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## Report - EI2410 - 2021-06-15

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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):**

Martin Norgren, mnorgren@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.**

After the final written exam was graded and the results announced to the students, a questionnaire (LEQ6) was opened to obtain feedback on the course.

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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 meetings related to the course development.

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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.**

Abandoned the prerecorded lectures followed by consultation sessions online. Instead, back to real-time lecturing, with the lectures held online. Recorded versions of the lectures were available as an extra service for preparation and repetition.

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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?**

Like the previous year, the average was 30 hours per week (on the high side). The home-assignments take quite much of the time. They are not mandatory, but help a lot in reaching the course requirements. Hence, the students take them very seriously.

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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?**

Between C and D. No drastic change compared with previous years. Notably, the performance on the written exam is not up to par with the home assignments, even though the exam problems are reduced versions on the same thematics.

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

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

More physical understanding is requested for. This is a quite common comment on theoretical courses. Unfortunately, the pandemic held back the planned introduction of practical moments.

The project work was considered difficult, given the time to complete the project.

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

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

The outcome in the spider diagram is quite good. The lowest score (on item 4) is particularly important to improve, since "challenging in a stimulating way" I think is the prime indicator of a really good 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.**

Being the second time the course was held online, I think it worked quite well - definitely an improvement from the previous year. Due to the still on-going pandemic, the planned changes of introducing practical moments could not be done.

#### **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?

Male students seem slightly less satisfied than female students.

International students are less happy with items 1 & 4, related to the subject of the course.

I have no explanation to these differences.

#### **PRIORITIZED COURSE DEVELOPMENT**

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

Going back to class-room lessons. Introduce some practical moments in building a waveguide system, to get some "feeling" for the concepts that are thought. Set off more time for the project work.



## EI2410 - 2021-05-21

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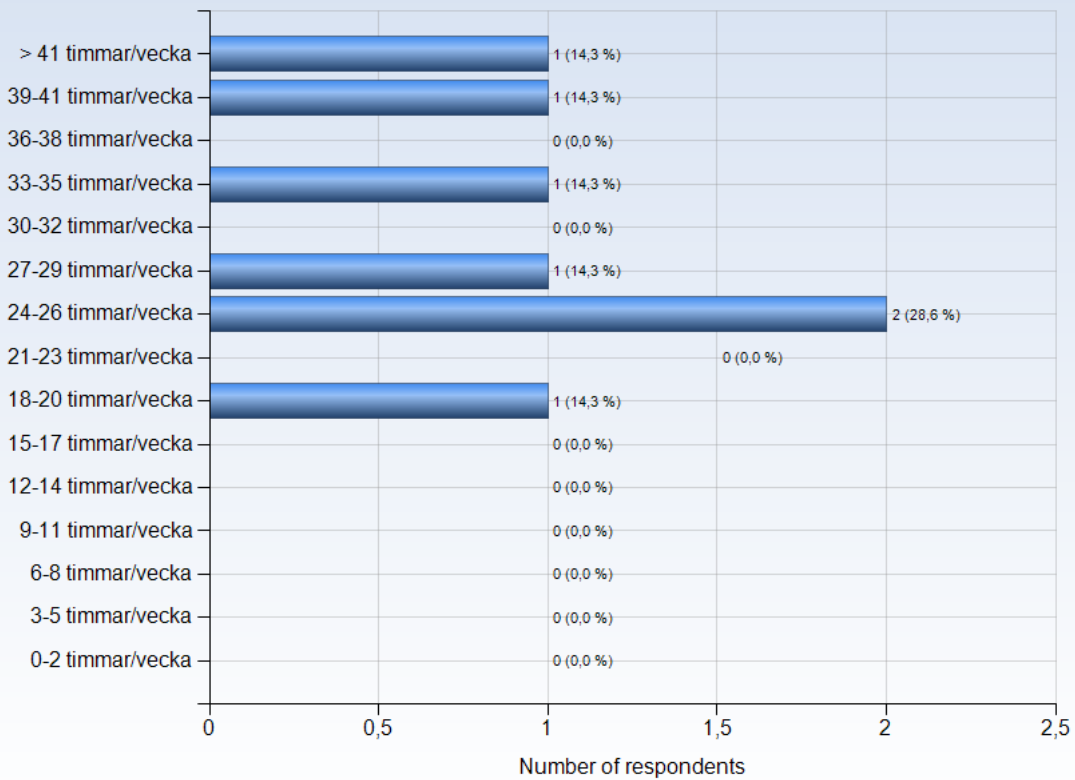
Antal respondenter: 15  
Antal svar: 7  
Svarsfrekvens: 46,67 %

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## ESTIMATED WORKLOAD

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



### Comments

Comments (I worked: 24-26 timmar/vecka)

The course needed hard work since we had exercises for each week that gave bonus points. These points could help the student reach E before the exam. I think this is a good thing to have in the course.

