Kursbokslut, Course review MATM39, Integration Theory, spring term 2023

Course responsible: Marcus Carlsson
Number of students: 29.
Grades: 3 VG, 10 G. 21 exams were handed in during the two exams, excluding repetition, so among active students the approval rate was above 62%, a bit higher last year.

Evaluation

6 students did the evaluation. The scores given on key questions are overall positive.

Sammanfattning av kursvärderingen, student evaluation:

About half state that they completely disagree that the prior knowledge was sufficient, the others completely agree. Subsequently, there is a wide span in the answers, ranging from 1 to 5 on almost every question.

In the free text zone a majority mention that the flipped classroom is very good for such a course with difficult proofs, and that the video material is very valuable, especially since one can pause and think, but some are not stating that they would still prefer traditional lectures. Other suggested imporvements were to focus more on exercises in class, rather than doing overview lectures.

Lärarnas kommentarer, teachers comments:

The students seem overall satisfied and I can not see any reason to do major changes. The first exam was quite difficult, which led to some disgruntlement, but the second one was more balanced so the amount passing was similar to previous years. The problem that some students enroll who do not have the necessary maturity, which has been discussed in earlier course evaluations, persists.

Evaluation of changes:

This year I tried a new concept in which I briefly introduced the coming topic, which in the end left little time for doing exercises. Judging from the comments, this was not optimal, so next year I will minimize the time spent on overview lectures and put more emphasis on solving exercises.

**Suggestion for changes:**

No changes except more focus on exercises.

Evaluator: Marcus Carlsson.

Course evaluation Integration Theory spring 2023

Answer Count: 6

I have studied this course as part of

I have studied this course as part of	Number of responses
Bachelor´s Programme in Mathematics	2 (40,0%)
Bachelor´s Programme in Physics, Theoretical Physics, Astronomy	1 (20,0%)
Bachelor´s Programme, other specialization	0 (0,0%)
Master's Programme in Mathematics	0 (0,0%)
Master´s Programme in Mathematical Statistics	0 (0,0%)
Master´s Programme, other specialization	1 (20,0%)
Teacher Education	0 (0,0%)
other programme or as stand alone course	1 (20,0%)
Total	5 (100,0%)
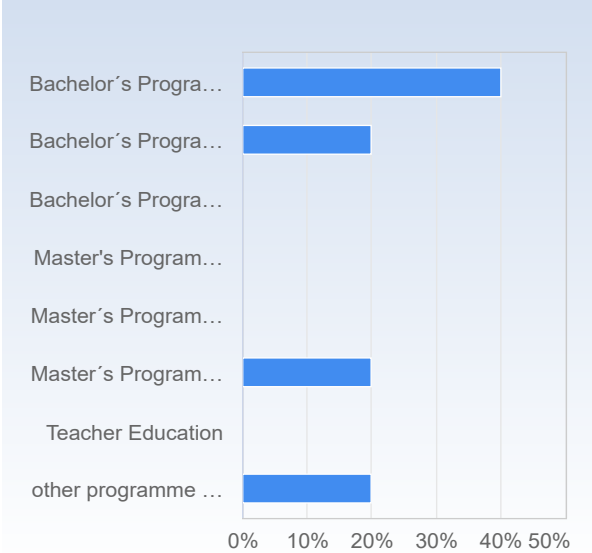
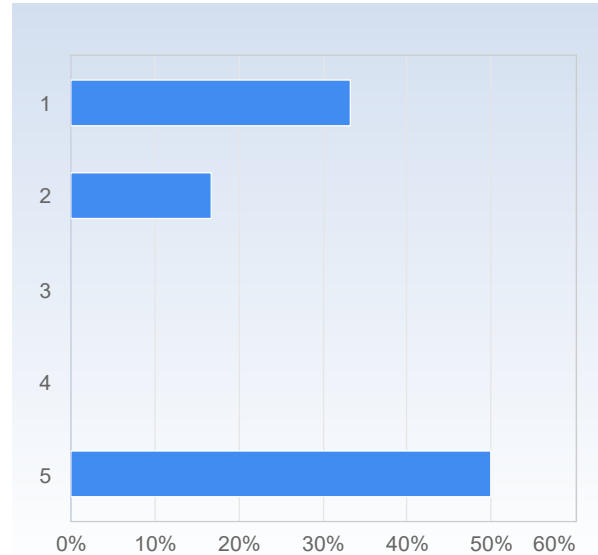|	Mean	Standard Deviation
I have studied this course as part of	3,6	3,2

On the scale 1-5 select the option that best matches your opinion: 1= disagree completely → 3= partly agree → 5= agree completely

## 2. My prior knowledge has been sufficient to assimilate the contents of this course.

2. My prior knowledge has been sufficient to assimilate the contents of this course.	Number of responses
1	2 (33,3%)
2	1 (16,7%)
3	0 (0,0%)
4	0 (0,0%)
5	3 (50,0%)
Total	6 (100,0%)

	Mean	Standard Deviation
2. My prior knowledge has been sufficient to assimilate the contents of this course.	3,2	2,0

