LUND UNIVERSITY
Faculty of Science

Centre for Mathematical Sciences
Division of Mathematics and Numerical Analysis

Course Analysis for MATA21 Analysis in One Variable, Spring 2023

Course Information

Lecturer: Jan-Fredrik Olsen
Teaching assistants: Joakim Cronvall, Alex Bergman
Number of students: 82 newly registered and 20 re-registered.
30 students answered the course evaluation, of which 23 are enrolled on BSc Physics and 7 listed as "other".

Examination

Project: 70 students passed.
Written examination: 34 students passed.
Oral examination: 11 students passed.

- Ordinary examination 24/05-2023: 64 students participated and 34 of them passed.

Final grades:
In all, 34 students, including 1 re-registered students, have got their final grade.
11 passed with distinction. 23 passed.

Note: These numbers do not include the re-sit examination in August.

Course Evaluation

Summary of student's answers:
The 5 most highly rated questions on the multiple choice part of the course survey are the following:

1. Attending lectures on campus has been valuable for my learning: 4,4.
2. Studying on my own has been valuable for my learning: 4,4.
3. The course has increased my ability to read a mathematical text: 4,4.
4. I have participated actively in the course: 4,3.
5. The number of teacher led activities has been satisfactory: 4,3.

Of these, items 2 and 5 are noteworthy as the number of seminars in Fall 2022 and Spring 2023 have been halved compared to previously (to increase the time for students to work on their own).

The 5 lowest rated questions are:

1. I have used Python when working on MATA21 even when not asked to: 1,8.
2. Before the start of the term, I already knew enough Python to get by: 2,2.
3. The pre-recorded YouTube films (linked in the book) have been valuable for my learning: 2,3.

4. The course has increased my ability to cooperate: 2,5.
5. The use of Python when working on problems and exercises has been valuable for my learning: 2,6.

Of these, the low rating on questions related to Python could be due to (a) Python is the most integrated to the first half of the course, (b) students have poor pre-requisites in Python, (c) while there are some Python-lectures (NUMA01) at the start of the course, the Python-course only starts half-way through the semester.

It is noteworthy that the popularity of pre-recorded YouTube films, that explain difficult parts of the course, is the question whose rating has dropped the most when compared to the previous term.

It is also noteworthy that almost no students report having used material from the online preparatory course (MNXA21) to read-up on high school level material (even though this was badly needed, as was noticed by teachers during seminars and on the exam).

Some highlights from the free-text answers:

- Out of 19 comments, 12 described ways in which Python had helped them understand the course material.
- Out of 23 answers, 14 preferred the current format of the seminars to the old (which are still used in linear algebra), 2 were neutral, and 7 critical.
- Comments on what students appreciate with the course tend to focus on mentors and lectures.
- Comments on what students think should be improved focus on requesting more worked examples in the course material.
- While a majority of students felt that the examination matched the level of the course (50% answered 4 or 5 on this question), many students felt that the examination was disconnected from the course, with one student even answering "we did nothing that came on the test" (which is puzzling as several exam problems were copied more or less directly from the seminar problems).

Teachers' comments:

About 40 students regularly attended the lectures, about 20 regularly attended the seminars, and 30 students attended at least half of the mentor meetings (from this perspective, the disappointing number of students passing was as expected).

Here is a description of the implementation:

- The lectures and seminars took place on campus. Recordings of each lecture was published on Canvas (but not of the seminars).
- A detailed planning was published and updated throughout the course, where the contents of lectures, seminars, and how to prepare (pages to be read, exercises to be attempted) was given.
- The seminars were held in Hörmandersalen. The students were asked to work on problems handed out on during the seminars. Assistants were present to answer questions. Students were expected to work on any problem not solved during the seminars at home.
- As support, students were offered a place in mentor groups (at most 8 students per group) and the option of going to exercise classes (räkneövningar).
- At the start of the course, students did a written project focused on mathematical proof and mathematical writing.

Changes from the previous course realisation:
There were no changes from the previous edition of the course (partially due to the short time between fall and spring terms).

Suggestions for the next course realisation:

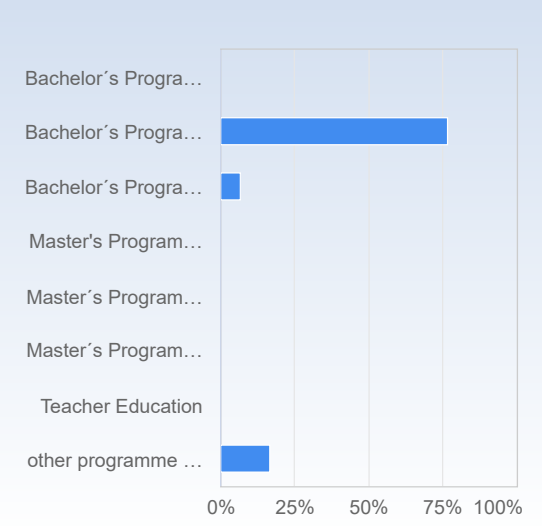
- **Course literature:** The number of exercises in the course literature having solutions could be increased. Also, there are many previous exams with extensive solutions. These could be compiled into a booklet giving students a rich source of worked examples.
- **Seminars:** The seminars are poorly attended (as is usually the case, no matter the format). It should be discussed how to tweak the format so that this becomes a valuable learning resource for more students. A concrete suggestion is to publish written solutions to the seminars.
- **Mentoring:** As with seminars, the mentor meetings are generally poorly attended, and adjustments need to be discussed. A suggestion is to give mentors more clear instructions and support.
- **Feedback from teachers:** Currently, instead of getting feedback from graded homework, the course depends on students attending seminars and mentor meetings to get feedback. This should be adjusted to give students more opportunities on getting feedback on written work. A danger of doing this, as has been noticed previously, is that students tend to believe that *only* doing graded homework is sufficient for passing the course. A compromise could be to allow students to hand in a few seminar problems for (formative!) feedback on a voluntary basis throughout the term.
- **Examination:** A reason why students found the exam disconnected from the course is probably that recent exams have a slightly different focus than exams from before the pandemic. Students that mainly study the course by looking at these exams will have a problem. A suggestion is therefore to indicate what previous exams are more or less relevant to the current exam.

MATA21 VT 2023 Kursenkät

Answer Count: 30

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	23 (76.7%)
Bachelor´s Programme, other specialization	2 (6.7%)
Master's Programme in Mathematics	0 (0.0%)
Master´s Programme in Mathematical Statistics	0 (0.0%)
Master´s Programme, other specialization	0 (0.0%)
Teacher Education	0 (0.0%)
other programme or as stand alone course	5 (16.7%)
Total	30 (100.0%)

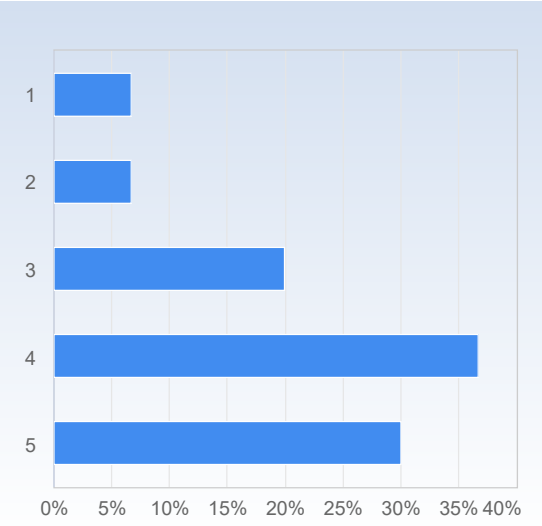


	Mean	Standard Deviation
I have studied this course as part of	3.1	2.3

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

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

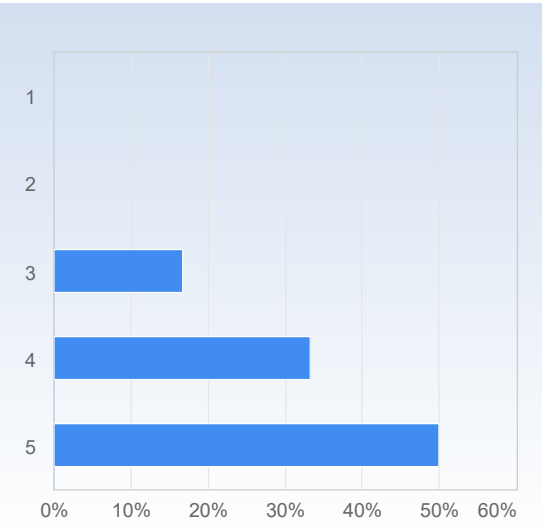
My prior knowledge has been sufficient to assimilate the contents of this course.	Number of responses
1	2 (6.7%)
2	2 (6.7%)
3	6 (20.0%)
4	11 (36.7%)
5	9 (30.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
My prior knowledge has been sufficient to assimilate the contents of this course.	3.8	1.2

I have participated actively in the course.

