



**LUND**  
UNIVERSITY

Centre for Mathematical Sciences  
Division of Mathematics and Numerical Analysis

Centre for Mathematical Sciences  
Faculty of Science

## Course Analysis for MATB22 and ÄMAD02 Linear Algebra 2, Autumn Term 2022

### Course Information

**Lecturer:** Kjell Elfström

**Teaching assistants:** Frej Weiström Dahlin, Niklas Kotarsky

**Number of students:**

MATB22: 63 newly registered and 9 re-registered.

ÄMAD02: No newly registered and 6 re-registered.

18 students answered the course evaluation, 16 of them are enrolled on the Bachelor's Programme in Physics and 2 on other programmes or the free-standing course.

### Examination

**Project:** 54 MATB22 students passed. Not applicable to ÄMAD02.

**Written examination:**

- Ordinary examination on 27 October 2022: 46 out of 54 MATB22 candidates passed and 2 out of 3 ÄMAD02 candidates passed.
- Resit examination on 12 November 2022: 2 out of 13 MATB22 candidates passed and none out of 1 ÄMAD02 candidate passed.

### Final grades

In all, 48 MATB22 students, including some re-registered students, have got their final grade.

22 passed with distinction.

26 passed.

For ÄMAD02 students, I refer to Anna-Maria.

### Course Evaluation

**Summary of student's answers:**

Overall there was a positive response. See the following pages.

**Teachers' comments:**

The course consisted of lectures and seminars on campus. A project consisting of exercises in Python is also included in the course. The textbook 'Linear Algebra' is written by me (Kjell Elfström).

**Changes from the previous course realisation:** None.

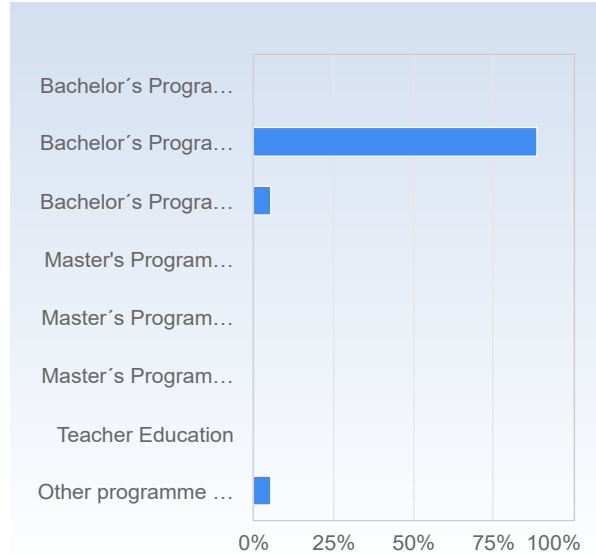
**Suggestions for the next course realisation:** None.

# MATB22-ht22

Answer Count: 17

## I have studied this course as part of

I have studied this course as part of	Number of responses
Bachelor's Programme in Mathematics	0 (0.0%)
Bachelor's Programme in Physics, Theoretical Physics, Astronomy	16 (94.1%)
Bachelor's Programme, other specialisation	1 (5.9%)
Master's Programme in Mathematics	0 (0.0%)
Master's Programme in Mathematical Statistics	0 (0.0%)
Master's Programme, other specialisation	0 (0.0%)
Teacher Education	0 (0.0%)
Other programme or as stand-alone course	1 (5.9%)
Total	18 (105.9%)

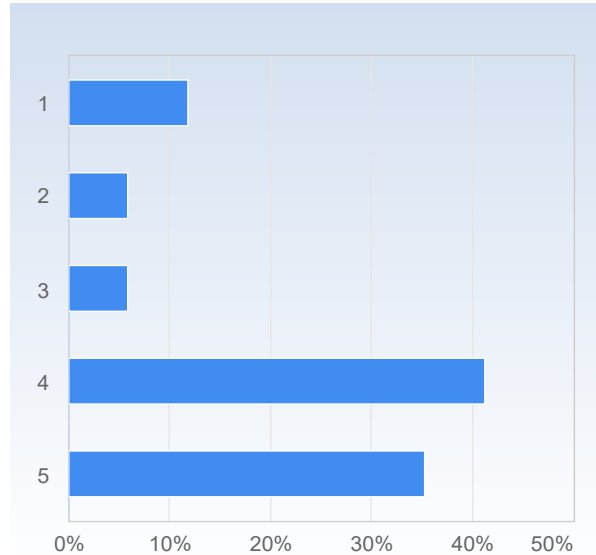


I have studied this course as part of	Mean	Standard Deviation
I have studied this course as part of	2.4	1.4

**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.**

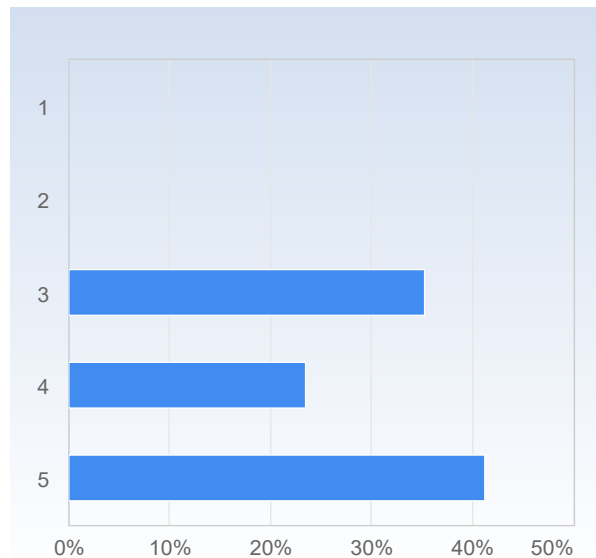
2. My prior knowledge has been sufficient to assimilate the contents of this course.	Number of responses
1	2 (11.8%)
2	1 (5.9%)
3	1 (5.9%)
4	7 (41.2%)
5	6 (35.3%)
Total	17 (100.0%)



