

Report - DD2410 - 2023-08-10

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 has been evaluated with a questionnaire at the end, and with discussions with groups of students in connection to the seminars in EL2220, as well as in their written comments. The questionnaire had fewer respondents than usual, at 16 answers, therefore it is not statistically relevant, and will mostly be used qualitatively.

The course was also commented in the general evaluation of the SCR Master program, for which it is primarily intended.

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.)

Meetings with students has been mainly via the EL2220 seminars, once per period.

COURSE DESIGN

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

The course covers a broad spectrum of subtopics from the interdisciplinary field of robotics. Three teachers (Christian Smith, Petter Ögren, Patric Jensfelt) cover different topics in lectures and assignments. The larger part of students' learning efforts are spent in working with 4 smaller and one larger programming assignments, focusing on the different subtopics, ranging from kinematics to planning, navigation, task switching, and system design.

Parts of the theoretical knowledge is also examined in a smaller P/F type exam. The assignments all come with different subparts that cover the topics to different levels of advancement. The students can choose to only complete the basic parts for a passing grade, or choose a set of more advanced topics for higher grades.

The course is mainly intended as an introduction to the topic area for the first year students of the SCR Master's program, but is available to other students as well. Currently, more than half of the students are from other programs, with varying degrees of coverage of the recommended prerequisites.

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 expected workload for the course should be 20 hrs/week. This was also the median response in the questionnaire (but 90% of students did not answer it!), but there is a thick tail of students who spend more time. This is probably due to two causes:

- 1) Some students do not have the necessary prerequisite knowledge, most typically not being familiar with programming in general, or the Python programming language used in the course, or being weak in linear algebra. For students who have to learn parts of the prerequisites on their own in parallel to the main course contents, the workload is expected to be very high.
- 2) Due to the higher grades being awarded to students who take on more difficult assignments, some students (including overlap with above group) take on more difficult assignments than they are prepared for, and spend more time with these than they would perhaps have done if the course was only examined with an exam. This can be observed in the automated submission system for the assignments, where it is evident that many students spend significant time on the more advanced parts, even after passing the basic parts of each assignment.

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?

A: 42 students
B: 7 students
C: 12 students
D: 6 students
E: 36 students

The proportion of students with an 'E' grade is lower, and the proportion of 'A' grades is higher than pandemic years, and is similar to pre-pandemic. The assignments have been the same, the lectures have been the same, and the textbooks have been the same as previous years, so a probable cause is the end of the pandemic, and the students again being able to sit in groups in the computer rooms and discuss the assignments as they work.

STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

(From the evaluation of SCR master program: some students listed DD2410 as a model course that other courses on the program should emulate:

- " Introduction to Robotics: This course had a great setup both for the projects / HWs and for the exam. The exam: I liked the continuous examination with quizzes before each lecture, requiring you to read ahead. Then to also have the exam be multiple choice was very appropriate for this type of course, which seeks and overview of the field. Therefore it might not be easy to move to many other courses (if they're not focused on having an overview). The homeworks and projects also had a great setup: It felt like great hands-on work on many different areas. Having different levels to the assignments could be good for different levels of ambition."

- "Laborations and projects are good if they are assigned enough credits, intro to robotics course for example had many heavy projects that was also a large part of passing the course."

-"The Introduction to Robotics course was a pretty well-structured course. Even if it had a lot of assignments and quizzes, I feel that I have learned a lot from the course and improved my coding skills, and learned about ROS. "

(From the course questionnaire:)

- "The best aspect of the course is the wide array of topics to read up upon. The field of Robotics is larger than you imagine and the course does a good job representing many different topics."

-"Learning about the broad areas which are required to successfully develop a robot. The very rewarding assignments, I also liked the energy and passion the instructors displayed".

-"The project was really good. It made us think a lot for each part. Especially the 'A' part where we had to come up with a lot of different stuff. It was totally insightful and interesting."

-"The reading material for the quizzes in the first half of the course should be boiled down more or limited. It actually seemed necessary to me, that we needed to read all of it to answer the quizzes."

-"I would say that there should be more instructions how to do some of the labs. Some of them are really hard for someone who hasn't studied Computer science before."

-"Reading helps in the course. Collecting bonus points for the exam is easier than the exam"

SUMMARY OF STUDENTS' OPINIONS

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

(Note that with less than 10% answers, these results may not be representative)

The highest scoring aspect was "1. I worked with interesting issues", which got an average score of 6 (from 1-7).

The lowest scoring aspects were "15. I could practice and receive feedback without being graded (j)", and "22. I was able to get support if I needed it (c)" which both scored around 4 (from 1-7).

Most students enjoyed the topics, but some students found the course too difficult, and did not feel that they received enough help.

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.

Most students performed well on the course, and were satisfied with the course structure and content.

However, some students were very far from fulfilling the prerequisites, and many of these students found the course very difficult. Examples include students with no prior experience with programming or working with computer systems, linear algebra, or basic mechanics. Some students were not familiar with the concepts of matrix inverses, mechanical friction, or coordinate transforms, and there was not enough time to explain these concepts during the lectures - as they were assumed to be known. The mismatch between these students knowledge and the expectations from the course must have been very frustrating.

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?
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No significant differences found as there were too few students answering.

However, outside of the questionnaire, there seems to be a clear difference between the students who are prepared for the course (typically by being familiar with the prerequisites), and those who were not.

PRIORITIZED COURSE DEVELOPMENT

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

For the next course round, we will mainly focus on two things:

1) Upgrade ROS environment and assignments to current version.

2) Look over the prerequisites for the course, so that students who are not prepared for the topic are not admitted. Specifically, students on some master programs are less prepared than others, and perhaps the course should be removed from the "recommended" list of some programs.