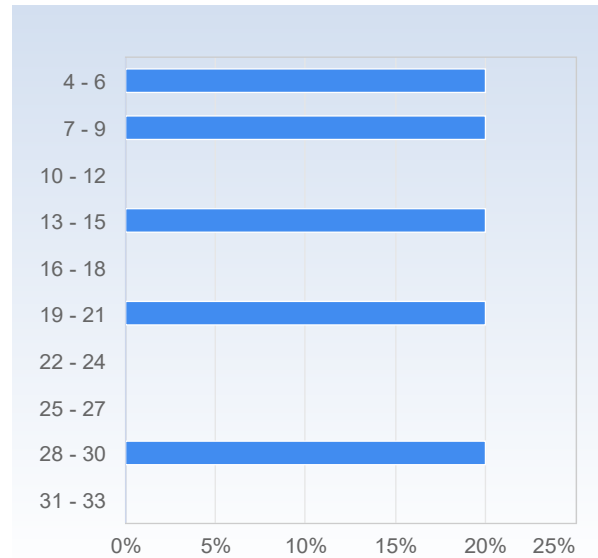## 3. I have participated actively in the course.

3. I have participated actively in the course.	Number of responses
1	0 (0,0%)
2	1 (16,7%)
3	1 (16,7%)
4	1 (16,7%)
5	3 (50,0%)
Total	6 (100,0%)
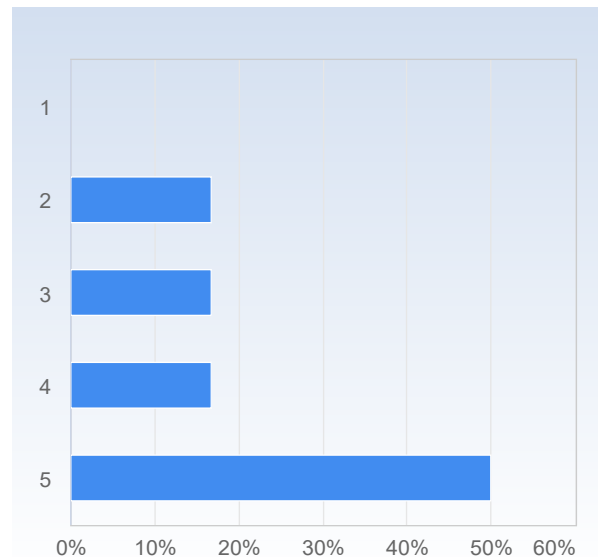
	Mean	Standard Deviation
3. I have participated actively in the course.	4,0	1,3

Average number of hours spent in total on the course per week (including scheduled activities):

Average number of hours spent in total on the course per week (including scheduled activities):	Number of responses
4 - 6	1 (20,0%)
7 - 9	1 (20,0%)
10 - 12	0 (0,0%)
13 - 15	1 (20,0%)
16 - 18	0 (0,0%)
19 - 21	1 (20,0%)
22 - 24	0 (0,0%)
25 - 27	0 (0,0%)
28 - 30	1 (20,0%)
31 - 33	0 (0,0%)
Total	5 (100,0%)

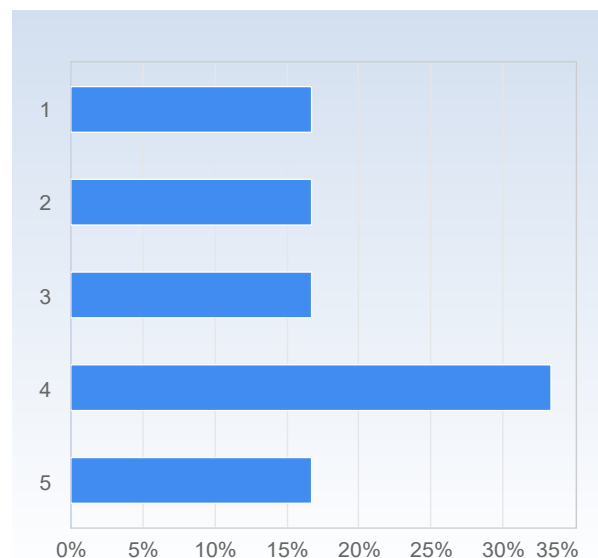|	Mean	Standard Deviation
Average number of hours spent in total on the course per week (including scheduled activities):	15,8	9,7

The course in general

On the scale 1-5 select the option that best matches your opinion: 1= disagree completely → 3= partly agree → 5= agree completely
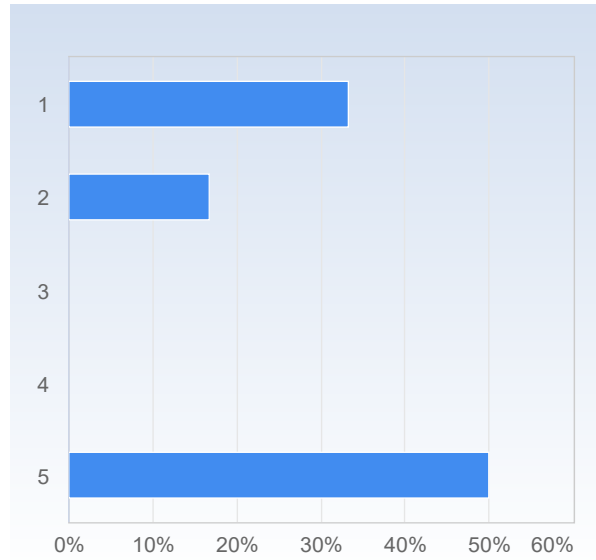
The way the course was taught and organised suited me.

