

Report - SH2314 - 2023-07-19

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.

After the course, the course participants were encouraged (by e-mail) to fill in a learning experience questionnaire (LEQ) with 12 questions answered with numerical values and a number of free-response questions. Six participants out of 22 answered the LEQ. Due to the small number of respondents to the LEQ, it was not possible to analyze differences based on gender and disability in the answer to the LEQ. However, inclusiveness in general, and gender inclusiveness in particular, was discussed in the course evaluation meeting (see below).

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.)

There were no course evaluation meetings during the course since no student expressed interest in taking part in this at that stage. After the completion of the LEQ, a course evaluation meeting was held (Zoom, 2023-07-04) where the examiner and one course participant participated.

COURSE DESIGN

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

SH2314 Medical Imaging Signals and systems (7.5 credits)
Course responsible, teacher and examiner: Mats Persson
Course requirements: Exam (TEN1, 4.5 credits), lab exercises (LAB1; 3 credits)

This course consists of a series of thirteen lectures and one exercise class. The classes are held as a combination of slide shows and blackboard derivations, with different active learning exercises mixed in. These active learning exercises can be anonymous quiz questions, which are subsequently discussed in class and sometimes in small groups. On one occasion the students performed a small computer laboration (on MRI) in class.

To ensure continuous learning, six sets of optional hand-in problems were given throughout the course, giving bonus points on the exam. There was also an opportunity for the students to present on a topic of their interest to get bonus points for the exam (which five students did).

The lab part of the course consisted of two parts: First, a study visit to the Karolinska University Hospital to look at the different kinds of imaging equipment, followed by a small quiz. Students who were unable to attend the study visit had to do a virtual study visit instead, by watching online videos showcasing different medical imaging equipment, followed by the same quiz, and by finding a video that they themselves were interested in and posting it on a discussion board. Second, there was a lab exercise where the students took a CT scan of a doll and measured an unknown contrast agent concentration. This exercise required numerical programming to analyze the data and was examined with a lab report.

The course was given in person at Albanova, but the lectures were also streamed on Zoom, and most of them were recorded. The lab was held in-person. Most students chose to attend the lectures in person.

Since last year's course evaluation was predominantly positive, only minor adjustments were made compared to last year. However, there were some changes to the course content, mandated by the planned co-teaching of this course with a similar course in the CBH school, CM2020, which is planned for next year's course round. Since CM2020 contains more material about detectors than this course has done previously, some material about detectors were added. To make room for this additional material, there were some reductions in the material about image quality metrics. Specifically, quantitative accuracy was omitted, and noise power spectrum was covered somewhat less in depth than before.

The decision to record this year's lectures as videos was also motivated by the planned future co-teaching with CM2020 and is in line with last year's course evaluation. Since a large part of the next course round will employ the flipped-classroom model of CM2020, these video lectures will be useful for the students of this future round.

Last year's course analysis identified that it was difficult for students to find other students to work together with. For this purpose, the lecturer pointed out at the beginning of the course that students who wanted to form study groups were welcome to contact the lecturer so that he could put them in touch with each other. One group of two students was formed in this way.

Another minor change, mandated by a need identified in last year's evaluation, was that the lab instructions for the x-ray ct lab was revised for clarity and what was previously multiple documents was merged into one.

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?

Since this is a 7.5 credit (five full time weeks) course running during one study period the expected number of work hours per week is $5 \cdot 40 / 10 = 20$. The students' responses suggest that they work between 3 and 20 h per week, i.e. there is a very large span. Those respondents who give lower estimated hours per week may perhaps not be including studying for the exam in these numbers. I therefore do not see a need to increase the workload based on this quite limited data sample.)

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?

Out of 22 students (originally 23 but one dropped out), the first exam was taken by 20 students. Of these 20, 17 passed the exam (after Fx completion). Therefore, of the 22 course attendees, 77% passed the exam. Of the passing grades, the grade distribution was 4 A, 0 B, 2 C, 6 D and 5 E. These are slightly lower grades on average than last year but still fairly typical. At the time of writing, three students have still not completed the lab part of the course.

STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

- On "What was the best aspect of the course?" There are very diverse answers: The guest lectures, the lab, the study visit, the clear structure, the lectures and the home assignments.
- On what could be improved, students suggest more continuous assessment instead of the big exam, more exercises and more material about MRI and ultrasound.
- On the question about what advice to give to future participant, the emphasis is on doing the homework:
"Do the homeworks! They help a lot to prepare you for the exam and understand the lecture topics"
- On the guest lectures, comments are generally positive. Examples:
"A nice contribution to get experts on the specific subjects. It could maybe get a bit more clear whether these was as important for the exam as the rest of the the lectures"
"They were good! I especially liked the lecture on MRI"
- On the lab, comments were also positive, although pointing out the need for more clarity in the instructions:
"Nice to use the knowledge in something real and relatable. It was also nice to have it after the rest of the course was pretty much done."
"It was fun to do. The lab instructions were a bit messy but we were able to understand after reading through some times"
- On the study visit, there were mixed opinions:
"Fun but maybe not so informative, just showed on stuff we had already learned."
"It was great! Very fun to see the machines and the topics we had studied"
- Did you think that the climate in the course was inclusive towards you and others? The answers to this are affirmative:
"Yes the teacher seemed very mindful of letting people speak"

SUMMARY OF STUDENTS' OPINIONS

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

The students' answers to the numeric questions were generally good (= high numbers). On the scale from 1 to 7, all average scores were above 6 except 7. "The intended learning outcomes helped me to understand what I was expected to achieve" (score 5.5.), 19. "The course activities enabled me to learn in different ways" (score 5.8) and 21. "I was able to learn by collaborating and discussing with others." (score 4.8). The conclusion from the course meeting is that in-class interactive activities such as anonymous polls are good and can be utilized even more, and that even more group discussion can be introduced to encourage students to discuss with each other.

Other conclusions from the course meeting are:

- Calculation examples on the blackboard were appreciated and there could be more of these.
- It can be good to be clear from the beginning about the fact that MRI and ultrasound are not covered in depth in this course.
- There was a shortage of time on the exam. It can be good to warn about this in advance.
- The page with old exams is helpful.
- It's good to keep deadlines for homework exercises at midnight, not at 17.00.
- It's good to keep having office hours the day before the homework deadlines.
- The current number of guest lectures (two) is good
- The lab instructions need to be further clarified.
- The study visit was good but it may be even better to have 1-2 more labs instead, on different modalities, since some of the material covered during the study visit was already known to the class.

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 overall impression is that the course is working well and was viewed favorably by the course participants. Since next year's course will see a major change in the course structure mandated by the co-teaching with SH2314, it will therefore be important to keep as much as possible of the aspects of the course that have been working well so far. The implemented changes seem to have been working as intended and careful additional changes in the same direction should be implemented for next year, such as further improvements of the clarity of the lab report and giving the students more opportunities to form study groups.

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?

Due to the small number of respondents on the LEQ it is not possible to identify differences in experience between subgroups of students. However, the feedback from the students suggests that the course climate is inclusive. For this reason, I will assume that there is no need for major changes while nonetheless continuing to look out for ways of improving the course climate. Encouraging the students to form study groups seems to have been a good thing but even more emphasis can be put on this to further increase the inclusivity for foreign students who may not know anyone in the class.

PRIORITIZED COURSE DEVELOPMENT

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

For next year's course round, the most important task is to make sure that the course can be co-taught with CM2020, without making unnecessary changes to the things that are currently working well. This will include adapting a large part of the course for the flipped-classroom format, which will be facilitated by the video lectures that were produced this year.

The plan is also to replace the study visit with 1-2 new labs (the current lab can be reduced in extent to make time for more). This will be made possible through collaboration with the CBH school which have access to lab facilities that have not been available for this course previously. In addition to this, it will be important to introduce in-class group work early in the course to help the students form study groups. Also, more opportunities to solve problems on the blackboard should be taken. More work should also be put into revising the lab instructions to make them clearer.