Report - DD2525 - 2022-07-20

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.

The course features continuous interaction and feedback between the teacher, students, and TAs. Students are given the possibility to ask questions and provide feedback during the online lectures, breaks, and lab sessions, as well as using standard channels like Canvas and email. Further, the teacher allocates 2 hours/week (every second week) to office hours for one-to-one meetings with students. The course also benefits from two course representatives who gather feedback anonymously from students and report it to the teacher.

This year the course was taught in person for the first time, while in the past years the course was taught online over Zoom. In-person interaction and office hours resulted crucial in receiving feedback as the course was running and helped taking on-the-fly countermeasures to improve aspects of the course. At the end of the course, a course evaluation survey was sent out to all students. In addition the standard questions from the course evaluation template, we asked questions to assess specific aspects of the course (labs and projects) as well as the cross-university Capture The Flag security contest, a novelty that we introduced last year. As last year, each graded moment of the course was accompanied by an optional one-to-one meeting between the teacher and student groups. The teacher met the groups before the live presentations of graded labs to get additional feedback about possible challenges with the labs. At end of the course, we organized a course analysis meeting between the course responsible, course representatives, TAs, and a faculty member from the division. Out of 40 course participants, the course was attended by 2 female students and there were no students with disabilities. The course contains several activities ranging from more structured (lectures, labs) to more creative (projects, exercise sessions, CTF contest), and the minority gender highlights that they felt included.

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.)

The following meetings were arranged with students during and after the course completion:
1.Office hours on a biweekly basis
2.Group meetings during the lab and exercise sessions
3.Project progress meetings (at least 2 with each group)
4.One-to-one meetings on-demand bases, whenever requested by the students
5.Continuous communication with course representatives
6.An optional final meeting with student groups after the course completion
7.Course analysis meeting with course representatives, TAs and a faculty member.

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 third offering of the course. The course consists of lectures and labs sessions, typically one lecture and two lab sessions per week, including one invited lecture. The lectures put emphasis on key concepts of the topic at hand, while lab sessions are dedicated to practicing those concepts with hands-on exercises, tutorials, and programming assignments. The examination consists of three graded labs and one graded project. In the spirit of close student-teacher interaction, the labs were presented to the TAs, followed by a report graded by the teacher. The project was also presented to the teacher and to other students in the form of a final workshop, followed by a final project report. To facilitate and monitor the progress on the project, we used three phases: (1) a project proposal by groups of 2 students; (2) a lightweight project review by opponent groups; (3) project presentation at the final workshop; (4) submission and evaluation of the final report.

In line with the previous course analysis, we implemented the following changes:
1.We improved non-graded activities to foster work in group and interaction. Specifically, we introduced an (1) new exercise session on web security; (2) a new exercise session on IoT app security; (3) a cross-university Capture the Flag contest involving students attending a related course at Chalmers and Aarhus university; (4) informal quizzes during the lectures.

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 workload seems in line with the expectations. The course evaluation results show that the majority of respondents spent between 8 and 20 hours per week. This is a slight decrease from last year and it is likely due to some course activities being taught in person. The students thought that the workload was just right and well balanced.

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 course had 40 registered students; 4 students dropped out after the first two weeks of the course. Of the remaining 36 students, 30 students completed the course successfully. The distribution of course grades is as follows: 16 students received grade A, 3 students received

grade B, 7 students received grade C, and 4 students received grade E. Overall, the results are in line with the last offering of the course.

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

We remark that 25% of the course participants (9 out of 36) responded to the course evaluation survey. In addition to the standard open questions, we asked extra open questions to evaluate: (1) positive and negative aspects of the labs; (2) positive and negative aspects of the project; (3) cross-university CTF contest.

Similarly to past years, the course was received very well by the students. They appreciate the combination of the conceptual aspects with practical aspects. In response to open questions, students emphasize the following points:
1. Lectures, labs and the project were highly appreciated by students, while they emphasize the practical aspects of the labs
2. The course structure, lecture-labs-project, was evaluated as excellent, and several emphasize the ungraded activities such as work-together labs
4. Suggestions for improvement are include better documentation for Troupe (the tool used in Lab 1) and possibility to choose a group partner in line with their ambitions.
5. The course was highly recommended to future participants with several students claiming that this was the best course in security they had taken.
6. Students liked that the project was open and that they could pick their favorite topic.
7. The Capture the Flag (CTF) contest was highly appreciated and it inspired several students
8. Students liked very much the invited lecture by the security engineer from Google

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

The outcome of the questionnaire and meetings with students show that the course was highly appreciated and it is highly recommended to future participants. The students like that the course is hands-on and that several activities are centered around breaking and fixing security vulnerabilities in several domains. The performance and availability of the teaching team was re-emphasized several times.

Suggestions for improvement include:
1. Mandatory activities during the project moments.
2. An exercise session on Troupe to help students getting familiar with the language.
3. Possibility to change the group partners after each lab.
4. Limit the number of groups that can choose a given project topic to ensure an equal distribution of projects across the topics.

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 teaching and learning environment seems to have been perceived very well by the students. This is clearly reflected in the course evaluation
as well as in personal feedback from the students. Non-graded activities had a very positive impact increasing both interaction and actual learning during the course. Cross-university activities such as the CTF context have contributed to further increasing the students' interest in the course. Student feedback about the project has also improved, although suggestions relating to mandatory activities should be accounted for in the next course offering. Finally, we remark that the transition of the course from virtual to in-person teaching caused some challenges about the labs which we solved as they occurred. We still kept some aspects of on-line teaching such as meetings, office hours, and lab presentations (on need basis) to provide diverse opportunities for the students to attend course activities.

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?

In line with the course evaluation survey and the final analysis, the following aspects of the course emerged:
Students were able to get support if I needed (6.9/7), they worked with interesting issues, and course activities helped
them to achieve the intended learning outcomes efficiently (6.8/7). They thought the course was challenging in a stimulating way
and assessment on the course was fair and honest (6.7/7). They report that they were able to learn from concrete examples they
could relate to, understanding of key concepts had high priority, and they could practice and receive feedback without being graded (6.2/7).
Most students found that their background knowledge was sufficient to follow the course and the course activities enabled them to learn
in different ways (6/7). Compared to the previous course offering, the indicators are very similar. No differences were spotted between
female and male students, and international and national students.

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

The course seems to be stabilizing in a good way. While in the long run we would like to investigate
aspects of flipped classroom, we plan the following changes in the short term:
1. Enhance collaboration and discussion through non-graded activities by developing exercises for three parts of the course (IFC, web, and android)
2. Minor changes to accommodate lifelong learning students
3. Improve distribution of projects over the different topics
4. Develop own platform for Lab Assignment 1

OTHER INFORMATION
Is there anything else you would like to add?

The results of the course evaluation survey were discussed in a course analysis meeting on June 21st, 2022 between the course representatives (Zoé Lagache), TAs (Amir M. Ahmadian and Mikhail Shcherbakov), TCS faculty member (Per Austrin), and course responsible and teacher (Musard Balliu).