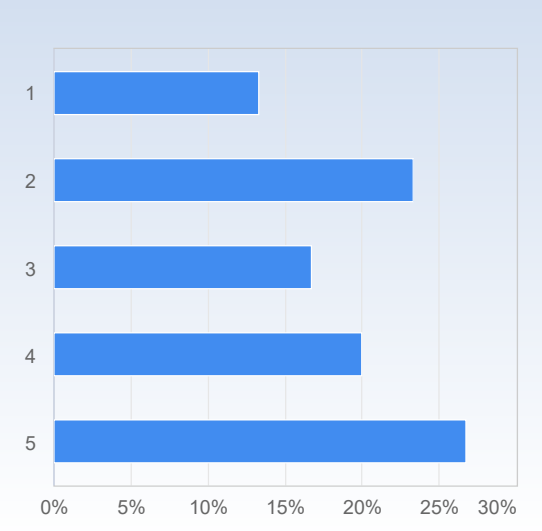
I have participated actively in the course.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	5 (16.7%)
4	10 (33.3%)
5	15 (50.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
I have participated actively in the course.	4.3	0.8

I feel that I have succeeded well in the course.

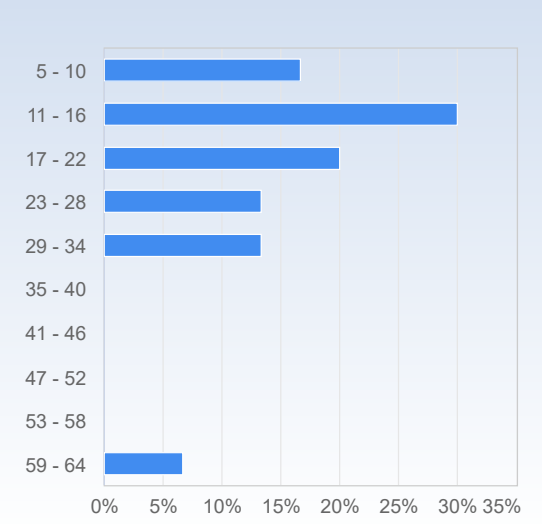
I feel that I have succeeded well in the course.	Number of responses
1	4 (13.3%)
2	7 (23.3%)
3	5 (16.7%)
4	6 (20.0%)
5	8 (26.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
I feel that I have succeeded well in the course.	3.2	1.4

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
5 - 10	5 (16.7%)
11 - 16	9 (30.0%)
17 - 22	6 (20.0%)
23 - 28	4 (13.3%)
29 - 34	4 (13.3%)
35 - 40	0 (0.0%)
41 - 46	0 (0.0%)
47 - 52	0 (0.0%)
53 - 58	0 (0.0%)
59 - 64	2 (6.7%)
Total	30 (100.0%)

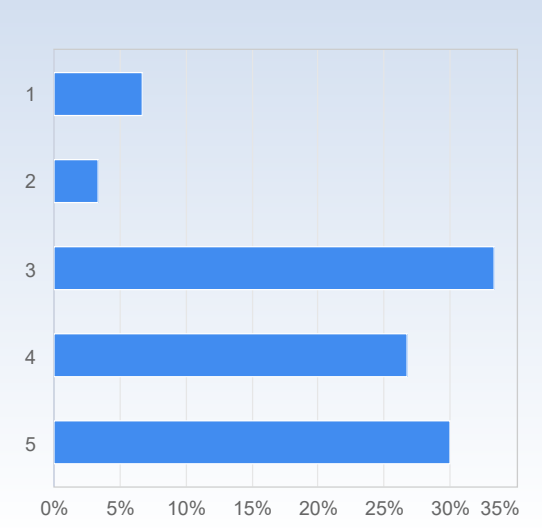


	Mean	Standard Deviation
Average number of hours spent in total on the course per week (including scheduled activities):	21.3	12.5

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 is taught and organised suits me.

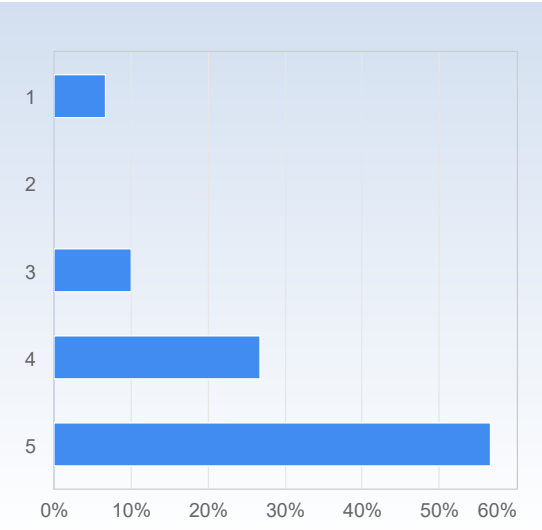
The way the course is taught and organised suits me.	Number of responses
1	2 (6.7%)
2	1 (3.3%)
3	10 (33.3%)
4	8 (26.7%)
5	9 (30.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
The way the course is taught and organised suits me.	3.7	1.1

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

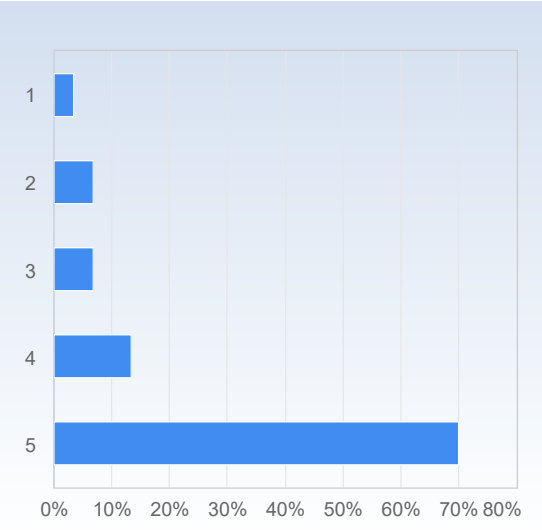
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	Number of responses
1	2 (6.7%)
2	0 (0.0%)
3	3 (10.0%)
4	8 (26.7%)
5	17 (56.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	4.3	1.1

Attending lectures on campus has been valuable for my learning.

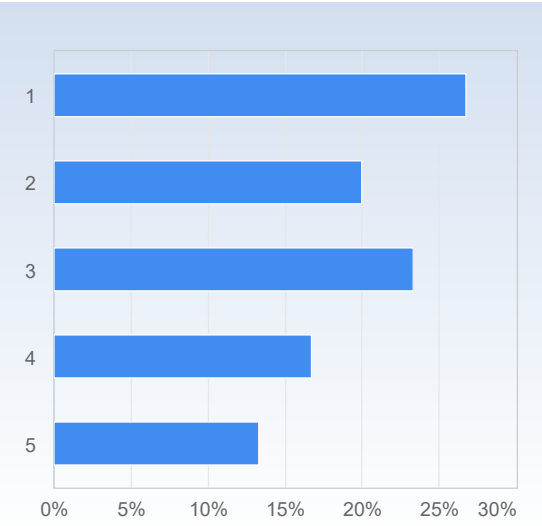
Attending lectures on campus has been valuable for my learning.	Number of responses
1	1 (3.3%)
2	2 (6.7%)
3	2 (6.7%)
4	4 (13.3%)
5	21 (70.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
Attending lectures on campus has been valuable for my learning.	4.4	1.1

Watching recorded lectures has been valuable for my learning.