The way the course was taught and organised suited me.	Number of responses
1	1 (16,7%)
2	1 (16,7%)
3	1 (16,7%)
4	2 (33,3%)
5	1 (16,7%)
Total	6 (100,0%)

	Mean	Standard Deviation
The way the course was taught and organised suited me.	3,2	1,5

## The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.

The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	Number of responses
1	2 (33,3%)
2	1 (16,7%)
3	0 (0,0%)
4	0 (0,0%)
5	3 (50,0%)
Total	6 (100,0%)

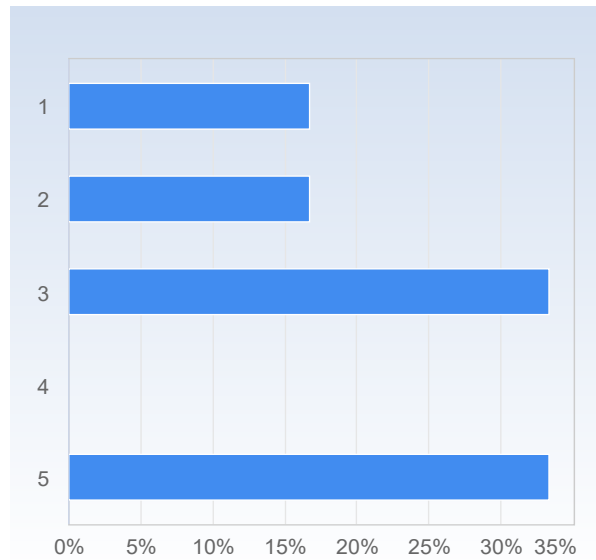|	Mean	Standard Deviation
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	3,2	2,0

The lectures were valuable for my learning.

The lectures were valuable for my learning.	Number of responses
1	1 (16,7%)
2	0 (0,0%)
3	1 (16,7%)
4	2 (33,3%)
5	2 (33,3%)
Total	6 (100,0%)
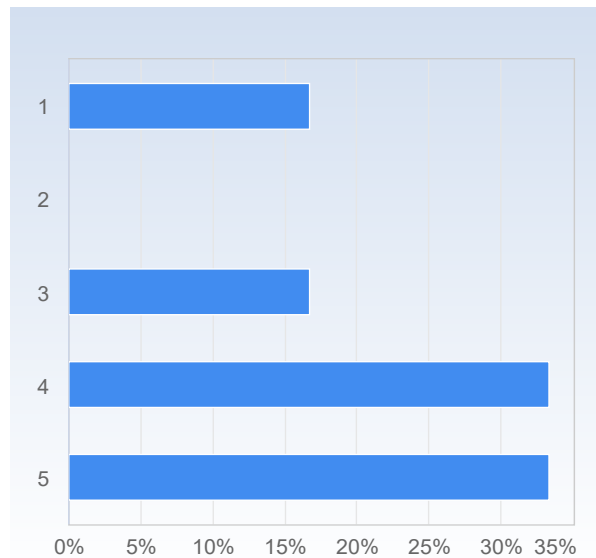
	Mean	Standard Deviation
The lectures were valuable for my learning.	3,7	1,5

The seminars were valuable for my learning.

The seminars were valuable for my learning.	Number of responses
1	1 (16,7%)
2	1 (16,7%)
3	2 (33,3%)
4	0 (0,0%)
5	2 (33,3%)
Total	6 (100,0%)

	Mean	Standard Deviation
The seminars were valuable for my learning.	3,2	1,6

Studying on my own was valuable for my learning.

Studying on my own was valuable for my learning.	Number of responses
1	1 (16,7%)
2	0 (0,0%)
3	1 (16,7%)
4	1 (16,7%)
5	3 (50,0%)
Total	6 (100,0%)
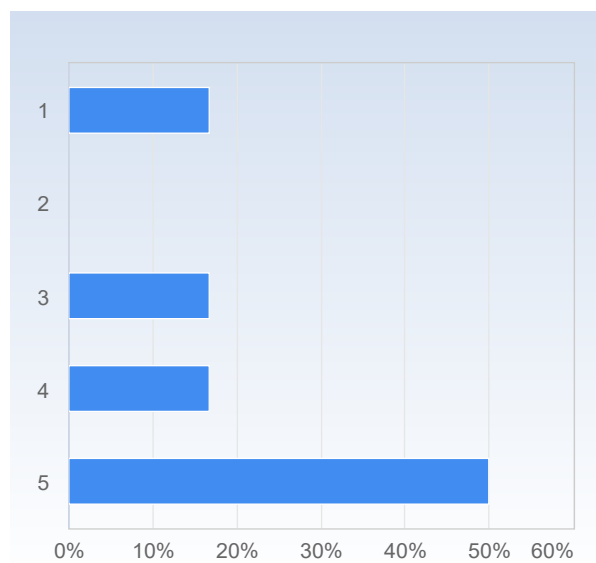
	Mean	Standard Deviation
Studying on my own was valuable for my learning.	3,8	1,6

The course literature/material was a valuable learning resource.

