Report - SF2822 - 2020-06-22

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):

Shen Peng, shenp@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.

We have used the course evaluation. Because of coronavirus, the course was given in distance via Zoom. Considering the situation, students have had the opportunity to contact me and the teaching assistant continuously throughout the course with email and Zoom. We have not specifically addressed aspects regarding gender and disabled students, except following standard KTH practice.

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.)

Meeting with the students has been arranged in two different types: questions about the subjects in the lectures and doubts in their projects. In both cases, I would always try to make the student understand the problem and lead them to solve it by themselves, not just provide the answer straight away.

COURSE DESIGN

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

The course covers nonlinear programming. The course is based on projects, where students get training in modeling and analysis of practical problems, in addition to lectures and tutorials, where students get an understanding of theory and methods. The second project is optionally an implementation project. This is the same setup as last year.

The group sizes for the project groups were two or three persons and the groups were selected by me. The projects are presented at a particular lecture. Because of coronavirus, this presentation lecture was also taken via Zoom. The presentation lecture is devoted to a discussion between students. First, students who have worked on the same project were grouped in the same breakroom and discussed in Zoom. As a second part of the lecture, students who have worked on different projects were grouped together and discussed in the same breakroom, three persons in each group. In addition, we have the "follow-up" discussions with the groups after the presentation lectures.

I was new to the course. I basically followed the setup from previous years. I used a laptop and project as support for the teaching. This gives a "skeleton" of the course material. The slides are written using LaTeX. By the laptop, I could also illustrate some example problems by using GAMS and Matlab.

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?

Counting for ten weeks and 7.5 credits would give 20 hours per week. Several students report a workload which is less, 12-14 hours a week would be the median. I think that the students think about the projects even when they do not work actively with them, so the workload is slightly higher.

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?

The results of the exam were good. The first exam, in May, had 21 passes and 7 failed, out of 28. We are still waiting for the results of re-exam in August.

The setup of the course is such that it suits students who want to take the course. I think this is valid for an advanced master course. It seems, however, that there is a group of students who are not that interested. The course being compulsory for some students is not something I prefer.

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

It seems that some mathematical proofs during the video lecture are not that attractive and may make the lecture hard to follow for some students. Some more intuitions behind the key concepts should be presented. However, the students seem to benefit a lot from the exercise session and project session.

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

Students seem to be happy with the course design and material and want more intuitions behind the key concepts, while the mathematical proofs during the video lecture may hard to follow. They highlighted their interest in the projects.

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 being my first time teaching in KTH, I was overwhelmingly impressed with the high quality of the students, their dedication, and their end results on the projects. They were able to tackle highly difficult modeling problems in a very short time, and every question directed to me showed me they were fully invested in their work. I also learned a lot from the evaluation, which pushes me to improve my teaching skill, especially via Zoom. As being my first year teaching in KTH, I should seize the real interest of students in this course more accurately. I am extremely happy to give the course and would love to repeat it next year.

Except the course was taken in distance via Zoom by a new lecturer, no big changes from last year.

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?

Some students are not happy with that the slides and the book did not have all the answers to the 10 potential theory questions. But all the basic ideas and knowledge to solving the answers were taught during the lecture although not written in the slides. I think it's a good way to lead the students to solve the questions by making full use of what they have learned.
Some students want to have freedom to choose their group mates. I understand their point of view but think there is an overall benefit of doing it the way it is done.

PRIORITIZED COURSE DEVELOPMENT

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

New projects are always useful. I would also be interested in developing some more real-life examples and exercises for the students. Maybe change the modeling language to Matlab or Python with the use of an academic license of a solver such as Gurobi or CVX.

OTHER INFORMATION

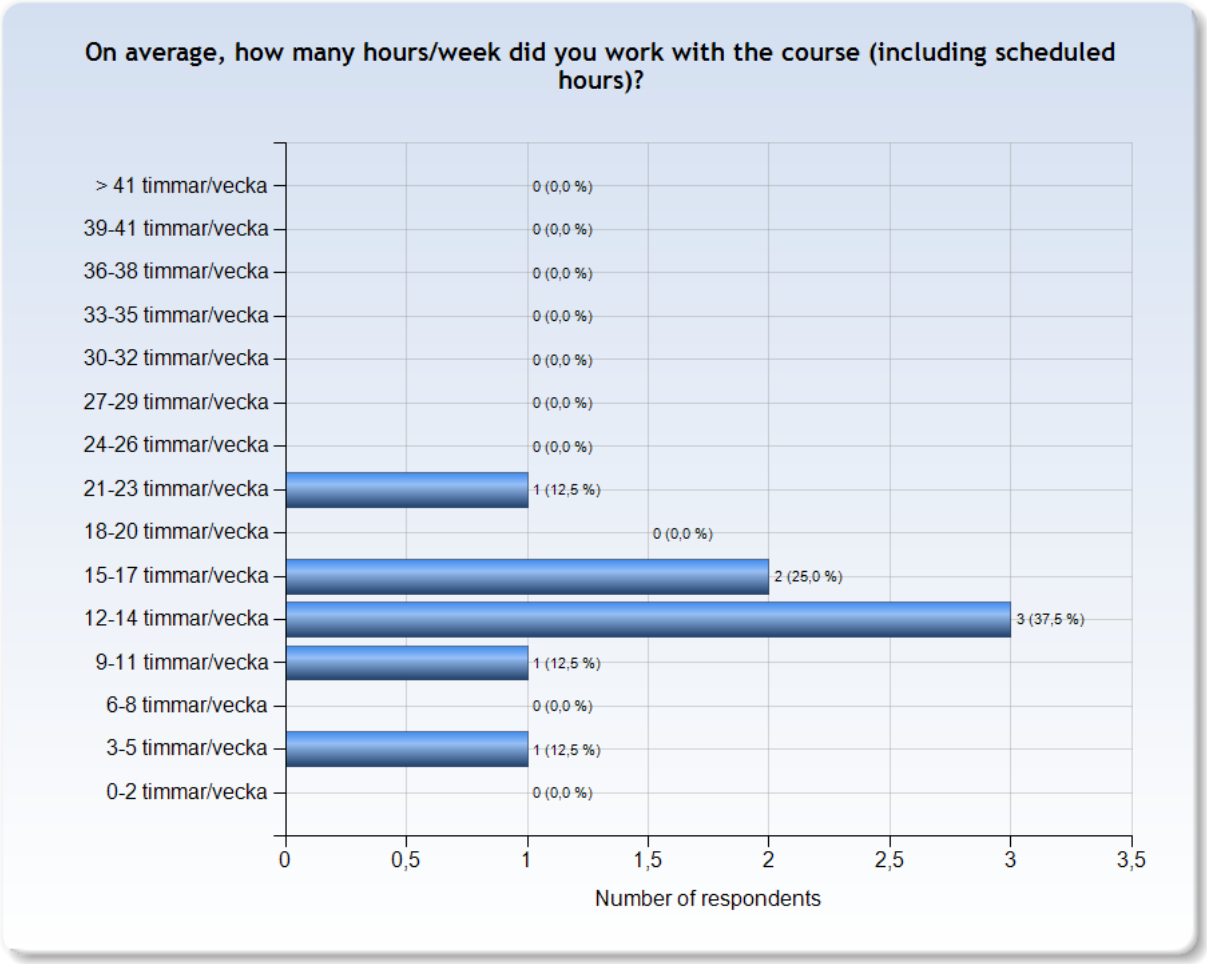
Is there anything else you would like to add?

It was very helpful to have David Ek as teaching assistant. He was very experienced and was highly appreciated by the students.

SF2822 - 2020-06-04

Antal respondenter: 44
Antal svar: 8
Svarsfrekvens: 18,18 %

ESTIMATED WORKLOAD



Comments

Comments (I worked: 9-11 timmar/vecka)
I followed the first courses but got bored of the video lectures. I realized it was enough to just go to the exercise sessions, do the projects and study 3 day for the exam. On average thus 2h a week, but if there was a project 20-30 hours in the week and for the exam 20-30 hours as well in one week.

Comments (I worked: 12-14 timmar/vecka)
I think the structure of the lectures (with powerpoints) and the exercise sessions made it quite straight-forward to study for the exam. The projects did however take up much time during a few of the weeks.

Comments (I worked: 15-17 timmar/vecka)
Most of the time spent on group projects

Comments (I worked: 21-23 timmar/vecka)
Reasonable

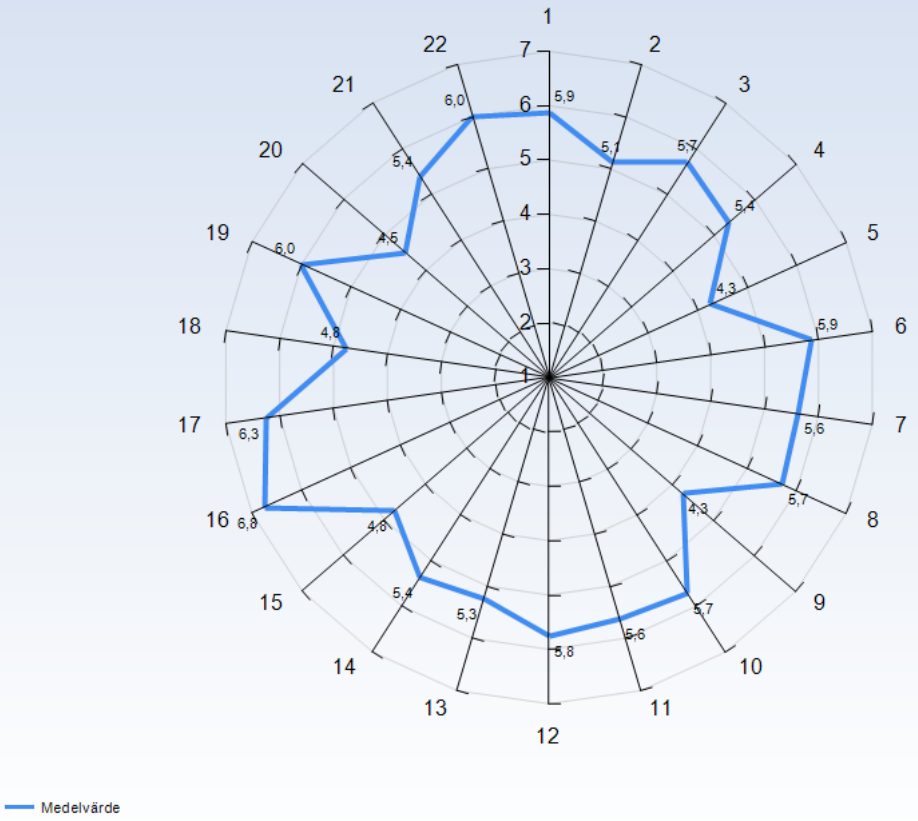
LEARNING EXPERIENCE

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.

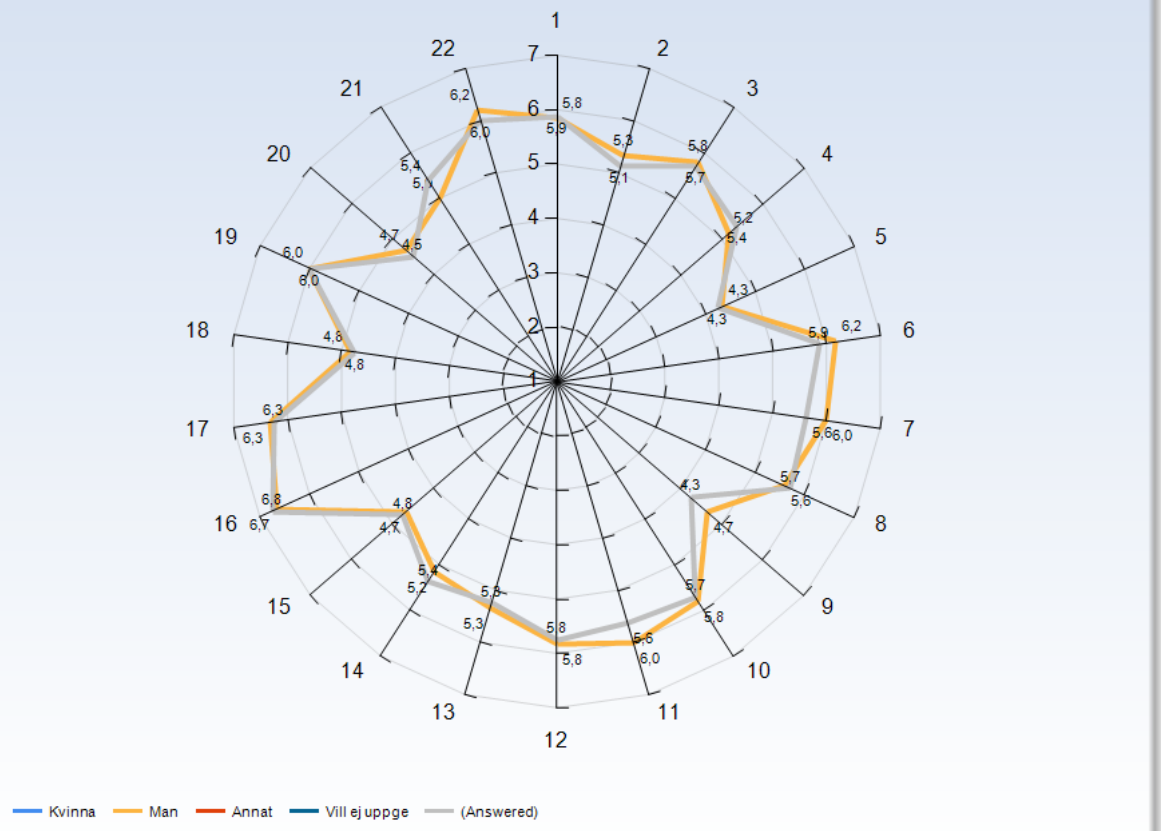
Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

