Report - MJ2515 - 2024-03-13

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):

Andrew Martin, andrewm@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 are encouraged to contact the course leader or other teachers if there are questions or concerns. Some input had been obtained this way. Feedback was also channeled via the involved MSc programs. No specific actions were taken in addressing issues related to gender or accessibility for students with special needs. However, the course leader completed a course on gender aspects during HT19 and has received continuous training since then, e.g. in his role as head of faculty renewal at ITM.

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.)

Meetings were arranged via the SEE Program during the course.

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

This course was offered for the first time during VT23. It is one of three elective courses (3 hp each) mapped to the three profiles within the SEE Program. Contents were taken from the theoretical and programming parts of MJ2424 and MJ2480 (both defunct), which had been developed continuously since the course leader took responsibility in VT20.

Additional programming support was offered for VT23. Otherwise most elements were similar to those in the phased-out course, MJ2424.

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?

A 3 hp course corresponds to a weekly workload of approximately 11 hours (assuming 7 weeks active study throughout P4). All respondees (6 of 61 students) reported efforts in this range. Two of the five students who completed the survey reported a workload well beyond this level. This appears to be linked to difficulties in programming, which varied among the responding students.

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?

As in the last round (MJ2424 VT22) students performed satisfactorily on the home assignments and exam. The oral confirmation following the exam allowed for a one-on-one check on student performance. During these 15 minute sessions it was possible obtain a reasonable idea on student engagement in the course, most notably on programming of CFD calculations. Here it was found that a majority students had made solid attempts at programming, with many excelling in this task. A few students did not manage the programming part well and had to submit an Fx assignment to pass the course.

STUDENTS´ANSWERS TO OPEN QUESTIONS
What does students say in response to the open questions?

In general the responses point to the need for additional support in programming. General positive responses to how the course is organized pedagogically.

SUMMARY OF STUDENTS' OPINIONS
Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.

The three main strengths of the course (scores 6.2 or higher): understanding of key concepts had high priority; the course activities helped me to achieve the intended learning outcomes efficiently; the assessment was fair and honest. The three main weakness of the course (scores 4.4-5.2): my background knowledge was sufficient to follow the course; the course activities enabled me to learn in different ways; I was able to learn by collaborating and discussing with others.

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.

As in MJ2424 VT22 the programming-based problems from the home assignments were highly emphasized as these problems were a basis for the take-home exam. Theoretical topics linked to these assignments remain critical but there is still scope to improve the presentation of these topics in lectures, including more emphasis on practical issues linked to programming.

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?

Not possible to address owing to the low number of respondees.

PRIORITIZED COURSE DEVELOPMENT

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

The overall structure of this course is judged to be satisfactory. Students joining the course are expected to have good programming skills since the course is elective, which should contribute to a smooth delivery. Important to keep improving the lecture contents and link them to actual applications.

For VT24 students will be able to program in either Matlab or Python (the latter is used in other courses within the SEE Program). Generative AI will be addressed for the first time. Means in which such tools can aid students in programming will be explored.

OTHER INFORMATION
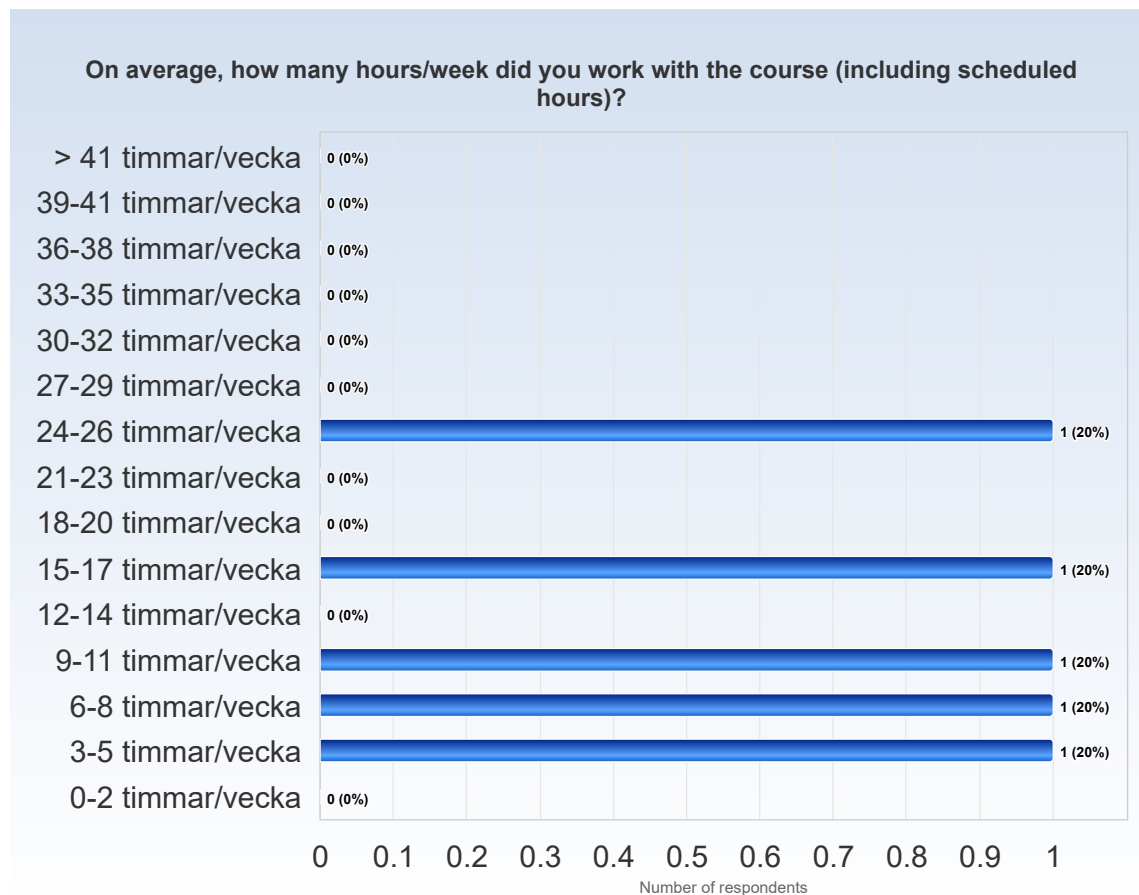
Is there anything else you would like to add?

No.

ESTIMATED WORKLOAD

On average, how many hours/week did you work with the course (including scheduled hours)?

Category	Respondents
> 41 timmar/vecka	0 (0%)
39-41 timmar/vecka	0 (0%)
36-38 timmar/vecka	0 (0%)
33-35 timmar/vecka	0 (0%)
30-32 timmar/vecka	0 (0%)
27-29 timmar/vecka	0 (0%)
24-26 timmar/vecka	1 (20%)
21-23 timmar/vecka	0 (0%)
18-20 timmar/vecka	0 (0%)
15-17 timmar/vecka	1 (20%)
12-14 timmar/vecka	0 (0%)
9-11 timmar/vecka	1 (20%)
6-8 timmar/vecka	1 (20%)
3-5 timmar/vecka	1 (20%)
0-2 timmar/vecka	0 (0%)

Number of respondents

Comments

Comments (I worked: 6-8 timmar/vecka)
I feel like a lot of time was spent on the home assignments, a little too much even if comparing to the assigned credits the course gives for the home assignments. I understand that the codes from home assignments are of great help for the test but when looking at the course content, the course looks like the home assignments won't be as hard as they actually are. I myself probably spent 60 hours on the two assignments.

Comments (I worked: 9-11 timmar/vecka)
Its a bit hetic for a 3credit course for beginners of MATLAB

Comments (I worked: 15-17 timmar/vecka)
While the time consumption wasn't that much different from other courses, those courses are worth 6 - 7,5 hp. It was WAY to much to do in a course that's only 3 hp.

Comments (I worked: 24-26 timmar/vecka)
The home assignments were very time intensive but were very good preparations for the exam so it balanced out in the end.

LEARNING EXPERIENCE

The polar diagrams below show the average response to the LEQ statements for different groups of respondents (only valid responses are included). The scale that is used in the diagrams is defined by:

1 = No, I strongly disagree with the statement
4 = I am neutral to the statement
7 = Yes, I strongly agree with the statement

Note! A group has to include at least 3 respondents in order to appear in a diagram.