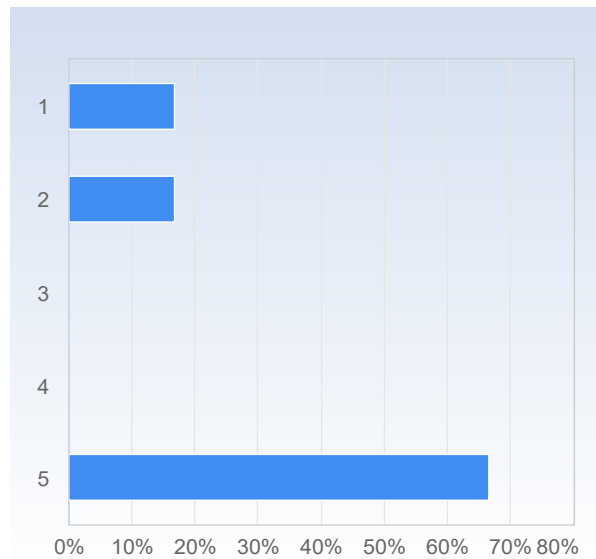| The course literature/material was a valuable learning resource.	Number of responses
1	1 (20,0%)
2	2 (40,0%)
3	0 (0,0%)
4	0 (0,0%)
5	2 (40,0%)
Total	5 (100,0%)
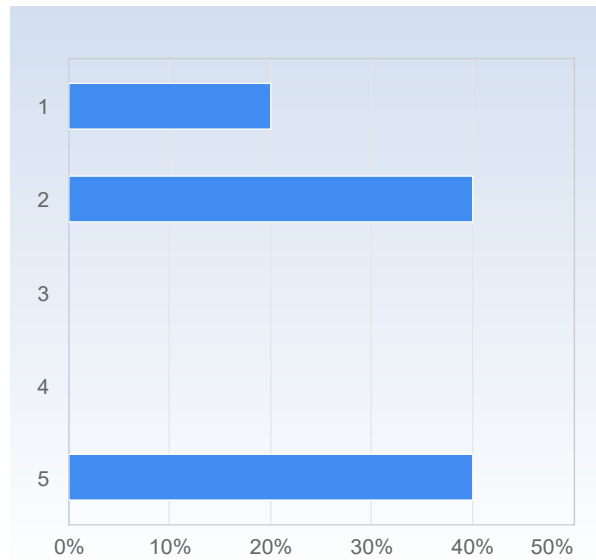
	Mean	Standard Deviation
The course literature/material was a valuable learning resource.	3,0	1,9

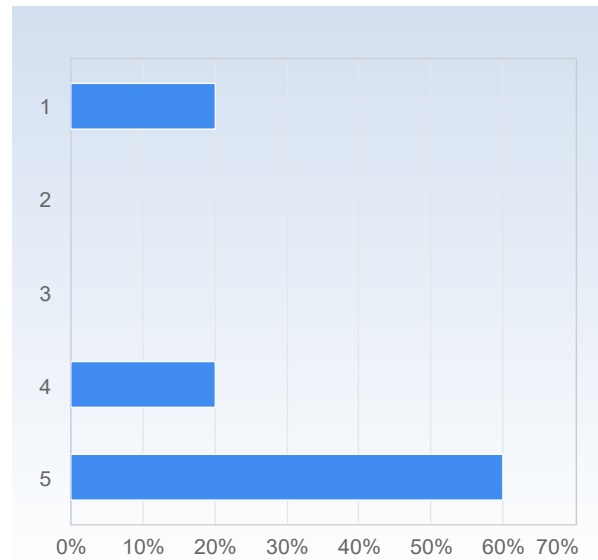## The information I received before the course start was satisfactory.

The information I received before the course start was satisfactory.	Number of responses
1	1 (16,7%)
2	1 (16,7%)
3	0 (0,0%)
4	0 (0,0%)
5	4 (66,7%)
Total	6 (100,0%)

	Mean	Standard Deviation
The information I received before the course start was satisfactory.	3,8	1,8

## The communication with the teaching staff during the course was good.

The communication with the teaching staff during the course was good.	Number of responses
1	1 (20,0%)
2	0 (0,0%)
3	0 (0,0%)
4	1 (20,0%)
5	3 (60,0%)
Total	5 (100,0%)

	Mean	Standard Deviation
The communication with the teaching staff during the course was good.	4,0	1,7

It was clear throughout the course what was expected of me.

