

# Report - MH2039 - 2023-01-10

Respondents: 1  
Answer Count: 1  
Answer Frequency: 100.00%

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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):**

Christopher Hulme, chrh@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.**

Students were asked to provide continuous feedback during the course. After the final lecture, comments were invited in a group setting. Students were also invited to contact the course leader (Christopher Hulme) directly if they wanted to discuss anything or make any comments/suggestions. An LEQ was distributed approximately two weeks after the final results were recorded on Ladok.

The LEQ includes the possibility of seeing gender breakdown and groups answers by gender, background, nationality (Swedish/non.Swedish) and disability categories. This requires at least three students to identify with each category, which is intended to protect the students' anonymity.

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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.)**

No students requested a meeting with the course leader/main teacher.

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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.**

The course consists of nine lectures, two assessed exercise sessions and two workshops.

The first two lectures are meant as background information to ensure sufficient background knowledge exists for the terminology used in this course and in other courses in the master's programme, regardless of the exact experiences and degree programmes attended by the students

1. Course introduction and introduction to extractive metallurgy
2. Introduction to ironmaking and steelmaking

The third lecture concerns the concept of mass balance calculations, which underpin the rest of the calculations in the course and are widely applied in industrial situations:

3. Introduction to mass balance calculations

There is then a workshop designed to train the students in the use of the KTH library resources, which is mainly intended for students who are new at KTH, but which students who attended KTH as bachelor's students

4. Research techniques workshop

There is then an assessed exercise for the mass balance calculations, which forms part of the formal examination of the course:

5. Mass balance assessed exercise

There is then a workshop on gender issues in metallurgy, which was designed by Charlotte Holgersson, who is an expert in the field. Charlotte was scheduled to lead the workshop, but Unfortunately, was unavailable at short notice, so Christopher Hulme had to do so.

6. Gender issues workshop

There is then a series of three lectures and an assessed exercise on heat balance calculations, which is the end goal of the course, and which occur in industry and form the foundation of thermodynamics in other courses in the master's programme:

7. Heat in metallurgy
8. Basic heat balance calculations
9. Advanced heat balance calculations
10. Heat balance assessed exercise

In addition to the face-to-face teaching, there is a series of videos, worked examples and quizzes available on Canvas to provide more detail and opportunity to learn about/practice the calculations.

Students were also scheduled to spend approximately four hours per week on their group projects, which were assessed by oral presentation at a seminar at the end of the course and a written report.

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**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?**

Three responses were received to the LEQ. Of these, two students claimed to spend 12-14 hours per week on the course, and one selected 9-11 hours per week. The course lasted eight (8) weeks, including the final exam, suggesting a workload of 72-112 hours in total. The course is worth six (6) credits, which implies a workload of 160 hours in total. Clearly, the workload demanded of the students seems too low, but it is difficult to suggest how it could be made higher, if students choose to spend less time on the course. The course could be simply made more difficult, so more time input is required of students to meet the intended learning outcomes, but this would reduce the effectiveness of learning during the course and is probably not needed at this time. The overall workload is almost at the expected level for 2/3 students who responded, so the course workload can probably be left at a similar level to the current one.

Two students provided more detailed answers, one suggested that the course workload was fair and distributed reasonably between lectures and project. The other suggested that commitments to the "TaMoS" course that runs in parallel with this course was more demanding and conversations with various students during the course showed that students were prioritising that course over this one in terms of work, as that course offered less flexibility in its design. Students did miss lectures to attend other courses, where scheduling clashes occurred, as the lectures in this course are not mandatory (but the other courses did demand attendance). However, the lectures are made available as recordings afterwards, so this is not necessarily a problem from a pedagogical point of view.

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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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In this course offering, the results were as follows:

A 5  
B 7  
C 1  
Others 0

In 2021, the results were:

A 9  
B6  
C2  
Others 0

Therefore, the grades are consistent with the previous year. The results are skewed to higher grades, but this is not unexpected, since the course is an introductory course and must account for the intake of students with different backgrounds, so the time limitations mean that advanced concepts are limited in the course. Other courses in the master's programme will be at a more advanced level and can distinguish more between students of different ability.