Comments (I worked: 27-29 timmar/vecka)

If one aims to do all homeworks, the term was very intense.

Comments (I worked: 39-41 timmar/vecka)

good course. If give more physics model, or more physics meaning of these e, h, f, g, phi, it would be easier to understand.

Comments (I worked: > 41 timmar/vecka)

It's a bit difficult, so it takes some time



## LEARNING EXPERIENCE

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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:

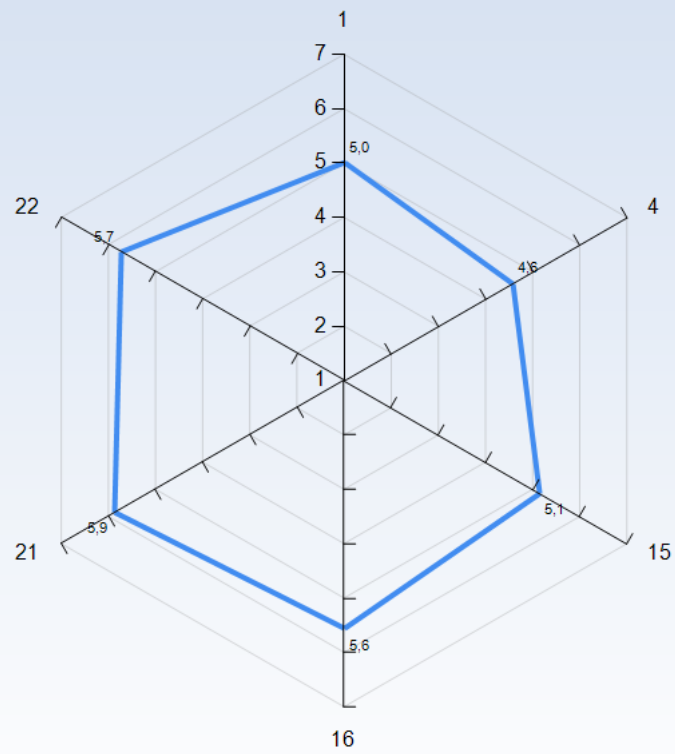
1 = No, I strongly disagree with the statement

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



— Medelvärde



## **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.

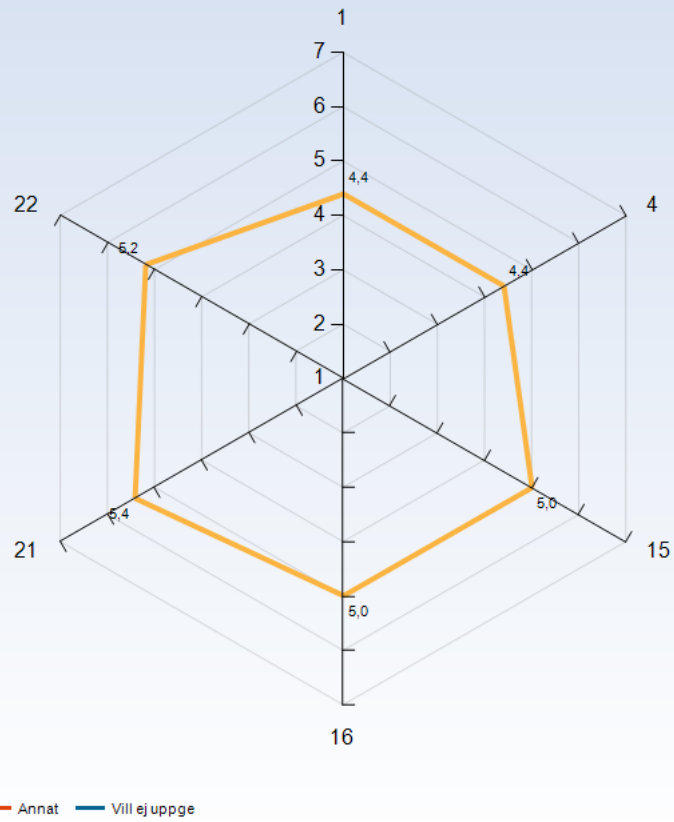
Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

