

Course analysis AK2030, AK2036, AK2038 & AK2040 period 1 2020-2021

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DESCRIPTION OF THE COURSE EVALUATION PROCESS

Describe the course evaluation process. Describe how all students have been given the possibility to give their opinions on the course. Describe how aspects regarding gender, and disabled students are investigated.

Students have been asked to fill out the LEQ through the central KTH system. This also investigates aspects regarding gender and disabled students. A 12 questions LEQ template was used without additional questions.

DESCRIPTION OF MEETINGS WITH STUDENTS

Describe which meetings that has been arranged with students during the course and after its completion.

Students were invited to send representatives to the course analysis meeting. Student unions were also asked to send representatives.

COURSE DESIGN

Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.

General: differences between courses

AK2030 and AK2036 takes the same lectures, with the lecture Engineering Design being particular for these students. AK2038 takes a lecture on Economic Methodology instead of Engineering Design. AK2040 takes a lecture on Algorithmic Reasoning and its Limitations instead of Engineering Design. These differences in lectures are reflected in the exam – a proportional number of questions concern these topics.

AK2030, AK2036 and AK2040 all take the same seminars. AK2038 takes a seminar called “Philosophy of Social Science” instead of the seminar called “Analysis, Evidence and Interpretation”. However, much of the content is the same in these two seminars.

Given that these courses are similar, it is useful to discuss these evaluations together.

Lectures

There are eleven lectures in this course and two flipped classroom lectures. During the last years, we have introduced seven video lectures replacing the previous campus lectures. We accelerated this process accelerated because of the pandemic, and this autumn we were able to offer ten lectures as pre-recorded lectures (the eleventh was cancelled). The flipped classroom lectures were given as discussion forum interactions, where the examiner answered students’ questions relating to these lectures. The exception is AK2040, where the Algorithmic Reasoning and its Limitations was given through Zoom.

For each lecture, from lecture 2 and on, there is an associated quiz. These give bonus points that are added to the exam score. We added new quizzes for each new video lecture. Quizzes were standardized to the same number

of points and a general overview of questions was performed. We also transcribed the video lectures and edited the transcription in to a course text, allowing multiple ways to learn, depending on your preferred learning style. Creating the new video quizzes and transcribing the new videos was done continually during the course, as fast as we were able to once the videos were completed. The students were informed that these texts contained the same information as in the lectures, and were a complement and not a substitute for taking their own notes.

Seminars

There are four seminars in this course, normally given as campus seminars. The first seminar was given on campus, in groups of half the size compared to normal. Students who were unable to come to campus for the first seminar were able to join an online seminar group for seminar 1 as well. The rest of the seminars were given on Zoom. The intention was to increase companionship and trust between students, with the hope that this would transfer from the campus seminar to the online format. The seminars had during the summer been somewhat reworked to suit the online format better. The seminars were given in a different way compared to period 4 2020, when we tried a different setup, with only a one-hour seminar and a preparation assignment instead, but the feedback indicated that this was not as good.

Exam

The course ends with an exam. The previous campus exam featured three parts: (1) a multiple-choice part, (2) a part explaining and using course terminology and (3) a part discussing the course terminology. In part (3) students taking the campus exam were given a fictional case, describing research with methodological flaws, which the students were to discuss and evaluate. Each part tested one of the three learning outcomes stated in the course plan, and hence one needed to score on a level for each part to get the grade A, for instance.

We changed the format for this exam in April, for the re-exam of period 2, because of the pandemic. The exam was transformed into an online exam, given as quizzes and assignments in Canvas. The format was changed so that parts 1 and 2 examined all three learning outcomes up to grade C. Part 3 became an optional part examining all learning outcomes based on the criteria for grades C-A, which was corrected if a student had reached the grade C on parts 1 and 2.