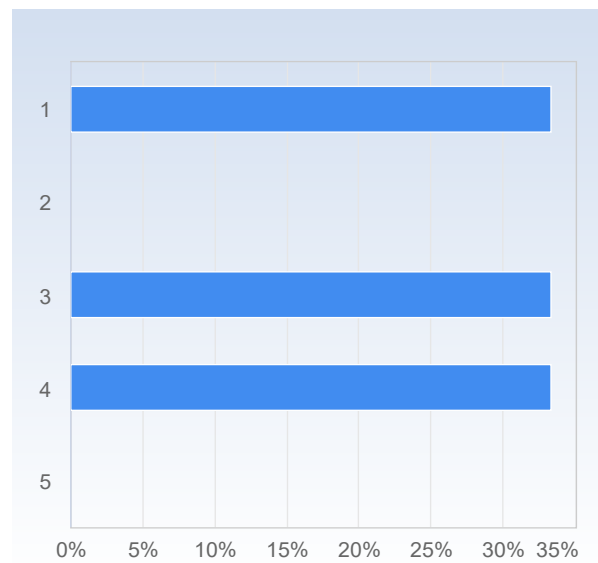| It was clear throughout the course what was expected of me.	Number of responses
1	1 (16,7%)
2	2 (33,3%)
3	0 (0,0%)
4	2 (33,3%)
5	1 (16,7%)
Total	6 (100,0%)
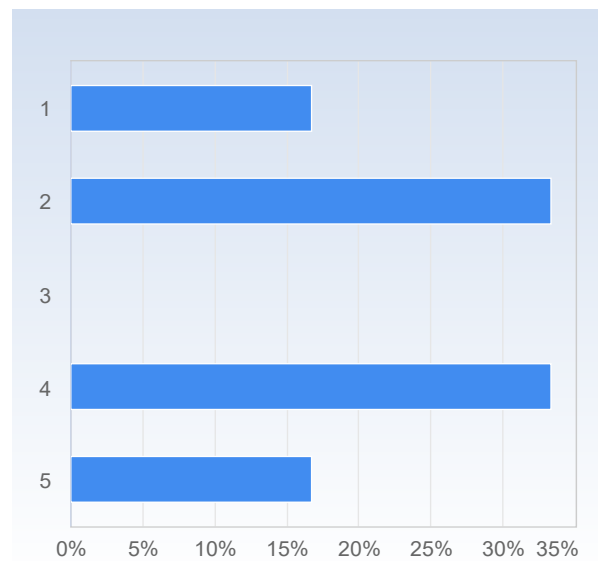
	Mean	Standard Deviation
It was clear throughout the course what was expected of me.	3,0	1,5

## I have received valuable feedback from my teacher/teachers during the course.

I have received valuable feedback from my teacher /teachers during the course.	Number of responses
1	2 (33,3%)
2	0 (0,0%)
3	2 (33,3%)
4	2 (33,3%)
5	0 (0,0%)
Total	6 (100,0%)

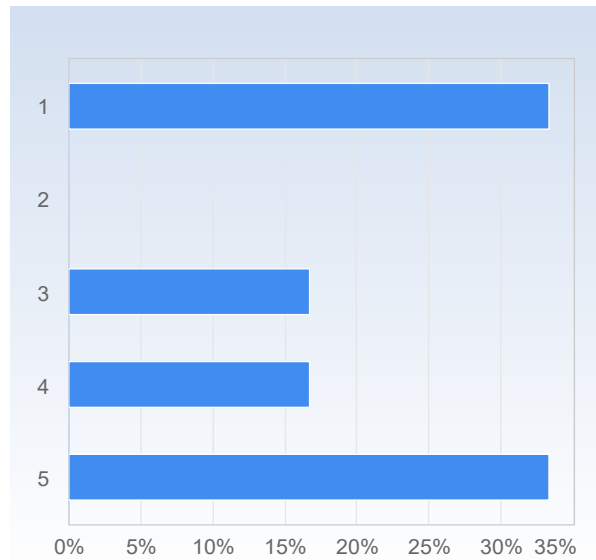|	Mean	Standard Deviation
I have received valuable feedback from my teacher/teachers during the course.	2,7	1,4

The course had a reasonable workload.

The course had a reasonable workload.	Number of responses
1	2 (33,3%)
2	1 (16,7%)
3	0 (0,0%)
4	1 (16,7%)
5	2 (33,3%)
Total	6 (100,0%)
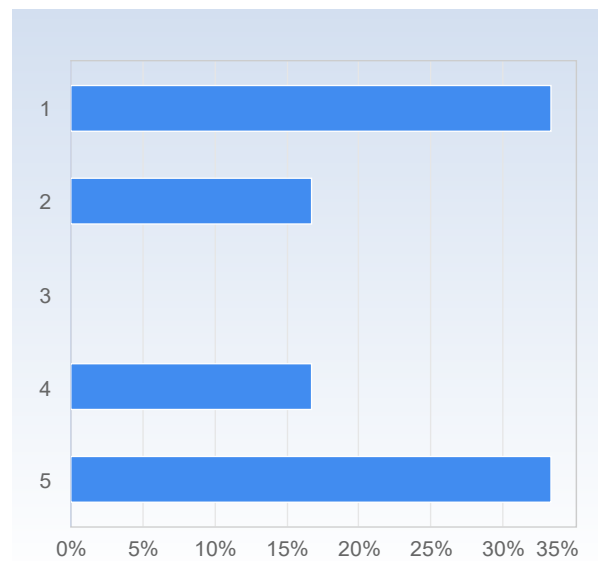
	Mean	Standard Deviation
The course had a reasonable workload.	3,0	1,9

The workload was evenly distributed throughout the course.

The workload was evenly distributed throughout the course.	Number of responses
1	2 (33,3%)
2	0 (0,0%)
3	1 (16,7%)
4	1 (16,7%)
5	2 (33,3%)
Total	6 (100,0%)

	Mean	Standard Deviation
The workload was evenly distributed throughout the course.	3,2	1,8

The examination matched the contents and level of the course.