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



#### Comments

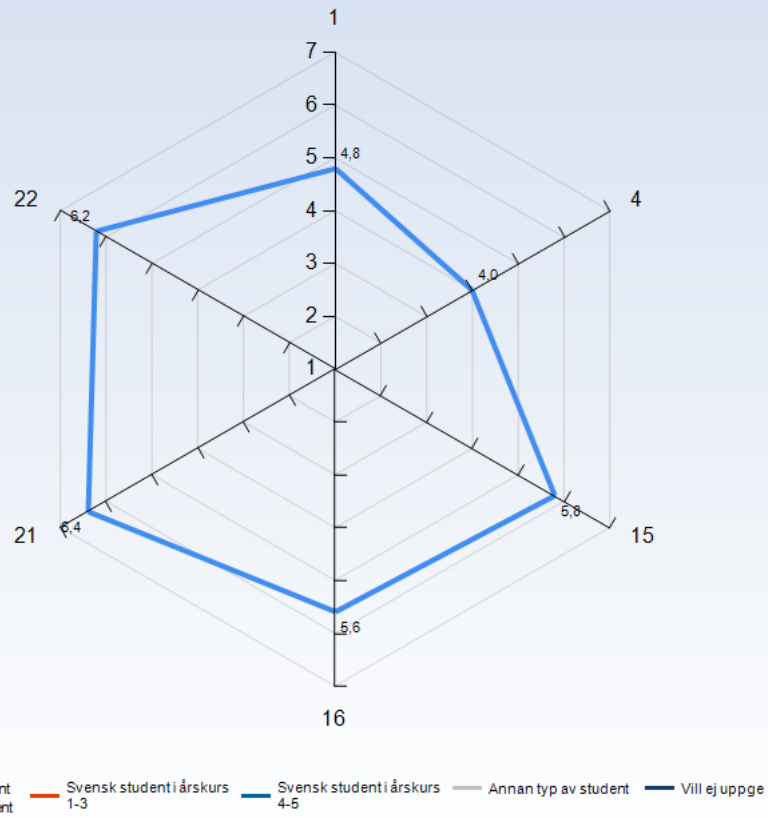
Comments (I am: Kvinna)

Good course

Comments (I am: Man)

good

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



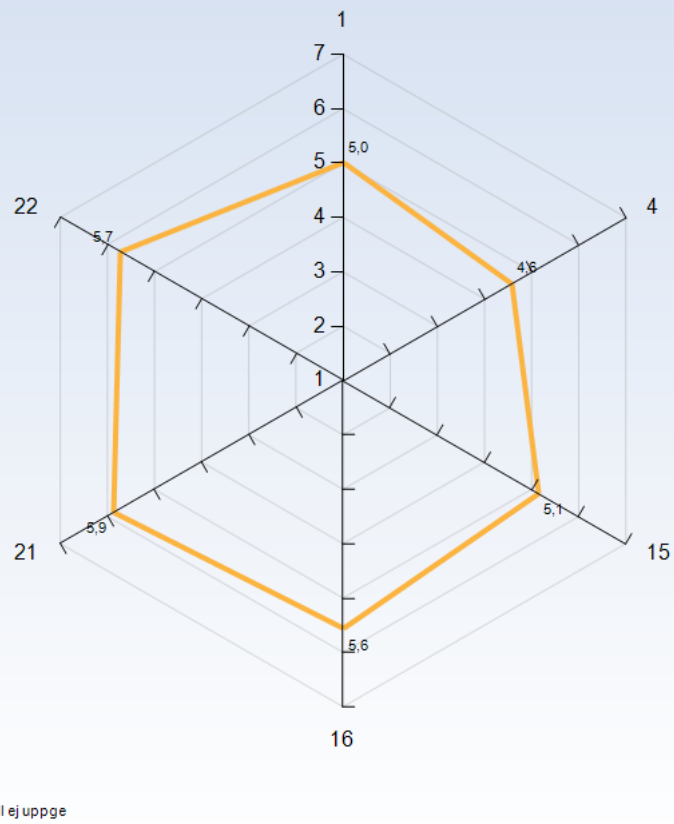
#### Comments

Comments (I am: Internationell masterstudent)

Good course

good

### Average response to LEQ statements - per disability



#### Comments

Comments (My response was: Nej)

Good course

good



## GENERAL QUESTIONS

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### What was the best aspect of the course?

