

# Report - MH2042 - 2022-06-09

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.

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

Mikael Ersson, bergsman@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.**

Students have given feedback through the LEQ system as well as through other channels that are used in the course. Such channels include, Discord, email, Canvas and physical meetings. No formal "kursnämnd" was used during the course.

**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 dedicated meetings with sole purpose to discuss course evaluation.

During the physical lecture and labs, students could express wishes on how the course was constructed (they did not wish to have randomized project group members so I changed it so that they could pick their own team members). They also asked for extensions of report dates on several occasions, which I easily could accommodate.

I think communication regarding such issues worked well, however, a more formal "kursnämnd" could possibly also be beneficial. I will try to add that information to Canvas for next course offering.

**COURSE DESIGN**

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

The major changes from last offering is that we had the final seminar physically now that the pandemic restrictions are lifted. The Dragon's Den videos remained though and we had that seminar on Zoom.

I also changed the lab reporting to a group report instead of individual report.

Description of course:

Today a wide variety of simulation tools are available to help with engineering tasks. Numerical solutions of the incredibly complex Navier-Stokes equations have been around for almost a century; in the early 20th century it was performed by human computers and today it can be performed on any desktop computer or on various super computers around the world. In materials processing simulation of steel flows is a very useful tool to aid with process understanding – many of the processes have such an environment that regular experimental methods cannot be used and as such modeling can complement experimental techniques. It is also important to note that problem solving skills and innovation are highly valued in any industry and as such there will be a focus on solving actual industrial problems in this course.

Intended Learning outcomes (ILO)

During the course you will plan, carry out and present an industrially relevant project, in a scientific manner, that also assesses the business impact.

Hereafter a number of ILOs will be listed with specific items that assess them. After successful completion of the course you will be able to

1. Present project ideas as well as project results in a clear and informative manner to a group of Peers.
  - a) Dragon's den pitch.
  - b) Project seminar.
2. Incorporate ideas of innovation and entrepreneurship into the project in order to enhance the outcome.
  - a) Project report
3. Operate in a project group with the intended goal to deliver a solution to an industrially relevant problem, using CFD simulation software. Assess the organization structure of the project group.
  - a) Individual reflection
4. Write, assess and criticize reports based on CFD simulations.
  - a) Lab report 1
  - b) Lab report 2
  - c) Peer-review lab report 1
  - d) Peer-review lab report 2
  - e) Opponent session during final seminar
5. Have a working understanding of the finite volume method in order to design a CFD model according to an industrially relevant problem.
  - a) Project report

### **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?**

Difficult to assess. According to the LEQ (8/19 responses), the average time per week was 12 hours. Assuming the course runs over 10 weeks (which is not really true) then that corresponds to 120 hours of total commitment from the students. This is fewer hours than the nominal 160 hours for a 6 credit course.

In the absence of more responses we cannot rely on "wisdom of the crowd" in this case so I also question the accuracy of the student self assessment of their invested time. This question is important, but the measurement is likely flawed. None of the written answers in the LEQ points to a too high or too low workload, therefore I conclude that the course is reasonable in that regard.

### **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?**

Some project groups performed really well and other not so well. On average this year performed a bit worse than previous years. This can be connected to high workload in other parallel courses. This is something that the students also have reported. I suspect that the students that focused more on other courses may also have ignored the LEQ, but this is speculation on my side. If it is true, then it is even more difficult to assess. I will discuss the matter though with especially MH2049.

### **STUDENTS' ANSWERS TO OPEN QUESTIONS**

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

They seem very happy with the course content and structure.

### **SUMMARY OF STUDENTS' OPINIONS**

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

Students are happy with 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.**

From the individual reflections submitted by the students and from my assessment during the project work it is clear that not all groups were equally balanced in terms of student effort. Two groups had quite large differences in the work input during the project.

I think it was a mistake to have the lab reports as group works. I will implement a better system for this in the coming course offerings (more information below).

### **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?

No, all responses are fairly well balanced.

### **PRIORITIZED COURSE DEVELOPMENT**

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

The course needs a quiz-based type of lab assessment system that is individual for each student. This is reasonably easy to create and should force all students to be on a similar knowledge-level in terms of the software being used.

I am thinking about changing the software since ANSYS Fluent creates a lot of problems in the computer rooms. FreeCad has a simple GUI implementation of OpenFOAM that may be used as an OpenSource alternative. There will be limits to what projects can be undertaken in such a case. COMSOL may also be an alternative, although the multiphase capability of COMSOL is a problem, especially with the short simulation times that are available to the students.