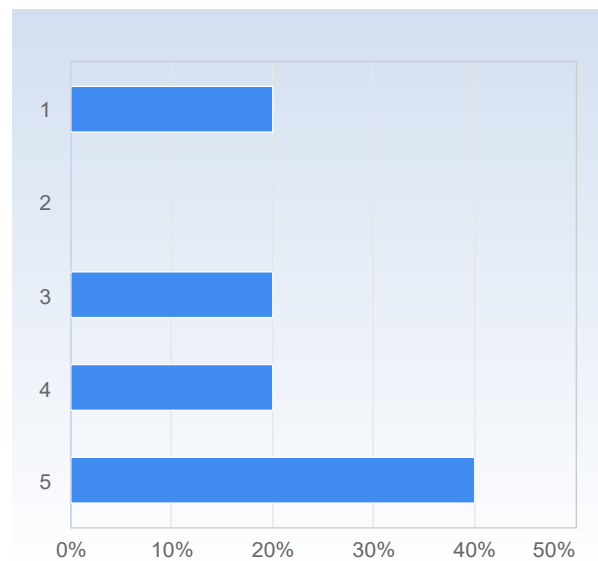| The examination matched the contents and level of the course.	Number of responses
1	2 (33,3%)
2	1 (16,7%)
3	1 (16,7%)
4	1 (16,7%)
5	1 (16,7%)
Total	6 (100,0%)
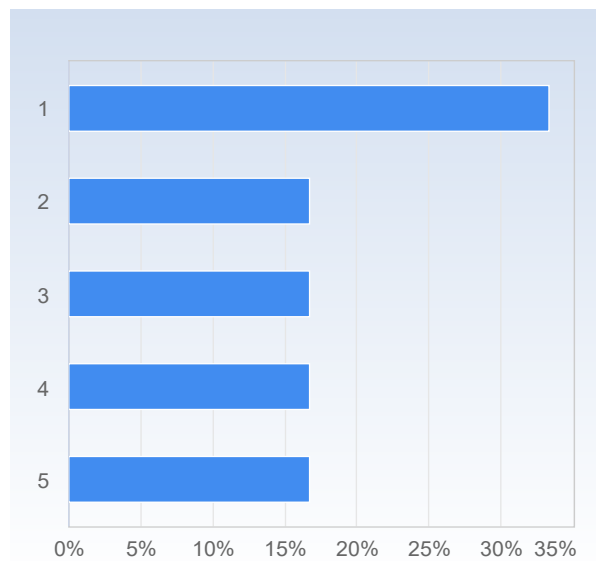
	Mean	Standard Deviation
The examination matched the contents and level of the course.	2,7	1,6

Overall, I am satisfied with the course.

Overall, I am satisfied with the course.	Number of responses
1	1 (20,0%)
2	0 (0,0%)
3	1 (20,0%)
4	1 (20,0%)
5	2 (40,0%)
Total	5 (100,0%)

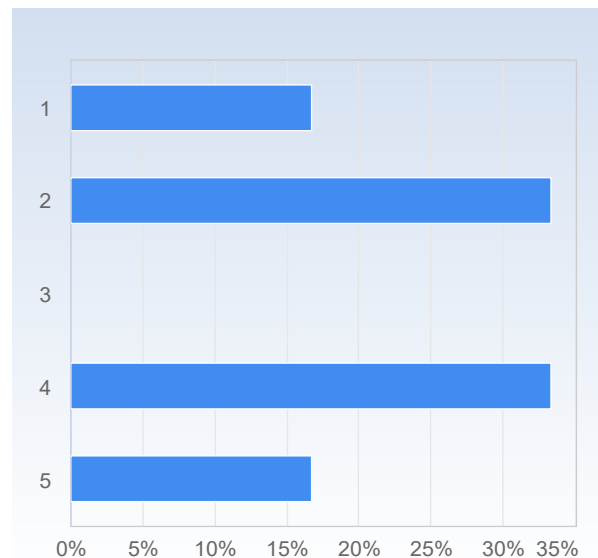|	Mean	Standard Deviation
Overall, I am satisfied with the course.	3,6	1,7

On the development of generic skills

On a scale 1-5 select the option that best matches your opinion: 1= disagree completely → 3= partly agree → 5= agree completely

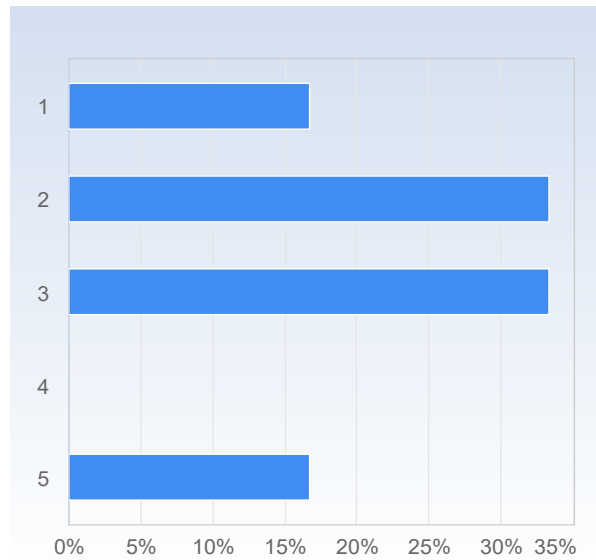## The course has increased my ability to read a mathematical text.