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

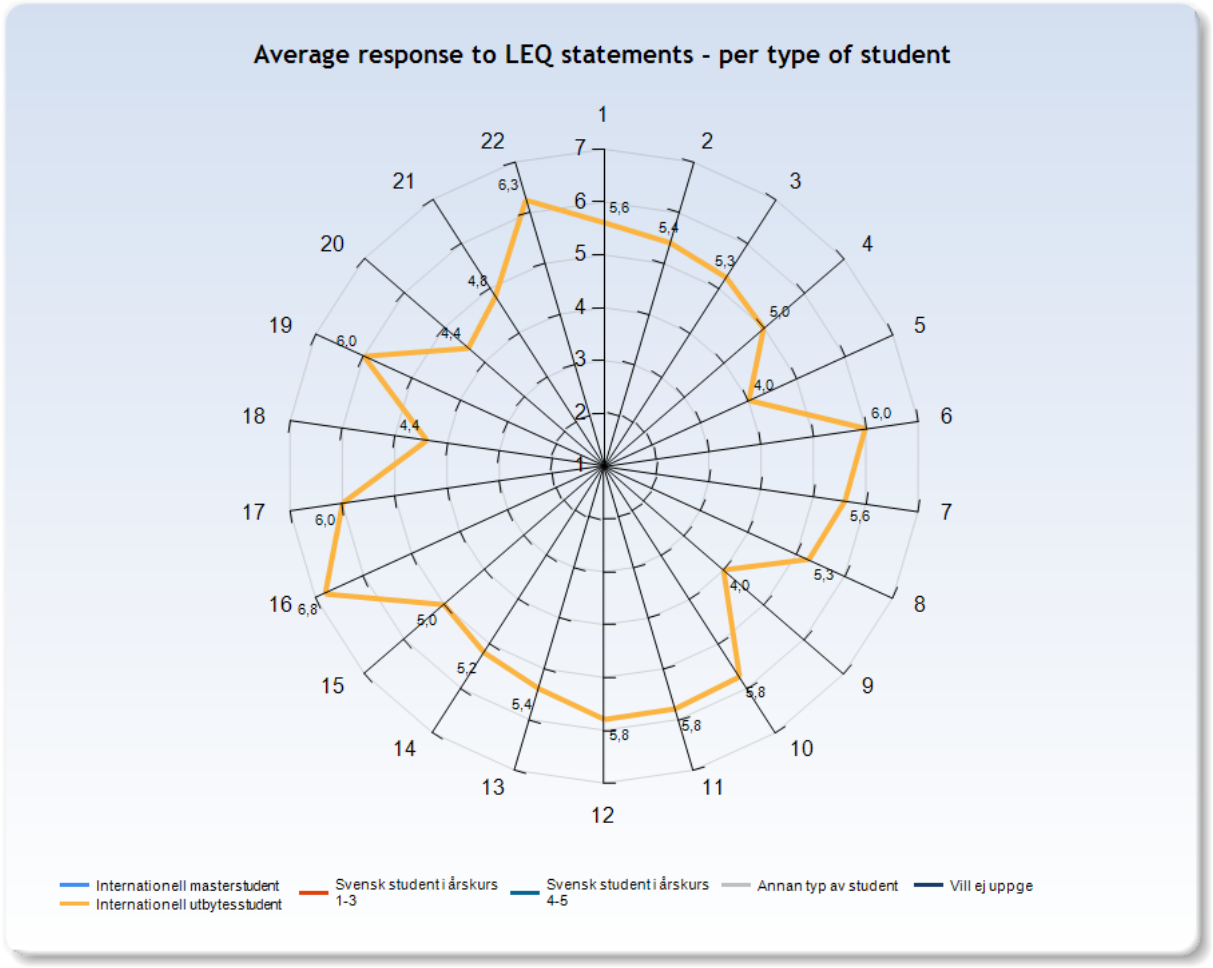
Kember, K. & McNaught, C. (2007). *Enhancing University Teaching: Lessons from Research into Award-Winning Teachers*, Chapter 5, pp. 31-40. Abingdon: Routledge.

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

Average response to LEQ statements - per gender

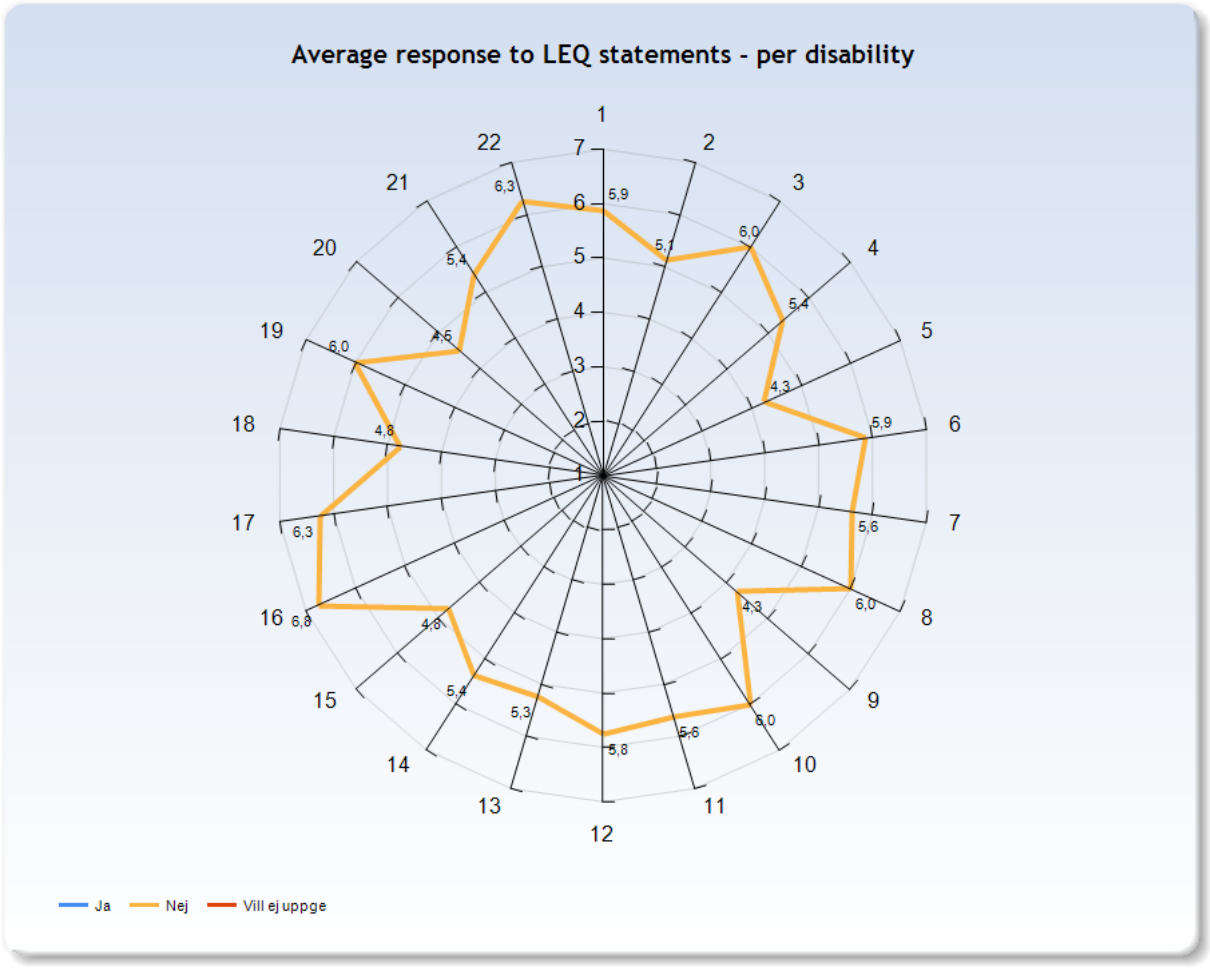


Comments



Comments

Comments (I am: Internationell utbytesstudent)
No problem at all


Average response to LEQ statements - per disability
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
7
6
5
4
3
2
1
5,9
6,0
5,1
5,4
4,3
5,9
5,6
6,0
4,3
6,0
5,6
5,8
5,3
5,4
4,8
6,8
6,3
4,8
6,0
4,6
5,4
6,3
Ja
Nej
Vill ej uppge

Comments

GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 9-11 timmar/vecka)
Exercise sessions were very good ! Thank you David Ek !!

What was the best aspect of the course? (I worked: 12-14 timmar/vecka)
I like the choice between two different types of projects for P2. And in general I like the combination of theory and projects.
The structure with well laid out exercise sessions and lectures/powerpoints. It was thus easy to follow, even if you missed one or two lectures. The projects were also fun and challenging.

What was the best aspect of the course? (I worked: 15-17 timmar/vecka)
Group projects that exposed us to applications of the mathematical concepts we learn in lectures.
I liked the projects, especially the second one because we could be creative. I liked the topics which gave a great overview of nonlinear optimization

What was the best aspect of the course? (I worked: 21-23 timmar/vecka)
Projects were very fun with interesting applications, especially the modelling projects.

What would you suggest to improve?

What would you suggest to improve? (I worked: 9-11 timmar/vecka)
- The courses were impossible to follow. It is of course not the most interesting subject to listen to, but still, doing all the derivations on the whiteboard was not good. The Chinese accent of the professor was also a big extra difficulty to understand what he was saying. I would have liked more overview as well of what we were doing and why. We often didn't know where the everlasting proofs were going to. - The second project I worked on interior point & qp solver. Was very interesting, but hard to know how far I should go or what problems should be able to be solved. Maybe having a test battery (with unknown problems, so you can't see what is wrong) would have been a nice way to see if our algorithm was enough. (There are a lot of more or less advanced enhancements that could be added) - The slides and the book did not have all the answers. For example the 10 potential theory questions on the exam couldn't be answered with just these. I would have liked 'complete' slides with all the information or something.

What would you suggest to improve? (I worked: 12-14 timmar/vecka)
More real-life examples. Some clearer explanations of key concepts that is not immediately understandable for a new student.

What would you suggest to improve? (I worked: 15-17 timmar/vecka)
Self-grouping for group projects or perhaps group people who live in similar timezones, so that it will be easier to schedule meetings for the projects.
Present the intuitions behind the key concepts during the lectures instead of long proofs which are hard to follow and not useful for the exam

What advice would you like to give to future participants?

What advice would you like to give to future participants? (I worked: 9-11 timmar/vecka)
Don't focus on the lectures as they don't serve any purpose. Go through the theory for yourself maybe once. Then solve all the exercises and learn the answer to the theory questions and you should be fine.

What advice would you like to give to future participants? (I worked: 12-14 timmar/vecka)
Follow along with the course, listen to lectures and exercises, and read up what you do not understand. Allocate time for the projects, they are difficult.
Work regularly

What advice would you like to give to future participants? (I worked: 15-17 timmar/vecka)
Work on the exercises and project regularly. It's a group project so it's alright even if your group seems lost at the start; hold regular PRODUCTIVE meetings and contribute your ideas, you will solve it eventually.
Read the textbook for further information

What advice would you like to give to future participants? (I worked: 21-23 timmar/vecka)
Work hard on the projects and try interact with other groups (!).

Is there anything else you would like to add?

Is there anything else you would like to add? (I worked: 15-17 timmar/vecka)
The seminar was great; I got to learn from other classmates and receive feedback on my group projects.
I found it confusing to present twice the interior methods (for quadratic problem and then the general case) but that's just my opinion

SPECIFIC QUESTIONS

Använde du kursboken av Griva, Nash och Sofer?

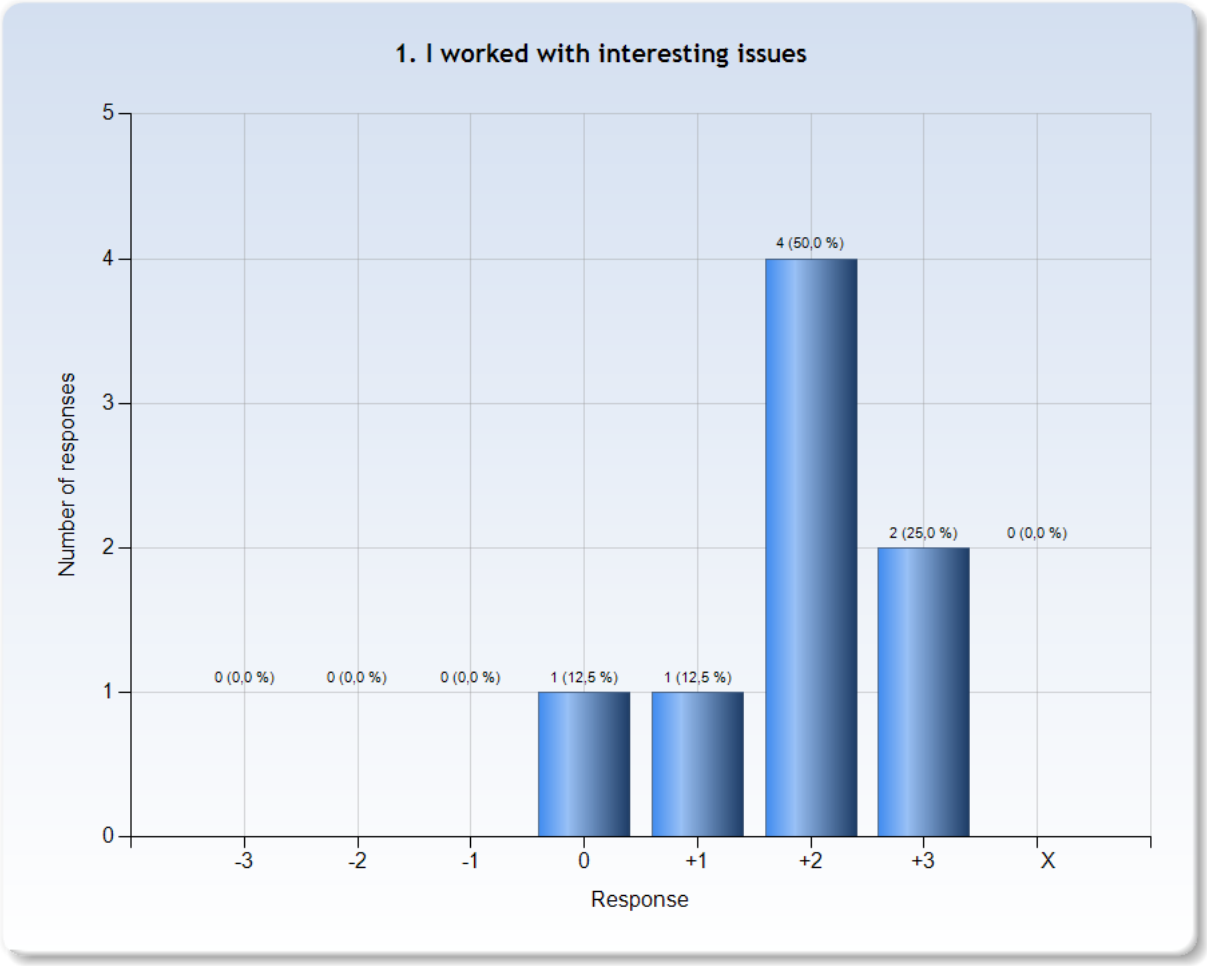
Använde du kursboken av Griva, Nash och Sofer?
a little bit for understanding the theory questions. Some of the answers were not clear from the slides.
Yes, it was needed, but didn't even have all answers. I often looked up on the internet (and often didn't find what you were asking for)
Yes, I think the book skips some important theoretical concepts, but algorithms are described well.
No, the lecture notes provided were sufficient.
Yes, I think it is well written but hard to buy. However, I did buy it because I really enjoy optimization and took both SF2812 and SF2822.
Yes, not to read each chapter thoroughly, but to look up specific subjects that I had difficulties understanding throughout the course. Also, they were great for seeing complete proofs and so on, useful for the theory questions.
Yes I found it nice to have additional support to the lecture slides

