



Report - IH2653 - 2021-01-25

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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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.

A course evaluation form (LEQ) was open during the examination period.

As a follow up, most of the students also got the chance to comment on some of the evaluation questions after their completed oral examinations.

DESCRIPTION OF MEETINGS WITH STUDENTS

Describe which meetings that has been arranged with students during the course and after its completion. (The outcomes of these meetings should be reported under 7, below.)

See above, discussions after the examinations.

Personal feedback, at the weekly tutorials, included discussion of the problem formulations and possible changes and updates for next year.

COURSE DESIGN

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

More material that supported the Python environment for the weekly assignments was added. In this way it became optional to use either Python or Matlab for the assignments according to the student's own preference and previous experience. Still some student had very limited experience in either software environment.

A short (30 minute) oral examination was added, to complete the weekly assignments. Assignment completion counted as 80% of the course requirements and the exam counted for the remaining 20%.

Examination questions were predefined to ensure fairness in the individual examination sessions. All questions were connected to the homework assignment.

This year marked the completion of the course material renewal. I started this work in 2018 as I took over the course. All lecture slides have been renewed, some content has been added. Significant parts towards numerical methods and electro-magnetic field theory have been cancelled or simplified, since they are not inline with the intended learning outcomes. This effort was indicated and planned in last year's evaluation.



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?

Most students reported a workload in the range of 9-14 hours/week, the expectation for a half-time course is 20 h/week.

The accumulated time corresponds roughly to participation in the 6 weekly scheduled hours plus one working day (8h) for the assignment. In summary, the student effort seems reasonable. Students seem to do relatively little self-study and reading outside the teaching events, this is partly explained by the focus on lecture slides over textbook material. Textbook reading in available free PDF-versions was suggested for some of the course modules.

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?

All (13) master students passed the course. The PhD students (2) were late in completion. Some student worked in pairs, some worked by themselves.

Working in pairs was an option in particular for students with less experience in coding and use of software tools.

Overall the grades were high, most students achieved A. This is partly due to the set-up of the homework assignments (80%) combined with the exam (20%). Most students were at the level of B already after the assignments, since they completed them every week at a high level.

For next year, course round of fall 2021, a criterion based grading system should be implemented, in contrast to the "score-based" system that has been in use for more than 10 years. This new system will be in better agreement with KTH general grading policy.

STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

Some examples are given here:

"It was an overall presentation of the simulation concept. I liked the fact that a code was given to us and we had to understand it and modify it. Learning by doing is the most effective way of learning."

"To have a weekly assignment. It gave some structure to the studies and it helped with learning about the concepts. I also thought it was really good to have the feedback, and the point system for each assignment was a motivating factor."

"The comments in the code could be improved since this course probably has a lot of programming novices in it. To explain blocks of code in greater detail."

"I felt like the lectures were not that connected to the weekly submissions. I would've liked the homeworks to more reflect the lectures."

"I think that the assignments could have included some more questions to explain the methods or the results a bit more."

"Don't be afraid to choose the course if your MATLAB or Python skills are weak. The homeworks motivate the participants to search about the details in the code like commands, functions etc. At the end of the course, the programming skills are brushed up and enhanced."

"I worked in a group because I wanted to discuss with someone while writing the report (especially during a distancing period!). It is really nice to see how another person deals with the same problem/question. You always learn new things just by cooperating with another person."

SUMMARY OF STUDENTS' OPINIONS

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

There are many positive comments and some that ask for e.g. improved assignment instructions.

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 addition of an oral examination to the weekly assignment was a very meaningful change. The examination session identifies conceptual understanding and the ability to reason in a wider context. In contrast, the assignment reports sometimes showed a lack of understanding since very little discussion was attempted, alongside the reported figures and tables.



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 for these be? Are there significant difference in experience between:

- students identifying as female and male?
- international and national students?
- students with or without disabilities?

The statistics of the survey, with 6 out of 13 students responding, do not make this type of analysis meaningful.

However, a certain group of students from the nano-materials track had less background in programming. This is a sign of the varying preparation of international master students. Their respective bachelor level degrees can vary significantly in subject e.g. electronics/physics /material science and chemistry.

PRIORITIZED COURSE DEVELOPMENT

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

Short term

- Include more compact device modeling, including a new weekly assignment
- Clean up the multitude of software tools, one way would be to focus more on COMSOL that provides most of the functionality that is actually needed in the course
- Provide a better connection to reading instructions, using the available, free PDF-version of suggested books!

Long term

-Change the name, it would be reasonable to replace this course in the curriculum by a course with the generic name of "Modeling for Nanotechnology". This change could be instantiated no earlier than fall of 2022 since the offering for fall 2021 is already announced under the current name. This development idea is kept from last year's evaluation and will hopefully be executed this time.

OTHER INFORMATION

Is there anything else you would like to add?

The course should also be marketed towards to Embedded Systems, Embedded Electronics (INEL) track. This student group has suitable prerequisites.
