Scientific, 3rd edition,

2016.
S. Boyd and L. Vandenberghe. Convex Optimization. Cambridge University
Press, New York, NY, 2004.
K. Deb. Multiobjective Optimization Using Evolutionary Algorithms.
Wiley, New York, NY, 2001.