Report - IL2230 - 2022-05-25

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.

Course evaluation is a continuous process throughout the execution of the course. I continuously ask for feedback from students during lecture intervals, right after lectures, during seminars etc. About gender balance, I ask both female and male students for feedback, and invite both female and male students to join the course meetings.

The course evaluation survey was sent out to all students on 2021-12-24 and finished on 2022-01-06. Students got plenty of time to answer. I also sent two reminders to students in order to increase the answer ratio. The answer rate is 21/43, 49%.

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.)

During the course, on December 7, 2022, 2:00 to 3:00 pm, I arranged a course meeting with 2 student representatives and 2 TAs. After completing the course on June 16, 2022, 1:00 to 2:00 pm, I arranged another course meeting with 3 student representatives and 2 TAs to go through the course evaluation survey and the course analysis.

COURSE DESIGN

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

This is the third offering of a newly developed course starting from HT19. This course is a specialized course tailoring for students studying the Embedded Systems master program (especially for the Embedded Platform/Electronics track) and those students who are interested in hardware acceleration of deep learning algorithms.

In this course run, the course consists of 11 lectures (including one invited lecture), 3 labs, and 2 seminars. In the seminar, students are partitioned into groups to present selected research papers, one group (4-5 students) presenting one paper. The course examination includes two parts: the lab part with Pass/Fail and the written examination with grades (A-F) which is then the course grade (if all labs passed).

I have implemented the following changes, most of which follow my last course analysis.

(1) Lecture slides were enriched in content and example.

(2) All lab materials were revised and updated with clearer instructions. Lab 3B added a section on "Quantization". Lab3 has two options, 3A and 3B. Students can select one of the two labs.

(3) More exercises were added in both modules.

(4) The reading paper list was updated with the latest state-of-the-art papers.

(5) Arrange an invited lecture on "Network-on-Chip based AI Accelerator".

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 course was offered in Period 2, Autumn term (HT 2020). The learning period spans over 10 weeks, with 50% of learning pace. The nominal workload is 20 study hours per week. In total, it is 200 study hours, worth of 7.5 ECTS credits.

According to the student survey, the average number of study hours (estimated workload) is about 16-17 hours per week. Some students spent a bit more time and some a bit less. One student spent more than 41 hours on the course ("mostly due to labs"). Overall, the course workload can be considered reasonable.

(A small note: Two students out of the 21 respondents wrote their study hours as 6-8 hours per week. This might be an underestimate, perhaps due to excluding the scheduled hours.)

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?

There are 43 registered students. The first exam was held on January 10, 2022, and the second exam on April 22, 2022. Two students did not attend the exams.

The results are 2 A, 13 B, 15 C, 6 D and 5 E. The results are as good as in previous years. Students showed greater interest in this hot topic on deep learning and its hardware architectures, and spent good efforts in learning. The good results are an expected outcome of their efforts.

STUDENTS´ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

What was the best aspect of the course? (I worked: 6-8 hours/week)
* The lectures were good and the lecturer did go through difficult parts and explained them in a good manner The labs were interesting and we did learn from them. The sessions with the TA during lab were very informative as well. The TAs did go through the labs but also expanded our knowledge by exposing areas that were not part of the tutorials.
* The course work plan and the professor's lectures
* The practicality

What was the best aspect of the course? (I worked: 9-11 hours/week)
* Having access to up-to-date papers and discussing them from different perspectives.
* The course is related to the popular topic of deep learning and moves further in the domain of hardware, which is related to what we have learnt.

What was the best aspect of the course? (I worked: 12-14 hours/week)
* I think the seminars are great. They help us read the papers.
* These labs were very inspiring and helped me understand the course content

What was the best aspect of the course? (I worked: 15-17 hours/week)
* You could see the efforts of the teacher and the TAs to make this course as good as possible, I appreciated it a lot.
* The professor puts the cutting-edge research results of this field into the course materials, giving us a big picture of how hardware structure and deep learning algorithms evolve to solve some limitations.
* How the important content of the course was all summarized well in the lectures.
* The labs were very interesting since you had the opportunity to try out your own ideas and models.
* The lecture slides were good for reviewing the material. The TA's were very helpful. I liked that we were given relevant papers to read if we wanted to learn more about a specific part of the course.

What was the best aspect of the course? (I worked: 18-20 hours/week)
* Learned many new things. I think this course works well as a general introduction to deep learning. The first block of the course (about ANN, CNN and RNN) was very well structured. - TA's were super helpful
* Workload is reasonable

What was the best aspect of the course? (I worked: 24-26 hours/week)
* The lab settings, where there are two directions for students to choose.

What was the best aspect of the course? (I worked: > 41 hours/week)
* The labs were interesting and one could learn a lot.

What advice would you like to give to future participants? (I worked: > 41 timmar/vecka)
* Very enjoyable course. Very helpful and educational. Passionate teachers and TAs.

SUMMARY OF STUDENTS' OPINIONS

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

Students give some thoughts in the course evaluation survey and the course meetings.

About the seminars:
* The seminars could be made more interesting with some comments from the professor's perspective on each of the papers if the presentation did not go into enough detail so all students understand the paper.
* Seminars can be more engaging by adding random Q&A sessions.

