Course information SF1811 Optimization 2019/2020

Teachers

Anders Szepessy (examinator) office hours Thursdays 12-13

Alexander Aurell, office hours Mondays 16.30-17.30 (cancelled 16/12)

Isabel Haasler, office hours Wednesdays 15-16 (cancelled 27/11, we can arrange another meeting that week by email)

Course Literature

The main literature for the course is the compendium *"Optimization"* by Amol Sasane and Krister Svanberg (ASKS), which you can buy at the **KTH bookstore** **(http://ths.kth.se/om-ths/ths-karbokhandeln/)** . ASKS contains some exercises, for which solutions are available here. Additional exercises are provided here **_"Exercises in Optimization" (EXOPT)._** **(https://www.math.kth.se/optsyst/grundutbildning/kurser/SF1811/optexsamleng2014.pdf)**

We also recommend the book Linear and Nonlinear Optimization, second edition, by Griva, Nash and Sofer. We encourage you to buy this book, especially if you consider taking the follow-up courses **SF2812** **(http://www.math.kth.se/optsyst/grundutbildning/kurser/SF2812/info.html)** and **SF2822** **(http://www.math.kth.se/optsyst/grundutbildning/kurser/SF2822/info.html)** , since it is used as course literature in both these courses. **Here you find some information about the book.** **(https://www.math.kth.se/optsyst/grundutbildning/kurser/SF1811/bookinfo.html)**

Teaching

Lectures 30 hours

Exercises 16 hours

Examination

The compulsory parts of the course consists of two computer lab home assignments 2 hp and a written scheduled exam 4hp.

The exam will include an alternative question related to **this list (https://canvas.kth.se/courses/12300/files?preview=2316850)** of theory questions. For one of the question numbers, e.g. number four, there will be two alternatives one standard question and one theory question from the list. Only answer to one of the two number four questions can be handed in.

No aids, except of course pen, pencil, eraser and ruler, are allowed in the exam. E.g. calculators or dictionaries are not allowed. A formula sheet will be included in the exam: **here is a preliminary version. (https://canvas.kth.se/courses/12300/files?preview=2241221)** To participate in the exam you need to register on "Mina sidor", see the link to **Studentexpedition matematik (https://www.kth.se/en/sci/kontakt/studentexpedition/matematik)** for the dates and additional information.

If you are a PhD student you cannot use "Mina sidor" to register for the exam. Instead, you fill in a form and send this by email to **elevexp(a)math.kth.se, (mailto:elevexp@math.kth.se)** see **Studentexpedition matematik (https://www.kth.se/en/sci/kontakt/studentexpedition/matematik)** for the dates and additional information. The exam can only be taken at KTH. The 6.0 hp exam given previous years cannot be taken anymore due to change in the course setup. Support for students with disabilities can be given, see **Funka (https://www.kth.se/en/student/studentliv/studentratt/stod-for-studenter-med-funktionsnedsattning-1.324605)** and **here (https://canvas.kth.se/courses/12300/pages/information-related-to-disabilities)** for more information.

Each passed homework assignment, which is handed in time, yields two bonus credits on the exam. The exam will consist of five or six problems that all together give a maximal score of 50 credits plus bonus credits. You are guaranteed to pass with 25 credits, including bonus credits. The questions in the exam will be in English and you may write your answers in English or Swedish. Typically the grades will be: E at least 25, D 29, C 34, B 39, and A at least 45 credits, including bonus credits.

Homework assignments

Each group of at most two students hand in a written report on each homework assignment in Canvas www-page: homework 1 before November 29th and homework 2 before December 14th 2019. Home assignment 1 has the title "Optimization modelling and the simplex method". For home assignment 2 you can choose to do either "Playing a game with nature" or "Markowitz portfolio problem". To pass the 2.0 hp home assignments examination, the assignments given this year need to be handed in this academic year. Next academic year the corresponding assignments given that year need to be done, unless the corresponding Ladok credits are obtained.

The aim of the homework assignment is to practice using mathematical concepts and methods and to write a good report. This means that a solution with only formulas is not acceptable. The solution should be similar to the presentation of examples in the course literature. The purpose of the report is to well explain the problem, theoretical background and results for a master student who has taken the course SF1811 but not done this home assignment. Write using your own

words and include additional explanations for the steps. In the grading, the teacher considers how well the report: explains the problem, describes the theoretical background, and presents the results.

For instance, the teachers take into account
is the report correct,
is the report well written,
are the figures and derivations well chosen,
will the reader of the report learn something.

The report does not have to be long, probably shorter than 10 pages. Matlab code should be included, e.g in an appendix. The most important is that what is written in the report is correct and that the reader learns something. The form of the report is not important, e.g. it does not matter if the there is table of context or a section "conclusion".

Dates

28/10 2019 The course starts

28/11 2019 Homework 1

13/12 2019 Homework 2

9/1 2019 Exam