What was the best aspect of the course? (I worked: 18-20 timmar/vecka)

We could learn a lot of fundamental theory and calculations from this course.

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

The home assignments and the project were interesting and very challenging.

What was the best aspect of the course? (I worked: 27-29 timmar/vecka)

Good connection to other courses in microwave track, for example mode excitation.

What was the best aspect of the course? (I worked: 39-41 timmar/vecka)

the knowledge is deep.

What was the best aspect of the course? (I worked: > 41 timmar/vecka)

You can learn a lot of important basic knowledge

### What would you suggest to improve?

What would you suggest to improve? (I worked: 18-20 timmar/vecka)

The time for each class is 3 hours which is too long for me. I cannot concentrate well in the last part of course.

What would you suggest to improve? (I worked: 24-26 timmar/vecka)

The time to do the project (or the difficulty of the project) because as you may have noticed, only one group tried to get an A on the project. I think this was mainly due to the time aspect. We had the final home assignment simultaneously as first week of the project and since the home assignments are so important, you obviously prioritise them...This effectively made us have 1 week to solve this rather difficult (still interesting) problem.

Perhaps a provided figure how each task (Task E, Task C and Task A) should possibly look like would have helped a lot since some had problems with boundary conditions and some had problems with modes in general without reflecting on that.

What would you suggest to improve? (I worked: 27-29 timmar/vecka)

To build confidence before getting assignments, there could be more introductory example problems.

What would you suggest to improve? (I worked: 39-41 timmar/vecka)

less math, more physics meaning. And for the exam, the most important thing is the understanding, which is A part. B part is more for math. Maybe we should focus more on understanding and less than math calculation.

What would you suggest to improve? (I worked: > 41 timmar/vecka)

After finishing the homework, give the corresponding reference explanation or solution ideas

### What advice would you like to give to future participants?

What advice would you like to give to future participants? (I worked: 18-20 timmar/vecka)

Work hard on compendium.

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

Work hard on the home assignments since they help you a lot in the course. Both knowledge wise but also credits wise.

What advice would you like to give to future participants? (I worked: 39-41 timmar/vecka)

don't be afraid. Study slowly and understand step by step..

What advice would you like to give to future participants? (I worked: > 41 timmar/vecka)

Don't give up. It's not so hard to study hard



**Is there anything else you would like to add?**

Is there anything else you would like to add? (I worked: 27-29 timmar/vecka)

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During the project, I feel like students did not invest enough time to be creative and attempt to find solutions on their own. Instead, I find that many asked for help from other students too quickly. Is it because the students did not find enough time to complete it? Was the E-level problem too difficult?

Because of this, I don't think students learn to solve problems independently if the E-level project is as difficult as it was this time.

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Is there anything else you would like to add? (I worked: 39-41 timmar/vecka)

no

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Is there anything else you would like to add? (I worked: > 41 timmar/vecka)

