

# Statistics and Algorithms

**Lecturer:** Davydov Ivan Alexandrovich, C.Sc.

**Turn:** 1 **Duration:** 18 weeks

**Workload (h):** 144      **Presence (h + CH):** 72 (4)      **Self-Study (h):** 72

**Contents:**

**Background and relations to other courses:** nothing.

**Main topics and learning objectives:**

Themes	Learning objectives
Introduction to optimization problems	To know principles of algorithmic theory. To know classification of algorithmic problems. To know Lagrangean duality theory.
Linear programming problems	To be able to apply simplex method
Necessary optimality conditions for convex optimization	To know necessary optimality conditions, Khun-Tucker optimality conditions
Computational methods for nonlinear programming problems	To know Gradient methods and Newton method for unconstrained optimization problems. To understand convergence theorems
Computational methods for nonlinear programming problems	To know method of feasible directions
Branch and Bound method	To know Branch and Bound method

**Assessment:**

**Formative:** in interaction with lecturer and tutor during learning period. On site, skype, email are preferable.

**Summative:**

Number and Type; Connection to Course	Duration	Part of final mark in %
Oral Exam	90 min	100%

**Learning outcomes:**

**Academic:** The students have insight into Operation Research and its application.

**Prerequisites for Credit Points:** The credit points will be granted when the course has been successfully completed, i.e. all parts of the examination are passed.