

Report - ML2308 - 2023-06-20

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):

Erik Flores-García, efs01@kth.se

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 was evaluated using an LEQ survey with a response rate of 9/12 representing 75% of participants. The LEQ was available to students between January 2 and 16 of 2023.

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.)

I presented information about the course including its evaluation and the need for participating in the LEQ on September 1, 2022. Additionally, I indicated the need for receiving student feedback with the LEQ on November 29, 2022 in the final lecture of the course.

COURSE DESIGN

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

Course ML2308 includes seven learning outcomes and four examination moments. The learning outcomes comprehend

ILO 1 - visa förmåga att behärska hela utvecklingsprocessen utforma – analysera – testa – utvärdera för att metodisk utveckla lösningsförslag för ett komplext problem inom området hållbar produktionsutveckling

ILO 2 - ha kunskap om etablerade designmetoder och verktyg, för att kunna identifiera områden för förbättringar av ny eller befintlig lösning för ett komplext problem inom området hållbar produktionsutveckling

ILO 3 - visa förmåga att inom en given tidsram planera och genomföra ett gruppbaserat tekniskt utvecklingsprojekt inom området hållbar produktionsutveckling, med olika roller och teknisk expertis i projektgruppen

ILO 4 - demonstrera förmåga att i grupp, både muntligt och skriftligt, tydligt redogöra för och diskutera sina koncept, prototyper, lösningar, slutsatser och de fakta och argument som dessa bygger på, med huvudintressenter och andra projektgrupper inom ramen för det tekniska utvecklingsarbetet.

ILO 5 - ha kunskap om och förmåga att visa hur den utvecklade lösningen kan implementeras och drifas i en industriell produktions- och logistikkontext.

ILO 6 - visa förmåga att göra bedömningar med avseende på relevanta sociala, socio-ekonomiska och etiska aspekter, både ur ett lokalt och globalt perspektiv.

ILO 7 - visa de färdigheter som krävs för att delta i utvecklingsarbete samt implementeringen och driften av den utvecklade lösningen, för att självständigt kunna arbeta i avancerad industriell verksamhet.

The four assessment of ML2308 include includes a report, presentation, prototype, and video. Where the evaluation of learning outcomes is the following.

The report evaluates ILOs 1, 4, 6, and 7.

The presentation evaluates ILOs 2 and 3.

The prototype evaluates ILOs 3, 5, and 6.

The video evaluates ILO 6.

Completion of all learning outcomes for all examination moments is mandatory to pass the course. The course is evaluated in an A to E scale.

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 extent of students work are estimated to correspond to the course's points (40 hours / 1.5 credits). The results of the LEQ show that one student 18 to 20 hours / week. One student worked 15 to 17 hours / week. Six students worked 12 to 14 hours / week. One student worked 3 to 5 hours / week.

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 year 12 students passed the course. Six students scored and A and six a B.

Last year 16 students passed the course (11 students scored an A, and five students a B).

STUDENTS' ANSWERS TO OPEN QUESTIONS

What does students say in response to the open questions?

The LEQ survey included 12 questions evaluated in a Likert scale (from 1 = Strongly disagree to 7 = strongly agree) with a mean average response as follows:

- Question 1|| worked with interesting issues|| 5,00
 - Question 4||The course was challenging in a stimulating way|| 4,40
 - Question 7||The intended learning outcomes helped me to understand what I was expected to achieve|| 5,30
 - Question 10|| was able to learn from concrete examples that I could relate|| 4,80
 - Question 11||Understanding of key concepts had high priority|| 4,20
 - Question 12||The course activities helped me to achieve the intended learning outcomes efficiently|| 4,60
 - Question 15|| could practice and receive feedback without being graded|| 5,10
 - Question 16||The assessment on the course was fair and honest|| 4,60
 - Question 17||My background knowledge was sufficient to follow the course|| 5,80
 - Question 19||The course activities enabled me to learn in different ways|| 4,70
 - Question 21|| was able to learn by collaborating and discussing with others|| 4,30
 - Question 22|| was able to get support if I needed it|| 4,20
-

