

# Kursrapport MM7027 VT24

Antal respondenter: 1  
Antal svar: 1  
Svarsfrekvens: 100,00 %

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## . Beskrivning av kursupplägget.

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The course deals with systems of linear differential equations with and without control variables, stability theory, basic control theory, some selected aspects of optimal control methods e.g. dynamic programming, optimal linear quadratic control or deterministic Kalman filter. The theory of the course is useful in applications in various areas in natural sciences, economy in addition to engineering applications. Recently, the theory is applied to life science and analysis of machine learning algorithms and design.

The evaluation is based on a final written exam (60% of the final grade) together with three sets of homework assignments and a project assignment (40%). Students can choose to base their grade completely on the final exam.

Instead of the traditional 2+1 layout, we opted to lecture in thematic blocks, and have, after those blocks, a session of discussion and problem-solving.

Two teachers teach the course, giving their different perspectives to the material.

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## . Kursens fördelar, beakta studenternas uppfattning i kursutvärderingar.

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The students' answers shows that the material is perceived as interesting and relevant for modern applications of Mathematics.

During the course, the students put into practice knowledge from different areas (linear algebra, Analysis, differential equations), showing mathematics as a connected subject.

Students can receive points through course-work (homework and final project) to be able to significantly reduce the number of exercises needed to be solved in the final written exam to pass the course. This seems to engage the students positively in working continuously in the course content.

Having two teachers offering slightly different perspectives in the course content is perceived as a bonus.

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## . Kursens nackdelar, beakta studenternas uppfattning i kursutvärderingar.

### Kursens nackdelar, beakta studenternas uppfattning i kursutvärderingar.

Some students registered in the course for gaining access to the knowledge, with no intention to take the final exam. This has happened at least in the last two years I have been involved in the teaching of the course. I copy underneath an extract of an email from one of such students:

"[...]I'm really sorry for not writing the exam, there are a lot of things happening right now and as I told you I don't need the credits for my Masters.

However, even though I did not put the work in that the course deserved, I will definitely use your material to catch up on it over the summer and might make use of it for my Thesis back in Germany. I really like the informal and relaxed setting here in Sweden! [...]"

The course literature is a notch more advanced than the average student in the classroom. One overcomes this difficulty by exchanging tedious technicalities in proofs and definitions for a more intuitive and still correct approach in the lectures. For instance, to suit the content to an average student, definitions of concepts, and hypotheses are "simplified" (avoiding things like measurability assumptions, presented in the coursebook, and replacing those by smoothness), and proofs are sketched on broad brushes. The most advanced students can complement the results with the course-literature, and class notes are provided by the lecturers after each session.

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## . Slutsatser samt förslag till förbättringar.

### Slutsatser samt förslag till förbättringar.

The course is an engaging course, mathematically interesting that attracts a bunch of students interested in the topic, but not necessarily motivated by having passing grades. It is a fun and rewarding course to teach and to learn, where students can quickly see a somehow direct applications in the real world.

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