Average response to LEQ statements - all respondents
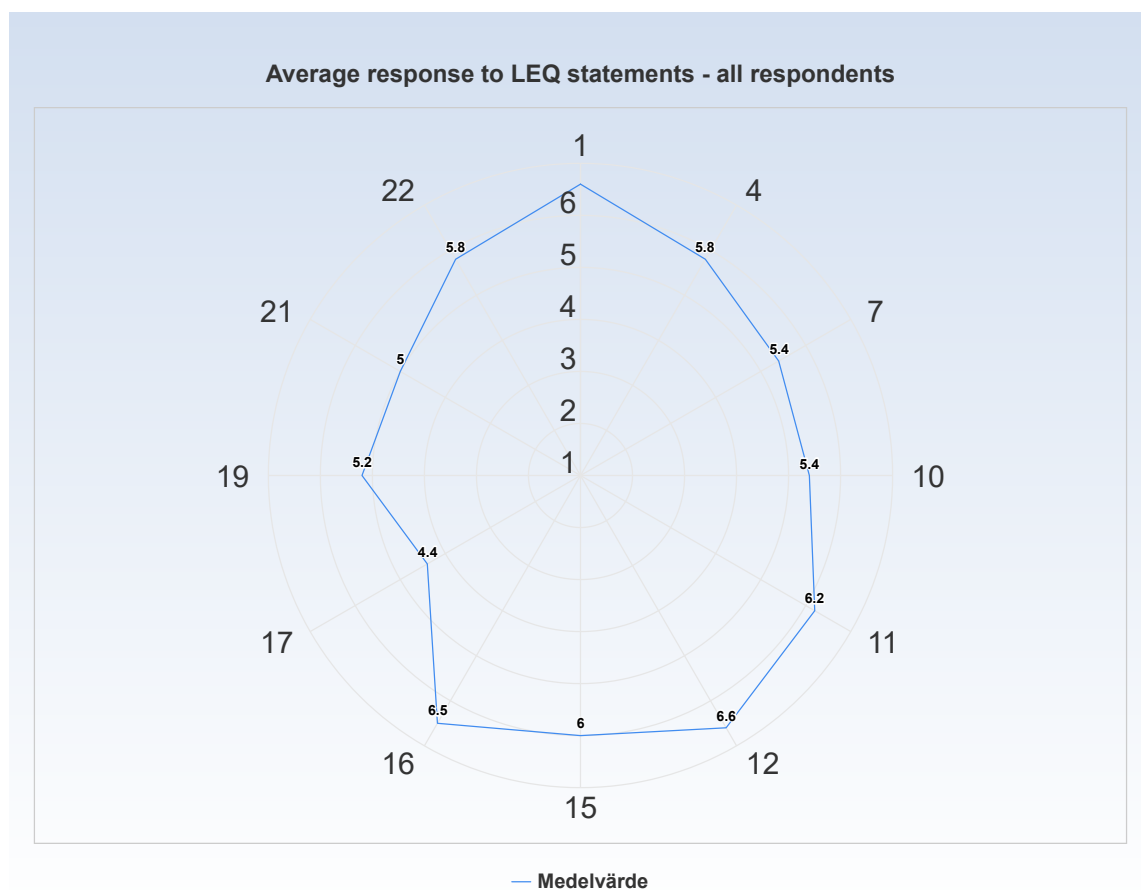
KTH Learning Experience Questionnaire v3.1.4

Meaningfulness - emotional level

Stimulating tasks

1. I worked with interesting issues (a)

Exploration and own experience

2. I explored parts of the subject on my own (a)
3. I was able to learn by trying out my own ideas (b)

Challenge

4. The course was challenging in a stimulating way (c)

Belonging

5. I felt togetherness with others on the course (d)
6. The atmosphere on the course was open and inclusive (d)

Comprehensibility - cognitive level

Clear goals and organization

7. The intended learning outcomes helped me to understand what I was expected to achieve (e)
8. The course was organized in a way that supported my learning (e)

Understanding of subject matter

9. I understood what the teachers were talking about (f)
10. I was able to learn from concrete examples that I could relate to (g)
11. Understanding of key concepts had high priority (h)

Constructive alignment

12. The course activities helped me to achieve the intended learning outcomes efficiently (i)
13. I understood what I was expected to learn in order to obtain a certain grade (i)

Feedback and security

14. I received regular feedback that helped me to see my progress (j)
15. I could practice and receive feedback without being graded (j)
16. The assessment on the course was fair and honest (k)

Manageability - instrumental level

Sufficient background knowledge

17. My background knowledge was sufficient to follow the course (f)

Time to reflect

18. I regularly spent time to reflect on what I learned (l)

Variation and participation

19. The course activities enabled me to learn in different ways (m)
20. I had opportunities to influence the course activities (m)

Collaboration

21. I was able to learn by collaborating and discussing with others (n)

Support

22. I was able to get support if I needed it (c)

Learning factors from the literature that LEQ intends to examine

We tend to learn most effectively (in ways that make a sustained, substantial, and positive influence on the way we think, reflect, act or feel) when:

a) We are trying to answer questions, solve problems or acquire skills that we find interesting, exciting or important

b) We are able to speculate, test ideas (intellectually or practically) and learn from experience, even before we know much about the subject

c) We are able to do so in a challenging and at the same time supportive environment

d) We feel that we are part of a community and believe that other people have confidence in our ability to learn

e) We understand the meaning of the intended learning outcomes, how the environment is organized, and what is expected of us

f) We have adequate prior knowledge to deal with the current learning situation

g) We are able to learn inductively by moving from concrete examples and experiences to general principles, rather than the reverse

h) We are challenged to develop a true understanding of key concepts and gradually create a coherent whole from the content

i) We believe that the work we are expected to do will help us to achieve the intended learning outcomes

j) We are able to try, fail, and receive feedback before, and separate from, each summative assessment of our efforts

k) We believe that our work will be considered in an honest and fair way

l) We have sufficient time for learning and devote the time needed to do so

m) We believe that we have control over our own learning, and not that we are being manipulated

n) We are able to collaborate with other learners struggling with the same problems

Literature

Bain, K. (2004). *What the Best College Teachers Do*, Chapter 5, pp. 98-134. Cambridge: Harvard University Press.

Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

Elmgren, M. & Henriksson, A-S. (2014). *Academic Teaching*, Chapter 3, pp. 57-72. Lund: Studentlitteratur.

Kember, K. & McNaught, C. (2007). *Enhancing University Teaching: Lessons from Research into Award-Winning Teachers*, Chapter 5, pp. 31-40. Abingdon: Routledge.
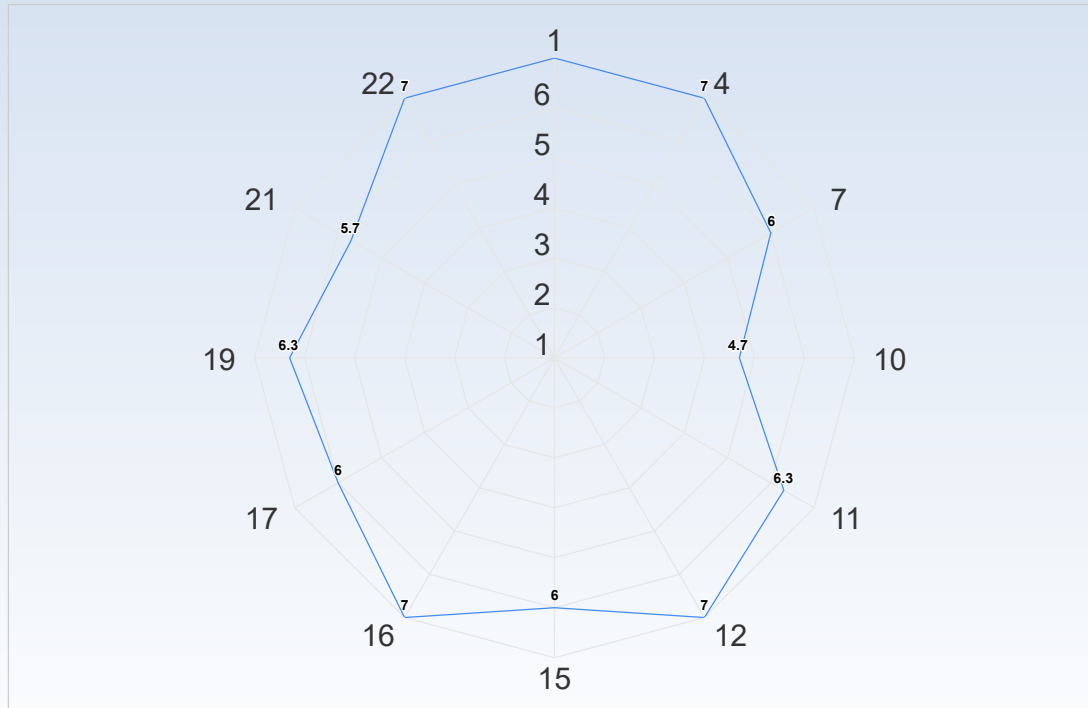

Ramsden, P. (2003). *Learning to Teach in Higher Education*, Chapter 6, pp. 84-105. New York: RoutledgeFalmer.