For period one we changed the system to make the grading of part 1 and 2 easier to understand, and that bonus points would not be “wasted”. After evaluating the results from the four online exams, we determined that removing the individual partial scores on each part for each grade would have no particular impact on the grade distribution, and thus was an unnecessary complication. Bonus points were now added to part 1, up to the maximum score possible for part 1.

Project part: AK2036 / AK2038

This part of the course was already without physical interaction, and was not changed during the period.

Project part: AK2040

This part was changed from the last time the course was run, including the learning outcomes. The previous topic was proofs in mathematics, which was by students and programme responsible for applied mathematics determined to be unsuitable for the programme. Instead, the topic was changed to the nature of mathematical objects and measurement theory. This was planned to be campus lectures and seminars, but was changed to zoom lectures and a home assignment.

THE STUDENTS' WORKLOAD

Does the students' workload correspond to the expected level (40 hours/1.5 credits)? If there is a significant deviation from the expected, what can be the reason?

In general, students study less than the expected level. As has been discussed in previous analyses, there are many possible reasons for this, such as students putting in the effort only to pass the course or other courses requiring more time than they should. It could also be that students are making incorrect assessments of their time spent on the course. The participants in the course analysis meeting considered that the amount of time reported was reasonable given these uncertainties, and did not suggest any particular change.

THE STUDENTS' RESULTS

How well have the students succeeded on the course? If there are significant differences compared to previous course offerings, what can be the reason?

2020	AK2030	AK2036	AK2038	AK2040	AK2050	Total	%
A	10	10	1	7		28	6%
B	6	21	1	6	1	35	8%
C	24	40	4	17	11	96	22%
D	35	68	6	28	12	149	34%
E	15	27	1	7	4	54	12%
F	8	23		10	2	43	10%
FX	7	19		2	2	30	7%
Tot	106	208	13	77	32	436	

2019	AK2030	AK2036	AK2038	AK2040	AK2050	Total	%
A	31	40	1	18	7	97	24%
B	23	34		16	5	78	19%
C	24	32		18	2	76	19%
D	18	19		2	6	45	11%
E	10	10		2	1	23	6%
F	23	18		7	3	51	13%
FX	8	18		9		35	9%
Total	137	171	1	72	24	405	

(Note: this table includes AK2050 who is not part of the evaluation and analysis, as that course runs in both P1 and P2.)

59% of the students with the grade C could have received a higher grade if they had submitted the part for the higher grade, but did not do so. 33 % of the submissions of part 3 that got the grade C were only a paragraph long (compared to 1-2 pages for the others). Since students were able to distribute the time for part 2 and 3 however they liked, it could be that these students spent all time on part 2 and would not have been eligible for the higher grade had they not done so. Last year 22 % of students got F or FX, whereas now it was only 17 %. If this difference is significant, the exam format with open book is presumably the reason. A comment from a student representative during the meeting indicated that the high number of people with the grade D could be due to students searching old exams for questions similar to the ones presented in the exam. Given that this was not prohibited, this points out the need for new questions for the online format.

The meeting discussed the distribution and concluded that the main reason for the difference in grade distribution is the difference in how the bonus points were handled. Previously there was an over-effect of the bonus points where having bonus points and getting the grade C often meant getting a B

or an A. The new system, where the bonus points work as a safety instead of a boost, favours a bell curve distribution. Since there are strong pedagogical reasons for this (mainly that scoring bonus points is done by answering questions similar to part 1, and that the bonus points are valid for part 1), this is not an issue.

STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

The videos receive many compliments, in particular regarding the high production value and the ability to study at a pace that suits you. The quizzes related to the videos were sometimes hard to understand, noted students. The quizzes in themselves are great, since they allow students to determine that they have the required knowledge. If the questions are formulated in a bad way, it might be hard to determine if you do not know or if it is a trick question. However, continual improvements are made, based on student feedback.

Some find the campus page hard to use, a part of this is that different courses use Canvas in different ways, and another part is that Till no longer is able to explain this at the first Campus lecture.