no

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## **SPECIFIC QUESTIONS**

## RESPONSE DATA

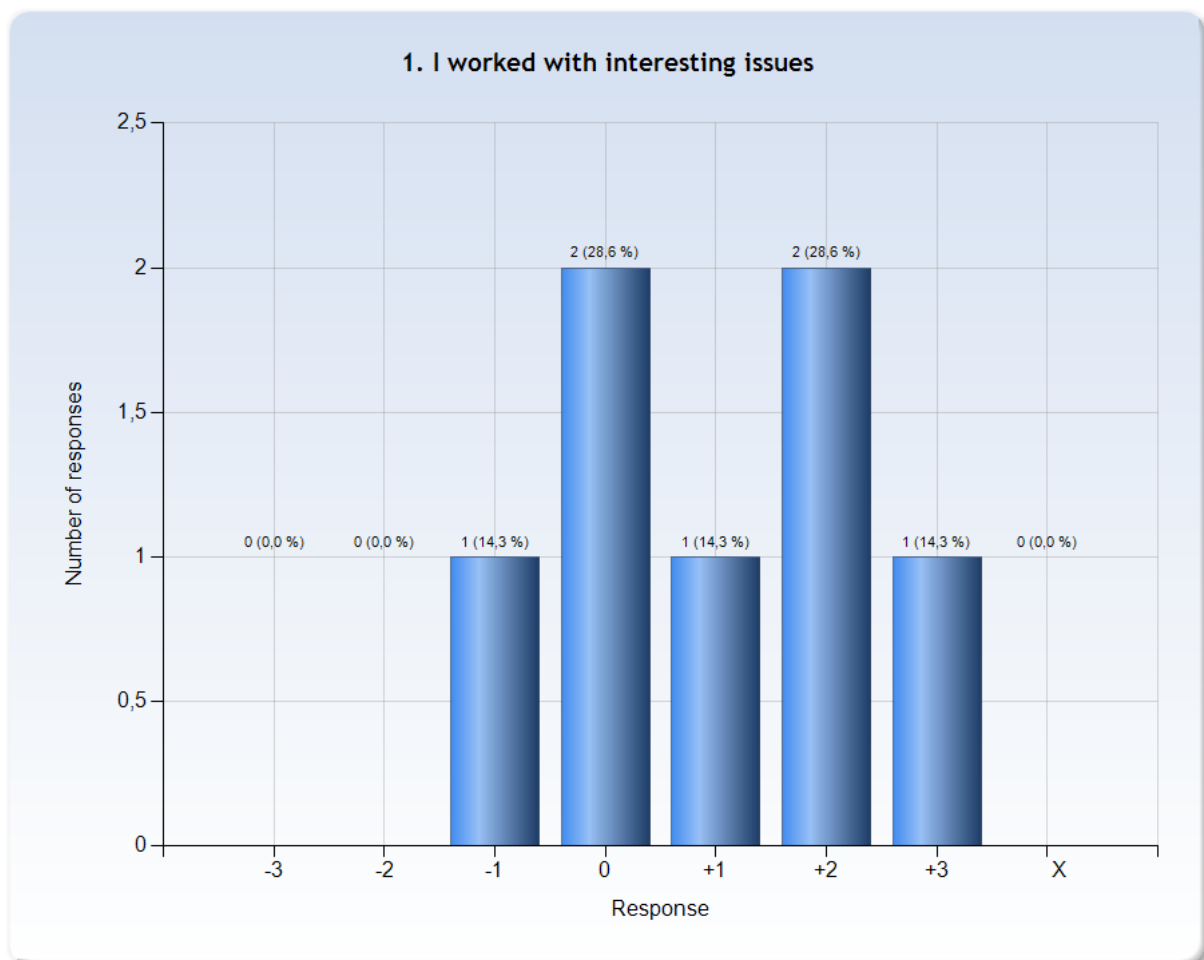
The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