Average response to LEQ statements - per gender
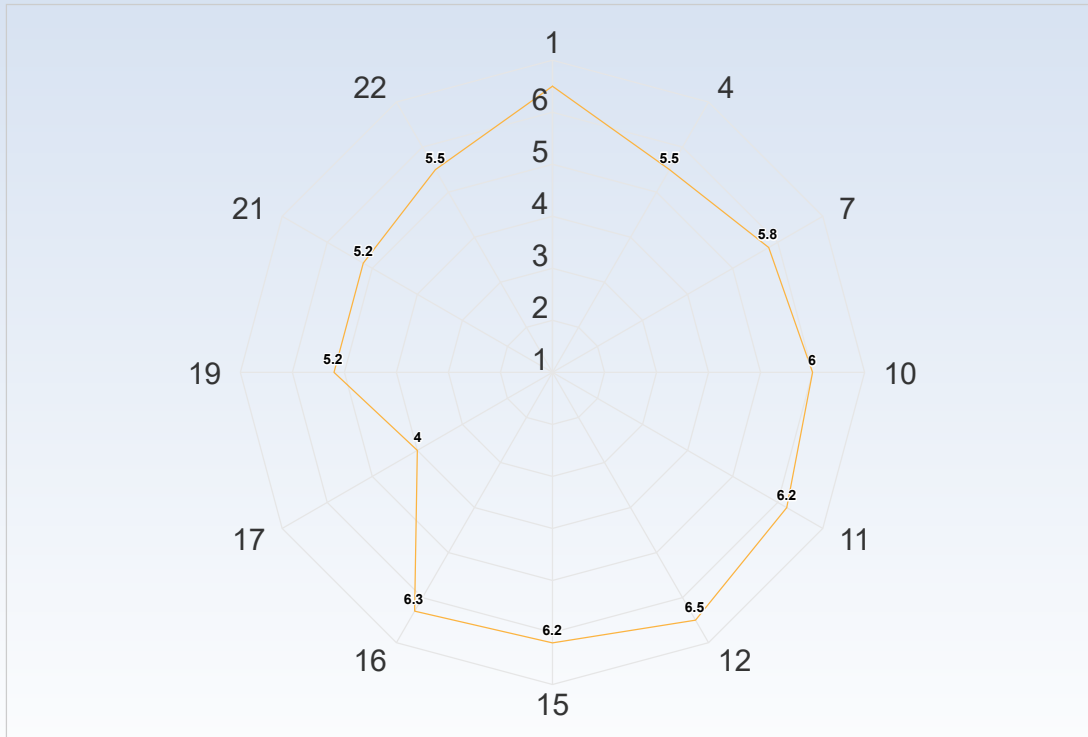
Kvinna — Man — Annat — Vill ej uppge

## Average response to LEQ statements - per type of student

Legend:
- Internationell masterstudent
- Internationell utbytesstudent
- Svensk student i årskurs 1-3
- Svensk student i årskurs 4-5
- Annan typ av student
- Vill ej uppge

Comments

Comments (I am: Svensk student i årskurs 4-5)

I know that a many of the Swedish students in SEE master are from the Energy and Environment bachelor, and that programme has only had one combined Python and Matlab course (this has been changed year 2022 and onward where they have two separate courses, one in python and one in numerical methods), and when speaking to them they told me that they would not dream of choosing this course because they don't feel comfortable programming. I myself come from a programme with a bit more programming but still found it quite hard.

Average response to LEQ statements - per disability

Legend: — Ja — Nej — Vill ej uppge
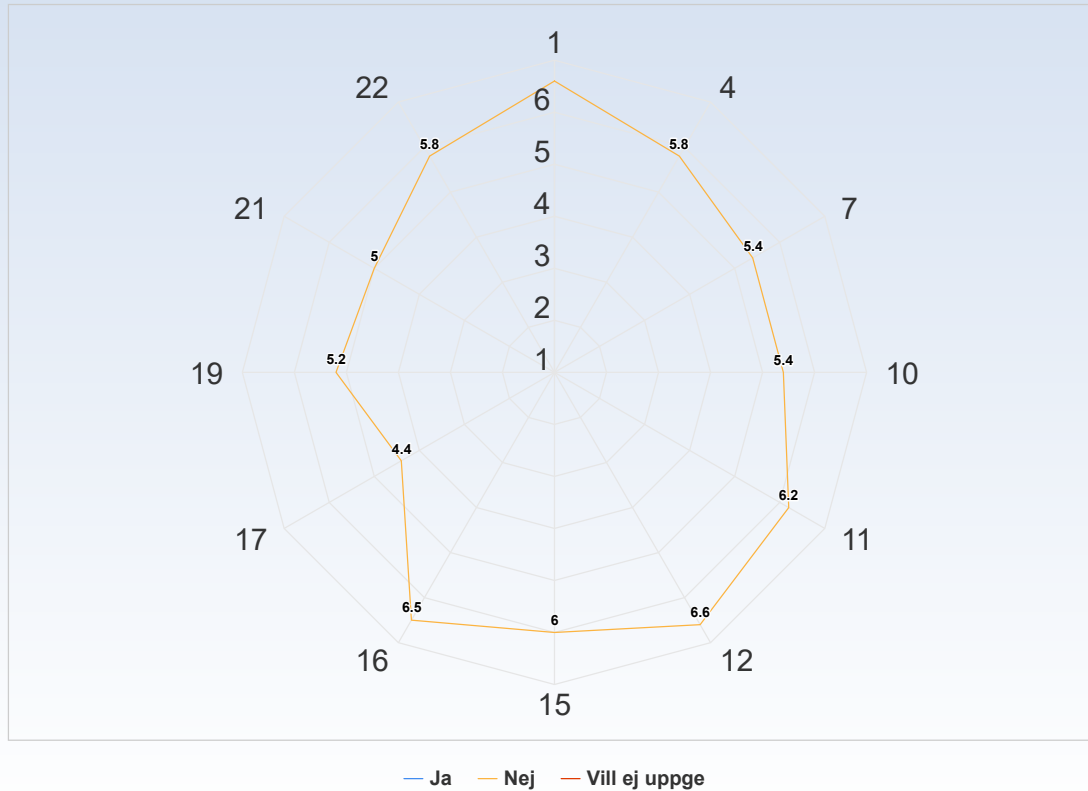
GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 9-11 timmar/vecka)

The integration of MATLAB coding to CFD

What was the best aspect of the course? (I worked: 15-17 timmar/vecka)

The teacher, no question about it. Andrew is/has been one of my favorit teachers so far at KTH. Even though the course it self has been way too difficult, he made the lectures worth attending. The calmness and certainty in his voice made me much calmer when I thought I didn't understand anything, jet he answered peoples questions very politely to not upset or hurt anyone's feeling that their question maybe should have been understood at a earlier stage.

What was the best aspect of the course? (I worked: 24-26 timmar/vecka)

The teaching staff was very supportive!

What would you suggest to improve?

What would you suggest to improve? (I worked: 6-8 timmar/vecka)

I thought the course would incorporate other CFD methods than more Matlab. Feels like Matlab is becoming a KTH classic and I would like to find a mathematics or physics code where I can do the heavier calculations and "learn by doing" in other applications than Matlab. I understand that the intention was to keep the fundamentals in the course and not skip the core concepts. I wish the course would have some moment in programs such as Comsol.

