Course analysis SF2940, HT20, P1

Course analysis carried out by:
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Course analysis based on:
-Midterm survey, course survey after regular exam.
-Two course meetings during the course with representatives of I-Chapters educational committee.
-Final course meeting with representatives of I-Chapters educational committee.
-Meeting with TTMAM PA, correspondence with CINEK PA.
-Regular online meetings with with teaching assistants.
-Results of regular exam.

All registered students were invited in week 2 of the course to take part in the kursnamnd. Only CINEK students chose to actively participate.

Course design:
Due to SARS-CoV 2 the course was offered in a blended approach:

-Lectures were replaced by prerecorded videos. The videos were of varying length; 20 to 45minutes, typically 4 to 6 videos per week. In addition for each week either an introductory video or a detailed description of the learning goals were published in Canvas.

-The course was organized by topics in `Modules' in Canvas.

-Exercises were offered in five groups, thereof four took place on campus and one was offered in addition online via zoom. For exercise groups on campus a preregistration in Canvas was mandatory in order to insure that the number of persons in the classrooms were well balanced; at any time less then 50 persons. Teaching assistants wore at anytime facial masks when teaching. The wearing of facials masks was recommended to all students for the exercise sessions and the written on campus exam.

-Discussion forum in Canvas monitored by the examiner.

-Weekly office hours on zoom, additional office hours before the exam and the re-exam.

-Examination concept: Optional midterm exam in the form of time limited (1.5h) assignment administered in Canvas without zoom proctoring. Midterm gave up to 15% bonus for final grade. Written exam (4h) on campus under additional measures due to SARS-CoV 2. Written distance re-exam (4h) using zoom proctoring.

Course development since earlier offerings:

-New examiner and course responsible.
-Updated outcome based ILOs, based on LH216V.
-Revised course content based on a MatStat faculty retreat in early spring 2020, discussion with the colleague who taught the course in the last years, and the new examiner's general assessment of the course.
-Systematic use of Canvas as LMS: https://kth.instructure.com/courses/20094
-New primary course literature: *An Intermediate Course in Probability* by Allan Gut.
-Second course literature: Lecture Notes: Probability and Random Processes by Timo Koski.
-Number of teaching assistants was increased from four to five upon examiners request.
-The examination time for the written exams was reduced from five to four hours.

Course results after regular exam including Fx-completion:
-A: 8.37%
-B: 6.40%
-C: 14.29%
-D: 10.34%
-E: 19.21%
-F: 41.38%

Number of registered and re-registered students: 283. Students writing the regular exam: 203. On average students in AK4 succeeded slighly better than students in AK3. Yet several students in AK3 succeeded extremly well.

Summary of student's opinions:

-Average responses to LEQ statements do not indicate significant problems with the course.
-Students emphasized the following: They work with interesting issues. The course is *very relevant* for their studies. The course was challenging. The assessment was considered mostly fair but more difficult than in earlier offerings. A midterm exam was highly appreciate and helpful in the learning process, in particular under the SARS-CoV 2 situation. Students acknowledge the work of the teaching assistants and find the exercise sessions helpful. Students seem to favor the new course literature, also it was pointed out that the course literature is available for free via KTH's library. Reduction of examination time was mostly welcomed.

-Related to the current situation students emphasized the following: The course was very well structured, content-wise but also in Canvas. Students seem to considerably favor prerecorded video over live zoom lectures. An online exercise session was found to a helpful complement to the on campus sessions.

-Due to the wide range of student's from AK3 and AK4, some students consider the course too difficult while others find the course is not to have the correct challenging mathematical level. This is also reflected in the reported workload of the students. The examiner's assesment of this is outlined below.

Summary of course meetings:

In addition to the above, the following was pointed out by student represenatives: The current form of teaching and learning activities was considered to be very helpful in the difficult situation, in particular the prerecorded videos were considered to be more helpful than live zoom lectures, e.g. they allow to pause and to rewind. Students consider the risk of loosing track of the course due to the availability of the videos as low. The representatives further noticed that the course content and literature was changed which were both welcomed. The student representatives further remarked that in this course they reach a new level in their mathematical education, and find this stimulating in a good way. That the course focuses on theory rather than applications is considered to be good; students expect that applications will follow in their continuation of studies. The students representatives proposed to talk to more senior students in order to learn which parts of the course are considered most useful in the continuation of studies, and provide further feedback.

With respect the course development, the student represenatives suggest to focus on the exercise sessions. Proposed ideas include to possibly reduce the number of exercises solved in a sessions, create a more interactive learning environment, and give students some time to solve exercise sessions before presenting solutions, etc. In sum, finding better ways for student activated learning. On the other hand it was also pointed out by the student representatives that they worry that many students do not prepare for exercise sessions despite that the material is available in advance, I share this concern. The

examiner is aware that the current form of the exercise sessions can be revised and welcomes suggestions. The next course development should hence focus on the exercise sessions and pedagogical aspects of these activities.

Examiner's assessment:

I consider the course SF2940 to be an important course for students in CINEK-TMAI AK3 and students in TTMAM AK1. In addition the course is read by students in CTFYS, as well as students from data and machin. Competencies and skills of the students are hence very `broad' as indicated above. Some students indeed succeed very well while others are struggling.

This year we had 283 registered students, compared to 200-240 in previous years. I expect that due to prevailing relevance of data science, AI, etc. and the popularity of these fields among students the number of participants will continue to grow. Certainly latest when the new CTMAT program comes to AK3.

For these reasons the examiner has contacted SRs and PAs at the department with a request to initiate a dialogue on the future development of this course. A first meeting was proposed by the responsible SR for January 2021.

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