2. My prior knowledge has been sufficient to assimilate the contents of this course.	Mean	Standard Deviation
	3.8	1.3

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

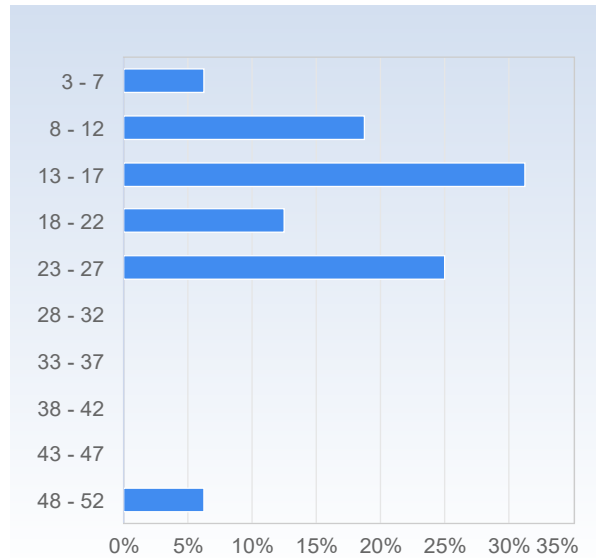
3. I have participated actively in the course.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	6 (35.3%)
4	4 (23.5%)
5	7 (41.2%)
Total	17 (100.0%)



3. I have participated actively in the course.	Mean	Standard Deviation
	4.1	0.9

## 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
3 - 7	1 (6.2%)
8 - 12	3 (18.8%)
13 - 17	5 (31.2%)
18 - 22	2 (12.5%)
23 - 27	4 (25.0%)
28 - 32	0 (0.0%)
33 - 37	0 (0.0%)
38 - 42	0 (0.0%)
43 - 47	0 (0.0%)
48 - 52	1 (6.2%)
Total	16 (100.0%)



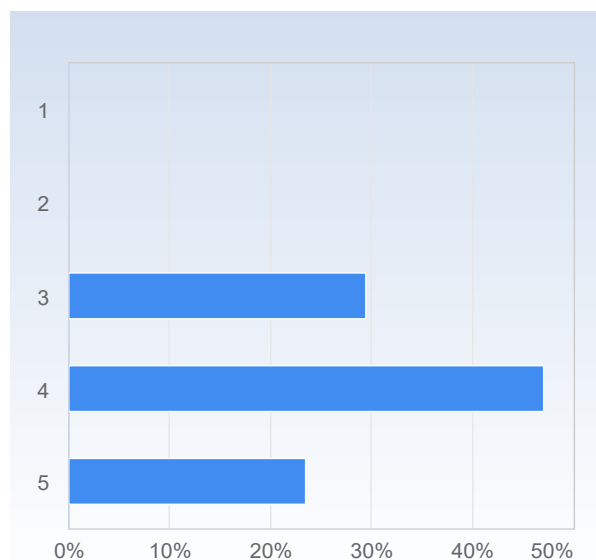
	Mean	Standard Deviation
Average number of hours spent in total on the course per week (including scheduled activities):	18.9	10.4

## 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.

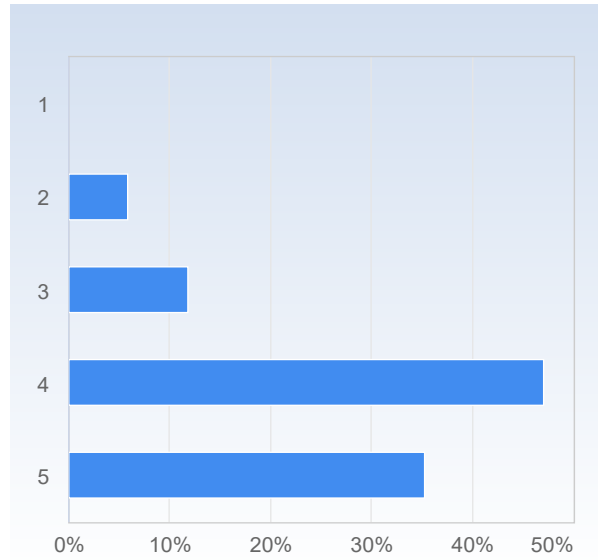
The way the course was taught and organised suited me.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	5 (29.4%)
4	8 (47.1%)
5	4 (23.5%)
Total	17 (100.0%)



	Mean	Standard Deviation
The way the course was taught and organised suited me.	3.9	0.7

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

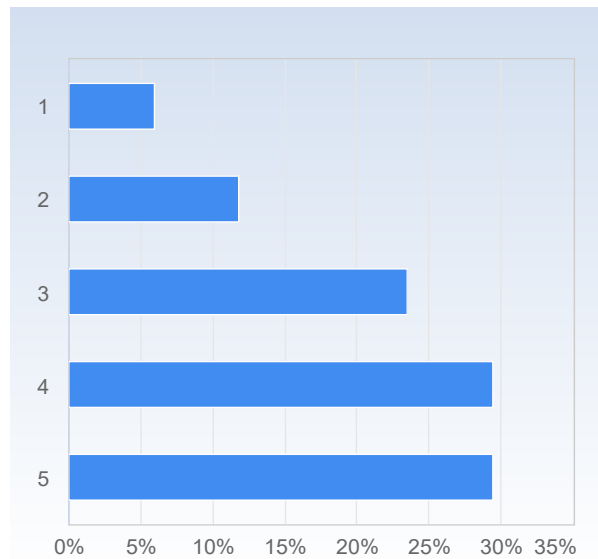
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	Number of responses
1	0 (0.0%)
2	1 (5.9%)
3	2 (11.8%)
4	8 (47.1%)
5	6 (35.3%)
Total	17 (100.0%)