-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

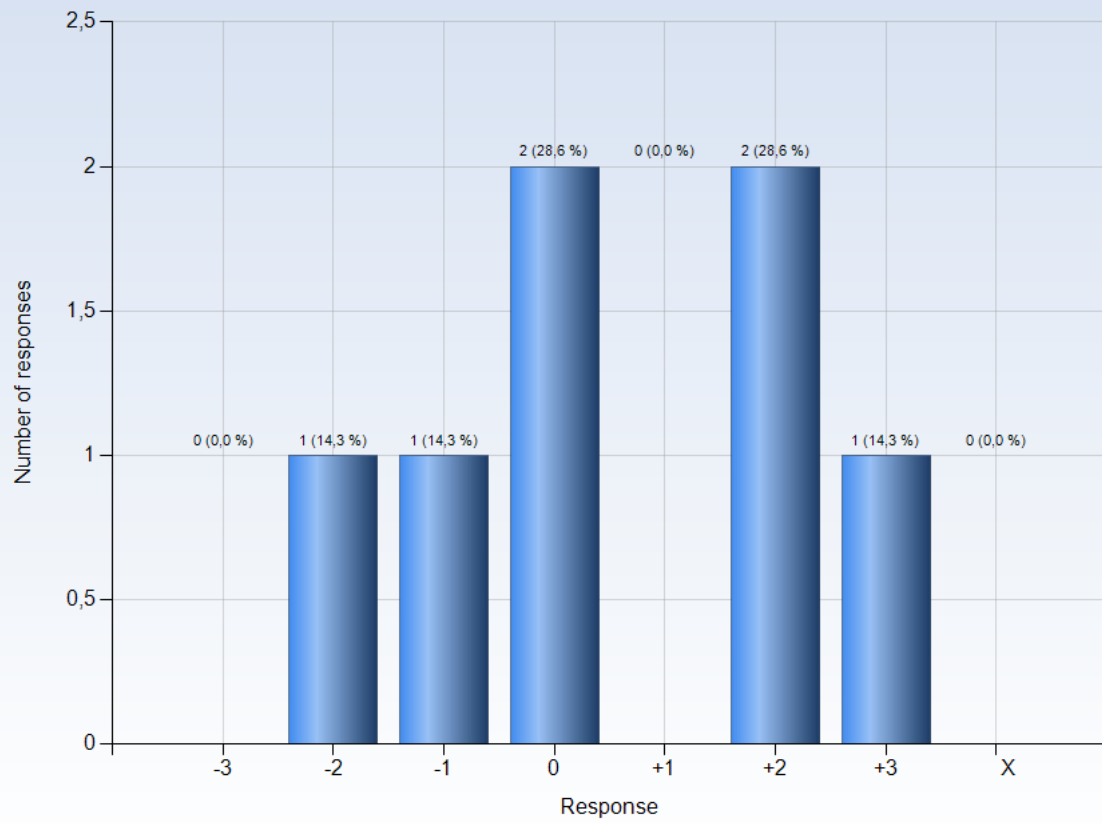


### Comments

Comments (My response was: 0)  
more physics, less math

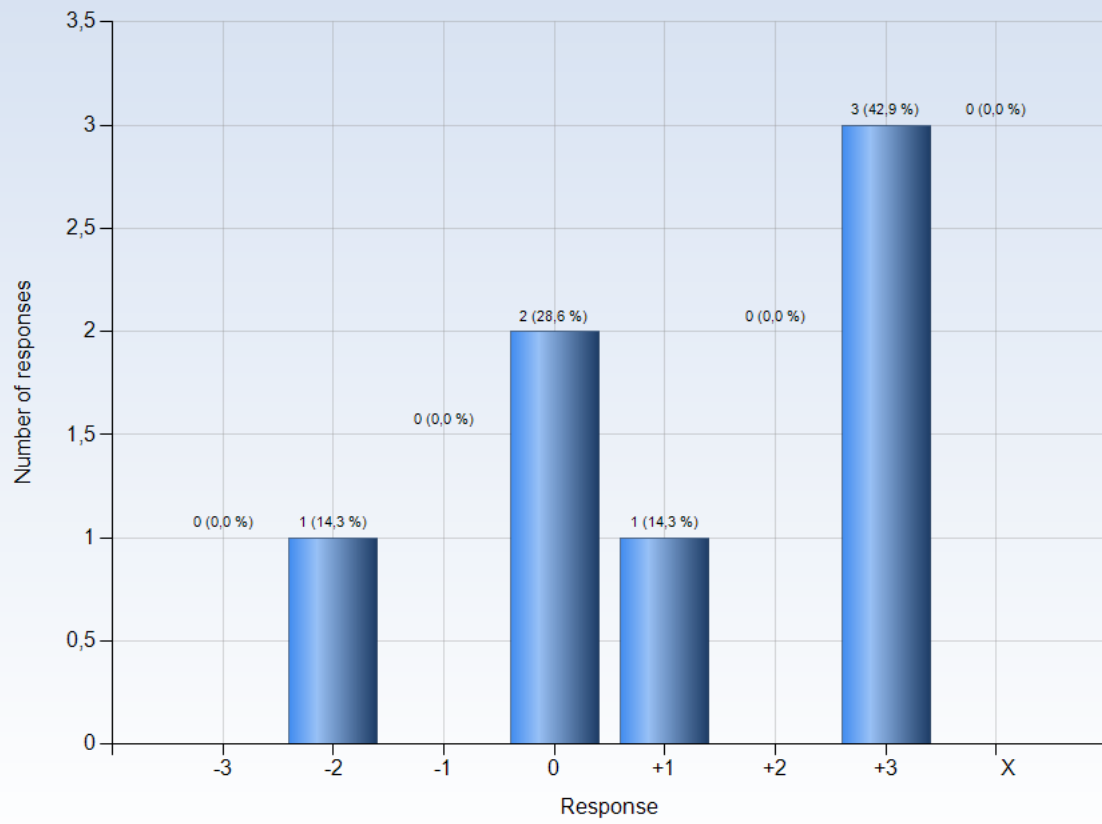


#### 4. The course was challenging in a stimulating way



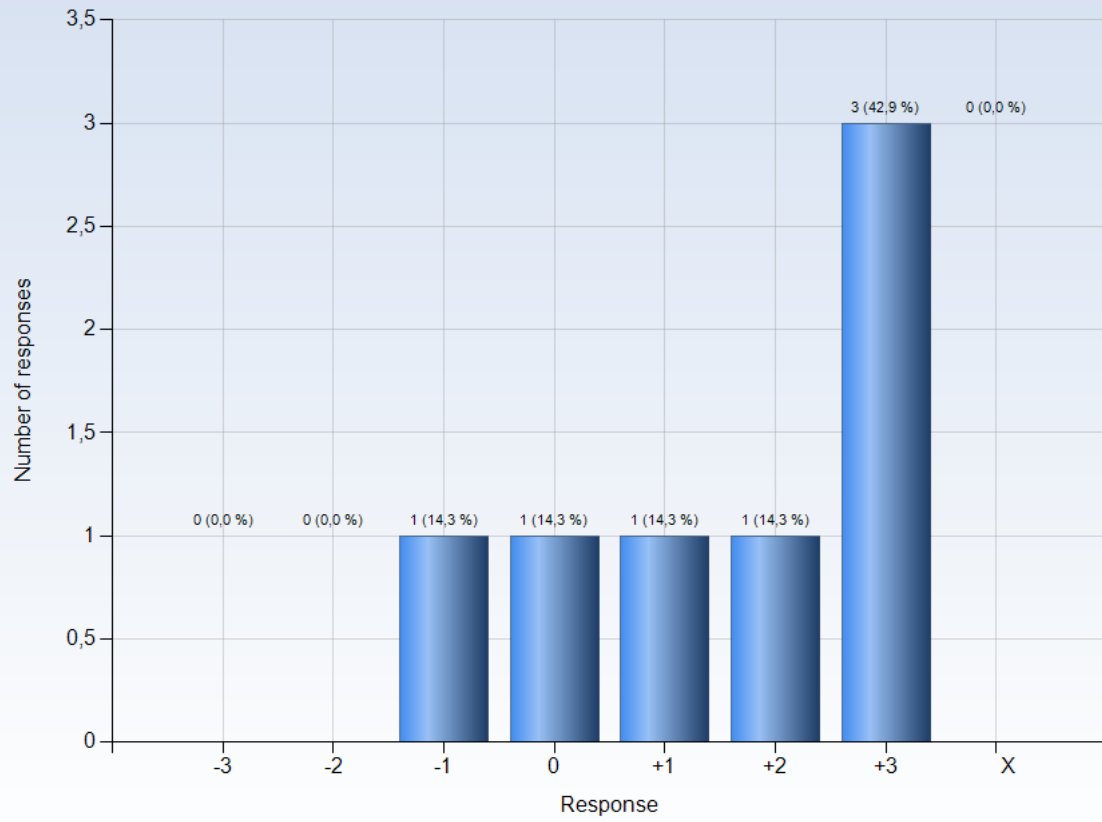
Comments