The seminars received praise, while some noted that the campus seminars were better than the online ones. The teachers agree with this, but there is not much to do at this point. On a longer time scale, if this continues, one can see if further improvements to the seminars can be made to make them more suitable to the online format.

For AK2040, the other main comment was the project part. This has, as said, been changed but it is clear there is still some way to go. Given that the setup was hastily changed to suit online teaching, eliminating the group work, this is hardly surprising, and presumably, the views will change when the project is implemented as intended.

SUMMARY OF STUDENTS' OPINIONS

Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.

Generally, have a favourable impression of the learning environment in this course. On this scale, zero equals an average of -3 and 7 equals on average +3, while 4 being neutral. Students rate all aspects of the learning environment between 5,1-6 for AK2036 (78 responses). AK2030 rate all aspects of the learning environment between 5,5-6,2 for AK2030 (36 responses). None of these aspects of the learning environment stands out for these courses. For AK2038 and AK2040, the result is more varied and generally lower, with AK2038 rating between 3,4-4,8 and AK2040 rating 4,0-6,3 (8 and 28 respondents, respectively). Common for both was the indication that they noted problems with comprehensibility and, compared to AK2030 and AK2036, considered the intended learning outcomes not to be as useful and thought that the assessment was less fair and honest. However, it should be noted that all four courses have almost the same content and almost the same exam, and none of the differences allow for any clear cut answer why these courses report lower than the others. Excluding the possibility that this is statistical variance in respondents, the most apparent possibility is that the issue is with the matching between the course and the master programme.

OVERALL IMPRESSION

Summarize the teachers' overall impressions of the course offering in relation to students' results and their evaluation of the course, as well as in relation to the changes implemented since last course offering.

The teachers' overall impression is that students, in general appreciated the course. The most of the discussion in the course analysis meeting focused around the seminars, and how to handle two students taking an online seminar using the same device, and other similar technical issues.

ANALYSIS

Is it possible to identify stronger and weaker areas in the learning environment based on the information you have gathered during the evaluation and analysis process? What can the reason be?

There is no aspect of the learning environment that sticks out in either direction, the courses taken as a whole. The general structure of the course is functioning well and fills its purpose. Improvements can be made to particular aspects, such as quizzes or the project part for the mathematics students.

Are there significant differences in experience between:

- students identifying as female/male?

AK2030: Students identifying as female ranked the course slightly lower for almost all areas. Some students commented positively on the use of female pronouns in examples in lectures and course materials.

AK2036: No significant variations.

AK2038: Low number of respondents make the graphs hard to interpret.

AK2040: No significant variations

- international/national students?

AK2030: International exchange students rank question 19 and 21 (learning in different ways and collaborating with others) lower than the Swedish students (1,5 points). International masters students rank half of the questions lower than the Swedish students (1-1,5 points).

AK2036: No significant differences.

AK2038: Low number of respondents make the graphs hard to interpret.

AK2040: Swedish students ranked the questions higher for most areas compared to international master's students.

- students with/without disabilities?

AK2030, AK2038, AK2040: No breakdown

AK2036: Students with disabilities ranked the questions significantly lower than the other students for all areas, except on question 15 where they ranked significantly higher, (I could practice without being graded).

In general, it is hard to draw any conclusions regarding these differences based on this material, as it is hard to determine what are statistical artefacts and not. Since there is no information about the size of these groups it is impossible to tell if the results are due to actual differences related to these aspects. There are no written comments to support any special conclusion.

PRIORITIZED COURSE DEVELOPMENT

What aspects of the course should be developed primarily? How can these aspects be developed in short and long term?

- The final video should be added, a quiz created and the video transcribed.

- The transcriptions should be edited further.
- The quizzes should be given an overview, to ensure consistency.
- The project part for AK2040 needs additional improvement.

OTHER INFORMATION

Is there anything else you would like to add?

The article for the project part for the TEFRM program needs to be changed.

JML might be integrated into the course in the long term, as a part of the normative discussion.