	Mean	Standard Deviation
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	4.1	0.9

**The lectures were valuable for my learning.**

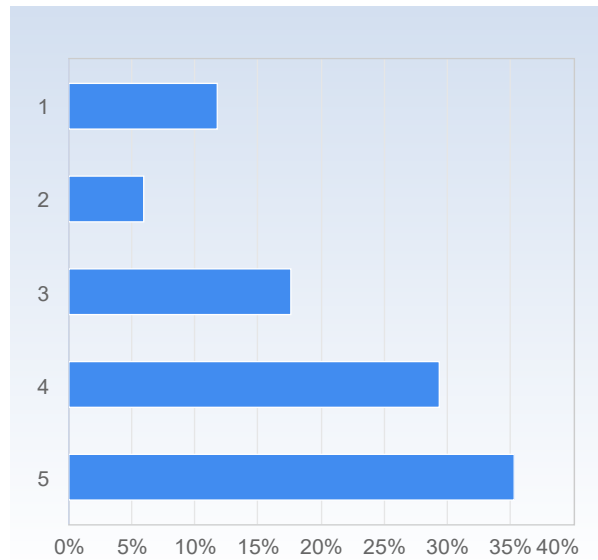
The lectures were valuable for my learning.	Number of responses
1	1 (5.9%)
2	2 (11.8%)
3	4 (23.5%)
4	5 (29.4%)
5	5 (29.4%)
Total	17 (100.0%)



	Mean	Standard Deviation
The lectures were valuable for my learning.	3.6	1.2

### The seminars were valuable for my learning.

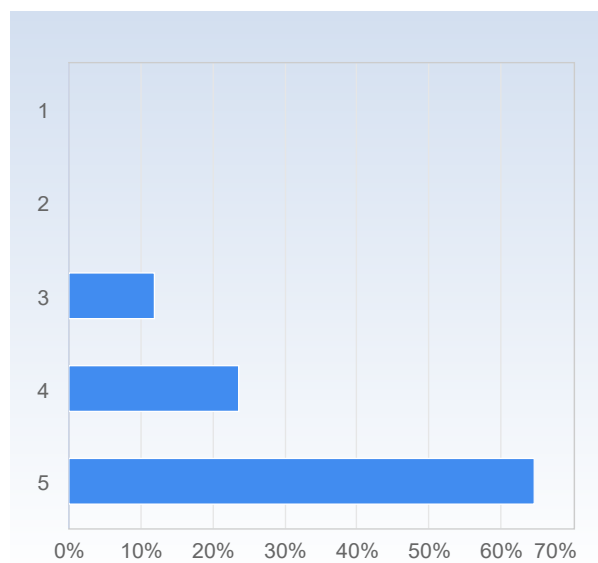
The seminars were valuable for my learning.	Number of responses
1	2 (11.8%)
2	1 (5.9%)
3	3 (17.6%)
4	5 (29.4%)
5	6 (35.3%)
Total	17 (100.0%)



	Mean	Standard Deviation
The seminars were valuable for my learning.	3.7	1.4

### Studying on my own was valuable for my learning.

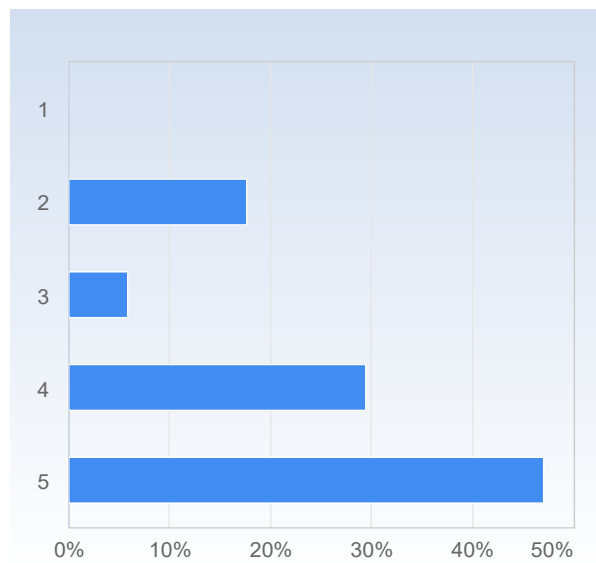
Studying on my own was valuable for my learning.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	2 (11.8%)
4	4 (23.5%)
5	11 (64.7%)
Total	17 (100.0%)



	Mean	Standard Deviation
Studying on my own was valuable for my learning.	4.5	0.7

### The course literature/material was a valuable learning resource.

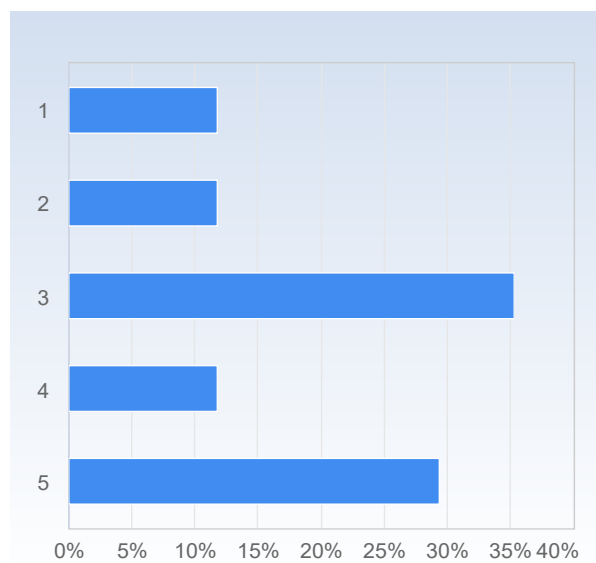
The course literature/material was a valuable learning resource.	Number of responses
1	0 (0.0%)
2	3 (17.6%)
3	1 (5.9%)
4	5 (29.4%)
5	8 (47.1%)
Total	17 (100.0%)