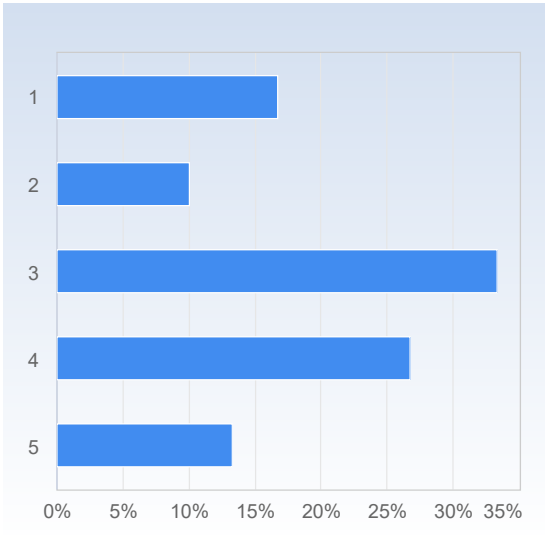
Watching recorded lectures has been valuable for my learning.	Number of responses
1	8 (26.7%)
2	6 (20.0%)
3	7 (23.3%)
4	5 (16.7%)
5	4 (13.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
Watching recorded lectures has been valuable for my learning.	2.7	1.4

The workshops (the lectures for chapters 3 and 7) were valuable for my learning

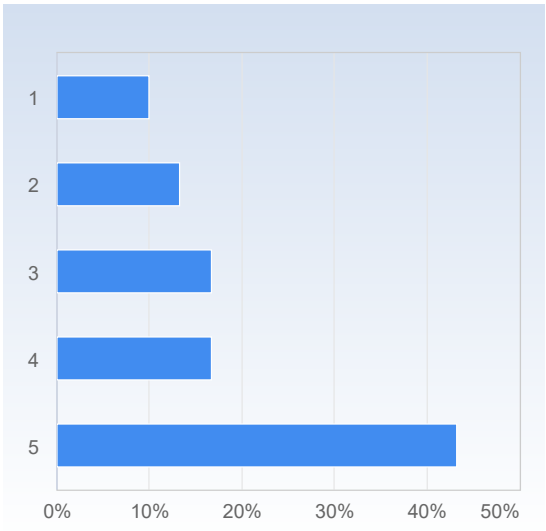
The workshops (the lectures for chapters 3 and 7) were valuable for my learning	Number of responses
1	5 (16.7%)
2	3 (10.0%)
3	10 (33.3%)
4	8 (26.7%)
5	4 (13.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
The workshops (the lectures for chapters 3 and 7) were valuable for my learning	3.1	1.3

Attending seminars on campus has been valuable for my learning.

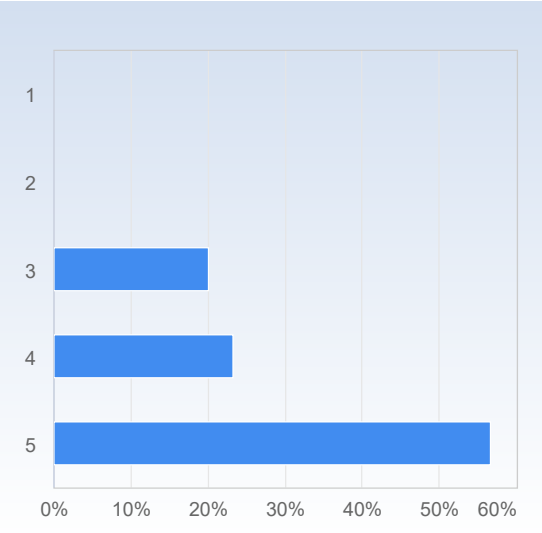
Attending seminars on campus has been valuable for my learning.	Number of responses
1	3 (10.0%)
2	4 (13.3%)
3	5 (16.7%)
4	5 (16.7%)
5	13 (43.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
Attending seminars on campus has been valuable for my learning.	3.7	1.4

Studying on my own has been valuable for my learning.

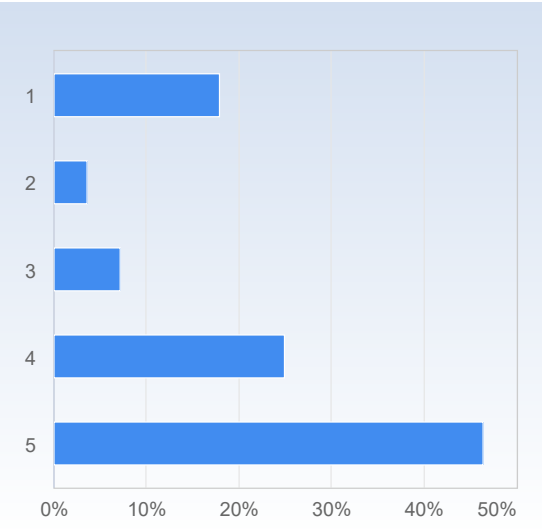
Studying on my own has been valuable for my learning.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	6 (20.0%)
4	7 (23.3%)
5	17 (56.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
Studying on my own has been valuable for my learning.	4.4	0.8

My mentor group has been valuable for my learning.

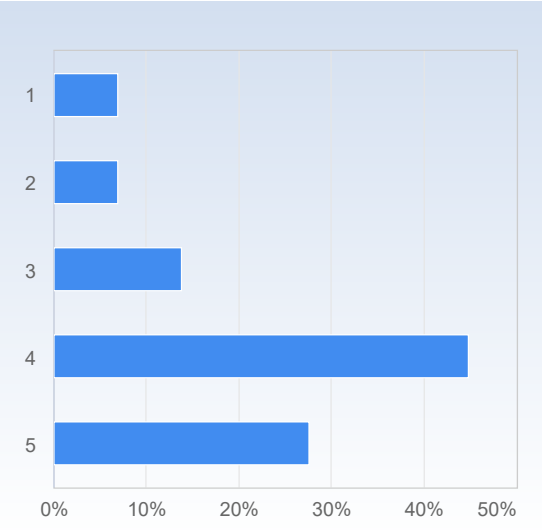
My mentor group has been valuable for my learning.	Number of responses
1	5 (17.9%)
2	1 (3.6%)
3	2 (7.1%)
4	7 (25.0%)
5	13 (46.4%)
Total	28 (100.0%)



	Mean	Standard Deviation
My mentor group has been valuable for my learning.	3.8	1.5

The course literature has been a valuable learning resource.

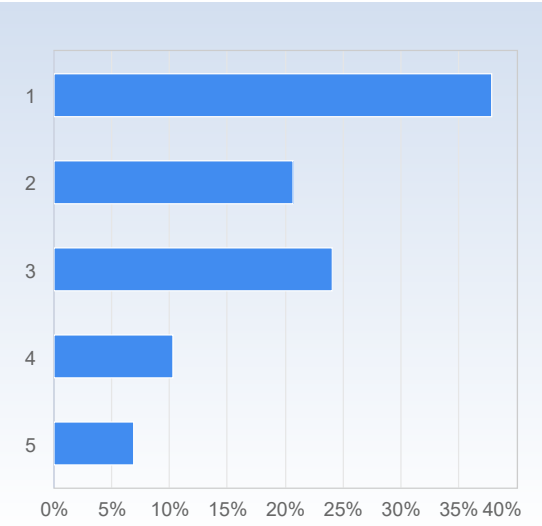
The course literature has been a valuable learning resource.	Number of responses
1	2 (6.9%)
2	2 (6.9%)
3	4 (13.8%)
4	13 (44.8%)
5	8 (27.6%)
Total	29 (100.0%)



	Mean	Standard Deviation
The course literature has been a valuable learning resource.	3.8	1.1

The pre-recorded YouTube films (linked in book) have been a valuable learning resource.

