Report - EL2850 - 2023-12-22

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.

* Two anonymous forms were sent out for student feedback during the course. An open discussion followed these in class.
* The standard course evaluation form was sent out following the final exam.
* Once the course result had been obtained, a meeting with the course evaluation board (two student representatives, the TA, and the course responsible) was held.

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.)

* Following the sending out of the two anonymous forms, an open discussion was held in class. The course responsible asked for clarifications and explained why choices had been made concerning what material was covered in class.
* Following the course evaluation, a two-hour meeting was held with the course board. The board discussed the results and course structure in detail and provided feedback 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.

This was the first time the course was given. The learning activities were:

Lectures: Review and introduction of essential theory and definitions of important concepts in safety in cyber-physical systems in general and time-critical systems in particular.

Exercises: Practice applying model and data-based methods for safety in cyber-physical systems, particularly for time-critical systems, together with a teacher assistant (TA).

Assignments:
INL1: Demonstrate ability to apply model and data-based methods for safety in cyber-physical systems, particularly for time-critical systems. Individually solve problems and hand in for assessment (3 turn-in assignments).
INL2: Demonstrate ability to formulate basic theory and definitions of essential concepts in safety in cyber-physical systems in general and time-critical systems in particular. Individually write an essay and present in class.
Written exam (TEN1): Demonstrate ability to apply model and data-based methods for safety in cyber-physical systems, particularly for time-critical systems, and formulate basic theory and definitions of essential concepts. Individual solution of exam problems.

THE STUDENTS' WORKLOAD
Does the students' workload correspond to the expected level (40 hours/1.5 credits)? If these is a significant deviation from the expected, what can be the reason?

The students ' workload seemed right given the course evaluation data and the course evaluation board feedback. However, the workload is a bit unevenly distributed, with a heavy load towards the end, which we will try to address next year (see below).

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?

This was the first time the course was given. Eight students submitted all assignments and took the final exam. The final grade distribution was:
A: 1
B: 1
C: 1
D: 1
E: 3 (1 completed Fx)
F: 1

Thus 87.5% of the students completed the course completely after the first exam.

STUDENTS´ANSWERS TO OPEN QUESTIONS
What does students say in response to the open questions?

The evaluation was sent out to ten students, and four answered. Some answers are below:

What was the best aspect of the course?
* "Interesting topics, I like the intersection and combination of control theory and security. The education was well-structured, good to have lecture notes but lectures presented on blackboard."
* "The way exercise sessions complemented the lectures and provided a solid base to do assignments and eventually the exam was exceptionally good. It was also helpful to have specific literature for the whole course and each lecture, which greatly facilitates self-study."

What would you suggest to improve?
* "Judging from the outcomes, the essay/presentation assignment seemed a bit under-defined. The essay is a good opportunity to dive into a topic of personal interest, but having presentations for all students in one go was a bit hard to digest (specially when all students are also preoccupied with their own presentations)."
* "The scheduling needs a bit of work, especially towards the end of the course, having homework 2 deadline + presentation -> homework 1-3 deadline -> exam basically within the span of a week was stressful. Especially having deadline of homework 1-3 3 days before the exam didn't allow for much studying/preparation for the exam. Another scheduling issue was with the last exercise of before homework 1-2 ended on a Friday 17:00 (which touched on very relevant parts of the homework), and the deadline for homework 1-2 was due the following Monday. also it just felt a bit excessive with 3 Homeworks, 1 essay+presentation, and 1 exam. I think it would be better to have graded homeworks or "labs" instead of just pass/fail and perhaps do away with the exam altogether."

What advice would you like to give to future participants?
* "To focus on the literature, since the lectures are very similar and based on the chapters in the books."
* "Try to keep up to date with the suggested readings and attend the exercise sessions, this provides very clear guidance for the assignments and the exam."

SUMMARY OF STUDENTS' OPINIONS
Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.

The scores on the evaluation was pretty high (1=very bad, 4=neutral, 7=very good):

1. I worked with interesting issues: 6.2
2. I explored parts of the subject on my own: 5.5
3. I was able to learn by trying out my own ideas: 5.2
4. The course was challenging in a stimulating way: 6
5. I felt togetherness with others on the course: 5
6. The atmosphere on the course was open and inclusive: 6.5
7. The intended learning outcomes helped me to understand what I was expected to achieve: 5.2
8. The course was organized in a way that supported my learning: 6.2
9. I understood what the teachers were talking about: 6
10. I was able to learn from concrete examples that I could relate to: 5
11. Understanding of key concepts had high priority: 6.8
12. The course activities helped me to achieve the intended learning outcomes efficiently: 6.2
13. I understood what I was expected to learn in order to obtain a certaingrade: 3.5
14. I received regular feedback that helped me to see my progress: 6
15. I could practice and receive feedback without being graded: 5.8
16. The assessment on the course was fair and honest: 6.8
17. My background knowledge was sufficient to follow the course: 5.8
18. I regularly spent time to reflect on what I learned: 5.2
19. The course activities enabled me to learn in different ways: 6
20. I had opportunities to influence the course activities: 4.8
21. I was able to learn by collaborating and discussing with others: 6.5
22. I was able to get support if I needed it: 6.5

The only questions that stand out negatively are 13 and, to some extent, 20. The answers to 13 are explained by the students as "No previous exams, hard to know what type and level of questions would be on the different parts", which makes sense. Regarding 20, the curriculum was indeed fixed, but the intention was that the students could, to some extent, choose essay topics to allow for more flexibility.

The students on the course evaluation board were mostly favorable to the course. They mentioned that the topic was interesting, the workload was reasonable, the review of matrices was good, and the inclusion of Cybok was good. For the future, they recommended rescheduling the essay and including some more specific examples of essay topics. Furthermore, reviewing probability theory (confidence intervals, hypothesis tests, etc.) and sharing exercise solutions would be good. It was also suggested that more possibilities for interaction during exercises would be good, although it is unclear exactly how this is best achieved. Finally, explaining what happens if one fails a homework assignment would be good.

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 course responsible and TA are very happy with the course this year. It was a lot of work to prepare the material, but the outcomes were overall very good. The issues identified above seem quite possible to address in the next course round.

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?

Since there were so few students taking the class/answering the questionnaire, it was not possible to identify different groups.

PRIORITIZED COURSE DEVELOPMENT
What aspects of the course should be developed primaily? How can these aspects be developed in short and long term?

1. Shift the essay assignment (INL2) to the course's middle to better spread the workload.
2. Include block matrices in the linear algebra review exercise.
3. Create a rehearsal sheet for required probability theory concepts.
4. Emphasize matrix pencils more in Module 2, but Bayes' theorem less in Module 3.
5. Consider introducing bonus points on the turn-in exercises (INL1) for the written exam (TEN1).
6. Consider including an overview lecture on machine-learning-based methods in Module 3, but remove Principal Component Analysis from the course (no time for that).
7. Prepare to be able to share solutions to exercises.