The course has increased my ability to read a mathematical text.	Number of responses
1	1 (16,7%)
2	2 (33,3%)
3	0 (0,0%)
4	2 (33,3%)
5	1 (16,7%)
Total	6 (100,0%)

	Mean	Standard Deviation
The course has increased my ability to read a mathematical text.	3,0	1,5

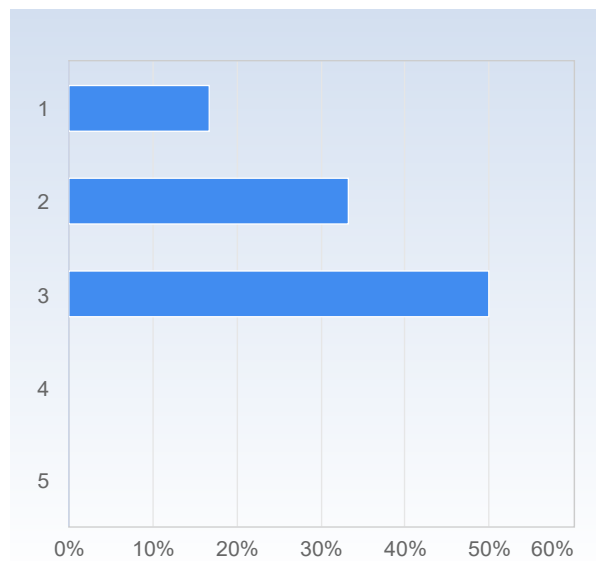## The course has increased my ability to communicate the subject in writing.

The course has increased my ability to communicate the subject in writing.	Number of responses
1	1 (16,7%)
2	2 (33,3%)
3	2 (33,3%)
4	0 (0,0%)
5	1 (16,7%)
Total	6 (100,0%)

	Mean	Standard Deviation
The course has increased my ability to communicate the subject in writing.	2,7	1,4

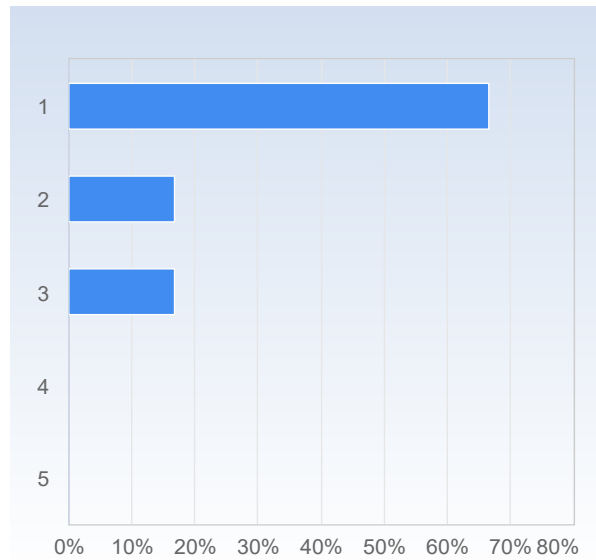## The course has increased my ability to communicate the subject orally.

The course has increased my ability to communicate the subject orally.	Number of responses
1	1 (16,7%)
2	2 (33,3%)
3	3 (50,0%)
4	0 (0,0%)
5	0 (0,0%)
Total	6 (100,0%)

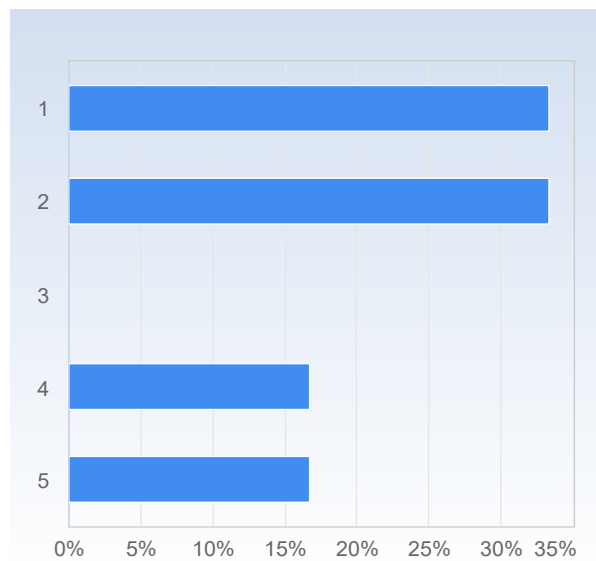|	Mean	Standard Deviation
The course has increased my ability to communicate the subject orally.	2,3	0,8

The course has increased my ability to cooperate.

The course has increased my ability to cooperate.	Number of responses
1	4 (66,7%)
2	1 (16,7%)
3	1 (16,7%)
4	0 (0,0%)
5	0 (0,0%)
Total	6 (100,0%)

	Mean	Standard Deviation
The course has increased my ability to cooperate.	1,5	0,8

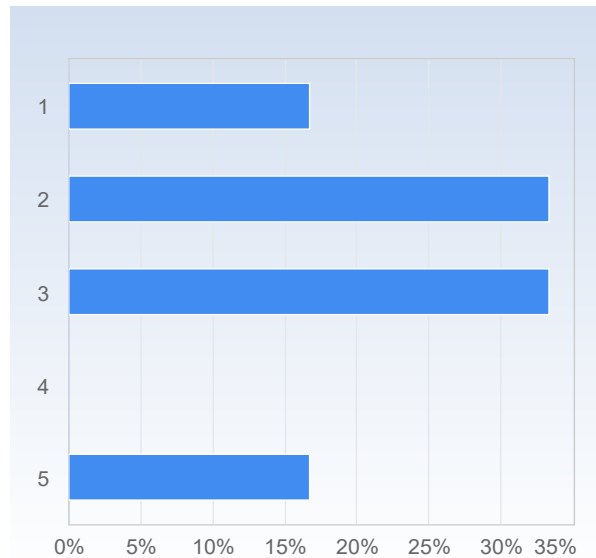## The course has increased my ability to search and process information.