What would you suggest to improve? (I worked: 9-11 timmar/vecka)

I would suggest to keep more MATLAB sessions keeping in view of beginners like help them to understand on how to plot graph using different functions

What would you suggest to improve? (I worked: 15-17 timmar/vecka)

Make the home assignments either less complex, or shorten them down. For a 3 point course, having so many in-depth questions is not a good idea. I became less and less interested in the subject the more time passed.

What advice would you like to give to future participants?

What advice would you like to give to future participants? (I worked: 6-8 timmar/vecka)

Start early with the home assignments be ready to spend a lot of time with them.

What advice would you like to give to future participants? (I worked: 9-11 timmar/vecka)

Try to do home assignments properly with or without help but understand the concept behind the code which is sufficient for exam

What advice would you like to give to future participants? (I worked: 15-17 timmar/vecka)

Do the homeworks as soon as you can, but also make them as general as possible, this will help a LOT with the final exam later.

What advice would you like to give to future participants? (I worked: 24-26 timmar/vecka)

Start the home assignments early and try to keep on track with the deadlines

Is there anything else you would like to add?

Is there anything else you would like to add? (I worked: 6-8 timmar/vecka)

Last time I did a course in numerical methods the teacher went through the theory, and then showed an example of how to implement the theory/method/algorithm in MatLab, this was extremely helpful when doing home assignments, and made it easier to get started with home assignments.

While we're on the subject of coding. The previous two python courses I have done there was weekly help sessions where assistants could help students one on one in a zoom room. I know that students that have had the pleasure to even do coding courses pre and post corona, where there was in class help sessions say that it is lovely to receive "actual" help when coding. I assumed the two help sessions in this course would be my first time experiencing hands on help with my coding by a course assistant, but instead there was this super tense Q&A session that just made me feel more stupid than I did before, because honestly I understood even less after them.

Is there anything else you would like to add? (I worked: 9-11 timmar/vecka)

I think professor needs to improve on the explanation part because he is literally writing what's there in the slides. Sometimes derivations need intermediate assumptions and some constants which come in between skipping these steps wouldn't make a student confused and he again needs to go through some videos online to understand them. This is my sincere suggestion for the professor.

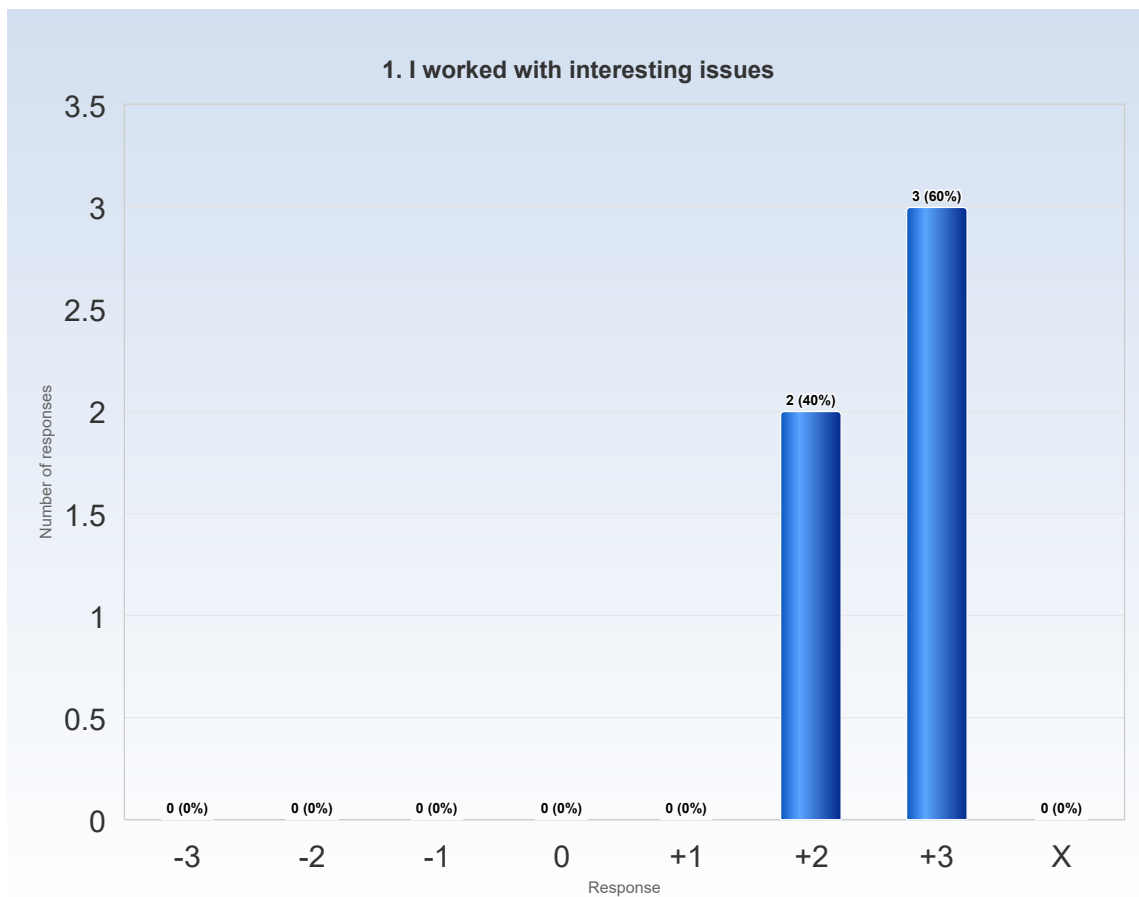# SPECIFIC QUESTIONS

RESPONSE DATA

The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

-3 = No, I strongly disagree with the statement
0 = I am neutral to the statement
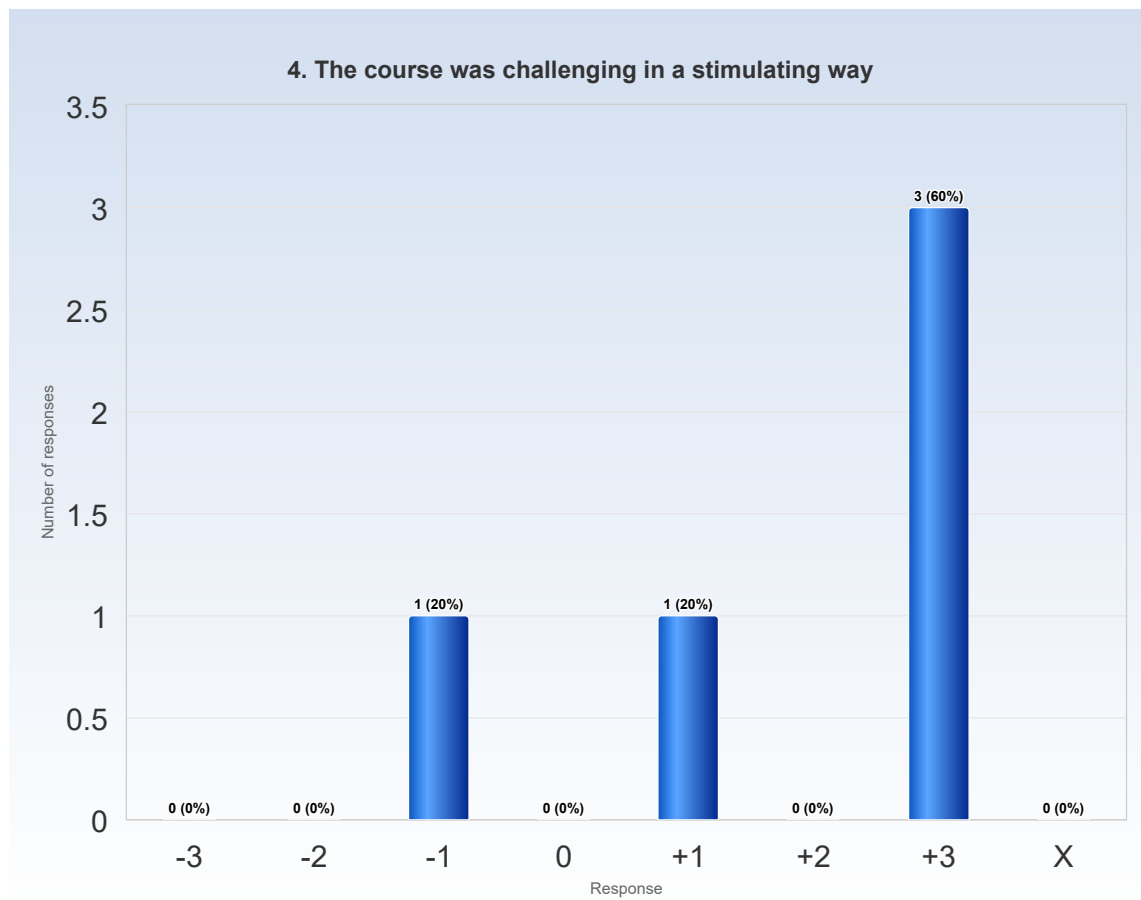+3 = Yes, I strongly agree with the statement

X = I decline to take a position on the statement

1. I worked with interesting issues

Response	-3	-2	-1	0	+1	+2	+3	X
Number of responses	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (40%)	3 (60%)	0 (0%)

Comments

Comments (My response was: +2)

It was interesting, but perhaps a bit too in-depth for such a small course.