SUMMARY OF STUDENTS' OPINIONS

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

Students found that the best aspects of the course included

- ||The real life applications to see what companies are doing and what they struggle with was great for me as I do not have a lot of experience in this.
- ||The free space, even though there were requirements, in general it was up to our engineer minds to build the structure and strategy. The project helped me feel like an engineer in a real world.
- ||The beginning lectures and the presentations not related to the project.
- ||Hands on experience in with a company especially in a field that is very much related to the programme
- ||Working with real cases. Much responsibility was put on the students. Not so much scheduled time in school

Suggestions for improving the course

- ||Improve feedback to students beyond showing the latest update of the project
- ||Allow students to form their own groups
- ||Discuss with companies the competence of students and their abilities, and select projects that align with the master's program
- ||Assign topics for team presentations that align with the CDIO methodology

Student advice for future students included:

- ||Start your project on time and have an agile plan that includes adapting to changes
- ||Maintain good and close communication with the companies, spend enough time at the beginning to clearly define there needs and be realistic on what is achievable in the given time frame
- ||Try including the opinion of operators and staff
- ||Agree on common expectations with the company

Additional suggestions for improvement included

- ||Plan for the distribution of activities with clear responsibilities
 - ||Align the video content with the purpose of the course
-

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.

Students had an overall positive impression of the course, and identified areas for improvement. This is the third time KTH offers the course.

The teachers are in agreement with the suggestions proposed by students including improving feedback beyond the status of the project, scoping projects according to the competence and knowledge of students, select projects with existing production, changing the topic of group-held presentations.

Improving feedback sessions remains a comment from students despite changes to the activities in the course. Since the last version of the course, we developed a rubric to present progress and areas in need of support. However, this measure seems insufficient for meeting student expectations.

The teachers disagree with having students form their own groups. The current design of groups considers gender, language, and knowledge diversity.

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 LEQ survey reveals the following strong and weak areas for ML2308.

Strong areas included

- My background knowledge was sufficient to follow the course^{5,8}

Changes to the course design including workshops about sustainability and the use of knowledge from previous courses may explain this score.

- The intended learning outcomes helped me to understand what I was expected to achieve^{5,3}

This year as well as previous ones we have made a point on highlighting the ILOS in every activity and assignment. We work continuously with the reflection of students and the self-assessment about the quality of their work

- I could practice and receive feedback without being graded^{5,1}

We have several moments where students present their findings and receive feedback from peers, teachers, examiner, and externals.

Weak areas comprehended

- I was able to learn by collaborating and discussing with others^{4,3}

The absence of mechanisms that assign responsibility and transparency to the activities of students in both activities and assignments may contribute to the absence of a collaborative environment. This represents an area of opportunity for future versions of the course.

- Understanding of key concepts had high priority^{4,2}

The current version of the course emphasizes the concepts of conceiving, designing, implementing, and operating a prototype. However, the current course does not present evaluation moments that ensure the accomplishment of requirements throughout the project. This may explain the reason for the low score in this category.

- I was able to get support if I needed it^{4,2}

The reason for this may include the need for improvements to existing supervision moments that have so far given students the opportunity to present concerns. However, there has been no direct feedback on compliance of work to the CDIO methodology by teachers. This is an area of further improvement in the next version of the course.

PRIORITIZED COURSE DEVELOPMENT

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

We design two changes related to the concern of students for providing additional support. First, the new version of the course includes changes to student-lead activities including presentations and flipped classroom. The topics of these activities will focus on the phases of conceiving, designing, implementing, and operating a prototype. Additionally, we designed four different milestones corresponding to the phases of conceiving, designing, implementing, and operating a prototype. The milestones include the non-graded evaluation of ILOs and completion of project requirements.

We present two changes to help the learning of students regarding key concepts. First, We modified our class activities and student learning from project planning to the realization of a CDIO course and development of production systems. Additionally, we designed activities so that students can develop engineering requirements in their projects and align with the CDIO.

We focus on two activities for supporting the collaborative learning of students in the course. First, we will continue with the group contract prior to the start of project work. Additionally, we will require the assignment and explicit presentation of responsibilities leading to the completion of tasks in the course for each student in a group (e.g., similar to contribution of authors in academic journals). Second, we will require that students present to companies four times and show progress of their work continuously.

Furthermore, this version of the course includes projects focused exclusively on production development (e.g., standardization, digitalization, material flow, circularity, or logistics). We expect that students can better relate the knowledge acquired during their master's program with the challenges presented by companies in the projects.
