Course information SF1811 Optimization 2020/2021

Teachers

Anders Szepessy (examiner) office hours Thursdays 12-13

David Ek, office hours Wednesdays 12-13, **https://kth-se.zoom.us/j/3426446475 (https://kth-se.zoom.us/j/3426446475)** .

Jevgenija Rudzusika, office hours Mondays 10-11, https://kth-se.zoom.us/j/9359652804.

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 (https://www.kth.se/student/kurser/kurs/SF2812?l=en)** and **SF2822, (https://www.kth.se/student/kurser/kurs/SF2822?l=en)** 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: Zoom ID 699 2515 3433

Exercises 16 hours

The lectures and exercise sessions will be given online at the scheduled times using Zoom.

Examination

The compulsory parts of the course consists of three home assignments (2 hp in total) and a written scheduled exam (4hp).

The exam will include an alternative question related to **this list** (https://canvas.kth.se/courses/20181/files?preview=3260052) of theory questions. For one of the question numbers, e.g. number four, there will be two alternatives one standard question and one specific 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/20181/files?preview=3526285) 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 will be on Zoom at the scheduled time 2020-01-11, since KTH decided that during 2020-11-18 to 2021-01-31 no exams will be at KTH in standard classrooms. KTH has also decided that only students who have not passed the course can take exams during 2020-11-18 to 2021-01-31. The exam January 11th 14.00-19.00 will be a written exam delivered in a separate Canvas-room accessible for all students who have registered for the exam. The five questions in the exam will have a similar form and content as in previous exams. Each student hand in pdf-files of the solutions, written on paper, in that Canvas-room. All students need to login to a Zoom-room for video-supervision at least 30 minutes before the exam starts. More detailed information about the examination setup will be delivered in the Canvas-room for the exam after the registration of the exam closes.

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://canvas.kth.se/courses/20181/pages/rules-for-funka-sf1811) and **here** (https://canvas.kth.se/courses/20181/pages/rules-for-funka-sf1811) for more information.

Home assignments which are handed in on time yields bonus credits for the exam: Assignment one and two give 1 credit each and Assignment three gives 2 bonus credits. 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: home assignment 1 no later than November 16th, home assignment 2 no

later than November 30 and home assignment 3 no later than December 11th 2019. Home assignment 1, 2 and 3 have the titles "A computer program for the simplex method", "A linear programming application" and "Markowitz portfolio problem", respectively. 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 assignments 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 5 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 2020 The course starts

16/11 2020 Home assignment 1

30/11 2020 Home assignment 2

11/12 2020 Home assignment 3

11/1 2021 Exam