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



Comments

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

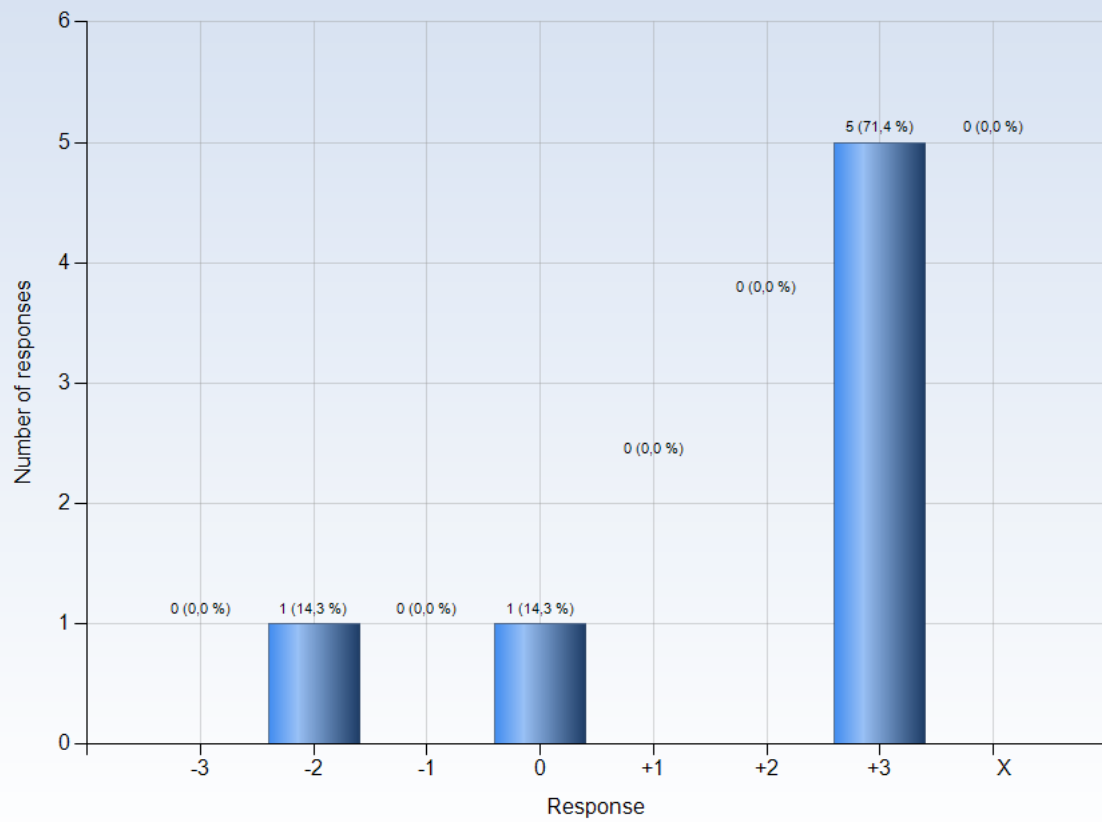


#### Comments

Comments (My response was: +1)

Some questions on our exam and the previous ones seem unrelated to what is emphasised on the lectures.