The course has increased my ability to search and process information.	Number of responses
1	2 (33,3%)
2	2 (33,3%)
3	0 (0,0%)
4	1 (16,7%)
5	1 (16,7%)
Total	6 (100,0%)

	Mean	Standard Deviation
The course has increased my ability to search and process information.	2,5	1,6

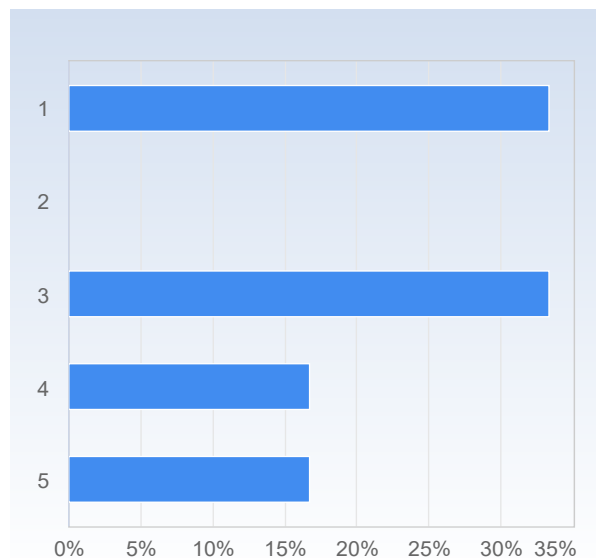## The course has increased my ability to analyze and solve problems.

The course has increased my ability to analyze and solve problems.	Number of responses
1	1 (16,7%)
2	2 (33,3%)
3	2 (33,3%)
4	0 (0,0%)
5	1 (16,7%)
Total	6 (100,0%)

	Mean	Standard Deviation
The course has increased my ability to analyze and solve problems.	2,7	1,4

As a result of this course, I feel confident about tackling unfamiliar problems.

As a result of this course, I feel confident about tackling unfamiliar problems.	Number of responses
1	2 (33,3%)
2	0 (0,0%)
3	2 (33,3%)
4	1 (16,7%)
5	1 (16,7%)
Total	6 (100,0%)

	Mean	Standard Deviation
As a result of this course, I feel confident about tackling unfamiliar problems.	2,8	1,6

What did you appreciate most with the course?

What did you appreciate most with the course?
I really enjoyed the flipped classroom style, it gave another "layer" of opportunity to practice and assimilate the difficult material
I think the subject is very interesting and it's good that the course covers all the big proofs in great detail. The flipped classroom works particularly well for the course since the proofs are so hard to digest.
The seminars to discuss the problems are sometimes useful, and also having the lectures available online is useful.
The material

What do you think should be improved?

Maybe sometimes details were left out a bit too much in the lectures, but the book was always available (although not always concordant), and it was always very open to ask questions, so really overall I don't think it's a big problem

There has to be more seminars with focus on solving and discussing exercises to aid the learning. This is a very hard course, so only having 4 hours of scheduled is absolutely baffling. Especially since like 80% of them were spent giving a brief overview of the material that's covered in detail in the lectures. Not to mention they were eihter cancelled or given via Zoom several times. It's essentially organized as a PhD course that only a few people take at a time which, as the exam results this year, I don't think is very good. Unfortunately, when it comes to exercises in the book, I found them either too easy or too hard. There was basically no exercises that I was able to figure out myself, and if I could they were just trivial applications of the theorems, so I learned almost nothing from them. Instead I found the Additional Exercises written by Marcus, and the exercises from old exams to be much more fun and helpful for learning the course material. Therefore, I think one improvement would be a more carefully curated selection of exercises from the book and more exercises written by Marcus.

In summary:
- More scheduled time with focus on problem solving
- Better exercises

Thought the lectures online are useful, I think that it's better to have the lectures in classes, and the online lectures just to review the content. I think that during online lectures the teachers do not really realize if the students are understanding the concepts, and during the seminar you will just talk about some problems. I think that it would be better to change the book, as there are not many useful examples, sometime they are too easy with respect to what we have in the actual exams. I think that it would be useful to actually see how to do proof from scratch, like for instance as we do in the course of Algebraic Structures. The exam was way more difficult than expected, so I think that it would be useful having more difficult exercises during the course to be prepared for the exam.

A bit more technical on the on-site lectures

Have you during this course experienced course literature, staff or teaching methods to be discriminatory in any way (gender, ethnicity, etc.)?

No

No

Not at all

How would your rate the flipped classroom technique compared to traditional lectures?

Excellent. Especially for a course like this with as advanced material, being given another chance to assimilate it was very helpful. Being able to watch the lecture at one's leisure was also nice.

I think the flipped classroom is absolutely essential for the course. It would have been impossible for me to understand the proofs if I weren't able to pause and think about them during the video lecture. However, as I explained earlier, the flipped classroom fails in that most of the time with the teacher is wasted by just overviewing the lecture material (and there is too little time overall).

I prefer to have traditional lectures, but it would be great to have the lecture online to review the material.

I must say I prefer traditional lectures, even though this turnt out okay.