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## STUDENTS' ANSWERS TO OPEN QUESTIONS

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

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The students were asked what the best aspect of the course was. One response was the sustainable development aspects of the course, which I have tried to work into the course continuously and not as a separate session or separate examination occasion. It is gratifying to see this is appreciated by the students. The learning goals were also liked as being clear.

Another open question was what suggestions the students had for improvements. The only suggestions was to add some more recordings to Canvas to aid learning. This shall be considered in advance of the 2023 course offering.

Students were asked to give advice to future participants. They suggested to do as many practice exercises as possible, to study continuously and not wait until the last minute before the exam and to practice before the assessed exercises. Similar comments were received in previous years and I have shown the comments to students in some years to motivate them to work in the way suggested by the students in this response, but I chose to not do so in this course offering. I shall try to do this again in 2023!

Students were then asked to make any other comments. One said they felt some groups did not work well (although they thought theirs did). This was supported somewhat by the personal reflections I asked the students to complete. However, it is not possible to solve this, other than to offer guidance to the groups, which was done for the first time in 2022 with supervision sessions. I shall try to make such sessions mandatory in 2023 with a doctoral students as a supervisor/advisor and aim to get each group to attend at least two such meetings during the project, instead of the one meeting I suggested this year. If the first meeting is early, it might help the groups to organise themselves more efficiently earlier in the project.

I added some specific question about the course, to which the students provided some useful answers. The first question was about the personal reflection that each person did individually as part of the group work. The intention is to identify if anybody did an unfair amount of work and to assign appropriate credit in such cases. Surprisingly, the students who responded liked it, but one wanted a higher word limit to give more chance to express their opinion. I can certainly do this in 2023!

The next question was about specific suggestions to improve the course, although this was already asked in the default questions (described above). One very specific comment was about the slides used during calculations. The student suggested having one slide that summarises the calculations displayed permanently while the slideshow runs to show the calculation itself. This is clearly a good suggestion, although I am unsure how it could be implemented technically. I will try to implement it in 2023, if a technical solution can be found.

Students were then asked if they got enough chance to practice calculations. One student suggested more calculations done as a group in class. This was actually disliked by earlier cohorts, who found it boring. I therefore reduced that and put such content on Canvas in the form of recordings. However, one other respondent disagreed and said the classes were enough. The final respondent suggested more videos. More videos seems to be a good compromise to give more content without making the classes boring and just copying exercises, where students write calculations from the whiteboard. I will try to record more videos before the 2023 course offering.

The final question asked if the gender perspectives workshop was useful. The overwhelming response was positive, and this should definitely be retained in a similar form for future years.

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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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Based on the LEQ, the students did approve of the course. The standard 21 question LEQ was used and the lowest average score was for question 3 (I was able to learn by trying out my own ideas), which received a score of 4.7/7. The next lowest results were both 5.3/7 and were given to questions 2 (I explored parts of the subject on my own) and 18 (I regularly spent time to reflect on what I learned). All other responses were 6/7 or higher.

The focus of the course on calculations does limit the scope of originality for the students, but the project is meant to offer some opportunity for individual thinking. The instructions for the project will be reconsidered for next year to try and allow more freedom in the project to enable students to explore their own ideas and areas of the subject (to address the lower scores for questions 2 and 3). The chance to reflect on course content will also be considered, possibly as a mandatory canvas quiz or a similar short exercise throughout the course.

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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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The students who responded seemed to like the course very much and no major changes are needed for future course offerings. Some specific changes (more pre-recorded content, changes to the way in which slides are displayed during discussions of calculations, etc.) can be applied, but the examination methods and course content/schedule should be maintained as they are.

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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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There were only three respondents, and since a minimum of three people must be in a group to get the information from the evaluation system, such information was only given if all three respondents were in the same group. The only characteristic that achieved three responses was the fact that none of the respondents was disabled. Since there was nobody outside the non-disabled grouping, the responses for this group are identical to the overall average responses and so no analysis of any sub-groupings of the class is possible.

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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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The only suggestion that requires significant development is to record some additional material for distribution on Canvas and to create more example calculations. This can be done before the 2023 course offering.

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