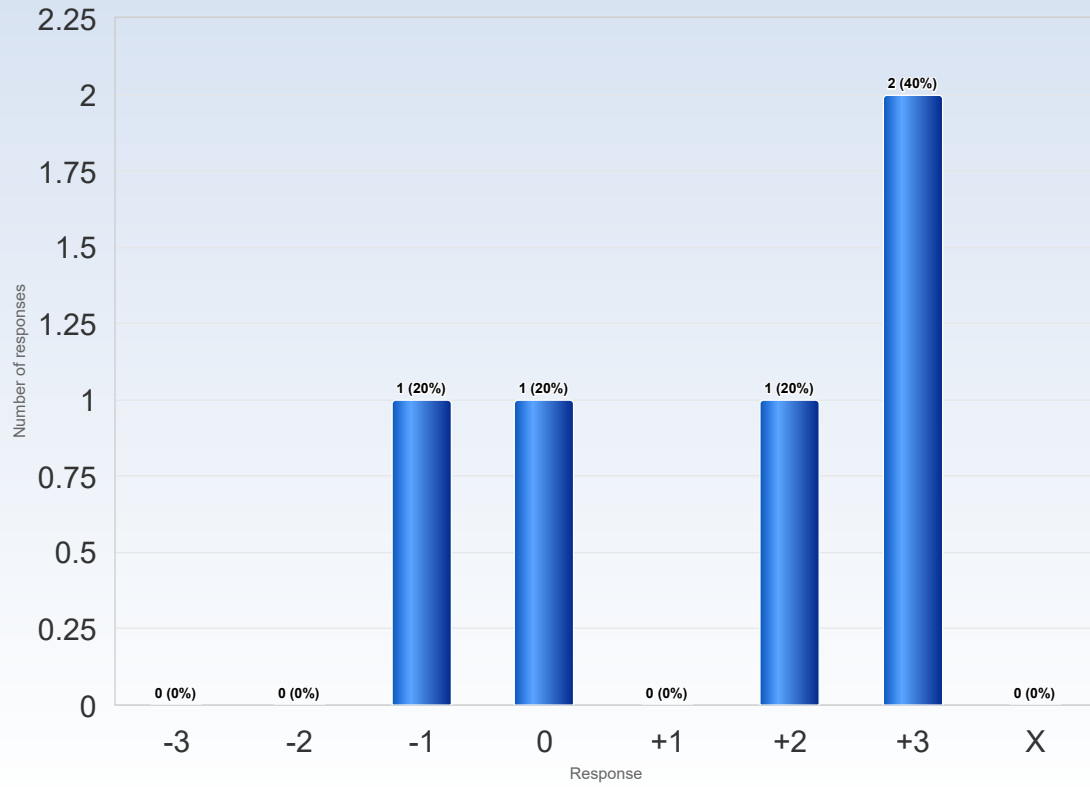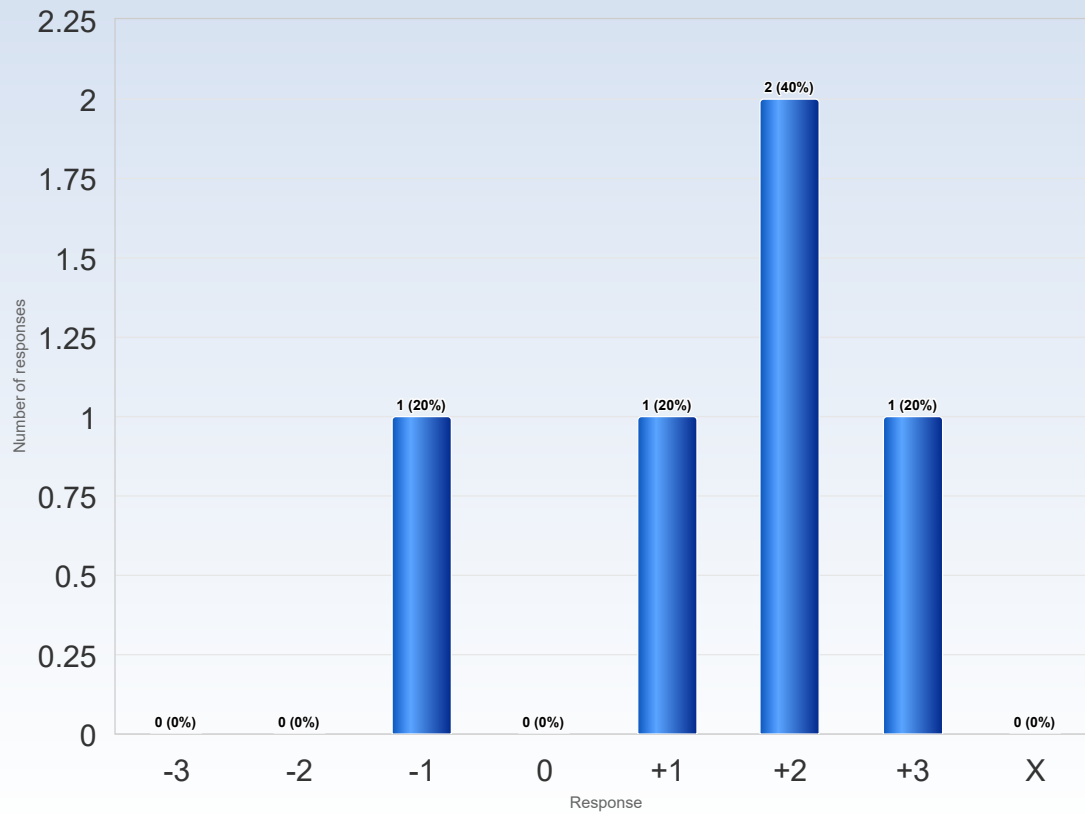**4. The course was challenging in a stimulating way**

Comments

Comments (My response was: -1)

No, it was too difficult. Especially considering it only being 3 hp. Any course should of course med stimulating, but it shouldn't be too challenging in too many places.