RESPONSE DATA

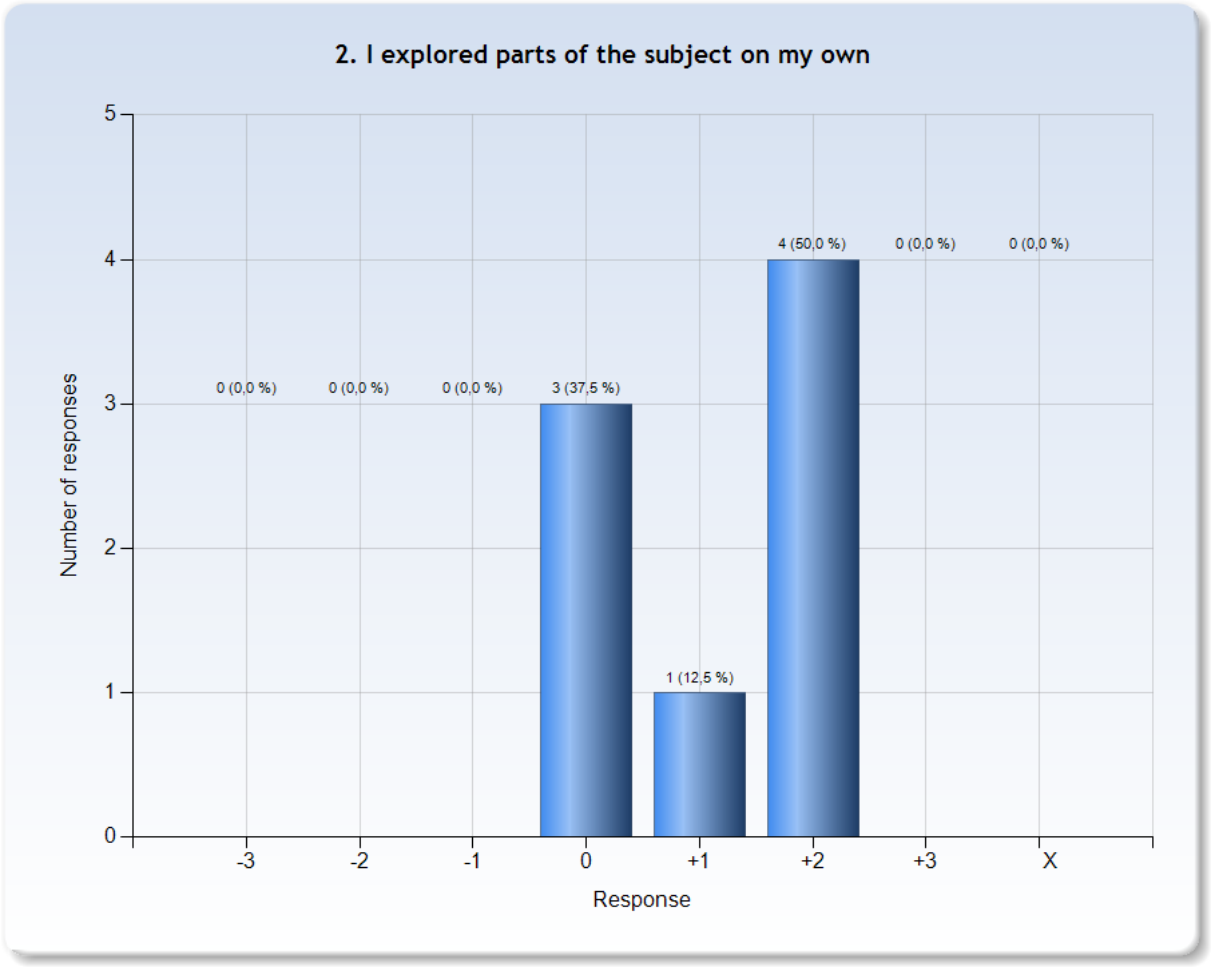
The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

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

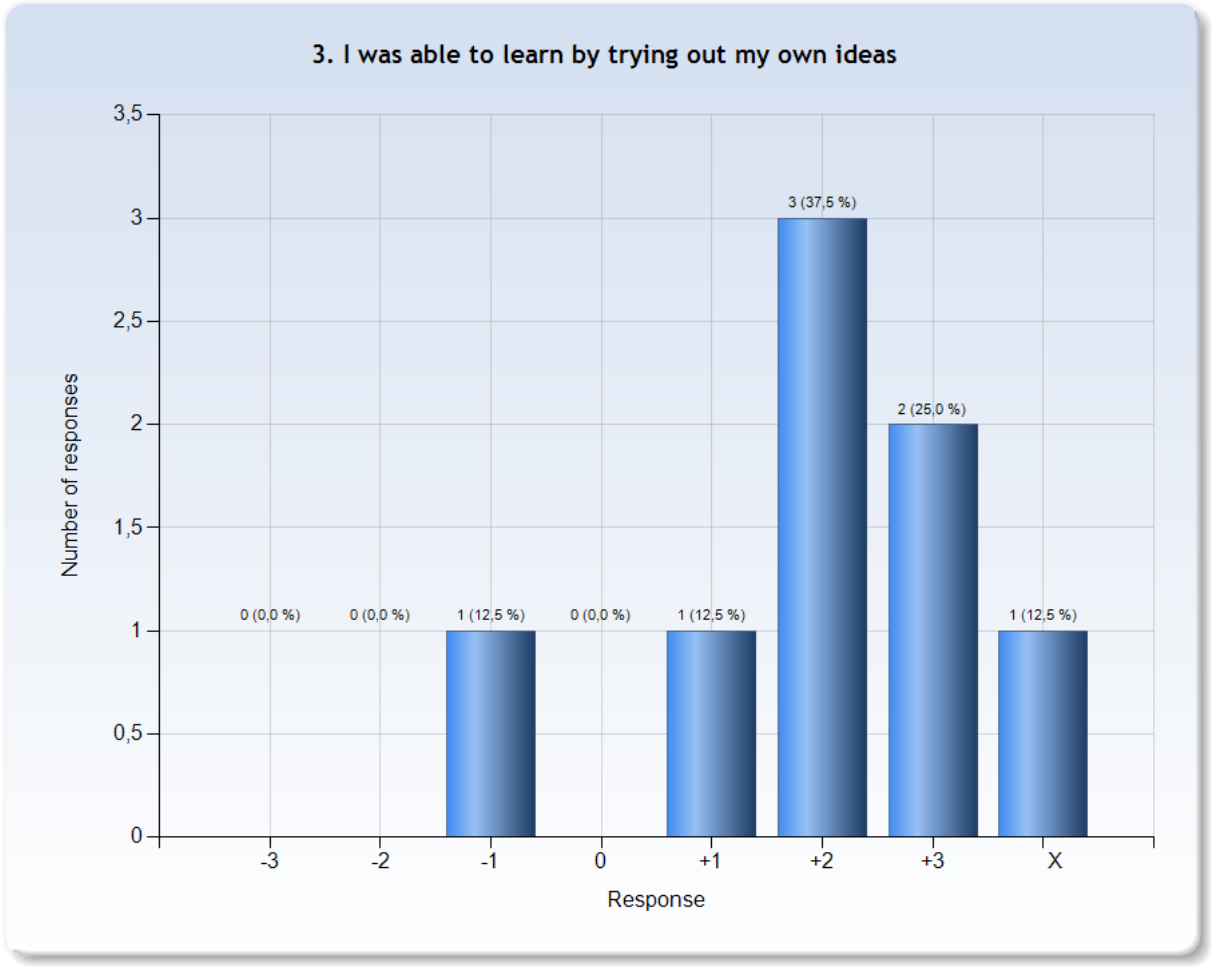
X = I decline to take a position on the statement



Comments

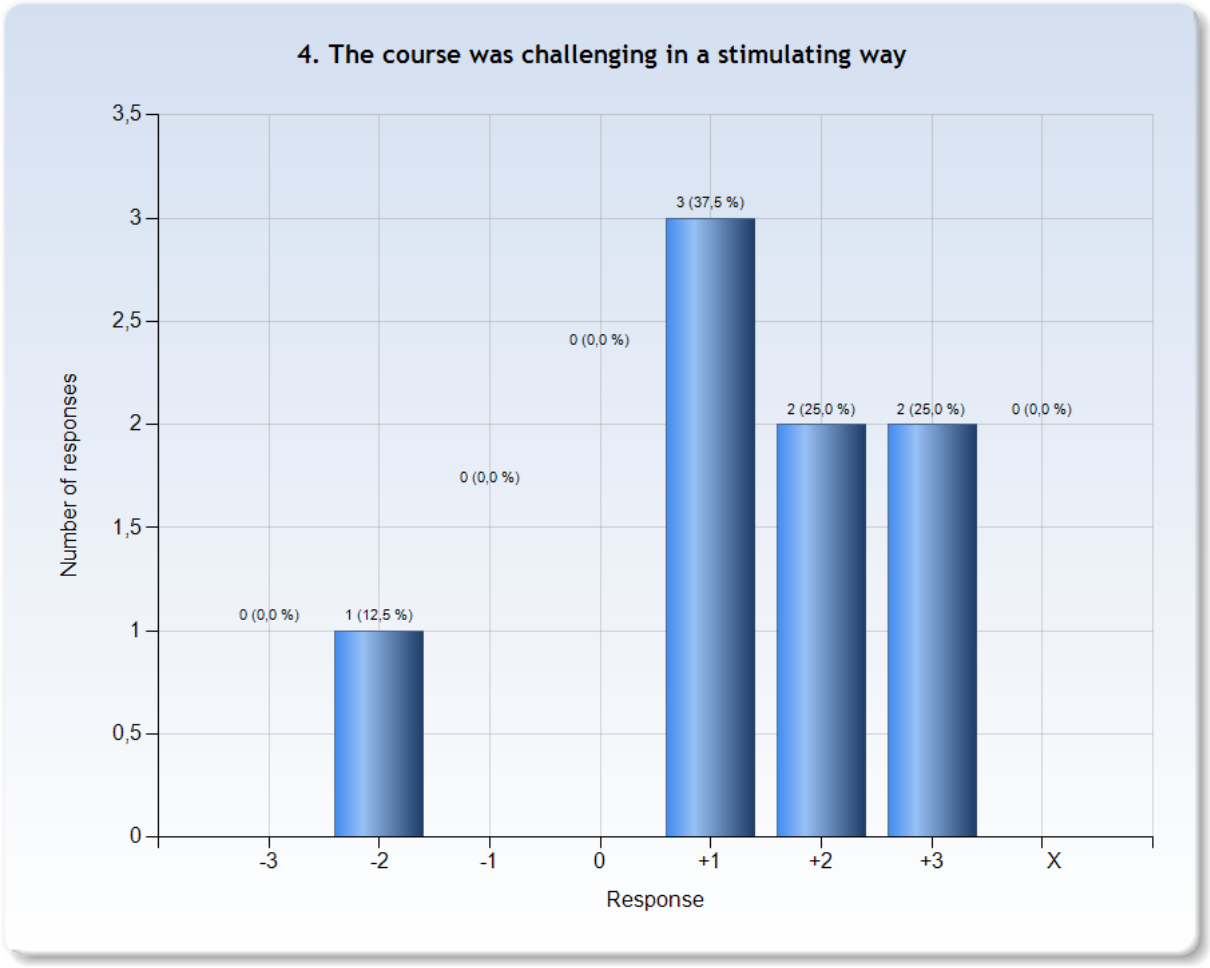

2. I explored parts of the subject on my own
Number of responses
Response
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
3 (37,5 %)
1 (12,5 %)
4 (50,0 %)
0 (0,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X

Comments

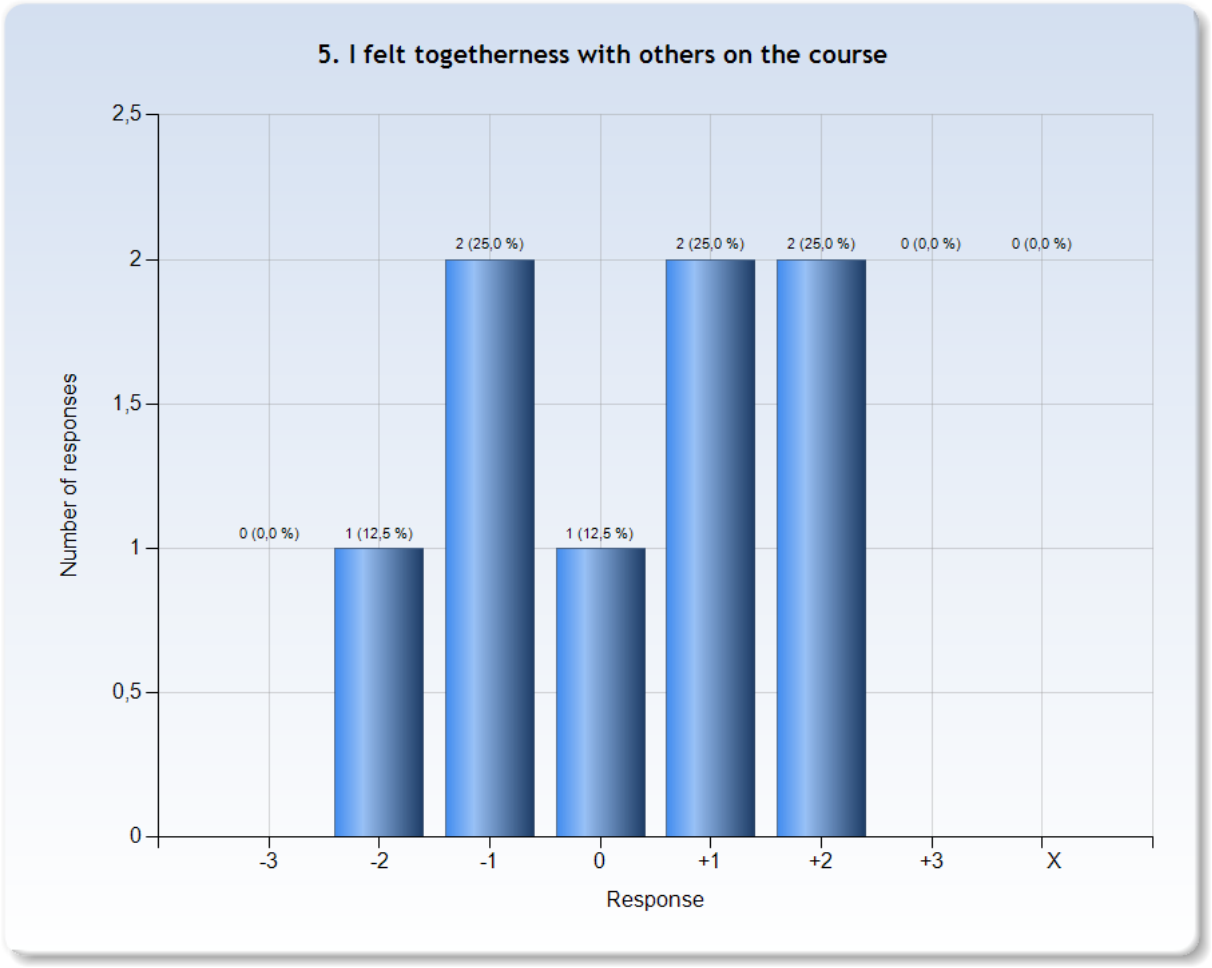


Comments

Comments (My response was: +2)
In the projects, particularly.