	Mean	Standard Deviation
The course literature/material was a valuable learning resource.	4.1	1.1

### The assignments were valuable for my learning.

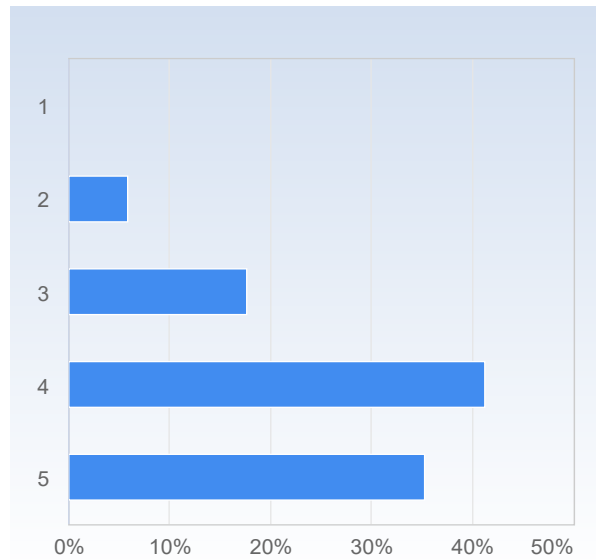
The assignments were valuable for my learning.	Number of responses
1	2 (11.8%)
2	2 (11.8%)
3	6 (35.3%)
4	2 (11.8%)
5	5 (29.4%)
Total	17 (100.0%)



	Mean	Standard Deviation
The assignments were valuable for my learning.	3.4	1.4

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

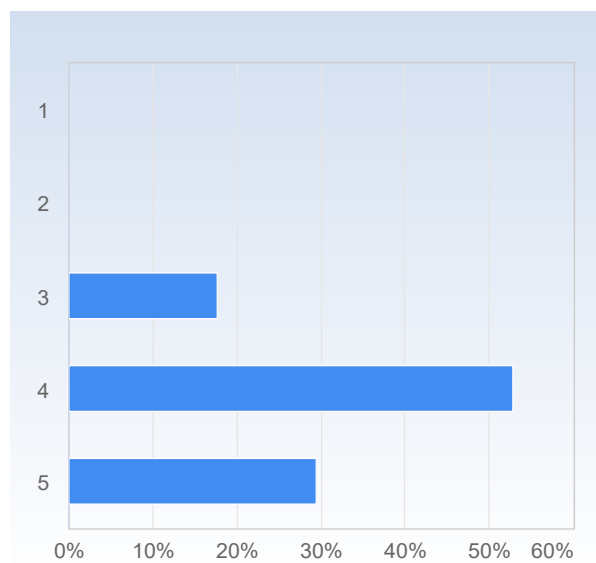
The information I received before the course start was satisfactory.	Number of responses
1	0 (0.0%)
2	1 (5.9%)
3	3 (17.6%)
4	7 (41.2%)
5	6 (35.3%)
Total	17 (100.0%)



	Mean	Standard Deviation
The information I received before the course start was satisfactory.	4.1	0.9

### 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	0 (0.0%)
2	0 (0.0%)
3	3 (17.6%)
4	9 (52.9%)
5	5 (29.4%)
Total	17 (100.0%)

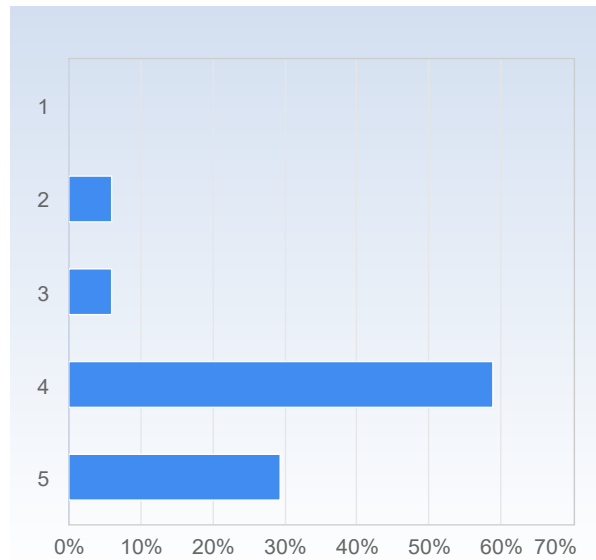


	Mean	Standard Deviation
The communication with the teaching staff during the course was good.	4.1	0.7



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

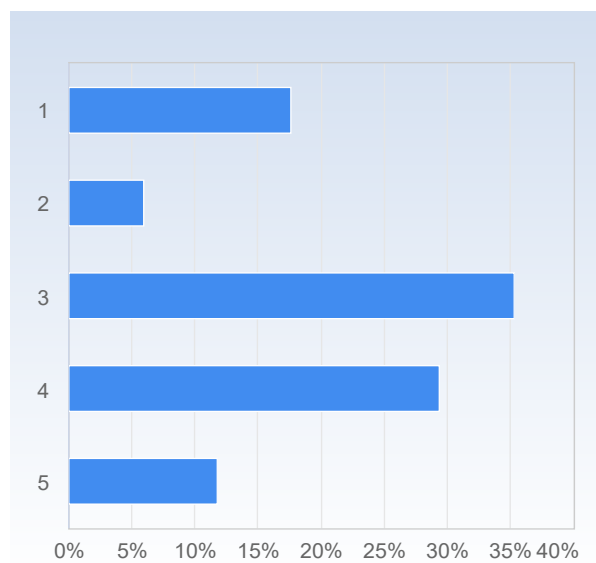
It was clear throughout the course what was expected of me.	Number of responses
1	0 (0.0%)
2	1 (5.9%)
3	1 (5.9%)
4	10 (58.8%)
5	5 (29.4%)
Total	17 (100.0%)



