



Faculty of Health, Science and Technology
Mathematics

Syllabus

Course Approval

The syllabus was approved by the Faculty Board of Health, Science and Technology on 26 November 2013 , and is valid from the Spring semester of 2014 at Karlstad University.

Course Code: MAGB22

Optimization with project, 7.5 ECTS Credits
(Optimering med projekt, 7.5 Swedish credit points)

Degree Level: Bachelor

Progressive Specialisation: G1F (First cycle, has less than 60 credits in first-cycle course/s as entry requirements)

Language of Instruction

Swedish or English

Prerequisites

Courses in Mathematics corresponding to Basic Mathematics 7.5 ECTS cr, One-Variable Analysis 7.5 ECTS cr, Multivariable Analysis 7.5 ECTS cr, Linear Algebra and Vector Analysis 7.5 ECTS cr

Major Field of Study

MAA (Mathematics)

Learning Outcomes

Upon completion of the course, students should be able to:

- formulate optimization problems mathematically,
- determine if optimization problems are convex,
- solve LP-problems with simplex algorithms and perform sensitivity analyses,
- formulate the dual of the LP-problem and apply the duality theory in the solving,
- perform oral and written presentations of project assignments.

Content and Form of Instruction

The optimization process, model formulation of applied examples, the convexity theory, LP-problems (linear programming problems), two-phase simplex algorithm, sensitivity analysis, duality theory, dual simplex algorithm, integer programming, network problems, introduction to computer tools for optimization problems.

Students carry out a problem in relation to the course content. The project can be based on a concrete optimization problem or have a theoretical focus. The project part corresponds to 3 ECTS cr.

Reading List

See separate document.

Examination

Assessment is based on a written exam and on an oral and written presentation of the project. The number of examination opportunities is limited to 3 per academic year.

Grades

One of the grades Fail (U), pass (G) or Distinction (VG) is awarded in the examination of the course.

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course assessment is based on student views and experiences as reported in written course evaluations and/or group discussions. Students will be informed of the result of the evaluation and of the measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional Information

Students who enrolled before 1 July 2007 will complete their studies in accordance with the requirements of the earlier admission. Upon completion students may request degree and course certificates to be issued under the current ordinance if they meet its requirements.

The course MAGB22 cannot be included in the same degree programme as the course MAGB65 Optimization 4.5 ECTS cr.

The local regulations for studies at the Bachelor's and Master's levels at Karlstad University stipulate the obligations and rights of students and staff.

Karlstads universitet 651 88 Karlstad, Sweden
Tel +46-54-700 10 00 Fax +46-54-700 14 60
information@kau.se www.kau.se