4. The course was challenging in a stimulating way
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
0 (0,0 %)
1 (12,5 %)
0 (0,0 %)
0 (0,0 %)
3 (37,5 %)
2 (25,0 %)
2 (25,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

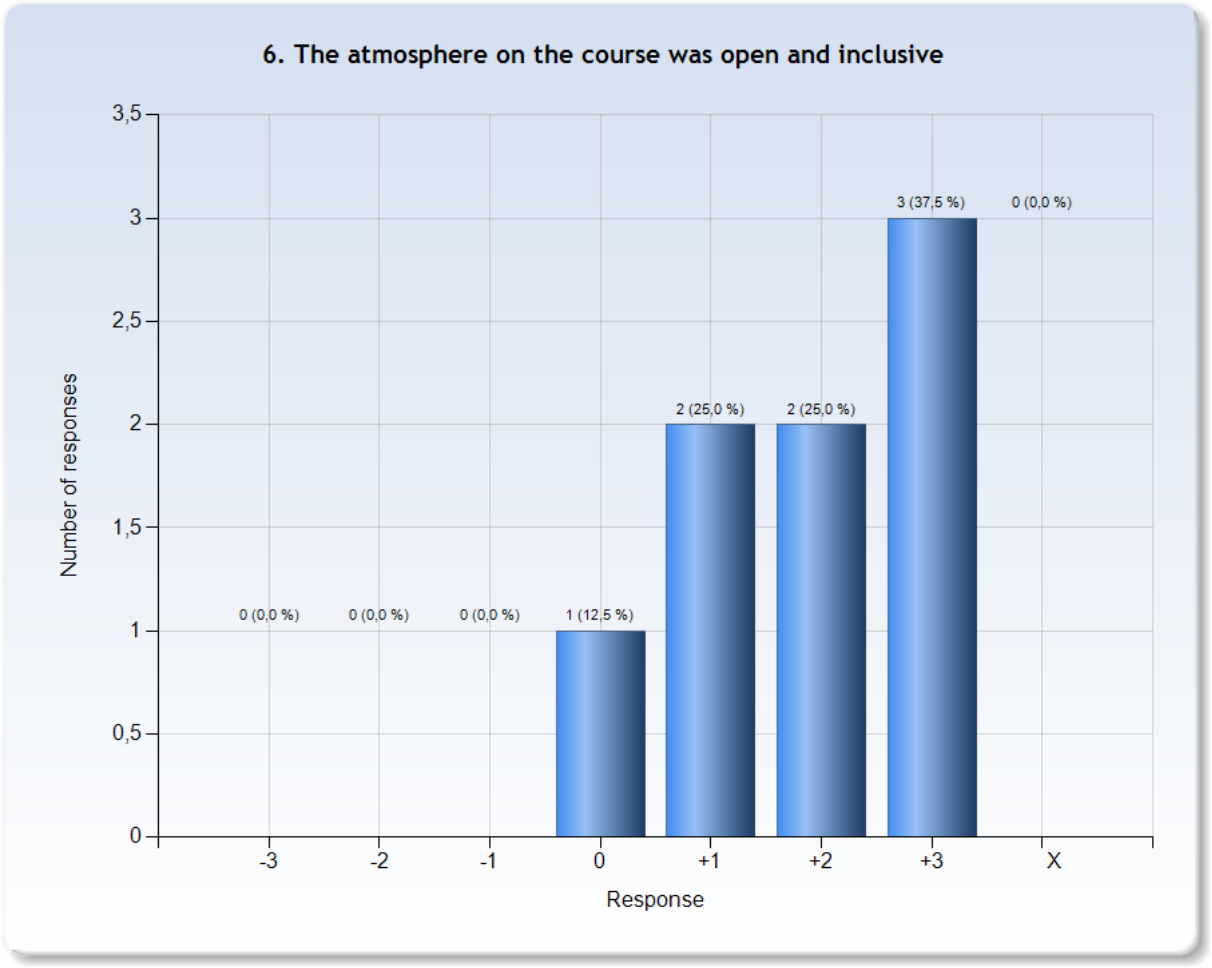
Comments



Comments

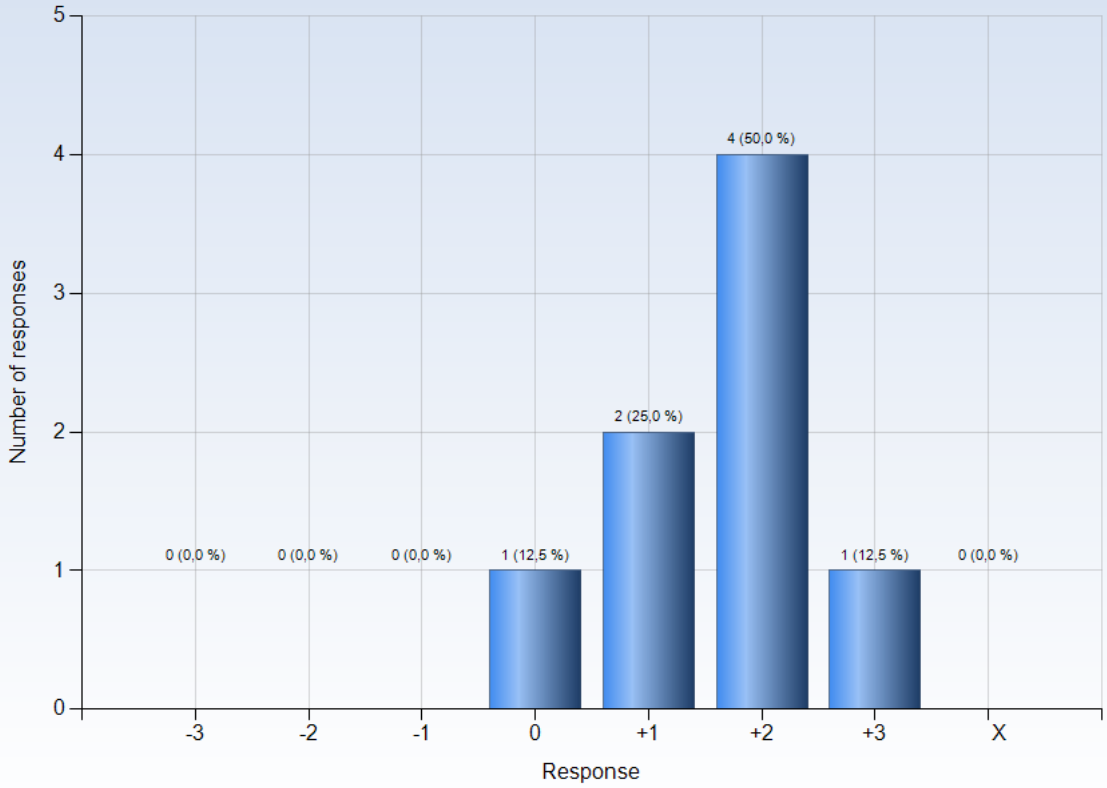
Comments (My response was: -1)
Sadly not so much, apart from the projects, but this follows naturally from the less interactive online-format of the course.

Comments (My response was: +1)
Less because of Corona virus but projects were fun and more interactive.

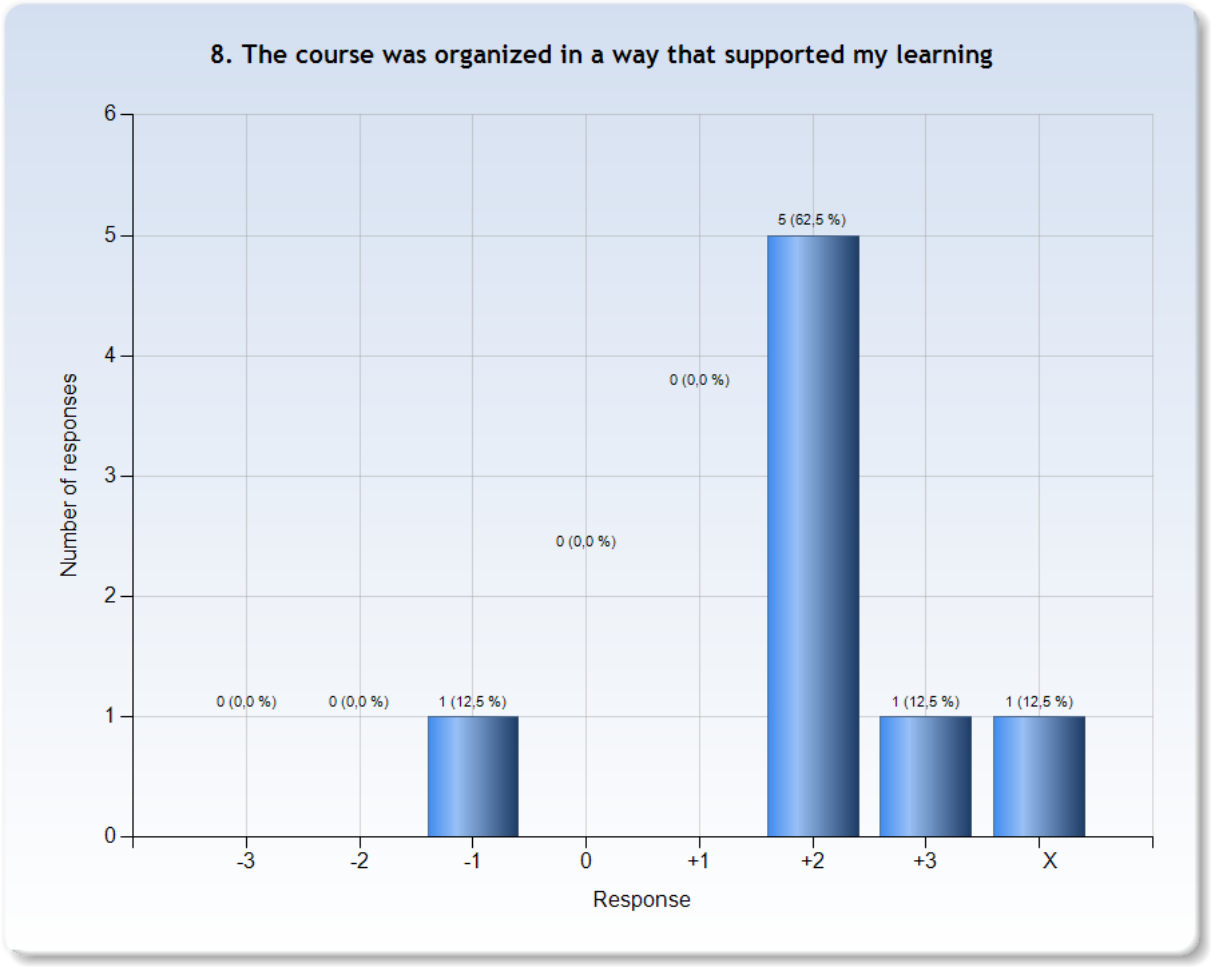

6. The atmosphere on the course was open and inclusive
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
1 (12,5 %)
2 (25,0 %)
2 (25,0 %)
3 (37,5 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