	Mean	Standard Deviation
It was clear throughout the course what was expected of me.	4.1	0.8

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

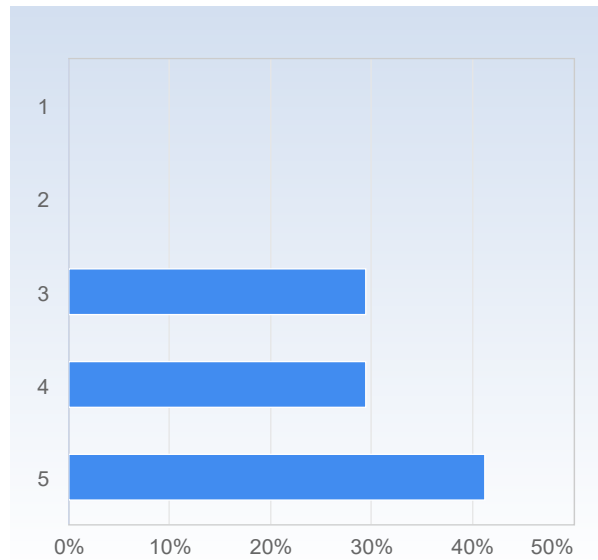
I have received valuable feedback from my teacher/teachers during the course.	Number of responses
1	3 (17.6%)
2	1 (5.9%)
3	6 (35.3%)
4	5 (29.4%)
5	2 (11.8%)
Total	17 (100.0%)



	Mean	Standard Deviation
I have received valuable feedback from my teacher/teachers during the course.	3.1	1.3

### The course had a reasonable workload.

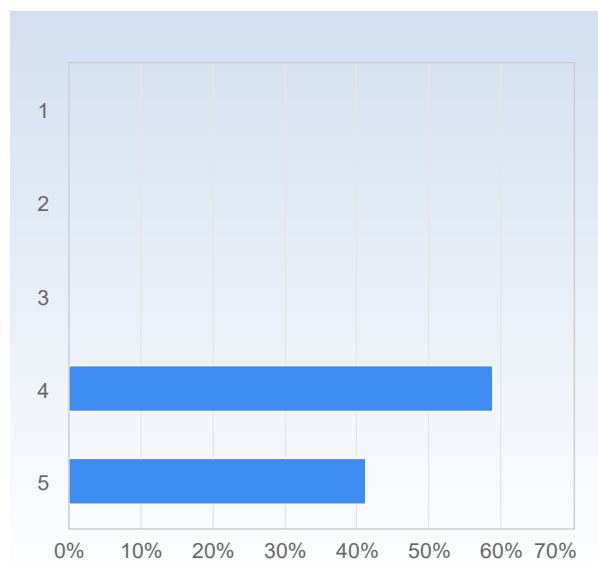
The course had a reasonable workload.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	5 (29.4%)
4	5 (29.4%)
5	7 (41.2%)
Total	17 (100.0%)



	Mean	Standard Deviation
The course had a reasonable workload.	4.1	0.9

### The workload was evenly distributed throughout the course.

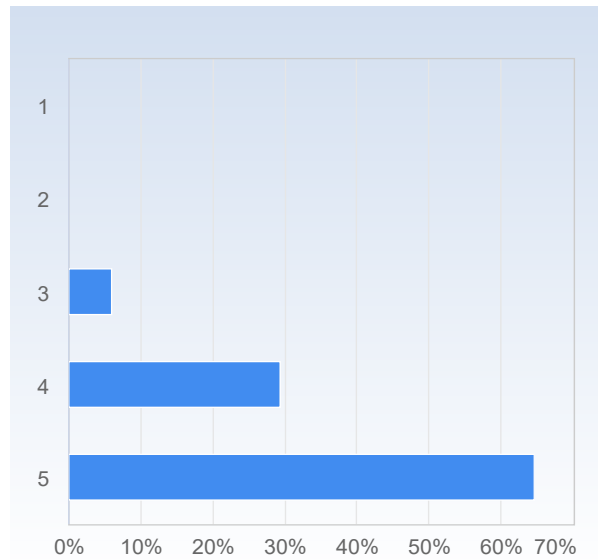
The workload was evenly distributed throughout the course.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	0 (0.0%)
4	10 (58.8%)
5	7 (41.2%)
Total	17 (100.0%)



	Mean	Standard Deviation
The workload was evenly distributed throughout the course.	4.4	0.5

### The examination matched the contents and level of the course.

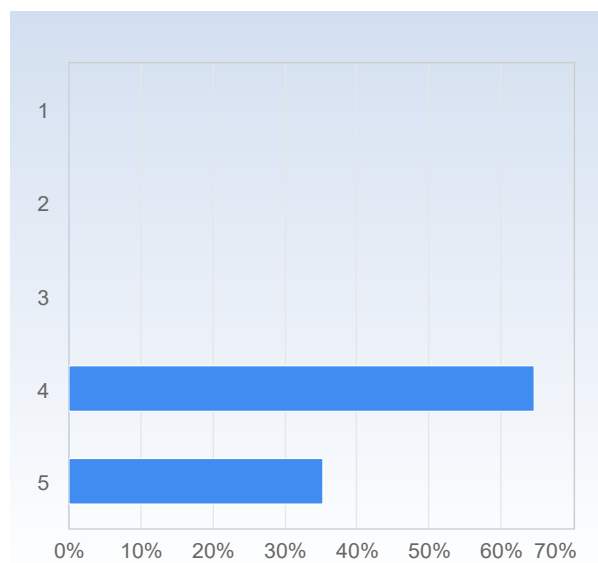
The examination matched the contents and level of the course.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	1 (5.9%)
4	5 (29.4%)
5	11 (64.7%)
Total	17 (100.0%)



	Mean	Standard Deviation
The examination matched the contents and level of the course.	4.6	0.6