About the labs:
* Re-arrange labs. If the lab2 can be lab1 it will be better to follow the course.
* Further improve lab instructions.

About the exercise
* It would be an improvement to recommend exercises from the course compendium after each lecture, that students should be able to solve after each lecture.

About the group work
* Working in such large groups was difficult. Everyone did not contribute as much. Some group members were difficult to reach initially.

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.

I feel that this course offering was a successful one.

The course contents were interesting and stayed up to the front. The labs were well designed and many students were enthusiastic about the tasks. The seminars allowed students to access the latest research papers and touched upon recent developments in this hot area. The exercises helped students to put theoretical knowledge into practice. The changes introduced in this course round further enhanced the course.

Students enjoyed reading the course, spent good efforts, and achieved good results. Students have thoughts on seminars, labs, exercises, and group work. Unequal contribution and smooth communication in group work have always been an issue. Some improvements will be done 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?

The responses to each statement are scored from -3, -2, -1, 0 (neutral), 1, 2, 3, X (no standing), corresponding to score 1 (-3) to 7 (+3). There are no big variations across the answers. The highest score is 6.6, while the lowest is 5.2.

The statements receiving higher scores are listed as follows.
22. I was able to get support if I needed it. (6.6)
6. The atmosphere on the course was open and inclusive (6.6)
10. I was able to learn from concrete examples that I could relate to (6.4)
16. The assessment on the course was fair and honest (6.4)
19. The course activities enabled me to learn in different ways (6.3)
11. Understanding of key concepts had high priority (6.3)
1. I worked with interesting issues (6.2)
12. The course activities helped me to achieve the intended learning outcomes efficiently (6.2)
21. I was able to learn by collaborating and discussing with others (6.2)

The statements receiving lower scores are listed as follows.
14. I received regular feedback that helped me to see my progress (5.3)
Comments :
* I had to actively ask for feedback
* Maybe it would be good to have some quizzes or something similar to be able to evaluate personal progress throughout the course?

17. My background knowledge was sufficient to follow the course (5.3)
Comments:
* I was accepted although I had not taken the VHDL course before, so the first lab was difficult for me
* I needed some more background on the lab part, especially coding with python.
* ASIC exercies are hard due to no previous knowledge
* I was a bit worried before the course since I had very little previous knowledge of neural networks, but I had no problems following the course.

20. I had opportunities to influence the course activities (5.2).
One comment: "We were able to choose what to focus on with the last lab, but it required the group to agree."

The detailed scores are listed for reference.
In Category 1, the score vector is [6.2, 5.8, 6, 5.6, 5.7, 6.6]
Meaningfulness - emotional level
Stimulating tasks
1. I worked with interesting issues (6.2)
Exploration and own experience
2. I explored parts of the subject on my own (5.8)
3. I was able to learn by trying out my own ideas (6)
Challenge
4. The course was challenging in a stimulating way (5.6)
Belonging
5. I felt togetherness with others on the course (5.7)
6. The atmosphere on the course was open and inclusive (6.6)

In Category 2, the score vector is [6.3, 6.1, 6, 6.4, 6.3, 6.2, 5.9, 5.3, 5.7, 6.4]
Comprehensibility - cognitive level
Clear goals and organization
7. The intended learning outcomes helped me to understand what I was expected to achieve (6.3)
8. The course was organized in a way that supported my learning (6.1)
Understanding of subject matter
9. I understood what the teachers were talking about (6)
10. I was able to learn from concrete examples that I could relate to (6.4)
11. Understanding of key concepts had high priority (6.3)
Constructive alignment
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 certain grade (5.9)
Feedback and security
14. I received regular feedback that helped me to see my progress (5.3)
15. I could practice and receive feedback without being graded (5.7)
16. The assessment on the course was fair and honest (6.4)

In Category 3, the score vector is [5.3, 5.7, 6.3, 5.2, 6.2, 6.6]
Manageability - instrumental level
Sufficient background knowledge
17. My background knowledge was sufficient to follow the course (5.3)
Time to reflect
18. I regularly spent time to reflect on what I learned (5.7)
Variation and participation
19. The course activities enabled me to learn in different ways (6.3)
20. I had opportunities to influence the course activities (5.2)
Collaboration
21. I was able to learn by collaborating and discussing with others (6.2)
Support
22. I was able to get support if I needed it (6.6)

There are no significant differences in experience between male/female students, international/national students, students with/without disabilities. Per disability, one student commented: "There is basically nothing to comment on this perspective, the most reading part of the course (seminars) got a good amount of time to read and make the presentation."

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 content will be continuously updated according to the state-of-the-art developments.
In the next offering, the following specific points are to be addressed.
(1) Re-order Lab 1 and Lab 2, so that it follows the course flow better.
(2) Arrange a pre-lab session to help students prepare labs and answer possible questions. Usually, students have more questions before running a lab. With a pre-lab session, students have the possibility to ask questions to TAs.
(3) Recommend exercises to students after a lecture, so that students can work on concrete tasks and get regular feedback.