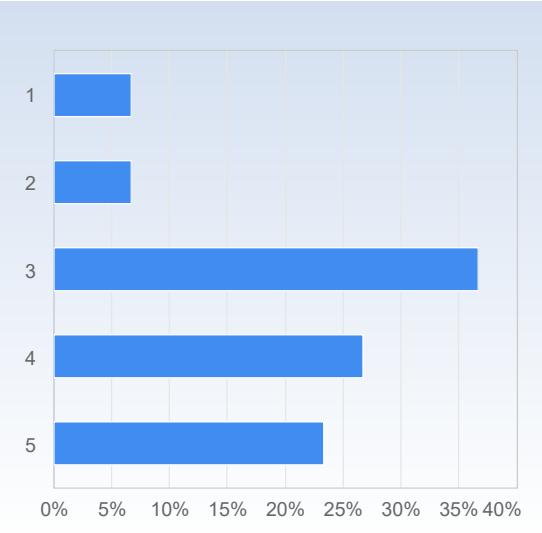
The pre-recorded YouTube films (linked in book) have been a valuable learning resource.	Number of responses
1	11 (37.9%)
2	6 (20.7%)
3	7 (24.1%)
4	3 (10.3%)
5	2 (6.9%)
Total	29 (100.0%)



	Mean	Standard Deviation
The pre-recorded YouTube films (linked in book) have been a valuable learning resource.	2.3	1.3

The information I received before the course start was satisfactory.

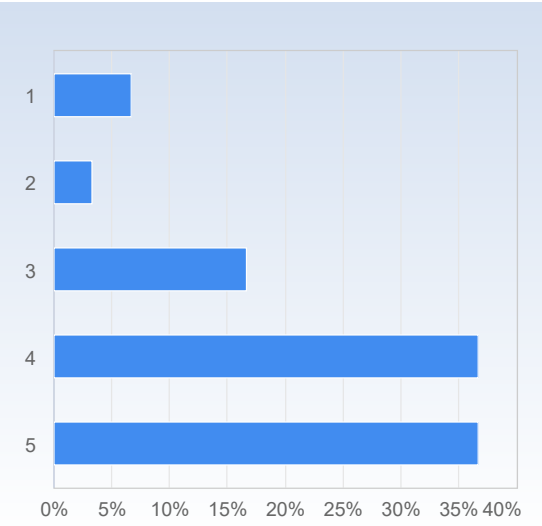
The information I received before the course start was satisfactory.	Number of responses
1	2 (6.7%)
2	2 (6.7%)
3	11 (36.7%)
4	8 (26.7%)
5	7 (23.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
The information I received before the course start was satisfactory.	3.5	1.1

The communication with the teaching staff has been good.

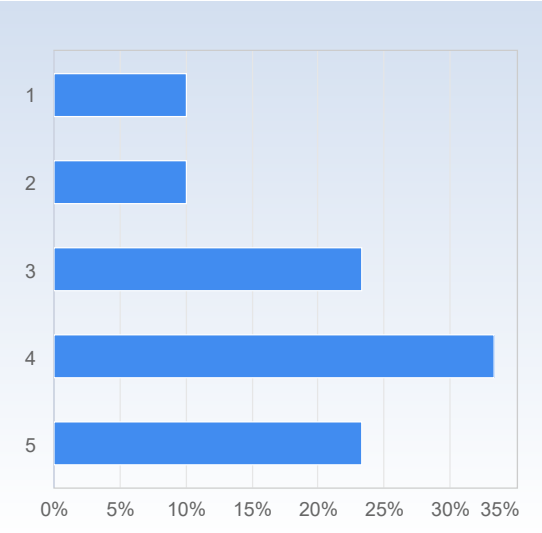
The communication with the teaching staff has been good.	Number of responses
1	2 (6.7%)
2	1 (3.3%)
3	5 (16.7%)
4	11 (36.7%)
5	11 (36.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
The communication with the teaching staff has been good.	3.9	1.1

It has been clear throughout the course what is expected of me.

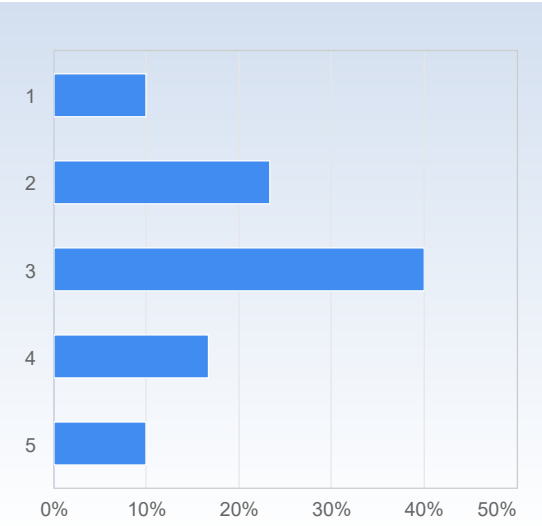
It has been clear throughout the course what is expected of me.	Number of responses
1	3 (10.0%)
2	3 (10.0%)
3	7 (23.3%)
4	10 (33.3%)
5	7 (23.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
It has been clear throughout the course what is expected of me.	3.5	1.3

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

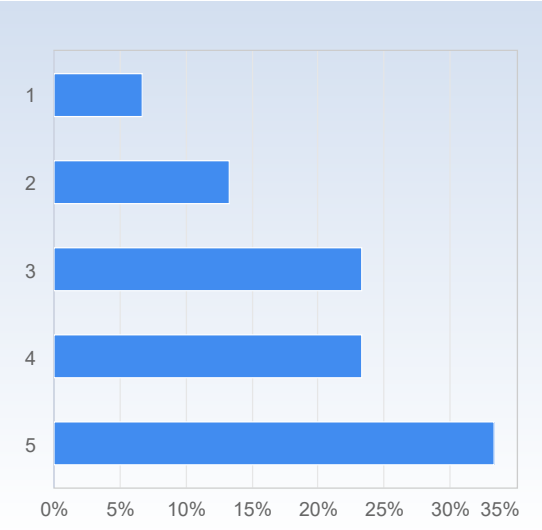
I have received valuable feedback from my teacher /teachers during the course.	Number of responses
1	3 (10.0%)
2	7 (23.3%)
3	12 (40.0%)
4	5 (16.7%)
5	3 (10.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
I have received valuable feedback from my teacher/teachers during the course.	2.9	1.1

The course has had a reasonable workload.

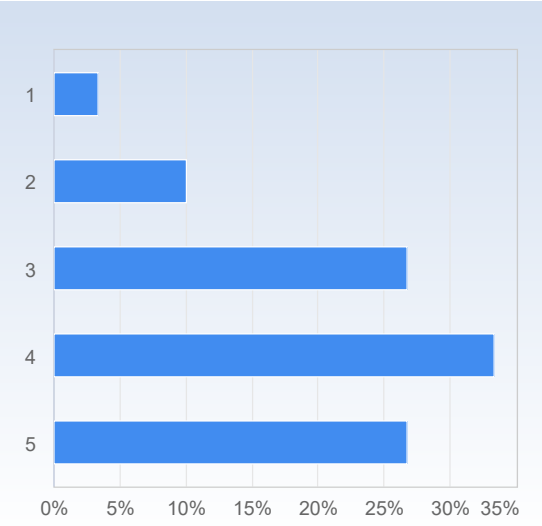
The course has had a reasonable workload.	Number of responses
1	2 (6.7%)
2	4 (13.3%)
3	7 (23.3%)
4	7 (23.3%)
5	10 (33.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
The course has had a reasonable workload.	3.6	1.3

The workload has been evenly distributed throughout the course.

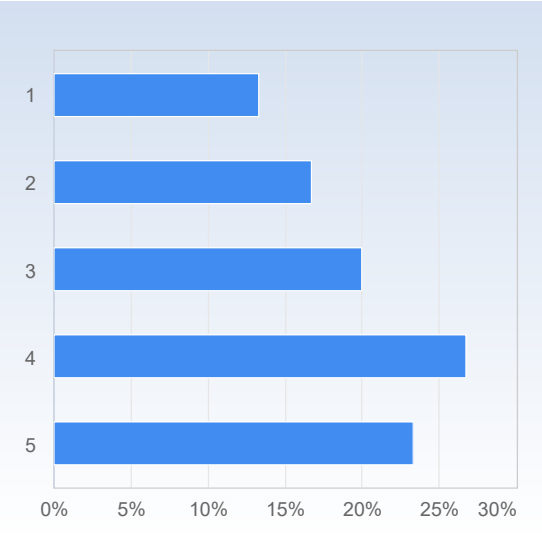
The workload has been evenly distributed throughout the course.	Number of responses
1	1 (3.3%)
2	3 (10.0%)
3	8 (26.7%)
4	10 (33.3%)
5	8 (26.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
The workload has been evenly distributed throughout the course.	3.7	1.1

The examination matched the contents and level of the course.