### Overall, I am satisfied with the course.

Overall, I am satisfied with the course.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	0 (0.0%)
4	11 (64.7%)
5	6 (35.3%)
Total	17 (100.0%)



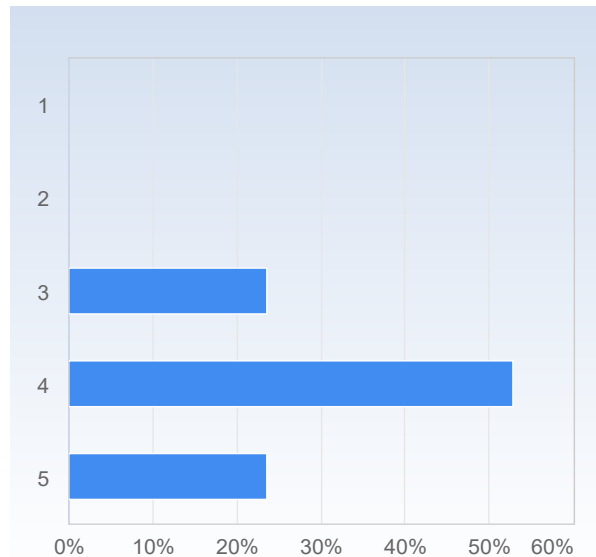
	Mean	Standard Deviation
Overall, I am satisfied with the course.	4.4	0.5

## On the development of generic skills

On the 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.

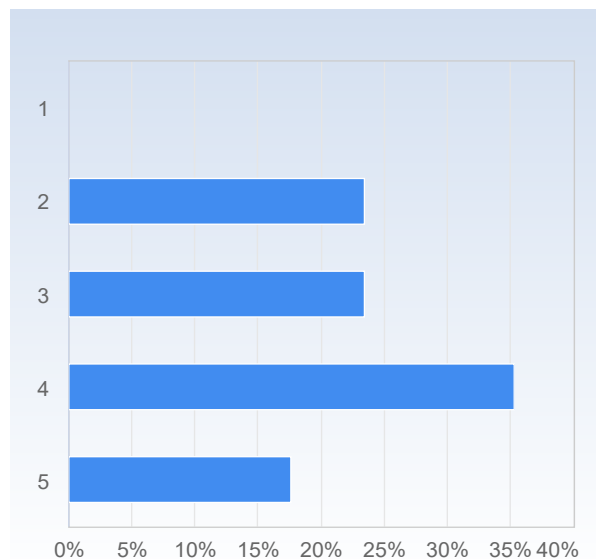
The course has increased my ability to read a mathematical text.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	4 (23.5%)
4	9 (52.9%)
5	4 (23.5%)
Total	17 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to read a mathematical text.	4.0	0.7

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

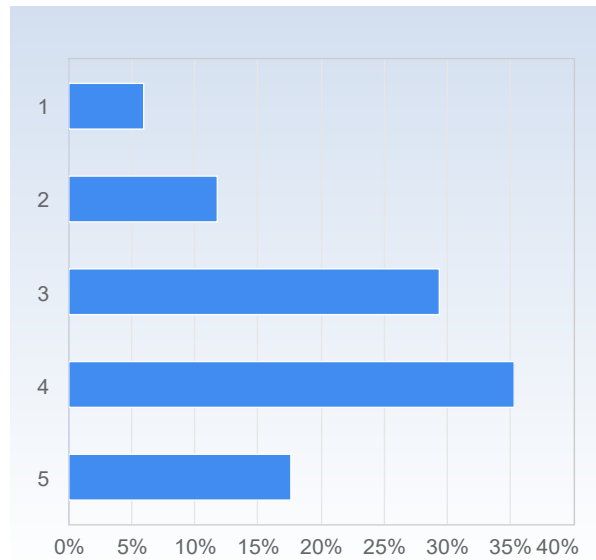
The course has increased my ability to communicate the subject in writing.	Number of responses
1	0 (0.0%)
2	4 (23.5%)
3	4 (23.5%)
4	6 (35.3%)
5	3 (17.6%)
Total	17 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to communicate the subject in writing.	3.5	1.1

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

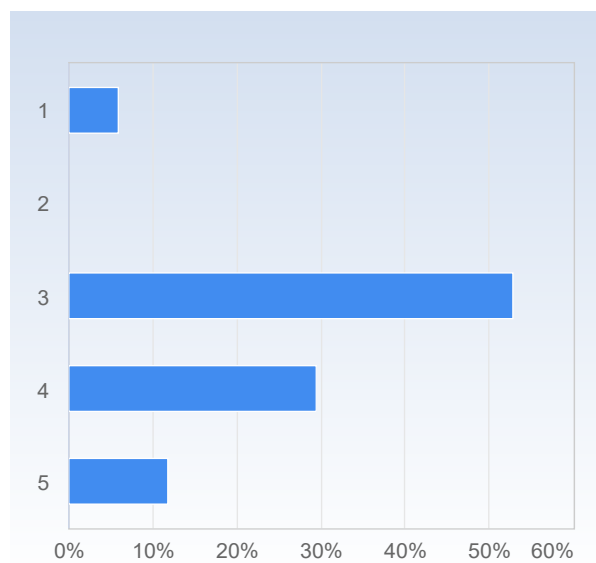
The course has increased my ability to communicate the subject orally.	Number of responses
1	1 (5.9%)
2	2 (11.8%)
3	5 (29.4%)
4	6 (35.3%)
5	3 (17.6%)
Total	17 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to communicate the subject orally.	3.5	1.1