7. The intended learning outcomes helped me to understand what I was expected to achieve

Number of responses

Response	
-3	0 (0%)
-2	0 (0%)
-1	1 (20%)
0	1 (20%)
+1	0 (0%)
+2	1 (20%)
+3	2 (40%)
X	0 (0%)

10. I was able to learn from concrete examples that I could to relate to

Number of responses

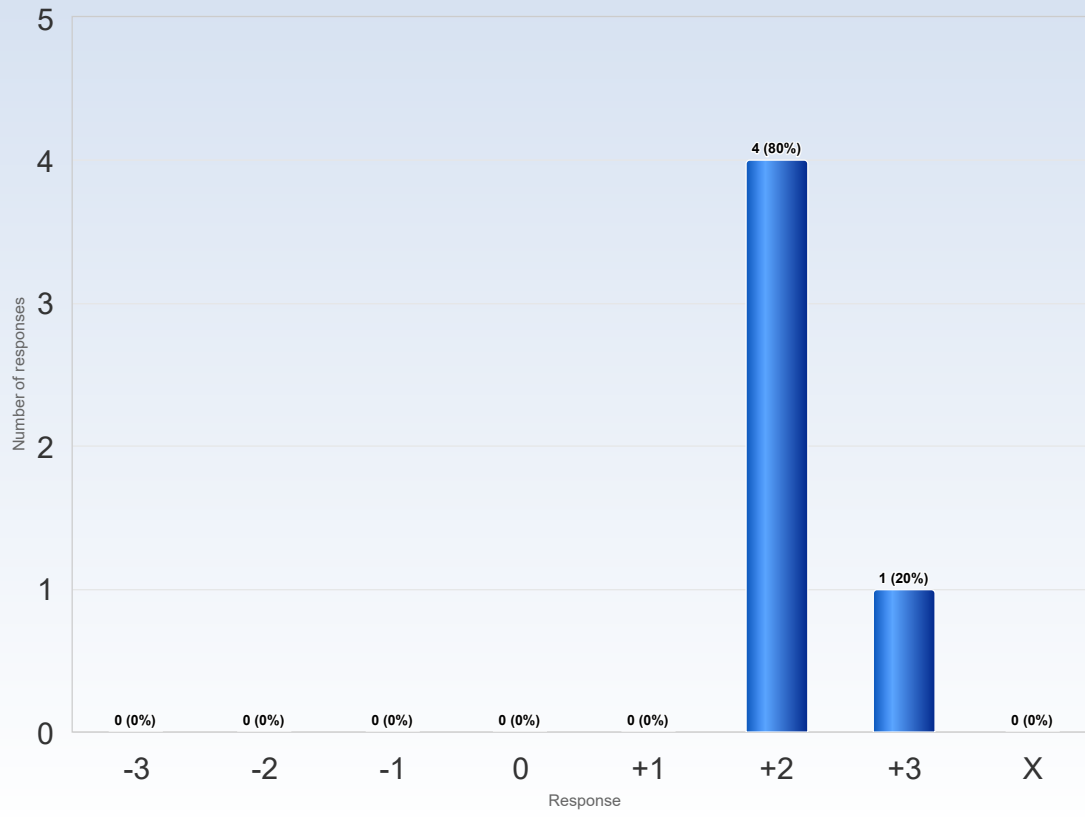| Response	Count
-3	0 (0%)
-2	0 (0%)
-1	1 (20%)
0	0 (0%)
+1	1 (20%)
+2	2 (40%)
+3	1 (20%)
X	0 (0%)

Comments

Comments (My response was: +3)

Since the course is regarding about applied numerical heat transfer, it is supposed to have concrete examples. Which were done both with the home assignments, and lecture exercises.

11. Understanding of key concepts had high priority

0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (80%)	1 (20%)	0 (0%)
-3	-2	-1	0	+1	+2	+3	X

Number of responses

Response

12. The course activities helped me to achieve the intended learning outcomes efficiently

Number of responses

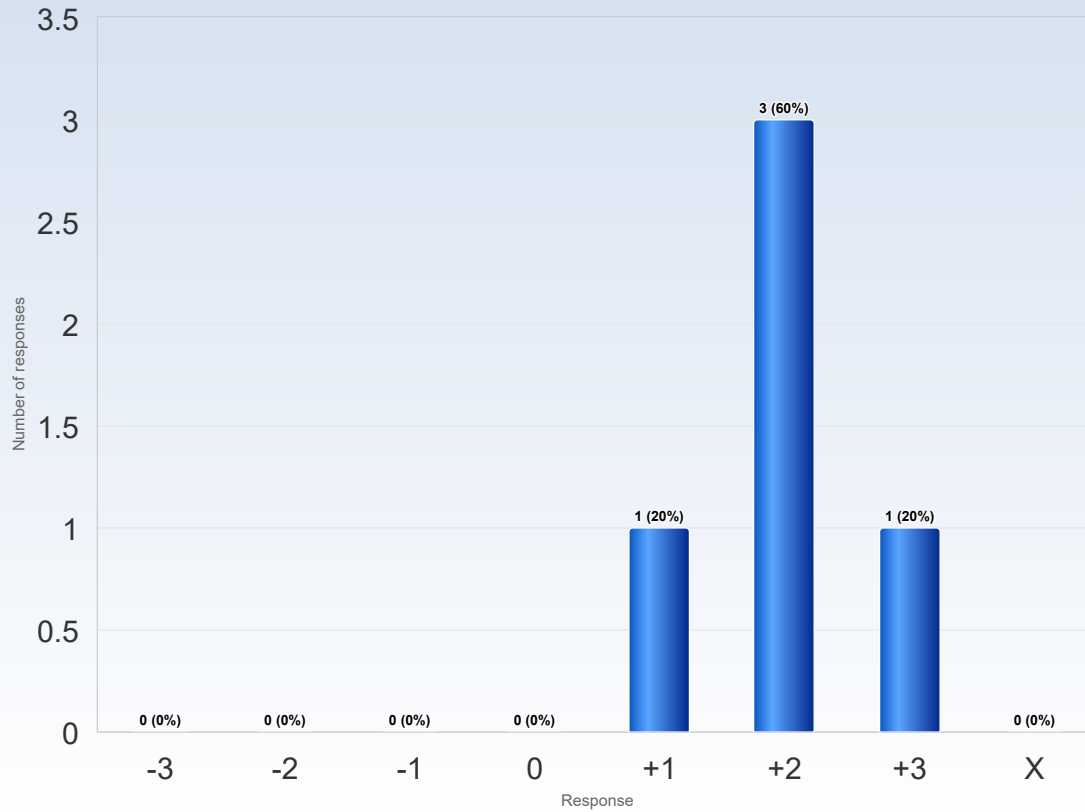| Response	Count
-3	0 (0%)
-2	0 (0%)
-1	0 (0%)
0	0 (0%)
+1	0 (0%)
+2	2 (40%)
+3	3 (60%)
X	0 (0%)
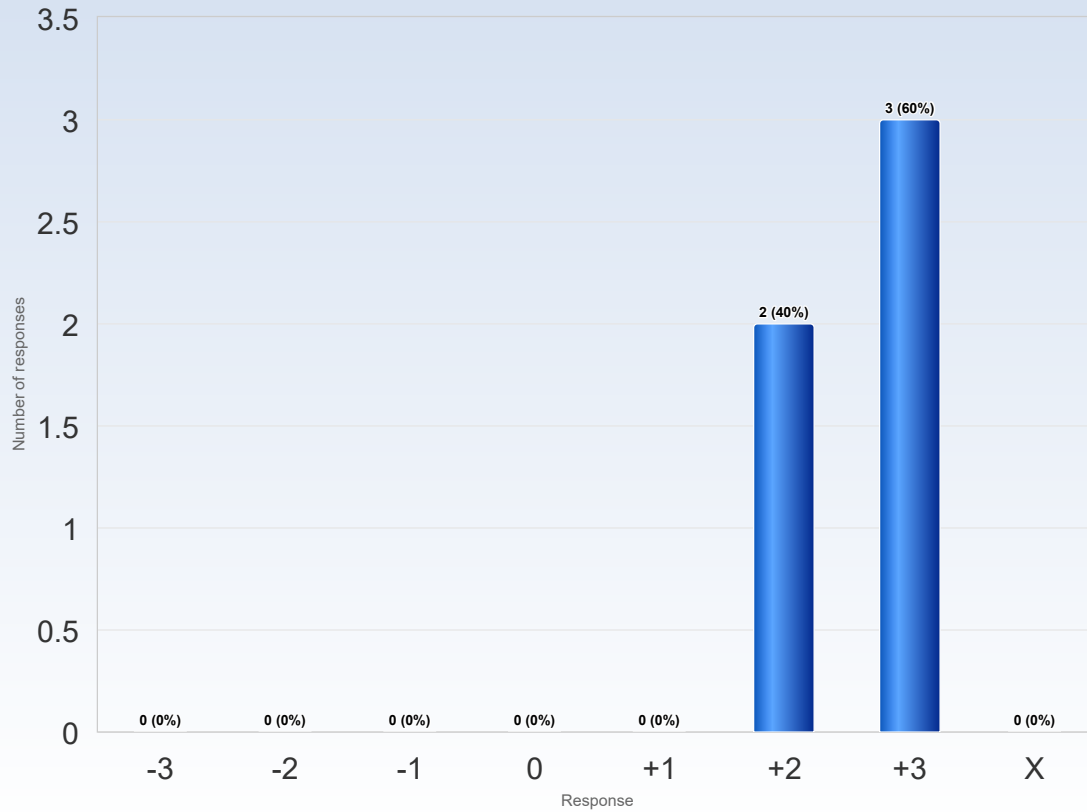
Response

Comments

Comments (My response was: +2)

Yes, especially the homework go-throughs were they explained what expected results we were supposed to get, but also to help those of us who hadn't been able to fully complete it before the first hand-in.