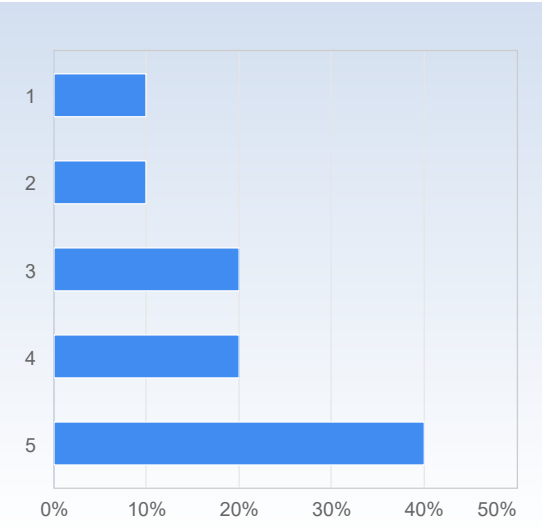
The examination matched the contents and level of the course.	Number of responses
1	4 (13.3%)
2	5 (16.7%)
3	6 (20.0%)
4	8 (26.7%)
5	7 (23.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
The examination matched the contents and level of the course.	3.3	1.4

Overall, I am satisfied with the course.

Overall, I am satisfied with the course.	Number of responses
1	3 (10.0%)
2	3 (10.0%)
3	6 (20.0%)
4	6 (20.0%)
5	12 (40.0%)
Total	30 (100.0%)



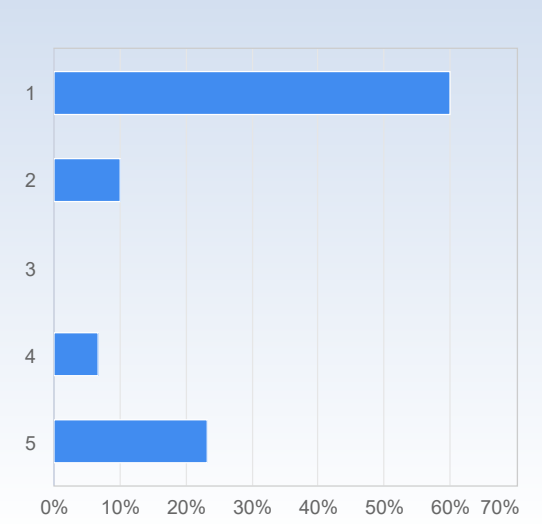
	Mean	Standard Deviation
Overall, I am satisfied with the course.	3.7	1.4

The use of Python in the course.

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

Before the start of the term, I already knew enough Python to get by in this class.

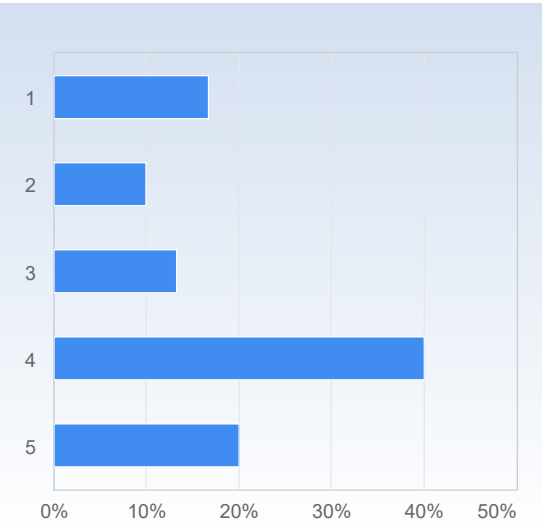
Before the start of the term, I already knew enough Python to get by in this class.	Number of responses
1	18 (60.0%)
2	3 (10.0%)
3	0 (0.0%)
4	2 (6.7%)
5	7 (23.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
Before the start of the term, I already knew enough Python to get by in this class.	2.2	1.7

In my view, the three Python lectures at the start of the term worked well as a preparation for the Python-related material in MATA21.

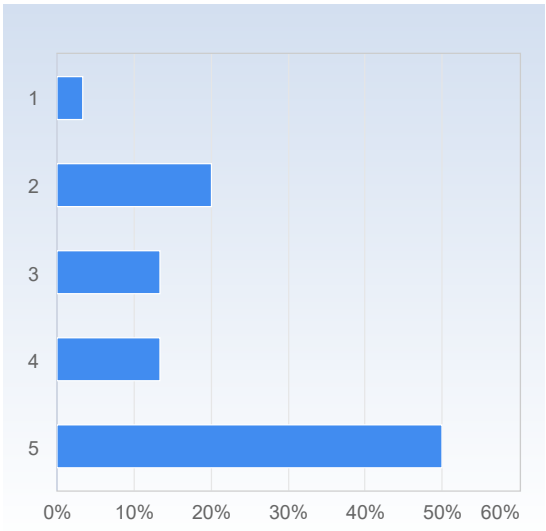
In my view, the three Python lectures at the start of the term worked well as a preparation for the Python-related material in MATA21.	Number of responses
1	5 (16.7%)
2	3 (10.0%)
3	4 (13.3%)
4	12 (40.0%)
5	6 (20.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
In my view, the three Python lectures at the start of the term worked well as a preparation for the Python-related material in MATA21.	3.4	1.4

I have understood the Python code used in demonstrations during lectures, seminars and workshops.

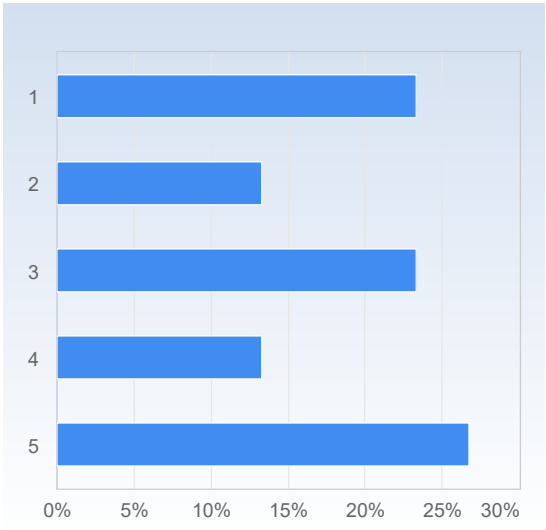
I have understood the Python code used in demonstrations during lectures, seminars and workshops.	Number of responses
1	1 (3.3%)
2	6 (20.0%)
3	4 (13.3%)
4	4 (13.3%)
5	15 (50.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
I have understood the Python code used in demonstrations during lectures, seminars and workshops.	3.9	1.3

I have avoided using Python in problems and exercises where I was asked to use Python.

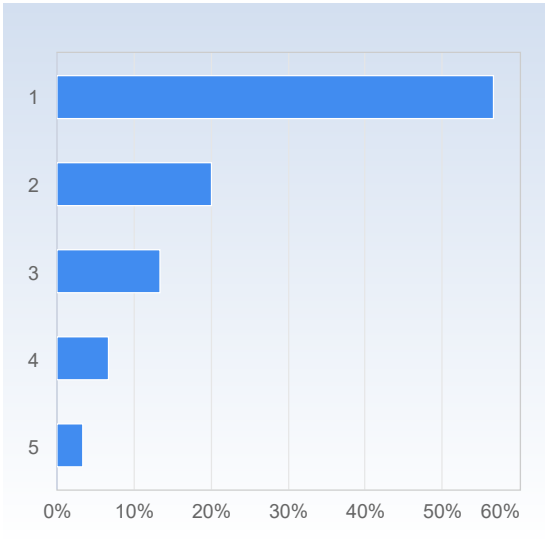
I have avoided using Python in problems and exercises where I was asked to use Python.	Number of responses
1	7 (23.3%)
2	4 (13.3%)
3	7 (23.3%)
4	4 (13.3%)
5	8 (26.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
I have avoided using Python in problems and exercises where I was asked to use Python.	3.1	1.5

I have used Python when working on MATA21 even when not asked to.

