

Kursrapport MM5021 HT23 period ABCD

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

. Beskrivning av kursupplägget.

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The course deals with real numbers, the Bolzano–Weierstrass theorem, theorems concerning continuous functions, metric spaces, differentiation and integration in \mathbb{R}^n , series of functions, uniform convergence, and the implicit function theorem. The course is intended to impart a deep and thorough understanding of the fundamentals of mathematical analysis in \mathbb{R}^n .

. Kursens fördelar, beakta studenternas uppfattning i kursutvärderingar.

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The course offers a rigorous introduction to abstract topics, that are key for unlocking the access to more advanced courses, and creates the space for students to develop the skill of reading a mathematics text.

Whenever I give this course, a transversal skill I aim students to develop, is to learn how to read a mathematics text, and I think that baby Rudin is a very good text to train on that. Many (subtle) details are left to the reader to fill-in (the lack of visual representations in Rudin is a characteristic!), that can be discussed and expand upon during the lectures and tutorials, leaving the lecturer the role to bridge in between students and text [I produced a 4 pages document, and made it available in the course-page, with tips to help the students to go through a mathematics text.] I also try to emphasise the importance of this, on helping the students in the process of creating their own mathematical style. I was glad to see that some students appreciated that, and that those consider the course very relevant for them.

Besides Rudin, to help those other students that find the course-literature more challenging, students have electronic access to the book "G. Raffi, Real analysis lifesaver : all the tools you need to understand proofs", which was originally designed as a companion reading to the first chapters of Rudin's book. In that book, there is a series of exercises where formal proofs are provided, with blanks on it, that students need to fill in with the proper wording. (Inspired by these, I'm currently trying to experiment with such exercises in the MM5010-VT24 as a tool to improve math-literacy).

We ran a pre-course survey to have an insight on students expectations and aims for the course. (The access to the course-page was restricted by a password, that students obtained after answering the survey, so, to some extent, it was mandatory to answer it) In connection to the question in that pre-course survey regarding expected outcomes from the course (What do you want to get out of this course?, Why are you taking this course?), the students claimed in large, aiming to "gain a better understanding of the theoretical fundamentals of mathematics", and "Deepen my mathematical understanding and develop my skills in reading and writing rigorous mathematics". Although the number of answers in the post-course survey is not significant, these expectations seem to have been matched.

The rapport with the attending students was very good, as reflected in the answers received. They were active and engaged in the lectures, and we managed to create the atmosphere where they felt free of asking questions and intervene. It was definitely a very pleasant group to work with.

. Kursens nackdelar, beakta studenternas uppfattning i kursutvärderingar.

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As in many other courses, I think that the number of dropouts is big, and I believe that, in this course at least, many students underestimate the time dedication for the course, which may be an important factor in the dropouts. I try to argue for this below.

Despite being "compulsory" to answer the pre-course survey, only 32 students filled it in (out of the 43 registered in Ladok). Of those, less than half were attending lectures/tutorials, and were really actively participating in the course by handing in homework. Note that 14 students wrote the first exam, roughly matching the number of "active" ones. In the pre-course survey we asked the students how many hours they intended to dedicate towards the course, and only 26.7% answered at least 20 hours/week (it's a 50% paced course!), and we had similar figures for students intending to dedicate less than 10 h/w (This is not possible to see in the after-course questionnaire.)

Since there was no blackboard in the room, I have been using the document camera instead of the whiteboard, and some students found the layout discomfoting. Initially I thought of uploading the material in the course-page (which is one of the advantages of using the document camera since "slides" can be easily scanned), but I really wanted them to jump into Rudin's pages. Some students in the group had diagnosed ADHD, and despite one of them had the right to get help from a fellow student in the form of note-taker, no-one volunteered for that job. So, this particular person struggled with the layout and the fact that we rely the course in having access to the coursebook.

The results in the first exam were below my expectations after looking at the homework (bonus point problems) and the in-class participation, but it had a normal pass ratio for those attending.

. Slutsatser samt förslag till förbättringar.

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In the aforementioned pre-course questionnaire, when prompted to do a self-assessment on how confident students feel about reading a mathematical text on their own, they answered that it is pretty high (average 4 in a scale of 1(poor), 5 (Excellent)), but when prompted to the question on how confident they feel presenting their arguments in writing, the answers went into the other direction. It is difficult to tackle many fronts at the same time within a single course, given also the time-span given, but I think that it would be good to introduce in the tutorial times, in not all of them, some activities where students have the chance to present their solutions on the blackboard to others.

I discarded this option this year, as when I tried to implement that in the past, students impression of those sessions are a waste of time and the TA was not comfortable with that layout. Nevertheless, I believe that such layout would help students to feel more comfortable to present ideas to others.