Comments

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

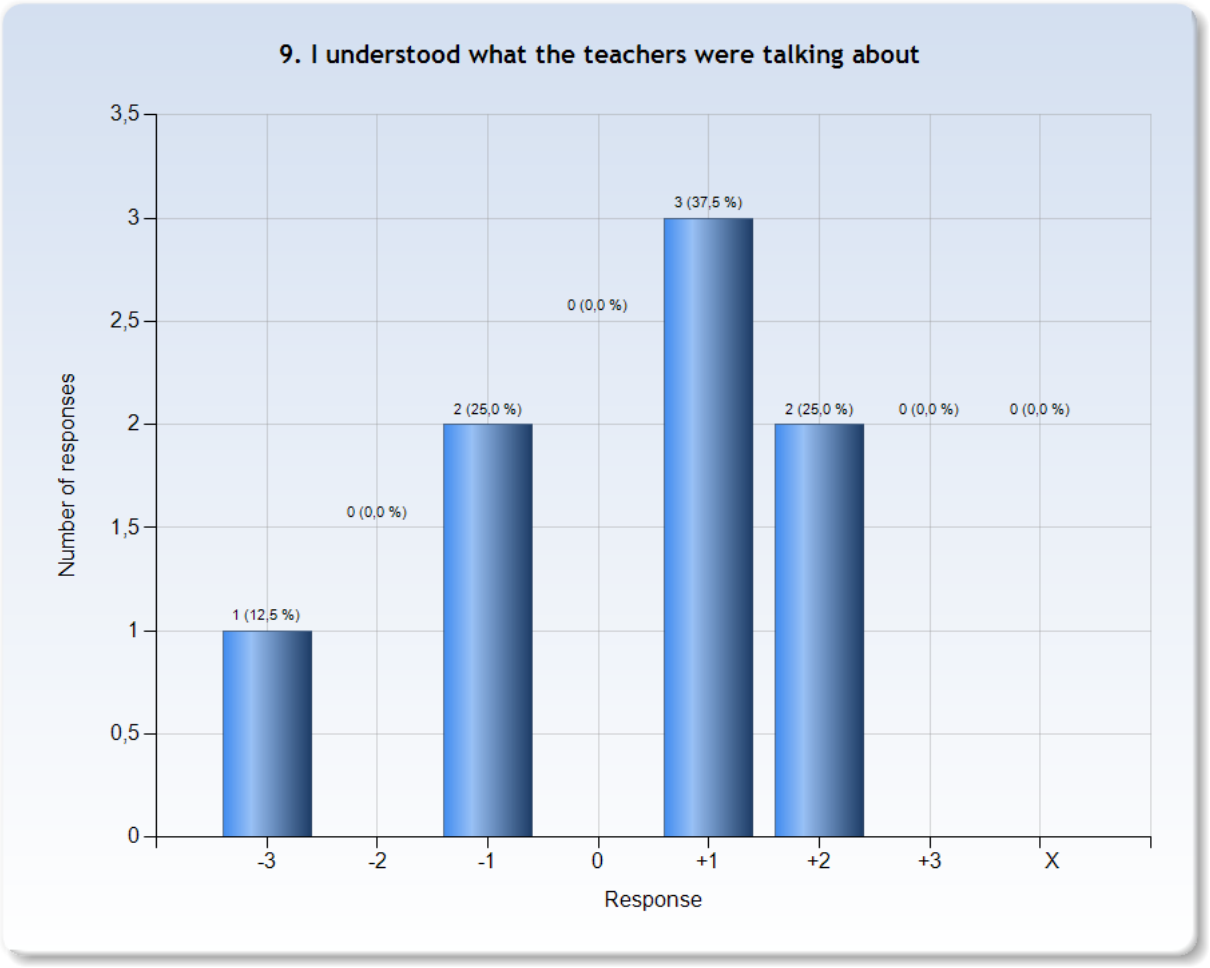


Comments



Comments

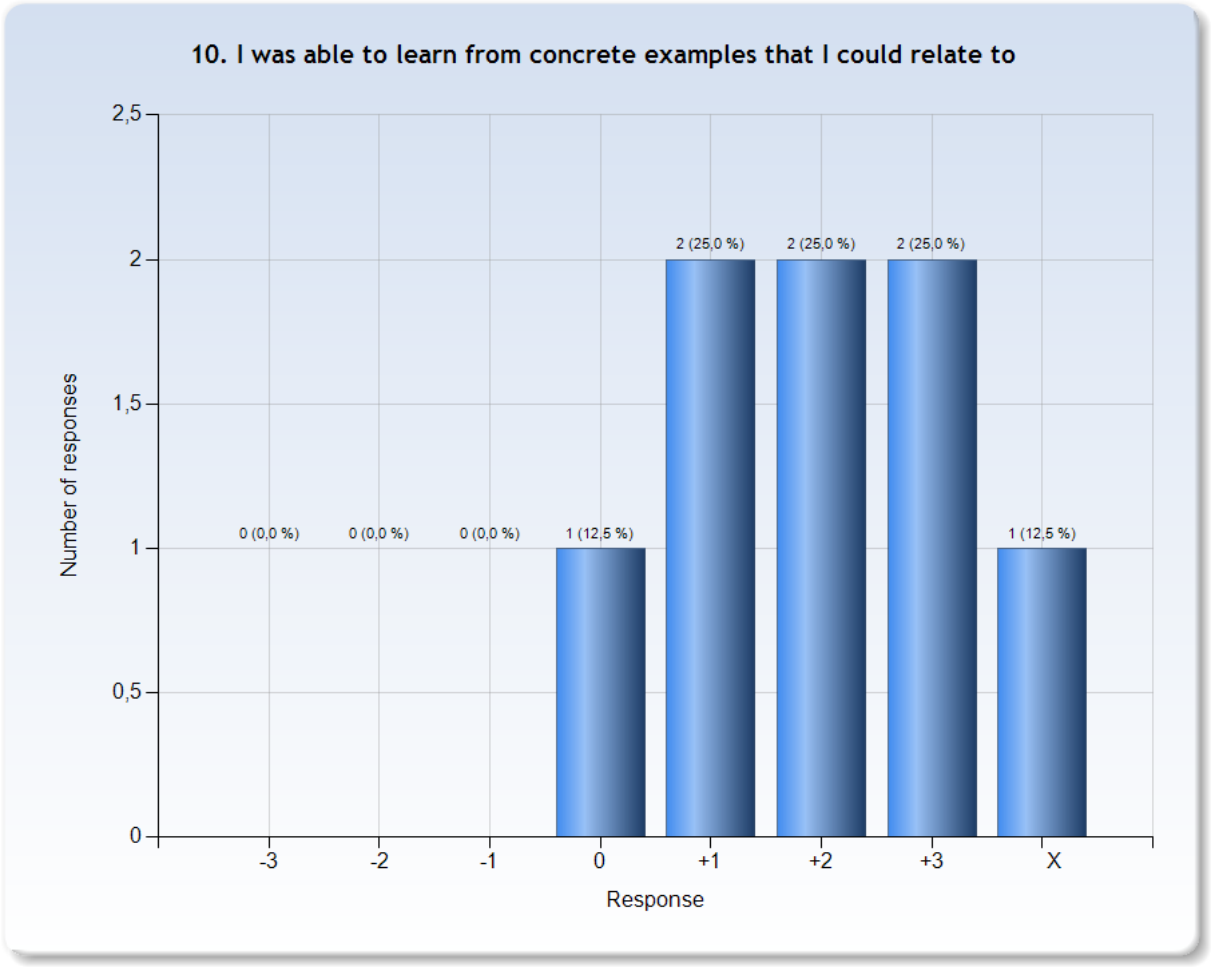
Comments (My response was: +2)
The projects are great for keeping up with the course.



Comments

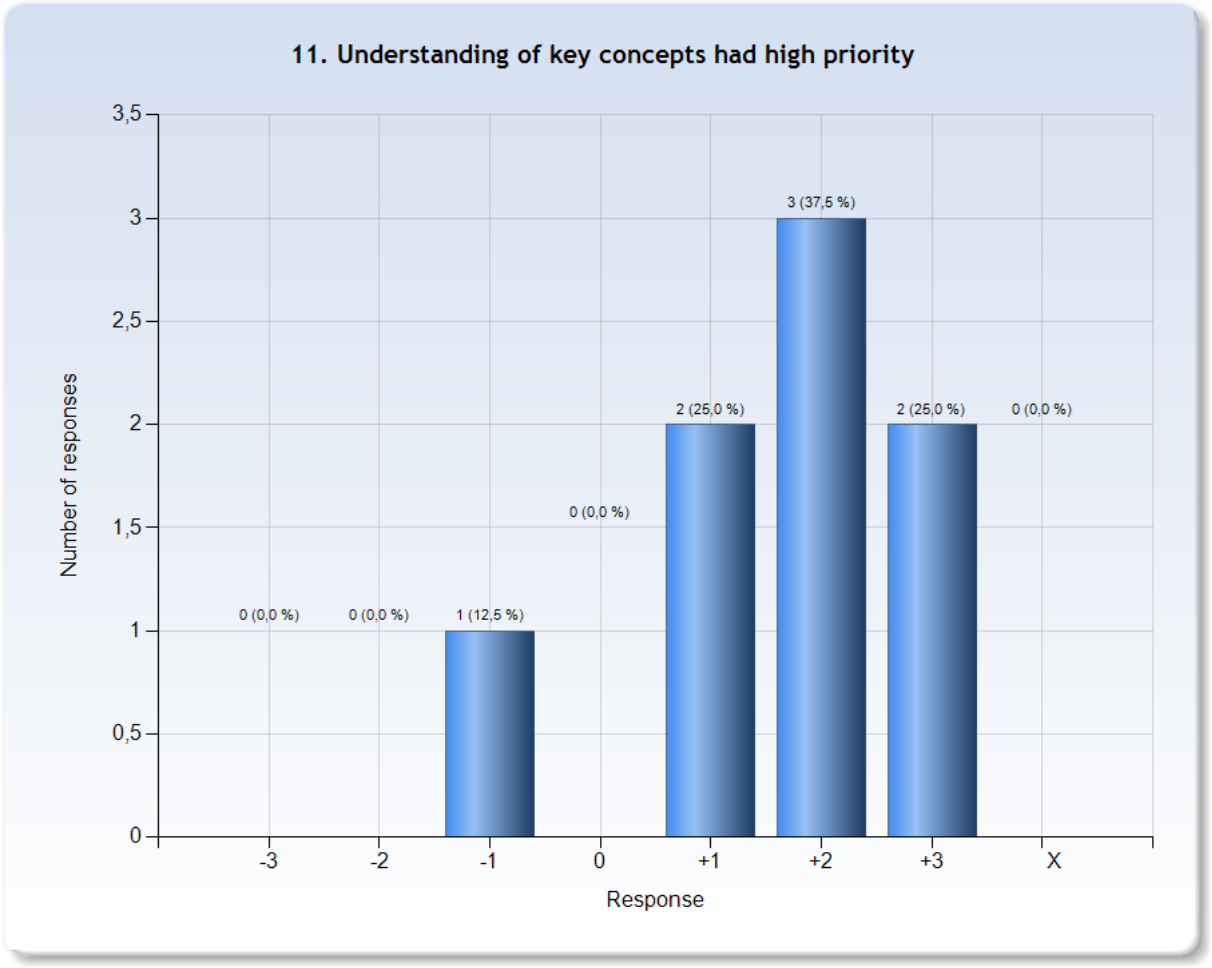
Comments (My response was: -1)
Some proofs during the lectures were hard to follow

Comments (My response was: +2)
Online lectures by Shen were a bit hard to follow



Comments

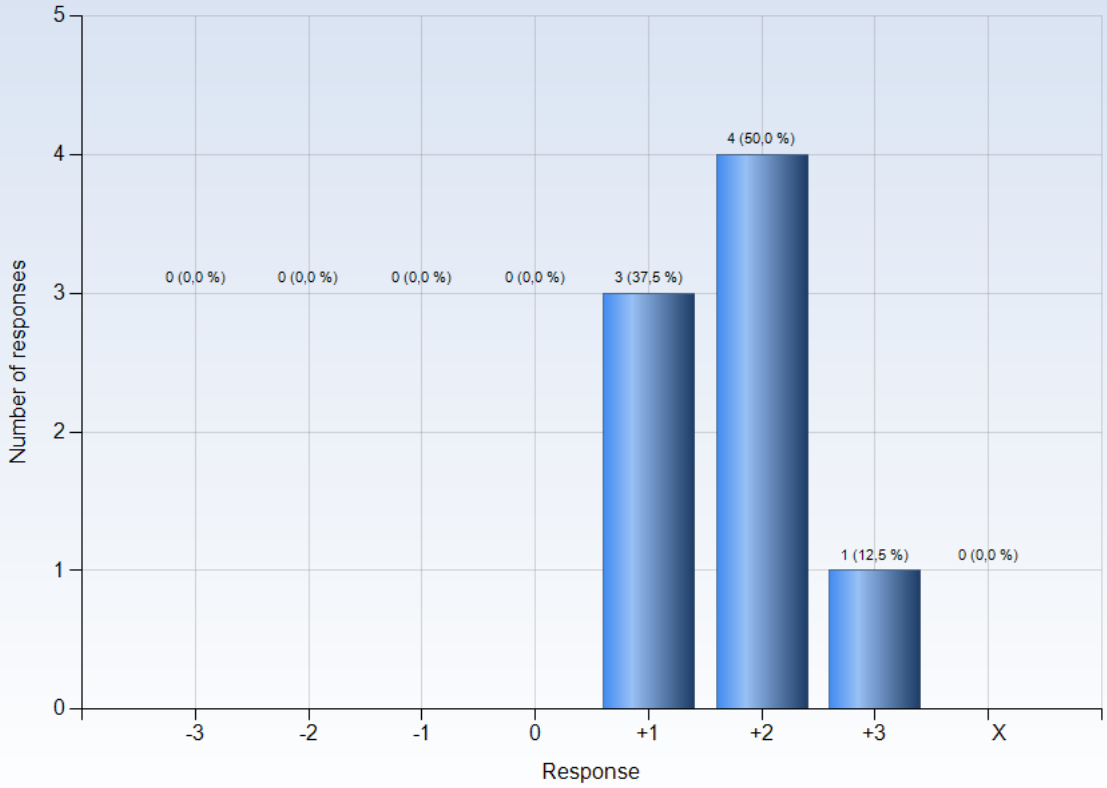
Comments (My response was: 0)
Apart from the projects, I miss some more real-life examples.



Comments

Comments (My response was: -1)
The lectures went too much into details for things which were not essential (hard proofs which didn't help for understanding the key concepts)

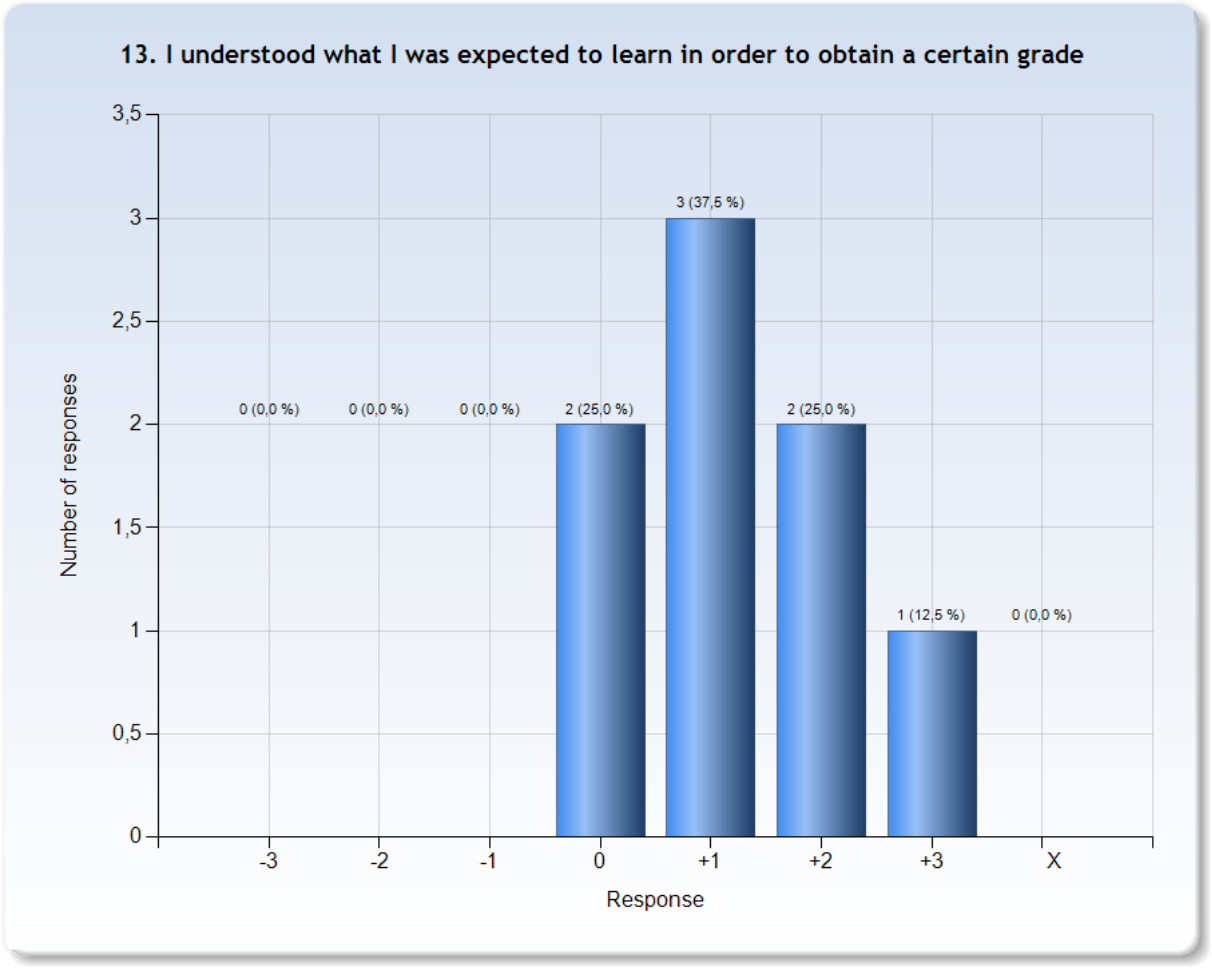
12. The course activities helped me to achieve the intended learning outcomes efficiently



Comments

(My response was: +1)