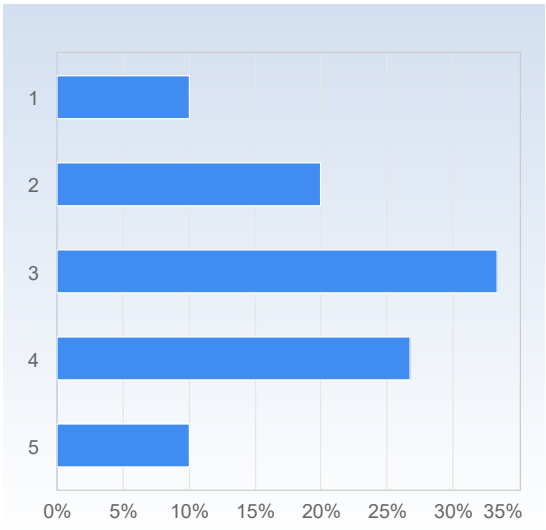
I have used Python when working on MATA21 even when not asked to.	Number of responses
1	17 (56.7%)
2	6 (20.0%)
3	4 (13.3%)
4	2 (6.7%)
5	1 (3.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
I have used Python when working on MATA21 even when not asked to.	1.8	1.1

The use of Python by the lecturer during lectures and workshops has been valuable for my learning.

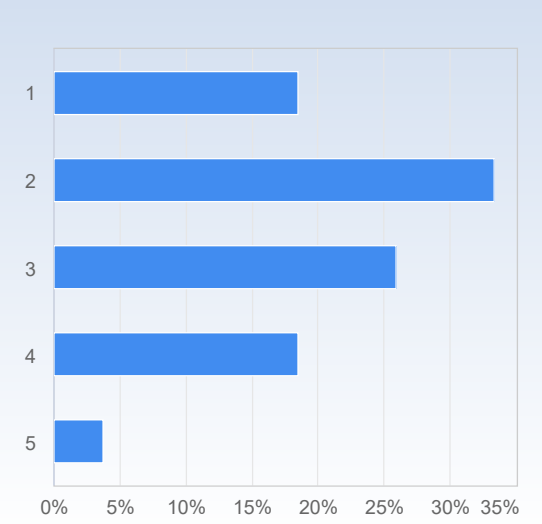
The use of Python by the lecturer during lectures and workshops has been valuable for my learning.	Number of responses
1	3 (10.0%)
2	6 (20.0%)
3	10 (33.3%)
4	8 (26.7%)
5	3 (10.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
The use of Python by the lecturer during lectures and workshops has been valuable for my learning.	3.1	1.1

The use of Python when working on problems and exercises has been valuable for my learning.

The use of Python when working on problems and exercises has been valuable for my learning.	Number of responses
1	5 (18.5%)
2	9 (33.3%)
3	7 (25.9%)
4	5 (18.5%)
5	1 (3.7%)
Total	27 (100.0%)



	Mean	Standard Deviation
The use of Python when working on problems and exercises has been valuable for my learning.	2.6	1.1

Did the use of Python helped you understand the course? Explain.

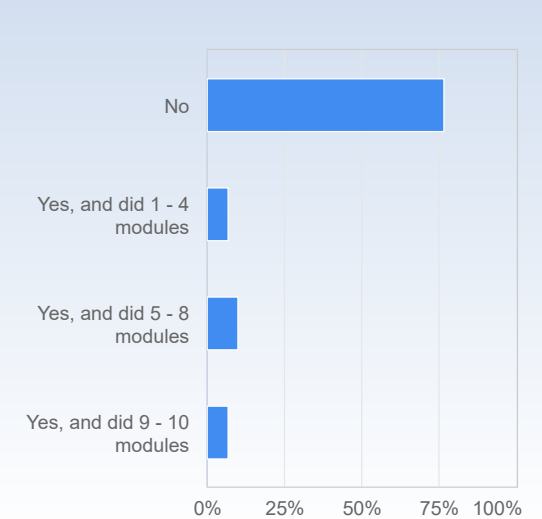
Did the use of Python helped you understand the course? Explain.
It gives a better view of say, a sum, when it is displayed in a different format, such as in python. It gives more intuition to work in python with these kinds of things.
Ja, lite det hjälper att förstå saker numeriskt oxh att lära sig samma sak på flera sätt är alltid nyttigt för mig.
A little bit in terms of how we apply the mathematics we learn.
No, I nerver used it.
Nope. I wish we would have actually incorporate modern methods more into the learning.
Yes, this is most evident with the chapter on Taylor polynomials where I made and algorithm in Python to check for which order Taylor polynomial it returns the value with a specific error. In particular, it helped me grasp the idea of a radius of convergence. When using it on values that lie just on the boundary of the radius the speed of convergence is much slower. Had it not been for the use of Python I would have not known about this fact.
At first no, but when we started to work more with error estimates and came to appreciate the importance of Python, and what the point of infinite series, Taylor polynomials and Big-Oh really is.
The use of python definitely helped me understand parts of the course however in the beginning I didn't know enough python to understand the code and even now I feel that I'm not capable of using python in a consistent manor.
To a certain point yes, for instance, it could help visualise how 1/k diverges.
Not really. Did not feel related to the course.
Not really.
Yes, it played a big part in getting comfortable with infinite series
Yes, I think the ability to numerically estimate the solutions to problems has been invaluable, however I found that it was very tedious to get the computer up during seminar etc.
Not at all. It only felt like something extra i had to learn while struggling with Linjär Algebra (which was severly overloaded with tasks!!!). And also, the classes in Python was not very informative did not contribute at all to me learning anything.
Somewhat, it was good for finding where certain series converged.
Yes, it helped with understandingin the early parts of the course when the concepts were new.
It's use during the lectures did, but I did not know enough python to write the code myself at the beginning of the course
Not really, I did not understand how to use it which became a problem when doing exercises that needed python.
I guess, but I felt like it was not extensively used

Did the use of Python negatively affected your understanding of the course? Explain.

Did the use of Python negatively affected your understanding of the course? Explain.
Många uppgifter krävde python för att approximera ex en serie eller taylorpolynom. Nästan inga uppgifter på hur man gör det utan python, vilket behövdes i ungefär 3 deluppgifter på tentan
Nej men ibland fanns det inte riktigt tid för att förstå programeringen ibland.
Nope!
No,it probably helped others
Many of the exercises surrounding python are incredible difficult to understand.
No
In the beginning it was difficult to understand, however that is due to my own inexperience with coding and not the way in which it was used during lectures.
No
It didn't affect it positively or negatively.
Nope.
not at all
It just made me feel more stupid
Finding the value of a convergence is not detrimental to the task of finding if something converges.
No.
It did not
Honestly, I barely used python which resulted in me not learning it at all, therefore it did not have a negative affect or a positive affect.
no

Did you take the refresher course MNXA21 before starting this course?

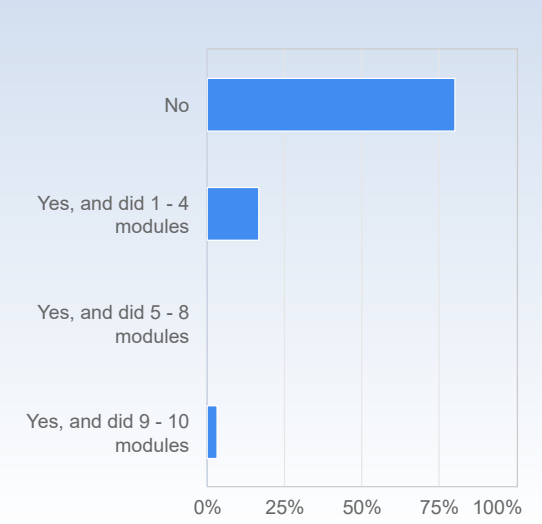
Did you take the refresher course MNXA21 before starting this course?	Number of responses
No	23 (76.7%)
Yes, and did 1 - 4 modules	2 (6.7%)
Yes, and did 5 - 8 modules	3 (10.0%)
Yes, and did 9 - 10 modules	2 (6.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
Did you take the refresher course MNXA21 before starting this course?	1.5	0.9

Did you do any modules of the refresher course MNXA21 in parallell to MATA21?