## 15. I was able to practice and receive feedback without being graded

Number of responses

- 3.5
- 3 — **3 (60%)** at +2
- 2.5
- 2
- 1.5
- 1 — **1 (20%)** at +1, **1 (20%)** at +3
- 0.5
- 0 — **0 (0%)** at -3, **0 (0%)** at -2, **0 (0%)** at -1, **0 (0%)** at 0, **0 (0%)** at X

Response: -3, -2, -1, 0, +1, +2, +3, X

Comments

Comments (My response was: +2)
Sort of, the home assignments were graded, but since they could be fixed and handed in again, I sort of consider it feedback without grading.

## 16. The assessment on the course was fair and honest

Response	Number of responses
-3	0 (0%)
-2	0 (0%)
-1	0 (0%)
0	0 (0%)
+1	1 (20%)
+2	0 (0%)
+3	3 (60%)
X	1 (20%)
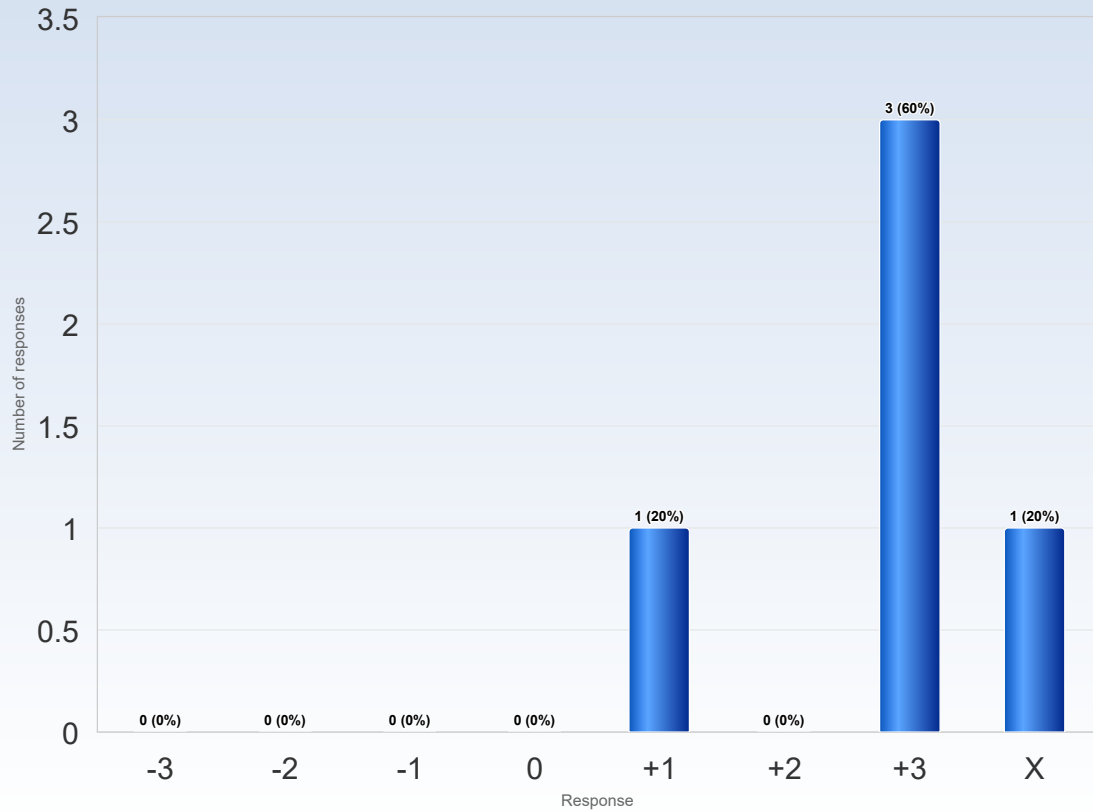
Comments

Comments (My response was: X   )
Don't know since we haven't gotten the exam graded jet. Even though the home assignments has been graded, no one is in position to actually judge the entire course

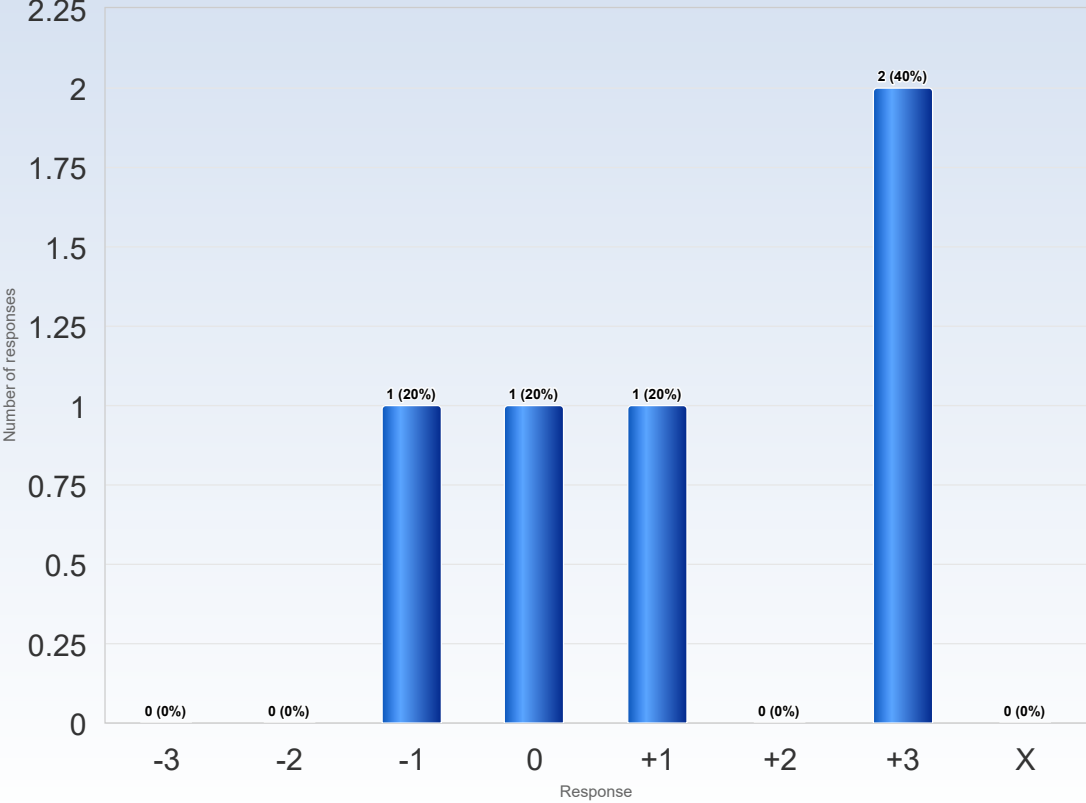## 17. My background knowledge was sufficient to follow the course
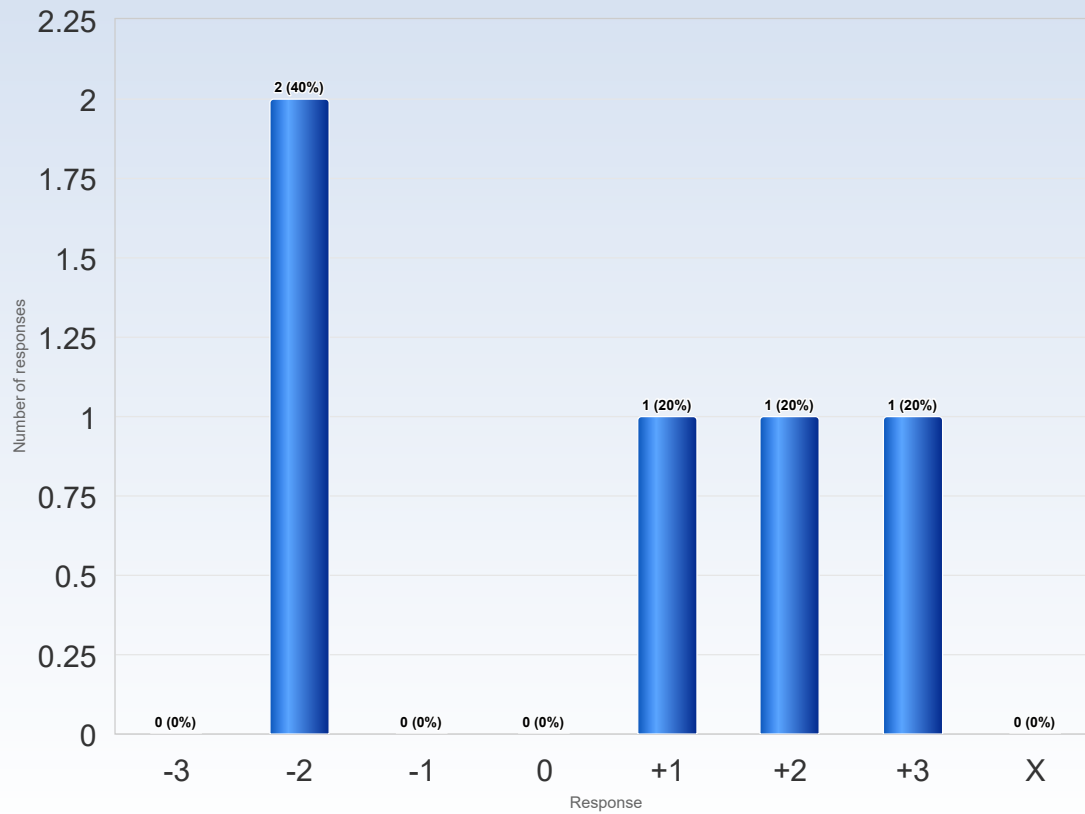
Comments