### The course has increased my ability to cooperate.

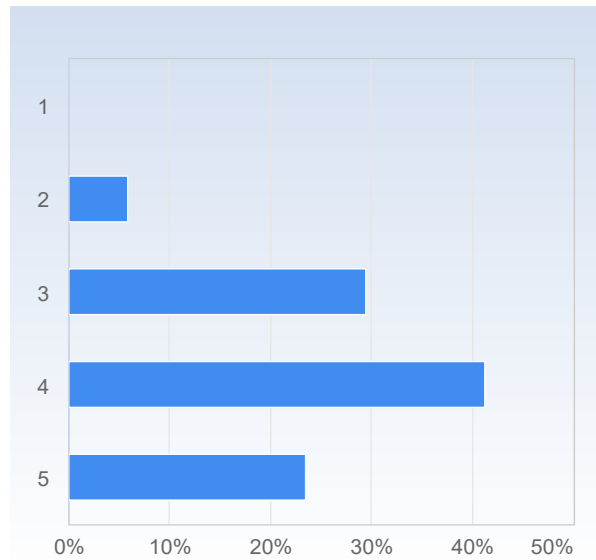
The course has increased my ability to cooperate.	Number of responses
1	1 (5.9%)
2	0 (0.0%)
3	9 (52.9%)
4	5 (29.4%)
5	2 (11.8%)
Total	17 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to cooperate.	3.4	0.9

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

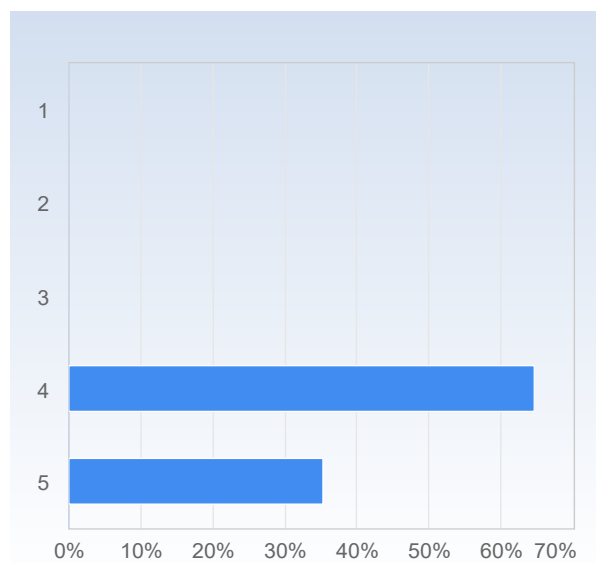
The course has increased my ability to search and process information.	Number of responses
1	0 (0.0%)
2	1 (5.9%)
3	5 (29.4%)
4	7 (41.2%)
5	4 (23.5%)
Total	17 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to search and process information.	3.8	0.9

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

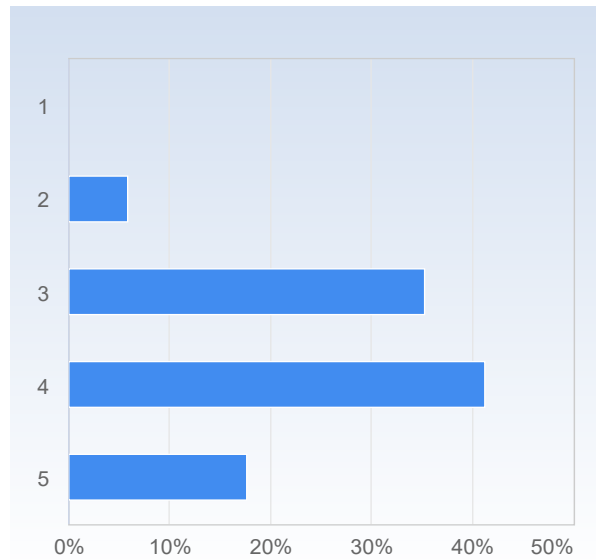
The course has increased my ability to analyze and solve problems.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	0 (0.0%)
4	11 (64.7%)
5	6 (35.3%)
Total	17 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to analyze and solve problems.	4.4	0.5

### 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	0 (0.0%)
2	1 (5.9%)
3	6 (35.3%)
4	7 (41.2%)
5	3 (17.6%)
Total	17 (100.0%)



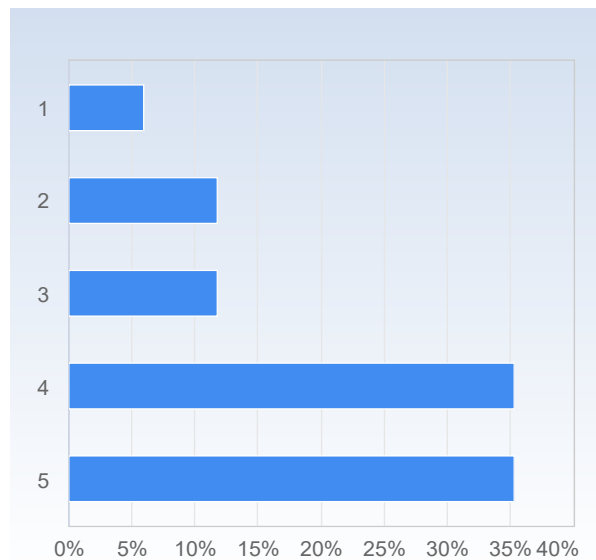
	Mean	Standard Deviation
As a result of this course, I feel confident about tackling unfamiliar problems.	3.7	0.8