Did you do any modules of the refresher course MNXA21 in parallell to MATA21?	Number of responses
No	24 (80.0%)
Yes, and did 1 - 4 modules	5 (16.7%)
Yes, and did 5 - 8 modules	0 (0.0%)
Yes, and did 9 - 10 modules	1 (3.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
Did you do any modules of the refresher course MNXA21 in parallell to MATA21?	1.3	0.6

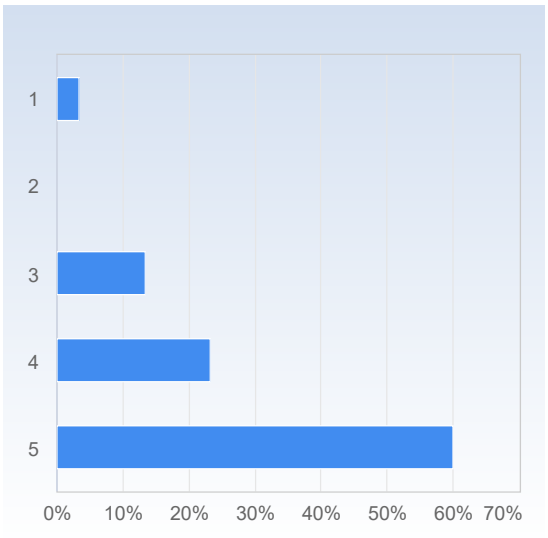
This term, we have organised the seminar in a new way (the old was more similar to that of the Linear Algebra course). Which of the two seminar formats do you think promotes your learning the most, and why?

This term, we have organised the seminar in a new way (the old was more similar to that of the Linear Algebra course). Which of the two seminar formats do you think promotes your learning the most, and why?
I like the way the seminars in lin-alg better since we got the solutions and tips on which ways to start the process exercises and some small tricks that someone who's more knowledgeable in maths know but not someone who has only taken one math-course on university before. But I like that we get to do the exercises ourselves during, but I would like more on the board
Det nya formatet passade mig bättre (eller en kombination) bra för att testa sig själv om man förstått innehållet från veckan
I don't remember the seminars from Linear Algebra, probably because I barely attended them, but I disliked the seminars in this course. I disliked them because it was hard to concentrate for me when there were so many people around and questions were often solved on the blackboard, which was distracting. I appreciate having someone to ask for help when I don't understand, but I wish it was more personal and quiet. The mentors were probably made for this but it did not have the desired effect for me.
Denna är mycket bättre för att man faktiskt måste räkna själv och att alla rund omkring sig sitter med samma problem.
The one you used this term was very good and much better.
I only went to a couple of the seminars in this course because I did not like the way they were set up. I felt stressed working on problems in the lecture hall. And it was unclear wether or not the problems were going to be run though at the end. I liked the seminars in linear algebra, because I got the time to sit with the problems on my own, and then knew someone was going to explain the process of how to solve them when I attended the seminar.
Linear algebra. The seminars were so bad in the analysis course. Linear algebra actually made me learn things, whereas i feel like i just became even dumber by attending the analysis seminars. As Jan-Fredrik put it: he does it to torture us so we will know what it feels like during the tenta. If you actually want to make the seminars valuable, try giving the students solution examples to all of the exercises, so that we are able to first try ourselves, and then compare with how a professional mathematician would do it. As of right now the seminars didn't teach us well enough, proof of that is clearly the result on question 5 from the tenta.
For me personally, this new format suits me better. I enjoy working with the problems myself and not needing to do the tasks ahead of time.
I prefer the linear algebra seminars. I think they promote conversation between students and teachers better, since the class room is smaller. Futhermore, it is more comfortable working on regular tables, rather than the awkward seats in lecture halls
I liked the linear algebra form as it was more structured and it was in smaller groups so it was easier to ask questions. Though I liked the seminars in calculus aswell but i didn't feel like it was very helpful when we didn't get answers of we did the exercises correctly,maybe after the seminars you could post solutions, so we can learn. I felt very insecure about this course because I almost never knew if I did a task correctly.
I prefer this way a lot more because you gain a lot more understanding for the material when you try, fail, ask questions, talk with your peers, instead of just treating it like homework like in the Linear Algebra course.
I believe the new seminars are an improvement since I personally learn more from working on a more complex task that challenges me than doing easier problems and seeing the solution after I have already finished it.
The old way. Because then you can ask more questions regarding the problems since you've done them beforehand.
I think the missing piece to the seminar format of envariabelanalys is simply handing out facit/lösningsförslag after each seminar. Even though you might be able to get some help during the seminar, I find that having something more tangible like lösningsförslag helps with my learning. Also it further mimicks a test, which i think is good.
This way, it gave an environment we're one was encourage too work and help was available if needed. The problems were also more interesting.
The seminars in MATA21 was better, more interactive. Watching someone else solve problems doesnt help me that much.
This way is better
This one, the linear algebra seminar was useful when you couldn't understand the course material but that wasn't really necessary in this course because the lecture was very good.
The seminars in MATA21 is a bit more focused on us solving the problems, which is good, but it also needs a little more time for the teachers to explain things
I personally liked the seminars in this course more. I have a problem with actually working with tasks but being in a place where we are supposed to do tasks makes it easier.
I prefer this way. Getting more difficult problems and the ability to discuss them as you solve them is in my opinion better than showcasing solutions.
I did not attend the linear algebra seminars, but I think the seminars in Envariabel could use some more structure. It is a good concept, but since it was sometimes hard to get help and the solutions were on mist occations not presenten on the board at the end of each seminar, I stopped attending.
Due to extra-curricular activities and work I have not attended seminars in either of the courses

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.

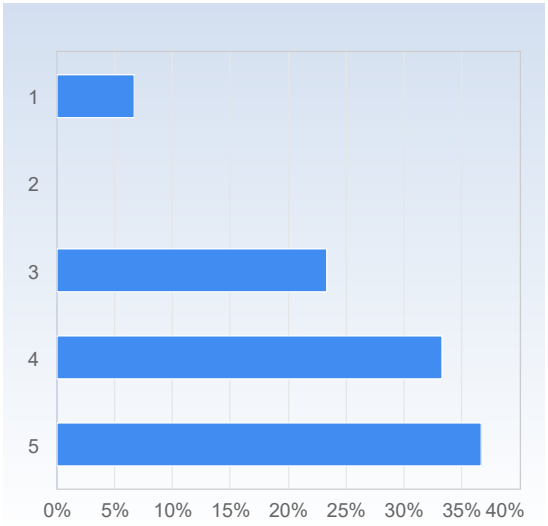
The course has increased my ability to read a mathematical text.	Number of responses
1	1 (3.3%)
2	0 (0.0%)
3	4 (13.3%)
4	7 (23.3%)
5	18 (60.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to read a mathematical text.	4.4	1.0

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

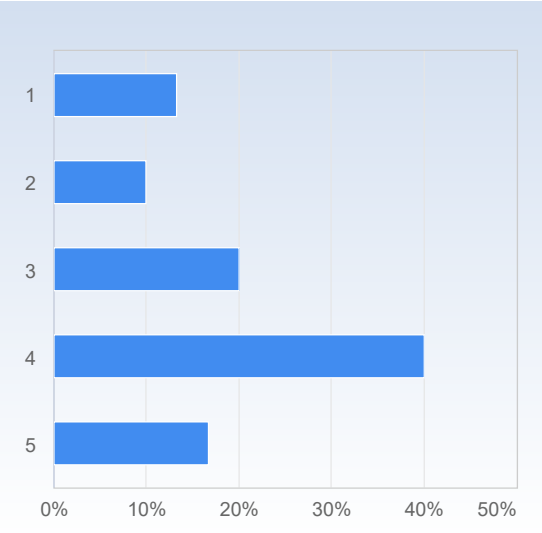
The course has increased my ability to communicate the subject in writing.	Number of responses
1	2 (6.7%)
2	0 (0.0%)
3	7 (23.3%)
4	10 (33.3%)
5	11 (36.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to communicate the subject in writing.	3.9	1.1

