

Course Analysis

EI1120 Elkretsanalys för Energi och Miljö (CENMI program) 7.5p

VT21 P3 (2021-01-18 - 2021-03-17)

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Staffing

Responsible department: Electromagnetic Engineering (KTH/EECS/EME)

Course-responsible, Lecturer, Examiner: Nathaniel Taylor (writing this analysis)

Other teachers (övning, medrättande): Md Tanbhir Hoq, Md Zakaria Habib

Events

Lectures: 15 double-period sessions (i.e. 22.5h), usually two per week.

Tutorial (övning): 14 double-period sessions (21h), usually 1 day after corresponding lecture.

'Laboratory' (substitute) tasks: 2 (obligatory), done by submitting a report on a computer simulation

Homeworks: 10 homeworks, submitted by email or paper; obligatory to pass 5, exam bonus from doing more.

Lectures and tutorials were generally well attended, by more than half of the class.

Registered students

88 students participated at some point during the course. This is close to (a few higher than) what has been the typical number historically. 73 were new registrations.

Results

The same principle was used as in recent years: a final exam and two partway exams (KS) that can contribute to it.

Exam, 2021-03-17: 69 students, 73% pass after Fx completion: A (11), B (6), C (8), D (11), E (14), F (19)

Re-exam, 2021-06-10: 19 students: A (1), B (3), C (4), D(5), E (4), F(3)

The main-exam pass rate is low compared to a level in other years typically somewhere in the mid-eighty percent range. 71% of new-registered students had passed by the time that the re-exam was reported.

Course 'moments' and points

The course's 7.5 points consist of the final exam (TEN1, 5.0p) and two other 'moments' (PRO1, 1.5p; PRO2 1.0 p).

This year, as in several previous years, PRO1 is passed by a required proportion of approved homeworks, and PRO2 is passed by passing both labs. The final course grade (A-F) is the same as the exam grade, when all three moments are approved.

Prerequisites

Adequate. See earlier analyses: the impression about prerequisites is very consistent. The course really doesn't require more than maths as a prerequisite. Some students struggle on the first time they need a specific type of algebraic step that's common in this subject, and then similarly with some manipulations of complex numbers; but they quickly get familiarized. Low scores are far more related to poor understanding of what steps to take in the circuit analysis than in troubles with prerequisites in maths.

Course material

This was unchanged, apart from some variation of which homework tasks were chosen, between alternatives developed over the years. All the material is available online on the course webpage; see earlier analyses for more detail.

Special conditions

This was the first course-round under covid-restriction conditions. The 2020 round was just finished before all of that blew up. Lectures and tutorials were all done in zoom. In lectures this mainly consisted of a camera recording writing on paper, to substitute for what typically in earlier years would have been whiteboard-based presentation (apart from a few cases when slides with pictures were used).

The labs when done physically would either need a lot of sessions or a lot of proximity of students. It was therefore decided that these too would be converted to online forms as quizzes based on using an online circuit simulator to try some situations and report the results. This had some interesting features, such as allowing interested students even more time to explore different situations, but it clearly lacked some of the purpose of the real lab, for demonstrating actual equipment.

The KS1 and KS2 were done as hand-written, invigilated tests on campus. The exam and re-exam were done as zoom-invigilated home exams with photographing of written answers for uploading in Canvas. The different formats were a consequence of KTH covid-related preferences and student concerns at the later times in the period.

Load and timing

The events of lecture, tutorial, lab, are only a minor part of the total course time (<25%), and were not significantly changed in timing compared to earlier years despite the covid-caused change of format. Homeworks and the final project-task were the same as in the previous year. There was no complaint about excessive pressure with deadlines.

Evaluation

An anonymous 'free form' web-form was made available for student comments after the (main) exam. There were only a low number of responses (10) and the general impression was not as good as has been the case for earlier years. This fits with my perception too. The whole environment of working mainly alone and not having person contact is doubtless unhelpful to many people. Some comments concerned the KSs being on campus, which two respondents were annoyed by as they hadn't wanted to travel and sit with others, for personal or family reasons. The impression of the usefulness of lectures or tutorials was lower than usual, as the quality of writing and audio was not always good. However, it was noted that writing zoom messages made it in a way easier to queue questions during a tutorial. There were not any enthusiastic comments about the simulation-based lab tasks, but only neutral or somewhat negative (when the online simulator had been problematic for a student).

Views

Student feedback (and the much lower level of responses than previous years) fits my own perception: obvious worse contact and motivation than usual, due to the prevailing situation and the practically entirely online course. This course has the good feature that it has been designed on the principle that all the "meetings" (lecture, tutorial) should be voluntary and should be alternatives or additions to already available written course material that is available in Canvas from the start of the course. Thus, even a lack of lectures and other meetings should not prevent students from following the course. However, previous evaluations make clear that both types of meetings are useful for them, for alternative presentation type, asking questions, and just feeling motivated to study a newly introduced topic. We and the students feel that overall the zoom-based meetings have been inferior to real ones, despite the small advantage of a messages system for queuing questions. We could doubtless have handled the online format better than we did, if using more time, equipment (stylus pad and/or better camera) and experience. Compared to non-restricted years, the lower response rate to evaluation questions and the rather lower exam pass rate suggest (non-rigorously! - our perception) a weaker motivation and weaker connection between the staffing and students on the course.

Treatment of proposals from the 2020 analysis

This round deviated from the planned changes. Due to the lack of on-site meetings, it was felt unwise to abolish all homework tasks, because we felt that motivation to keep working regularly is even more important when the working environment (home) is more difficult. The considered removal of a topic was not implemented, as it would have required time to rearrange material, and time was very lacking in 2021 due to the changes needed to this course and a further course that had to be taught by the same course-responsible for the first time. All available attention went on covid-necessitated changes.

For the next (VT2022) round

Strongly hoping this can be free from restrictions, so that we can get back more in the way that was planned for 2021. Thinking of some changes, partly pushed by the covid restrictions we've experience: (1) It is tempting to work on simple videos as a further course-material option that could make it less pressing to have lectures, if e.g. there are continued restrictions; some students say that even the videos we made from this year were helpful for them in preference to written material - tastes of course differ on this. (2) After discussion in the circuits-courses "teacher team" (lärarlag) I am tempted to try Canvas quizzes at least for homeworks and possibly as the basis of an invigilated exam. This is partly to handle quick feedback, particularly for homeworks, and partly to make the course scale better even if there are few or no available teaching assistants, which is happening increasingly with the low level of PhD students in the department who are available for teaching.