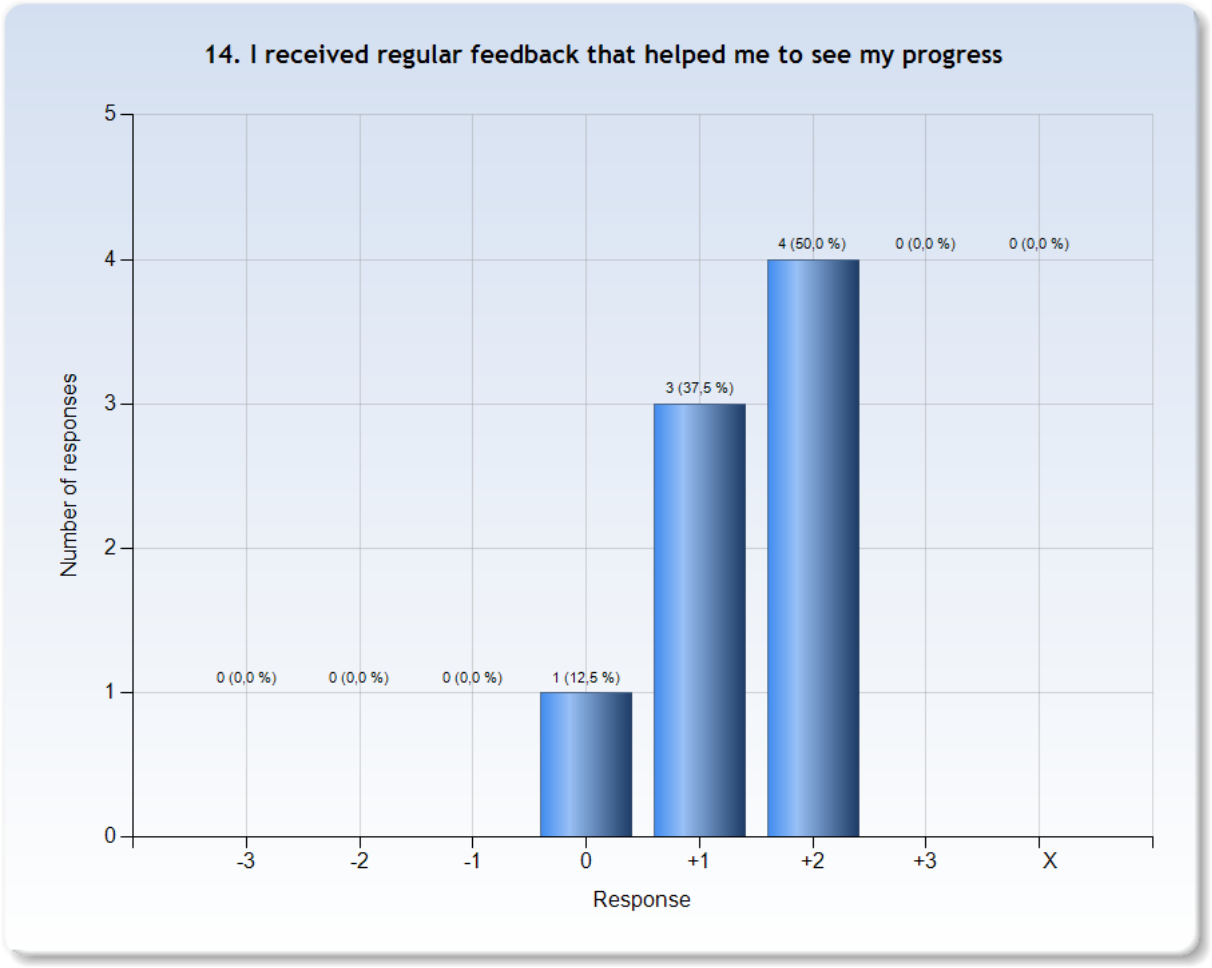
The exercise sessions and the projects were very nice but the lectures hard to follow



Comments

Comments (My response was: +2)

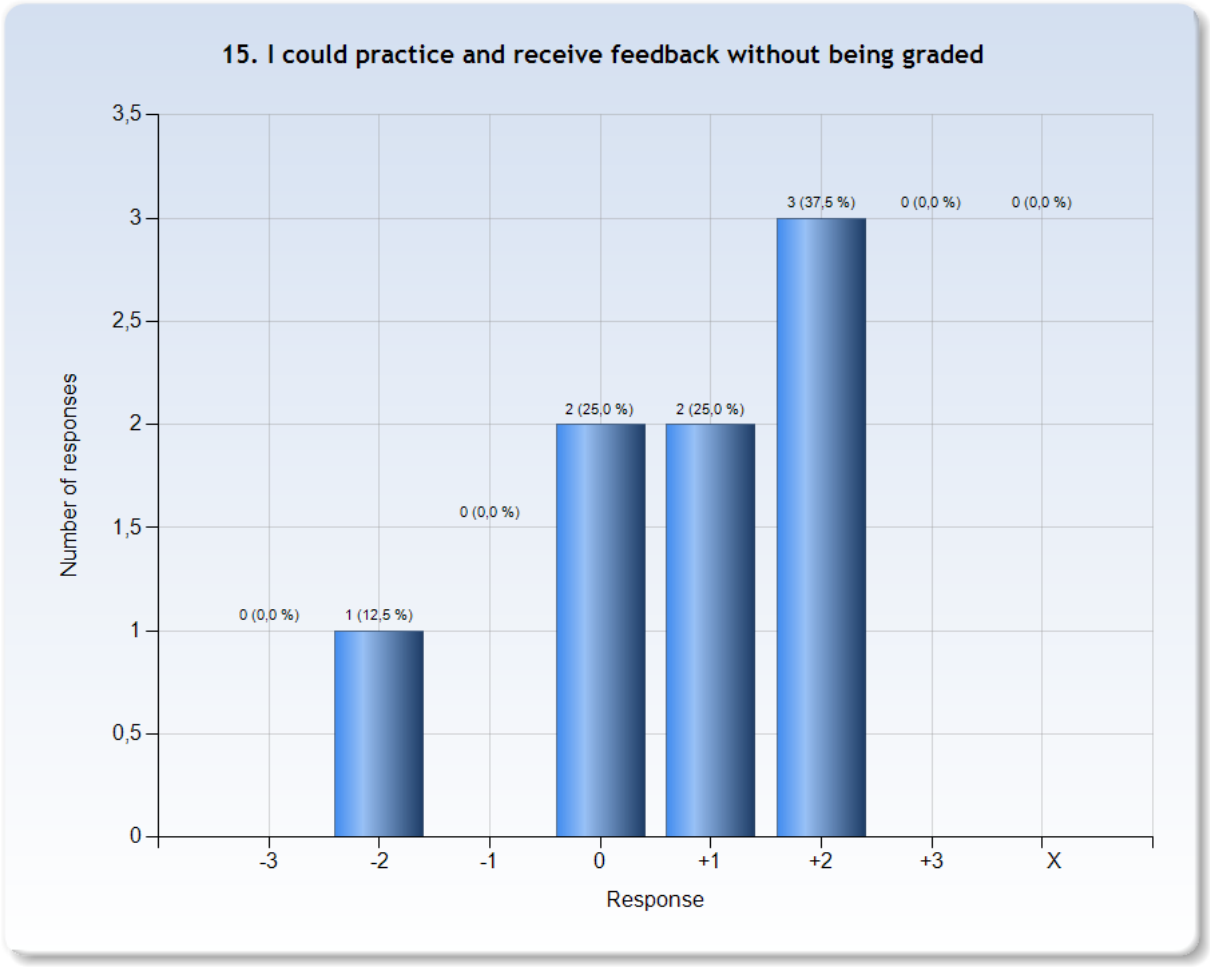
The examination moments covered the course contents well.



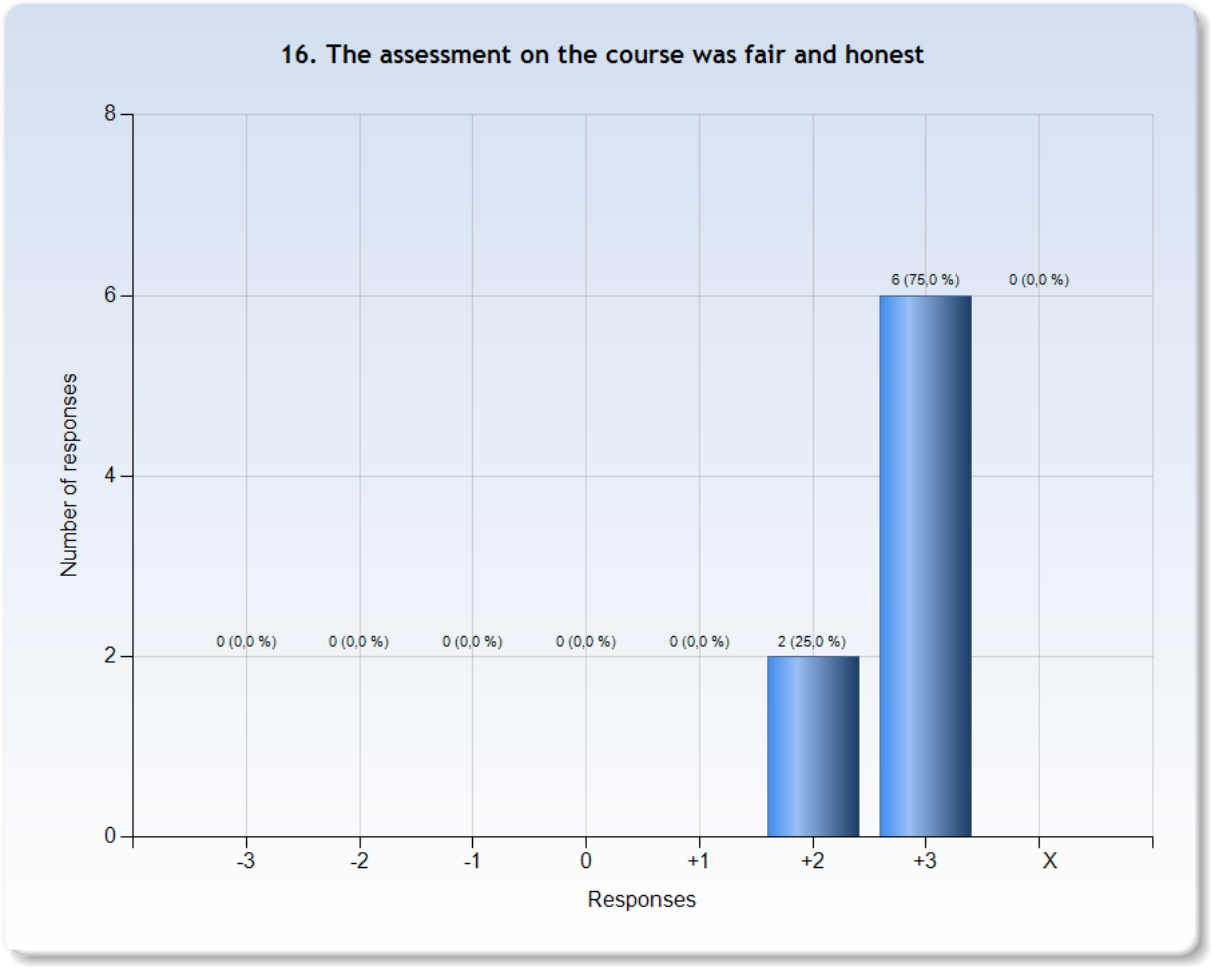
Comments

Comments (My response was: +1)
This is difficult without continuous examination, but the projects were given feedback in a very thorough fashion, which was great.

Comments (My response was: +2)
Good feedback on projects.


15. I could practice and receive feedback without being graded
Number of responses
3,5
3
2,5
2
1,5
1
0,5
0
0 (0,0 %)
1 (12,5 %)
0 (0,0 %)
2 (25,0 %)
2 (25,0 %)
3 (37,5 %)
0 (0,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X
Response

