



# Report - ML2308 - 2022-02-10

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.

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**Course analysis carried out by (name, e-mail):**

Erik Flores-García, efs01@kth.se

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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.

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The course was evaluated using an LEQ survey with a response rate of 6/16 representing 29% of respondents. The LEQ was available to students on January 3, 2022 with a deadline on January 17, 2022.

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**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.)

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I presented information about the course including its evaluation and the need for participating in the LEQ on August 31, 2021. Additionally, I indicated the need for receiving student feedback with the LEQ on December 15, 2021 in the final lecture of the course.

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**COURSE DESIGN**

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

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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 grubbaserat 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.

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**THE STUDENTS' WORKLOAD**

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

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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 worked 27 to 29 hours / week, one student worked 24 to 26 hours / week, two students worked 21 to 23 hours / week, and one student worked 12 to 14 hours / week.

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**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?

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

Last year all 12 students passed PRO1. Three students scored an A, three students scored a B, and six students scored a C.

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## STUDENTS' ANSWERS TO OPEN QUESTIONS

### What does students say in response to the open questions?

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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 - I worked with interesting issues 5
  - Question 4 - The course was challenging in a stimulating way 5,3
  - Question 7 – The intended learning outcomes helped me to understand what I was expected to achieve 5,2
  - Question 10 – I was able to learn from concrete examples that I could relate to 5,7
  - Question 11 – Understanding of key concepts had high priority 4,7
  - Question 12 – The course activities helped me to achieve the intended learning outcomes efficiently 5
  - Question 15 – I could practice and receive feedback without being graded 6
  - Question 16 – The assessment on the course was fair and honest 3,5
  - Question 17 – My background knowledge was sufficient to follow the course 4
  - Question 19 – The course activities enabled me to learn in different ways 5,5
  - Question 21 – I was able to learn by collaborating and discussing with others 4,7
  - Question 22 – I was able to get support if I needed it 5,2
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## SUMMARY OF STUDENTS' OPINIONS

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

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Students found that the best aspects of the course included

- Working on a real-life project. Working with students from other countries to understand their way working to learn how to work with a group that does nothing on its own.

Suggestions for improving the course

- Definition of ILOs, guidance throughout the course
- The dynamic between students in a group
- Prepare interesting and doable projects

Student advice for future students included:

- Try to get as many details in place early with the project owner
- Do not split the work individually and expect a perfect result. Make sure to meet each other at least once a week. Don't split the tasks it takes more time and creates more stress for the members.
- Start early and have plan Bs and Cs.

Additional suggestions for improvement included

- Setting a clear direction in the course and defining ILOs
  - There is a need to establish an evaluation method that considers the contribution that the members make to the result
  - Standard form or similar on how much everyone participated
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## 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.

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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 second time KTH offers the course. The teachers are in agreement with the suggestions proposed by students including helping students achieve a cohesive group dynamic, and preparing interesting and doable projects. The teachers are in disagreement with the lack of definition of ILOs and guidance for their completion. The first session of the course included a definition of ILOs and presentation of grading criteria. The teachers developed a rubric made available to students showing each ILO and the requirements for meeting E, C, and A level grades. The teachers asked students to use this rubric in four supervision moments spread in three-week intervals during the course. The students conducted a peer review based on the rubric with the purpose of improving the fulfillment of learning outcomes prior examination moments.

The changes implemented from the last version of the course included:

- A shift from internal projects based on laboratory work to problem-based projects together with five different companies. Working on the design of the course from April and meeting, defining, and selecting cases for the course together with companies.
  - Continuous peer review activities during the course divided into four supervision sessions based on rubrics describing the learning outcomes and grading criteria.
  - An increased focus on sustainability including three workshops linking knowledge from prior courses in sustainability with project tasks, identifying potential areas of improvement, tools for developing a solution, and discussion about the contribution of student work to SDGs.
  - Participating of guest lecturers supporting ILOs
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## 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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The LEQ survey reveals the following strong and weak areas for ML2308.

Strong areas included

- I could practice and receive feedback without being graded 6

The reason for this response may include continuous activities involving peer review feedback during lecture and supervisions. Therefore, we will continue with this structure during HT2022 as students appreciate the setup.

- I was able to learn from concrete examples that I could relate to 5,7

The reason for this response could involve participation of subject experts in different lectures, and continuous activities during lectures focused developing solutions for the project of the students.

- The course activities enabled me to learn in different ways 5,5

The course involves different ways of learning including flipped classroom activities, problem-based examinations, and different forms of examination (e.g., videos, presentation, reports, and prototypes). Additionally, the course includes many learning by doing activities in workshops and self-study moments.

Weak areas comprehended

- The assessment on the course was fair and honest 3,5

A criticism for the course includes the learning outcomes and grading criteria. The use of a rubric, used continuously during the course for peer review, does not seem sufficient in the eyes of students. In the next version of the course, we could exemplify the grading criteria in relation to the examination moments of the course. Additionally, the students seem to be dissatisfied with group evaluation instead of individual ones. We will conduct an internal analysis and discuss the possibility of other forms of evaluation targeting individual achievement complementary to or instead of group one.

- My background knowledge was sufficient to follow the course 4

The reason for this response includes the need and limited knowledge of students for developing a prototype. We began discussion with guest lecturers with competence in design thinking. We think that having activities in class were students practice a full cycle of conceive, design, implement and operate could help improve their knowledge in the course.

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## PRIORITIZED COURSE DEVELOPMENT

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

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A first step for improving course development in the short term involves creating learning opportunities where students continuously practice and reflect on the grading criteria. This could be achieved as part of the activities in class of every session by asking students to develop solutions contributing to examination moments. Medium term actions include involving guest lecturers complementing current course structure and providing knowledge on design and prototyping. This could improve the overall process of coming to a solution in the course. Additionally, a medium term solution includes the pilot project for ML2308 including changes from examination moments to a continuous evaluation. Long-term solution includes continued cooperation with companies in the course leading to well defined cases and a mutual understanding of needs that facilitates student learning.

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