### On the programming project

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

### The programming project is closely related to the course contents.

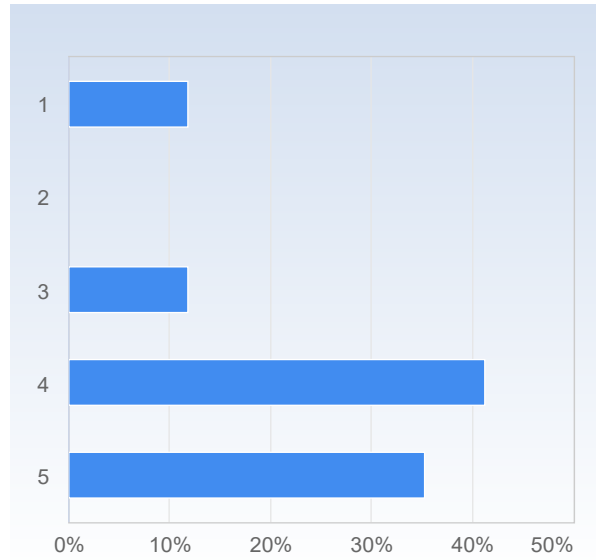
The programming project is closely related to the course contents.	Number of responses
1	1 (5.9%)
2	2 (11.8%)
3	2 (11.8%)
4	6 (35.3%)
5	6 (35.3%)
Total	17 (100.0%)



	Mean	Standard Deviation
The programming project is closely related to the course contents.	3.8	1.2

## Owing to the programming project, I have increased my programming skills in Python.

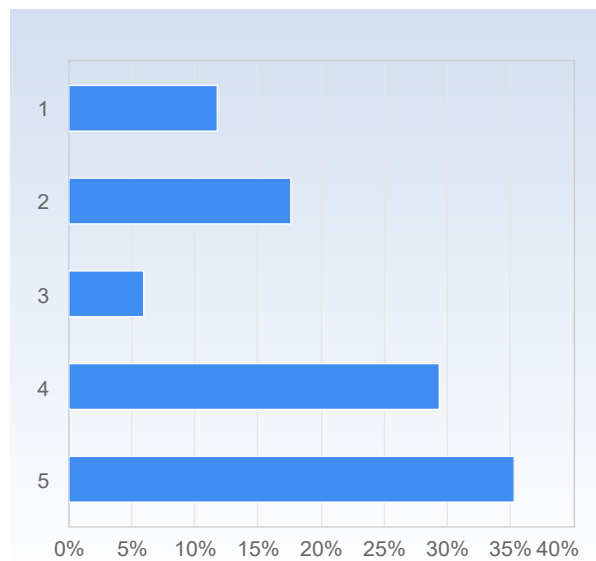
Owing to the programming project, I have increased my programming skills in Python.	Number of responses
1	2 (11.8%)
2	0 (0.0%)
3	2 (11.8%)
4	7 (41.2%)
5	6 (35.3%)
Total	17 (100.0%)



	Mean	Standard Deviation
Owing to the programming project, I have increased my programming skills in Python.	3.9	1.3

## I believe that the programming project has been valuable for my future learning.

I believe that the programming project has been valuable for my future learning.	Number of responses
1	2 (11.8%)
2	3 (17.6%)
3	1 (5.9%)
4	5 (29.4%)
5	6 (35.3%)
Total	17 (100.0%)



	Mean	Standard Deviation
I believe that the programming project has been valuable for my future learning.	3.6	1.5



## What did you appreciate most with the course?

What did you appreciate most with the course?

Course literature

The seminars are good and solving example problems on the board during lectures has helped a lot and I think is the most important for the exam.

I have to thoroughly praise the course book written by Kjell, it is excellent, contains relevant information, good proofs, and good exercises. Lund/Kjell should sell physical copies.

regular lectures and seminars; seeing examples in lectures

The lectures were very useful and well structured.

I really liked the Revision questions! It was a nice way of summarising the content of the course.

I personally loved the programming assignment. In addition I found the seminars and course material well structured, making it easy and approachable to revise and study.

The willingness of the teaching staff to answer any questions. Particularly that Frej took the time to answer any questions after the seminars.

The course was well structured. It was easy to know what was coming on the lectures and which questions were to be solved afterwards. The seminars were helpful. Having a lot of old exams available was also very helpful.

A clear plan from start of what we will go through and when. Since the lecturer wrote the literature, I could only read the compendium without wasting time to check which chapters we will go through or try to by myself understand the content of the course. The exam was standardized with great opportunities to study multiple previous exams.

## What do you think should be improved?

What do you think should be improved?

Maybe more examples

More example problems and maybe a bit more information on how to think when trying to prove the theoretical parts of the course .

-

I would have liked to have had a more geometrical explanation of some of the concepts regarding projections, rotations and reflections. The book could have more images related to this.

Maybe compile a list of relevant proofs so it's not about luck or unrealistic dedication.

The programming assignment was the worst thing I have done in my academic career. Same thing with analysis in several variables. It was extremely difficult to search up information on how you were supposed to code on the different tasks. The teaching assistants and other classmates did all they could to help, but there is only so much they can tell and help with without it going too far. The previous programming course in Python was of no use either.

I would have liked to that either the previous course in Python be improved or that you include some resources on how to find the right code.

I cannot think of anything to change.

Perhaps some digital tools could be used to give a visual representation of concepts like a kernel or a linear transformation.

The programming project felt like an unnecessary stressor. I felt like a gained nothing from doing it and it only took up time that could've been spent solving questions that were actually useful.

The compendium contained a lot of information and proofs, and when you don't fully understand the compendium it would be great if there would also be a suggestion of another good literature in linear algebra that covers the course content.

The compendium sometimes lacks intuitive understanding, by lack of figures and more concrete explanations of some concepts, ex. eigenvalues. We only got theorem after theorem without really getting a full picture of what they even mean, so even if I eventually succeeded to prove a lot of theorems, I still couldn't understand what they really said.

A final note is that the structure of the compendium was not optimal for my learning. For example, we start to use linear transformation in chapter 2 but it is defined in chapter 5. The same goes with eigenvalues, we learn what it is in chapter 6 but it seems to be used in earlier chapters without naming it. This makes it harder to understand the different aspects of the course and how they correlate. Some parts felt strange until you found out, from other resources, that the concept introduced much later in this compendium is vital to understand what happens here.

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

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

No

No

No.

no

Nope.

I have not. The professor and the teaching assistants were very nice.

absolutely not.

No.

No.

No.