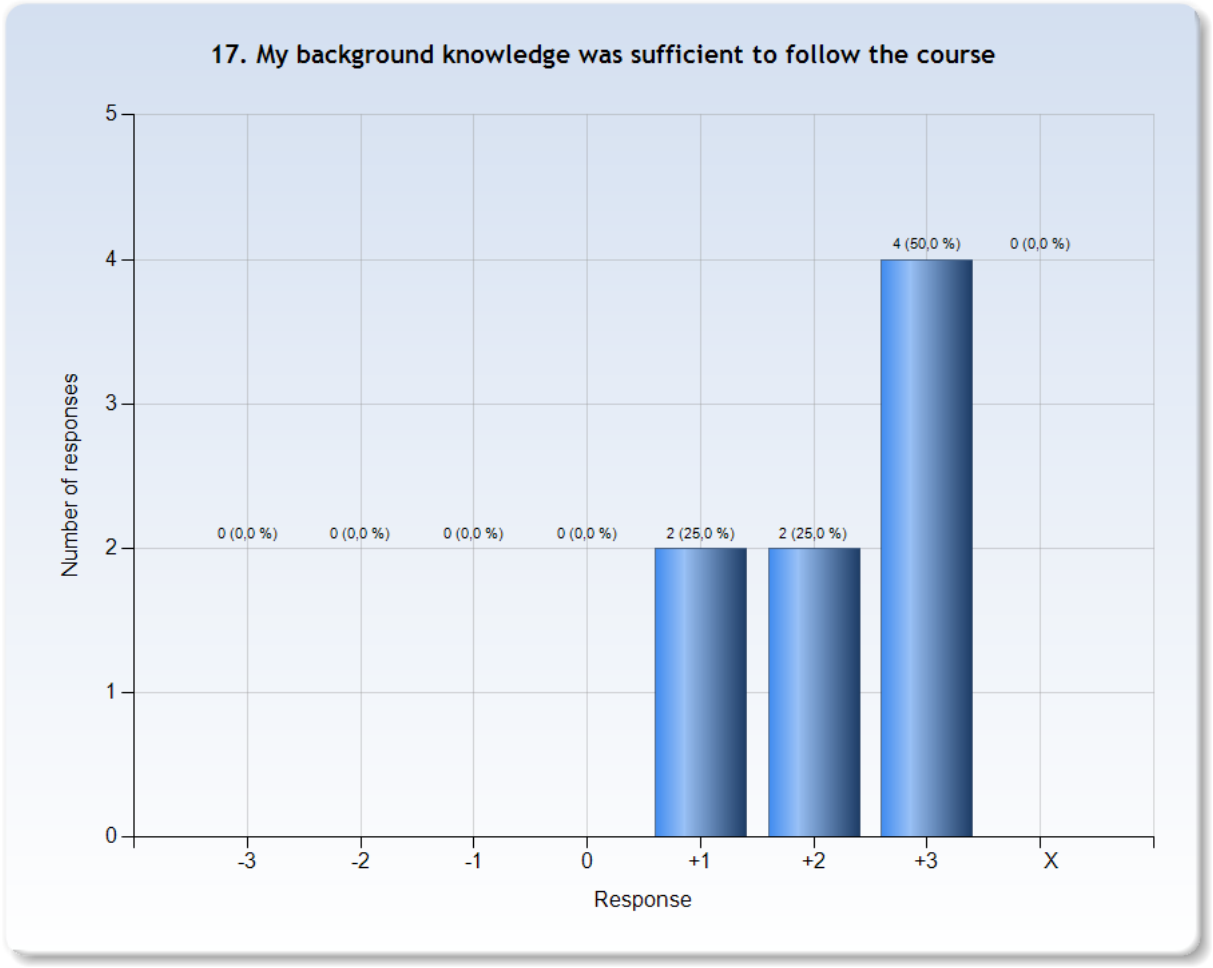
Comments



Comments

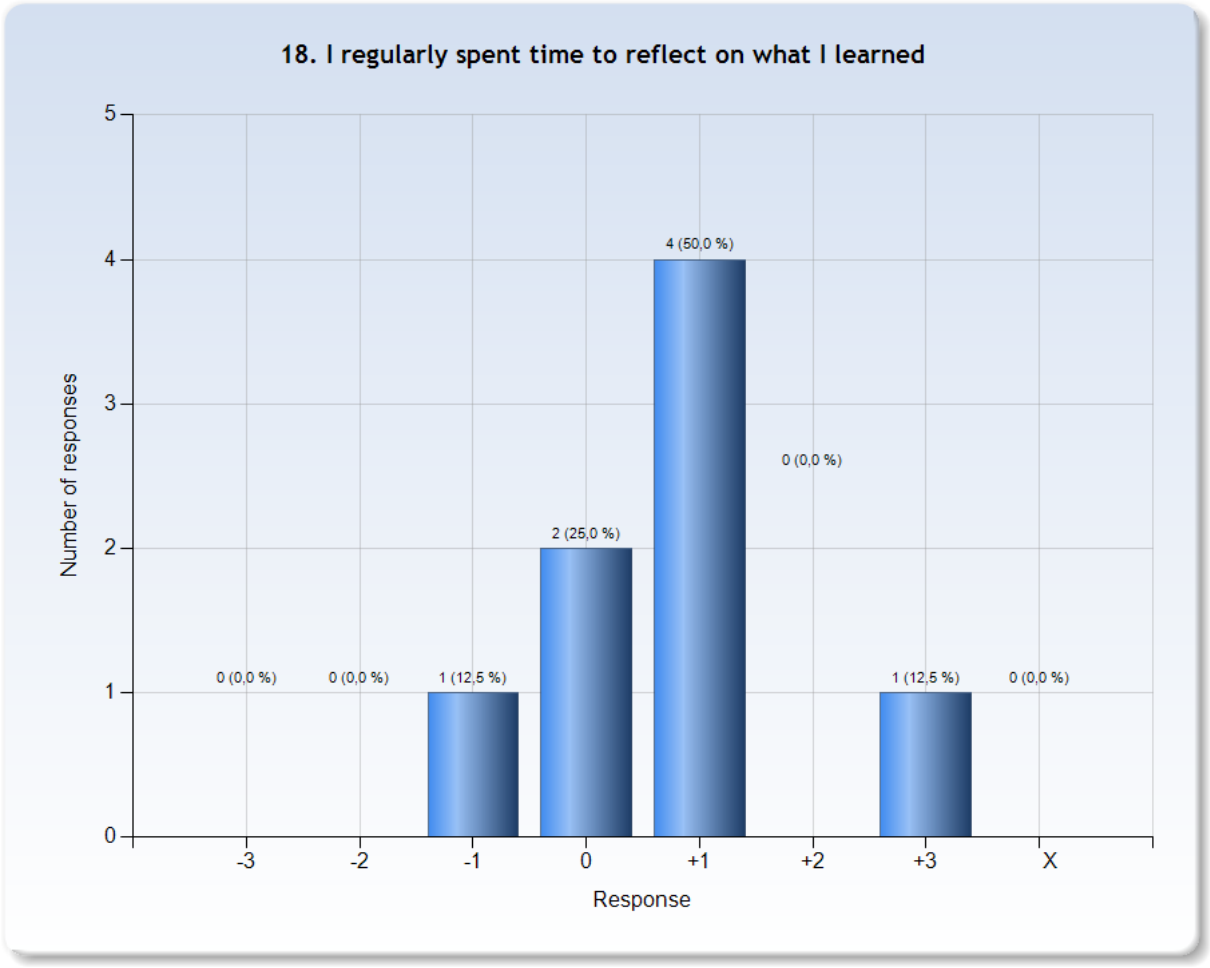
Comments (My response was: +2)
While we have not yet received the exam grade, the projects were assessed fair.

Comments (My response was: +3)
Project grades were fair I think, however it might be hard to grade a team project in a fair way. But making them not P/F raises the ambition level and you learn more so that's good.
Exam not graded yet but projects were graded fairly

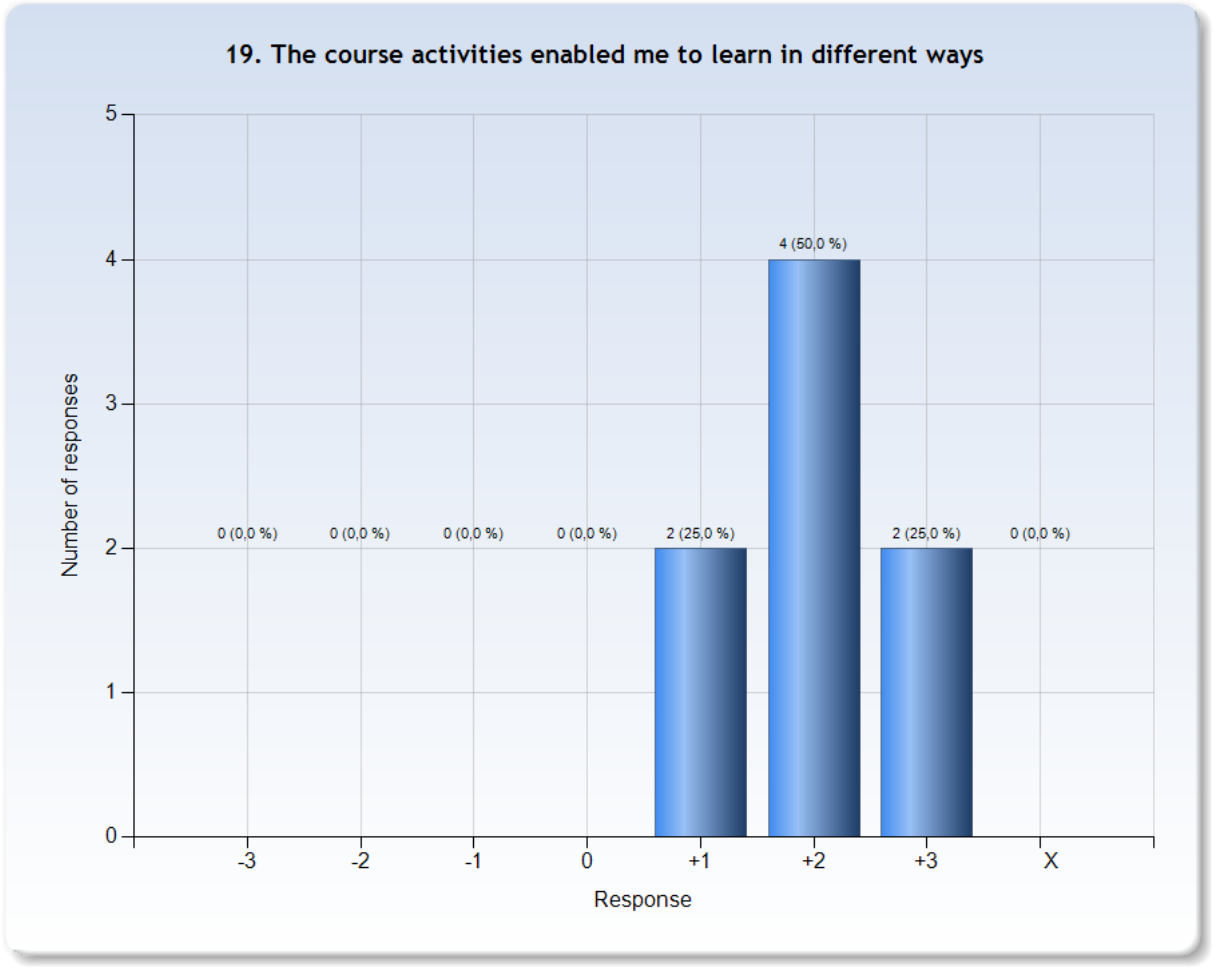


Comments

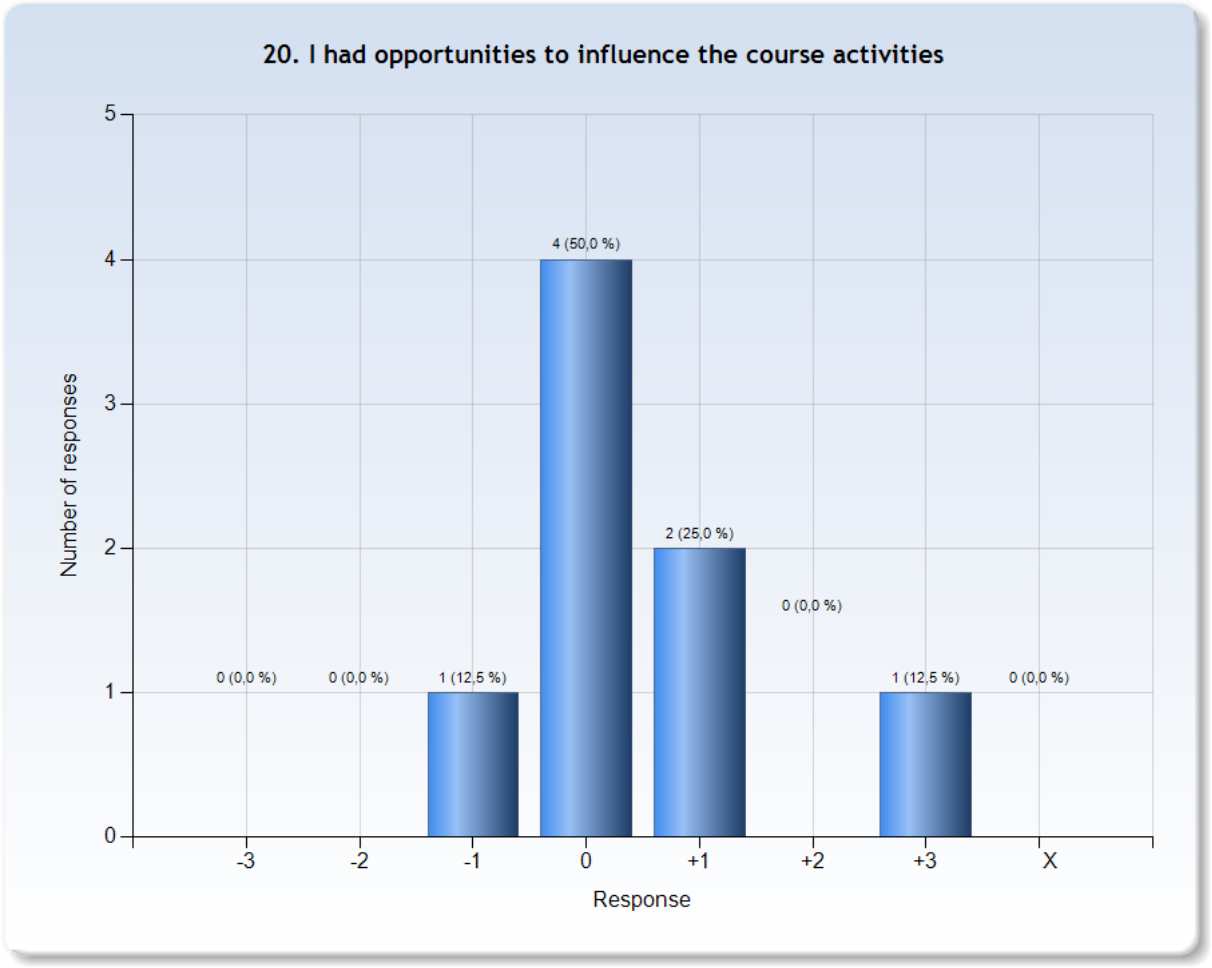
Comments (My response was: +2)
The new concepts were gereally introduced thoroughly, which was great.


18. I regularly spent time to reflect on what I learned
Number of responses
Response
0
1
2
3
4
5
-3
-2
-1
0
+1
+2
+3
X
0 (0,0 %)
0 (0,0 %)
1 (12,5 %)
2 (25,0 %)
4 (50,0 %)
0 (0,0 %)
1 (12,5 %)
0 (0,0 %)

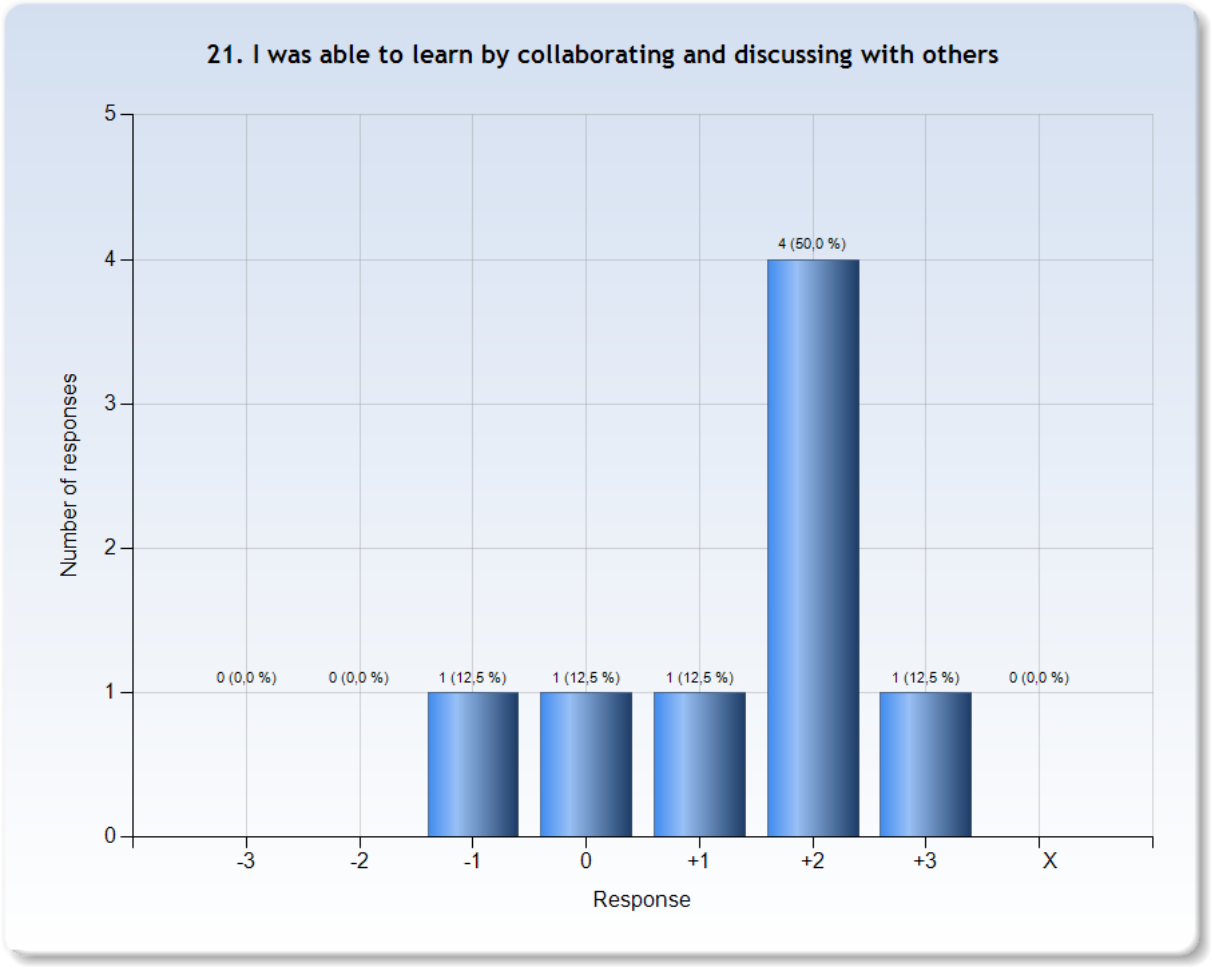
Comments


19. The course activities enabled me to learn in different ways
Number of responses
Response
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
0 (0,0 %)
2 (25,0 %)
4 (50,0 %)
2 (25,0 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X

