# Report - IH2653 - 2020-01-21

Respondents: 1
Answer Count: 1
Answer Frequency: 100.00 %

**Please note that there is only one respondent to this form: the person that performs the course analysis.**

**Course analysis carried out by (name, e-mail):**

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**COURSE DESIGN**

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

The course was designed with continuous assessment, where two lectures per week where followed by one homework assignment. One tutorial session per week provided an opportunity to solve the HW with support from the teacher and in discussion with peers. The tutorials were also used for individualized feedback on submitted HW.
The tutorials were now reintroduced, for a few years they were not offered. I am convinced that this was a significant improvement.

**THE STUDENT'S 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?**

The survey data points to a comparatively low workload < 20 hours/1.5 credits. That is reasonable since most of the time outside the classroom was dedicated to solving the HW. The amount of reading in the course could be relatively small even though supplementary reading was provided along with the lecture powerpoints. It was up to the students how much time they spent on that material.

**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?**

The students performed well. All students passed and most got a grade of B or higher. Out of all submitted HW only a few per week needed revision to reach a passing level. The course does require a certain amount of scientific programming background. That could be clarified in the course information. It seems that the students in this course had sufficient previous knowledge in programming. In practice most of the students worked in pairs. I encourage this but for the future some dedicated individual assessment could be added for increased fairness.

**OVERALL IMPRESSION OF THE LEARNING ENVIRONMENT**

**What is your overall impression of the learning environment in the polar diagrams, for example in terms of the students' experience of meaningfulness, comprehensibility and manageability? If there are significant differences between different groups of students, what can be the reason?**

My overall impression is that the learning environment was open and inspirational, this is supported by the response to questions 6, 13, 14, 44 that all got 7.0 out of 7.0.
In my opinion the learning environment only works well if lectures and tutorials are seen as a joint "package". That was my goal for the 2019 course round.
The attendance at lectures and tutorial was close to 100% and students were actively participating.

**ANALYSIS OF THE LEARNING ENVIRONMENT**

**Can you identify some stronger or weaker areas of the learning environment in the polar diagram - or in the response to each statement - respectively? Do they have an explanation?**

There were a few responses that indicated the learning in the course was not so flexible. Statements 2, 11, 18, 19, 29 got around 5 out of 7. Since the learning was centered around the weekly submission of HW this is quite natural. Students who wanted to explore the topics at another pace or by e.g. more reading could not really fit this into the course format. The main flexibility was the offering of an open project topic. However, that also meant higher workload and was probably not so attractive in the end.

As discussed above the atmosphere in the course got unusually good responses. With only 40% response rate this should be taken with some caution, but it is still encouraging.

**ANSWERS TO OPEN QUESTIONS**

**What emerges in the students' answers to the open questions? Is there any good advice to future course participants that you want to pass on?**

The students comment on the choice of simulation tools. They are generally positive and seem to find both nanohub and COMSOL quite useful. There is a preference for tools (COMSOL and TCAD) that are industrial (commercial) since these are used in most companies and will be useful after graduation. It is my intention to focus more on these tools. They are quite complex and well structured teaching and tasks could actually give the students a significant advantage in terms of how to use the tools in practice.

**PRIORITY COURSE DEVELOPMENT**

**What aspects of the course should primarily be developed? How could these aspects be developed in the short or long term?**

The programming tasks in MATLAB or Python are probably useful, but in a strict sense they are not really "simulations". They are part of an original course design that took its starting point in numerical methods for semiconductor equations (PDEs). The numerical methods part of the course should be revised and it is an ongoing effort from 2018 to 2019 that will be continued. As one student indicated it is important to either have a short introduction or a in-depth treatment and to avoid anything in between.

My main priority is to focus more on compact models for circuit simulation. I have introduced new reading material and new lecture notes. I will introduce new (pratical) laboratory exercises and real experimental data will be used as modelling input.
The multi-physics part of the course is another candidate for development. I have not completely decided on the direction, since the area is for sure highly relevant for nanotechnology students but it is not a core part of the topic "Semiconductor Device" simulation. If I go in this direction, one option would be to rename the course to e.g. "Modeling and Simulation for Nanotechnology" and to introduce some new intended learning outcomes. This needs to be discussed at the program level and the program director should provide some guidelines.

**OTHER INFORMATION**

**Is there anything else you would like to add?**

I spent significant time on course development and estimate my total workload (including the teaching) to at least 200 hours. The proposed changes for 2020 will also require a similar effort.