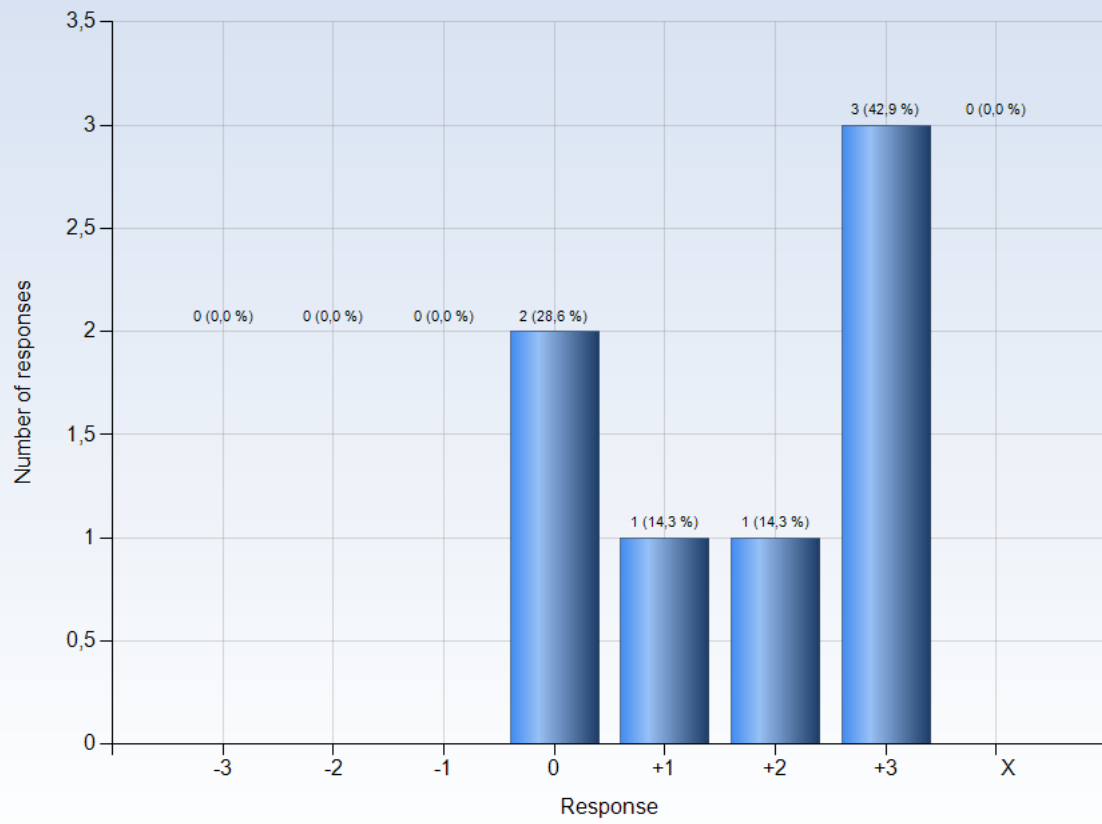
### 21. I was able to learn by collaborating and discussing with others



#### Comments

Comments (My response was: -2)  
due to social distancing

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



### Comments

Comments (My response was: +1)  
space after lectures were useful