Comments

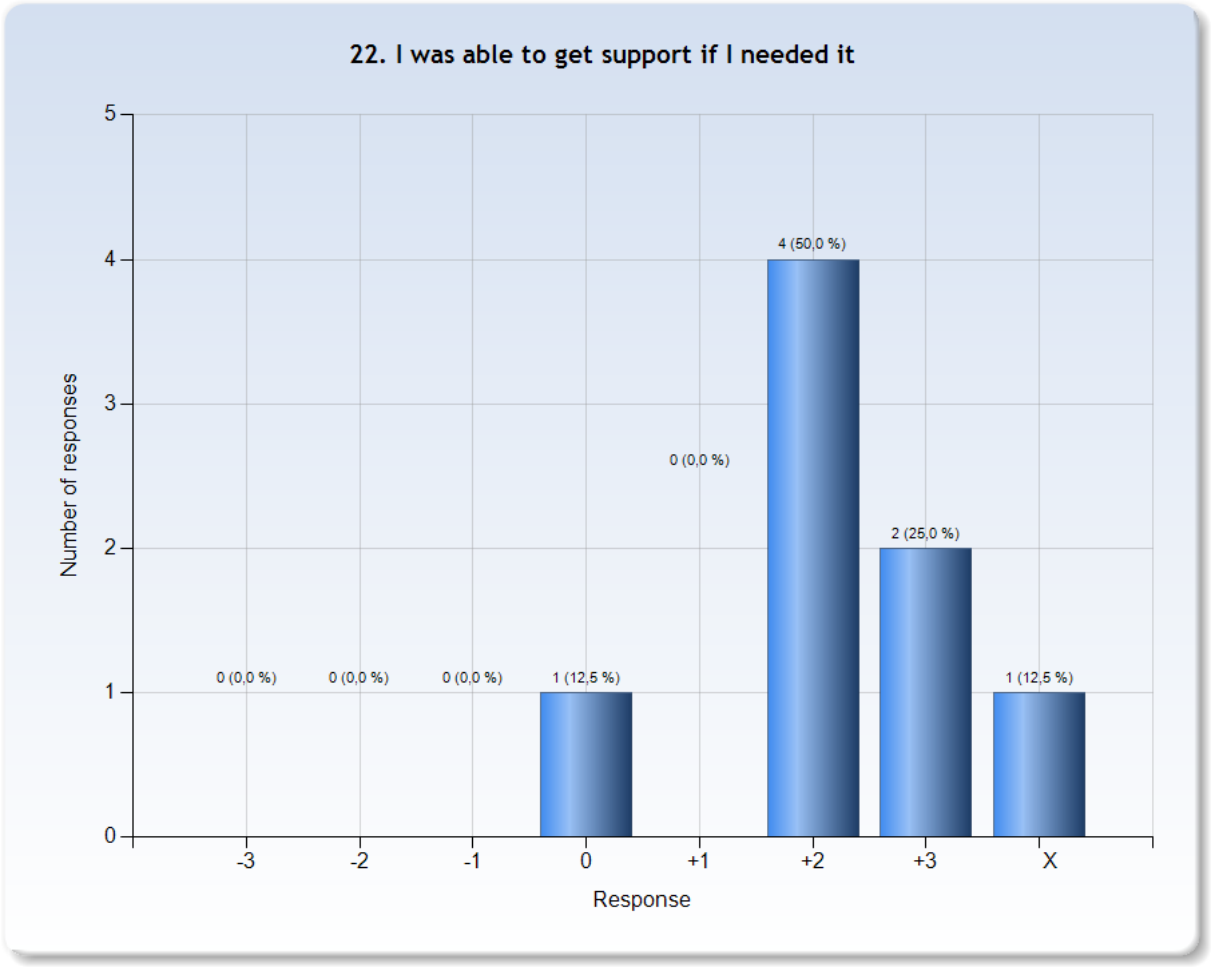

20. I had opportunities to influence the course activities
Number of responses
Response
0 (0,0 %)
0 (0,0 %)
1 (12,5 %)
4 (50,0 %)
2 (25,0 %)
0 (0,0 %)
1 (12,5 %)
0 (0,0 %)
-3
-2
-1
0
+1
+2
+3
X

Comments



Comments

Comments (My response was: +2)
Mainly on project.
Particularly during the projects, but less duing the class and exercise sessions, due to the online format.



Comments

Comments (My response was: 0)
The teaching assistant was very nice by answering quickly to questions sent by email (but the teacher wouldn't help for the project, leaving us by ourselves even if we hadn't seen some modelling tricks useful for the project)

Comments (My response was: +2)
Particularly the TA was very responsive and helpful, both during exercises and by general contact.

Comments (My response was: +3)
TA David Ek was very helpful with answering questions.
The professor and teaching assistant are very helpful even nearing the exam date.

Course PM

Edit More

SF2822 Applied Nonlinear Optimization, 7.5hp, 2019/2020

Instructor and examiner

Shen Peng (shenp@kth.se), room 3733, Lindstedtsv. 25.
Office hours: By agreement.

Exercise leader and project leader

David Ek (daviek@kth.se), room 3736, Lindstedtsv. 25, tel. 790 62 94.
Office hours: By agreement.

Course material

- *Linear and Nonlinear Optimization*, second edition, by I. Griva, S. G. Nash och A. Sofer, SIAM, 2009.
  (The book can be ordered from several places. Please note that you can become a SIAM member for free and obtain a discount at the SIAM bookstore.)
- *Exercises in applied nonlinear optimization, 2019/2020.* Available via Canvas.
- *Supplementary course material in applied nonlinear optimization, 2019/2020.* Available via Canvas.
- *Lecture notes in applied nonlinear optimization, 2019/2020.* Can be downloaded from this web page, see the schedule below. Also available via Canvas.
- *GAMS, A user's guide*. Available at the GAMS web site.
- *GAMS*. GAMS is installed in the KTH linux computer rooms. It may also be downloaded from the GAMS web site for use on a personal computer.
- Two project assignments that are handed out during the course, April 2 and April 22 respectively.

Additional notes that may be handed out during the course are also included.

Course goals

After completed course, the student should be able to:

- explain fundamental concepts of nonlinear programming;
- explain how fundamental methods for nonlinear programming work;
- illustrate how these methods work by solving small problems by hand calculations;
- starting from a suitably modified real problem, formulate a nonlinear program; make a model in a modeling language and solve the problem;
- analyze the solutions of the optimization problem solved, and present the analysis in writing as well as orally;
- interact with other students when modeling and analyzing the optimization problems.

Examination

The examination is in two parts, projects and final exam. To pass the course, the following is required:

- Pass project assignment 1, with presence at compulsory presentation lecture on Wednesday April 22, and presence at the following dicussion session.
- Pass project assignment 2, with presence at compulsory presentation lecture on Wednesday May 6, and presence at the following dicussion session.

- Pass final exam. Please note that advance application for participation in examinations is compulsory according to KTH's rules.

Course registration

Due to the project based nature of this course, students must register no later than March 30. Registration is made by the students online following KTH standard procedures.

Project assignments

The project assignments are performed in groups, where the instructor determines the division of groups. This division is changed between the two assignments. Assignment 1 is carried out using the modeling language GAMS. For project 2, there is a choice between a modeling assignment, to be carried out using GAMS, or a method assignment, to be carried out using Matlab. The project assignments *must* be carried out during the duration of the course and completed by the above mentioned presentation lectures. It is the responsibility of each student to allocate time so that the project group can meet and function. Presence at the presentation lectures is compulsory. For passing the projects, the following requirements must be fulfilled:

- No later than the night before the presentation lecture, each group must hand in a well-written report which describes the exercise and the group's suggestion for solving the exercise. Suitable word processor should be used. The report should be on a level suitable for another participant in the course who is not familiar with the group's specific problem.
- At the beginning of the presentation lecture, each student should hand in an individual sheet with a brief self-assessment of his/her contribution to the project work, quantitatively as well as qualitatively.
- At the presentation lecture, all assignments will be presented and discussed. The presentations and discussions will be made in small presentation groups, first in presentation groups where each student has worked on the same project assignment, and then in presentation groups where the students have worked on different project assignments. Each student is expected to be able to present the assignment of his/her project group, the modeling and the solution. In particular, each student is expected to take part in the discussion. The presentation and discussion should be on a level such that students having had the same assignment can discuss, and students not having had the same assignment can understand the issues that have arisen and how they have been solved. Each student should bring a copy of the project group's report to the presentation lecture, either in paper or electronically.
- Each project group should make an appointment for a discussion session with the course leaders. There is no presentation at this session, but the course leaders will ask questions and give feedback. There will be time slots available the days after the presentation session. One week prior to the presentation lecture, a list of available times for discussion sessions will be made available at Doodle, announced via Canvas. Each project group should sign up for a discussion session prior to the presentation lecture.
- Each participant in the course must contribute to the work of the group. Each group must solve their task independently. Discussion between the groups is encouraged, but each group must individually solve the assignments. It is *not* allowed to use solutions made by others in any form. If these rules are violated, disciplinary actions in accordance with the KTH regulations will be taken.

Each project assignment is awarded a grade which is either fail or pass with grading E, D, C, B and A. Here, the mathematical treatment of the problem as well as the report and the oral presentation or discussion is taken into account. The exercises are divided into basic exercises and advanced exercises. Sufficient treatment of the basic exercises gives a passing grade. Inclusion of the advanced exercises is necessary for the higher grades (typically A-C). Normally, the same grade is given to all members of a project group. A student who has not worked on the advanced exercises says so in the self assessment form.

Each project group must solve their task independently. Discussion between the project groups concerrning interpretation of statements etc. are encouraged, but each project group must work independently without making use of solutions provided by others. All project groups will not be assigned the same exercises.

Each project assignment is awarded a grade which is either fail or pass with grading E, D, C, B and A. Here, the mathematical treatment of the problem as well as the report and the oral

presentation or discussion is taken into account. Normally, the same grade is given to all members of a group.

Final exam

The final exam consists of five exercises and gives a maximum of 50 points. At the exam, the grades F, Fx, E, D, C, B and A are awarded. For a passing grade, normally at least 22 points are required. At the exam, in addidion to writing material, no other material is allowed at the exam. Normally, the grade limits are given by E (22-24), D (25-30), C (31-36), B (37-42) and A (43-50).

The grade Fx is normally given for 20 or 21 points on the final exam. An Fx grade may be converted to an E grade by a successful completion of two supplementary exercises, that the student must complete independently. One exercise among the theory exercises handed out during the course, and one exercise which is similar to one exercise of the exam. These exercises are selected by the instructor, individually for each student. Solutions have to be handed in to the instructor and also explained orally within three weeks of the date of notification of grades.

Feedback
News

The final exam is given Thursday May 28 2020, 8.00-13.00.

Final grade

By identitying A=7, B=6, C=5, D=4, E=3, the final grade is given as

round((grade on proj 1) + (grade on proj 2) + 2 * (grade on final exam)) / 4),

where the rounding is made to nearest larger integer in case of a tie.

Preliminary schedule

"L" means lecture, "E" means exercise session, "P" means project sesstion.

Type	Day	Date	Time	Room	Subject
L1.	Mon	Mar 16	15-17	Q21	Introduction. Nonlinear programming models.
L2.	Wed	Mar 18	10-12	Q21	Optimality conditions for linearly constrained problems.
L3.	Thu	Mar 19	8-10	Q21	Optimality conditions for nonlinearly constrained problems.
E1.	Mon	Mar 23	15-17	Q21	Optimality conditions.
L4.	Wed	Mar 25	10-12	Q21	Unconstrained optimization.
L5.	Thu	Mar 26	8-10	Q21	Unconstrained optimization, cont.
E2.	Mon	Mar 30	15-17	Q21	Unconstrained optimization.
P1.	Wed	Apr 1	10-12	Q31	Introduction to GAMS.
P2.	Thu	Apr 2	8-10	Q21	GAMS excercise session.
L6.	Fri	Apr 3	13-15	Q21	Equality-constrained quadratic programming.
E3.	Mon	Apr 6	15-17	Q21	Equality-constrained quadratic programming.
L7.	Tue	Apr 7	15-17	Q21	Inequality-constrained quadratic programming.
L8.	Wed	Apr 8	10-12	Q31	Inequality-constrained quadratic programming, cont.
E4.	Thu	Apr 9	8-10	Q21	Inequality-constrained quadratic programming.
L9.	Mon	Apr 20	15-17	Q21	Sequential quadratic programming.
P3.	Wed	Apr 22	10-12	V32	Presentation of project assignment 1.
E5.	Thu	Apr 23	8-10	V32	Sequential quadratic programming.
L10.	Mon	Apr 27	15-17	Q21	Sequential quadratic programming, cont. Interior methods for nonlinear programming.
L11.	Wed	Apr 29	10-12	Q21	Interior methods for nonlinear programming, cont.
E6.	Mon	May 4	15-17	Q21	Interior methods for nonlinear programming.
P4.	Wed	May 6	10-12	Q21	Presentation of project assignment 2.

L12.	Mon	May 11	15-17	Q21	Semidefinite programming.
E7.	Wed	May 13	10-12	Q21	Semidefinite programming.
E8.	Thu	May 14	8-10	Q21	Selected topics.

Overview of course contents

- **Unconstrained optimization**
  Fundamental theory, in particular optimality conditions.
  Linesearch algorithms, steepest descent, Newton's method.
  Conjugate directions and the conjugate gradient method.
  Quasi-Newton methods.
  (Chapters 11, 12.1-12.3 and 13.1-13.2 in Griva, Nash and Sofer.)
- **Constrained nonlinear optimization**
  Fundamental theory, optimality conditions, Lagrange multipliers and sensitivity analysis.
  Quadratic programming.
  Primal methods, in particular active-set methods.
  Penalty and barrier methods, in particular primal-dual interior methods.
  Dulal methods, local duality, separable problems.
  Lagrange methods, in particular sequential quadratic programming.
  (Chapters 3, 14.1-14.7, 14.8.2, 15.1-15.5, 16.1-16.3 and 16.7 in Griva, Nash and Sofer.)
- **Semidefinite programming**
  Fundamental theory.
  (Chapter 16.8 in Griva, Nash and Sofer. Separate article in the supplementary course material. Fundamental concepts only.)

Support for students with disabilities

Students with disabilities may have the right to certain compensatory support for example during examination.
KTH has coordinators for students with disabilities, Funka, who deals with issues relating to functional disabilities. You should turn to Funka at funka@kth.se for information about support.

Welcome to the course!

Feedback
News

Show earlier events (1) ›

Teacher Anders Forsgren changed the permissions 11 December 2018

Kan därmed läsas av alla och ändras av lärare.

Accessible to the whole world.

Last changed: 2020-03-15 21:42. Show versions

Tags: None so far.
▸ Add

Stop following this page Report abuse