Comments (My response was: -2)

It was far away from sufficient. The course went too deep, too fast.

19. The course activities enabled me to learn in different ways

21. I was able to learn by collaborating and discussing with others

Number of responses

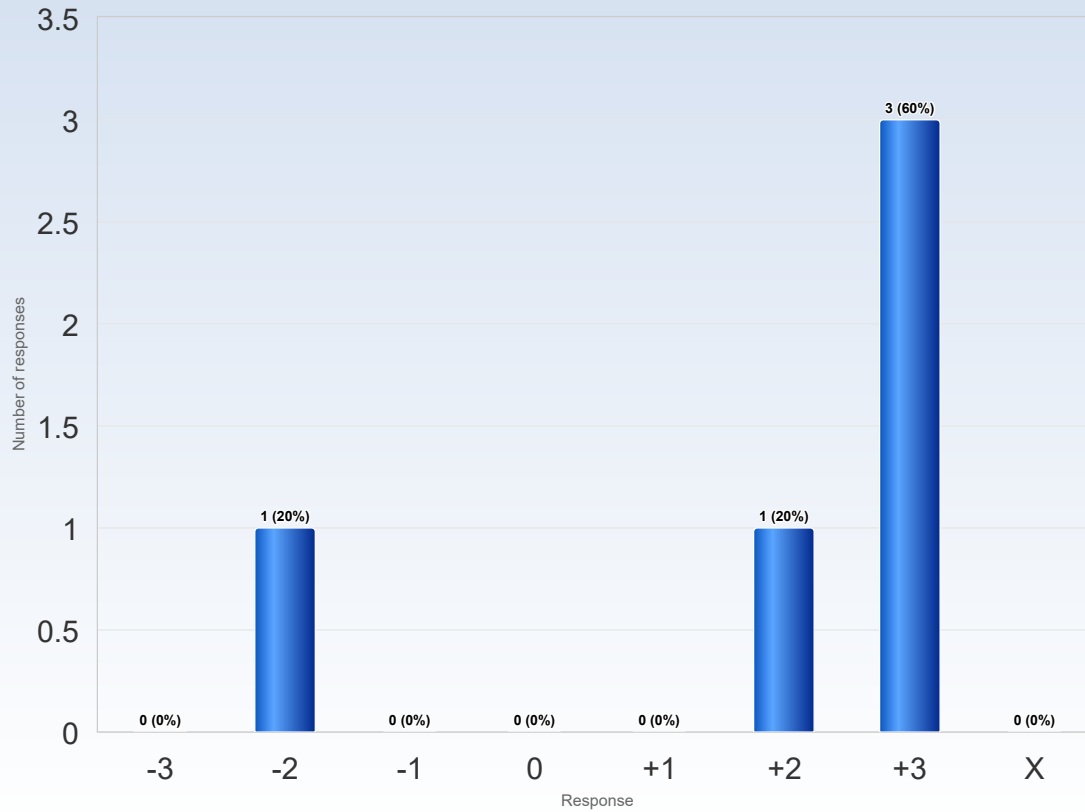| Response	Count
-3	1 (20%)
-2	0 (0%)
-1	0 (0%)
0	1 (20%)
+1	0 (0%)
+2	1 (20%)
+3	2 (40%)
X	0 (0%)
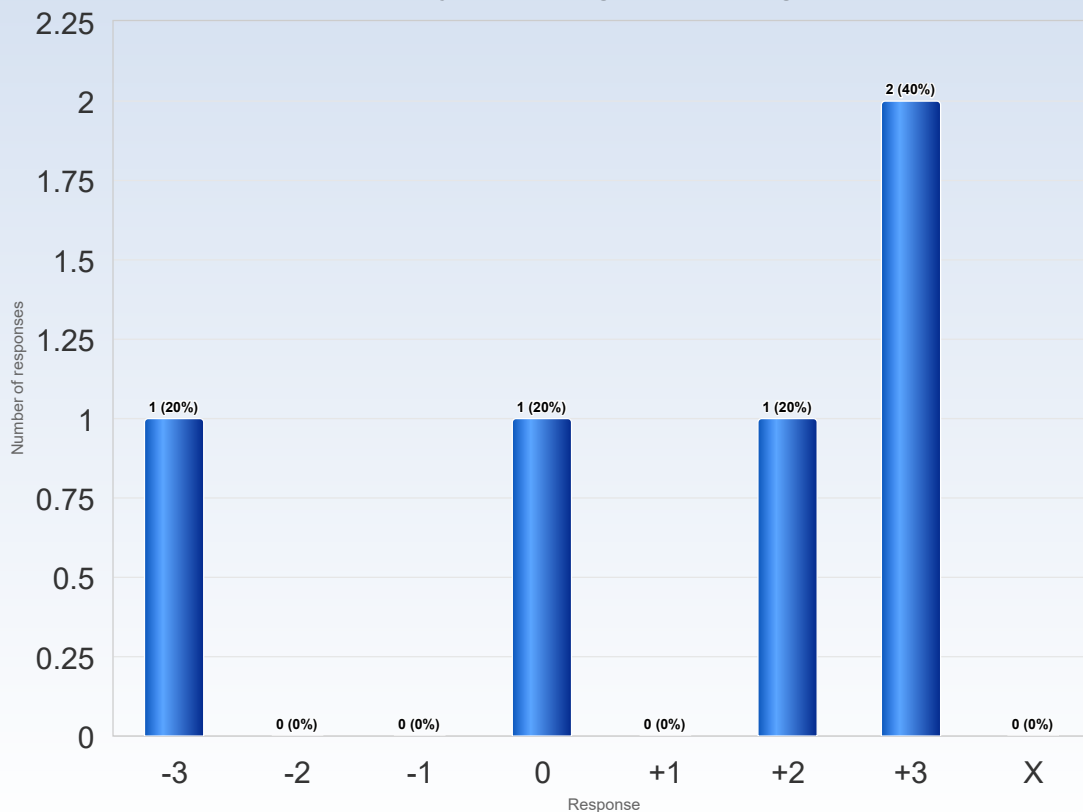
Comments

Comments (My response was: -3)
Hard to collaborate on coding without feeling like I'm going to get in trouble for plagiarism.

Comments (My response was: +3)
That was kinda the only way to actually be able to complete the course. Of course only as allowed.

22. I was able to get support if I needed it

Comments

Comments (My response was: +2)

Primarily from fellow students just because it was handier, but the teachers were available too.