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

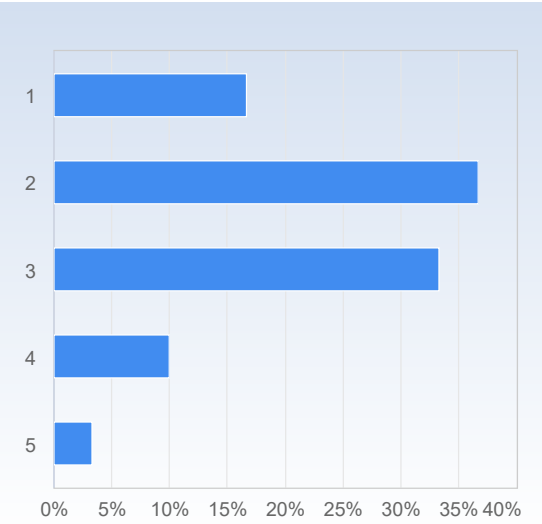
The course has increased my ability to communicate the subject orally.	Number of responses
1	4 (13.3%)
2	3 (10.0%)
3	6 (20.0%)
4	12 (40.0%)
5	5 (16.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to communicate the subject orally.	3.4	1.3

The course has increased my ability to cooperate.

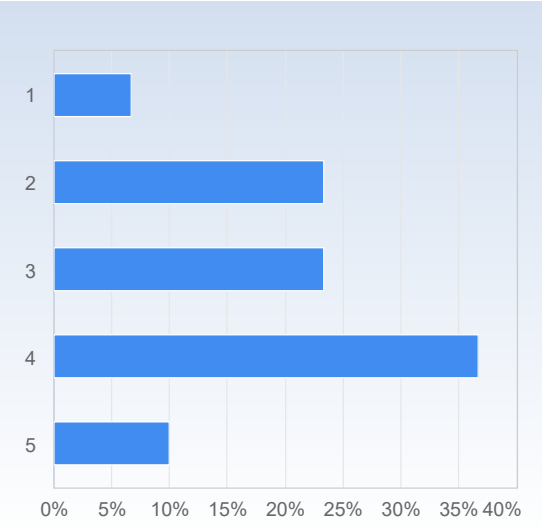
The course has increased my ability to cooperate.	Number of responses
1	5 (16.7%)
2	11 (36.7%)
3	10 (33.3%)
4	3 (10.0%)
5	1 (3.3%)
Total	30 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to cooperate.	2.5	1.0

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

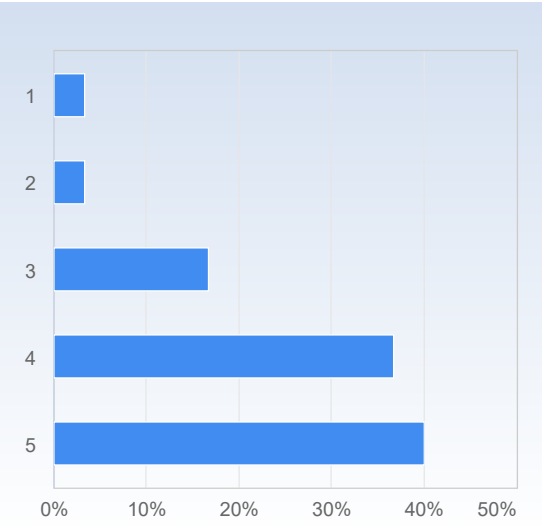
The course has increased my ability to search and process information.	Number of responses
1	2 (6.7%)
2	7 (23.3%)
3	7 (23.3%)
4	11 (36.7%)
5	3 (10.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to search and process information.	3.2	1.1

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

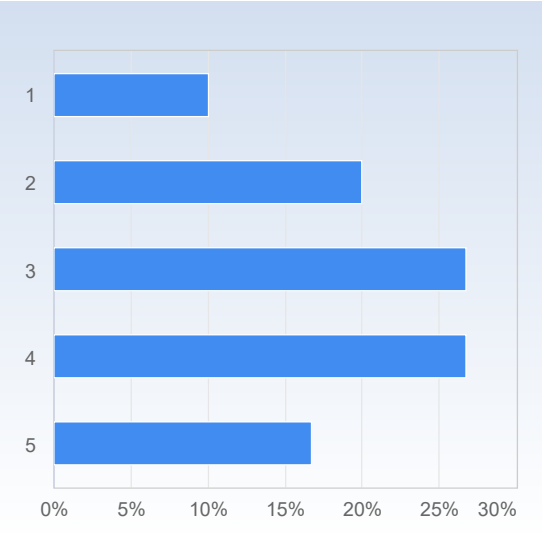
The course has increased my ability to analyze and solve problems.	Number of responses
1	1 (3.3%)
2	1 (3.3%)
3	5 (16.7%)
4	11 (36.7%)
5	12 (40.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to analyze and solve problems.	4.1	1.0

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

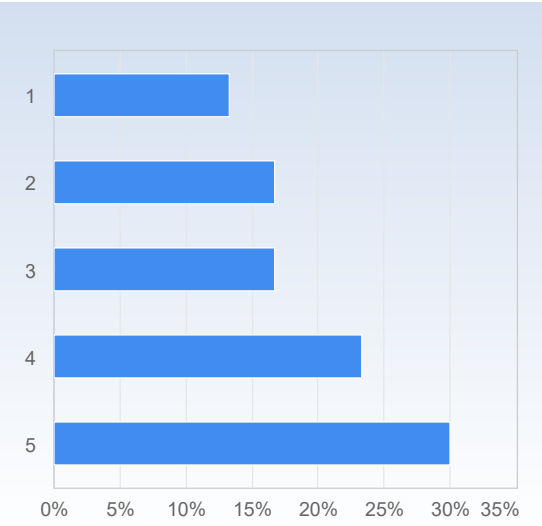
As a result of this course, I feel confident about tackling unfamiliar problems.	Number of responses
1	3 (10.0%)
2	6 (20.0%)
3	8 (26.7%)
4	8 (26.7%)
5	5 (16.7%)
Total	30 (100.0%)



	Mean	Standard Deviation
As a result of this course, I feel confident about tackling unfamiliar problems.	3.2	1.2

The course has stimulated my overall interest for mathematics.

The course has stimulated my overall interest for mathematics.	Number of responses
1	4 (13.3%)
2	5 (16.7%)
3	5 (16.7%)
4	7 (23.3%)
5	9 (30.0%)
Total	30 (100.0%)



	Mean	Standard Deviation
The course has stimulated my overall interest for mathematics.	3.4	1.4

What did you appreciate most with the course?

What did you appreciate most with the course?
The course feels abstract for a beginner which was a cool feeling.
Tror faktiskt seminarierna för att just få svåra uppgifter som tvingar en att tänka själv även fast de ibland va väl svåra. Sedan tycker jag att boken är pedagogisk och mer lättförstålig än andra matteböcker.
Seeing how some parts of the mathematics we learned were applied in physics problems, like Taylor polynomials.
I will have use of the mathematical skills that the course taught in the rest of my studies.
Nothing
Our mentor is a nice guy. Sometimes Jan-Fredrik landed some funny jokes.
I really appreciate that there is an overarching structure to the course where almost everything has its place and ties in well with the rest of the material. Also, the sneak peeks at more advanced mathematics has really piqued my interest in further mathematical studies e.g. topology and measure theory.
The rigour and depth that we covered the different parts of the course
The lectures, it was fun and I threshing to listen during lectures and I really liked the fact that you use PowerPoint in the way that you do.
The lectures are very engaging and the scheduling allowed me to start my studying before the lectures and seminars which allowed me to be more prepared compared to previous courses. The support from the seminars are also very helpful. I also really like the mentor groups as it evolved into a smaller seminar in a way that you had more influence over.
That most of the proofs have a video explaining them since this makes it easier to understand them, and thereby understand how the are used in later proofs / formulas.
Having a mentor was appreciated.
I really enjoyed the lectures. Jan-Fredrik doesn't just monotonously read from a paper for 2 hours etc. He is engaged with the audience and tries to makes sure that we understand whats being taught. I feel like his seeming passion for math shines through in the way he goes about lecturing.
Jag tycker det är bra att vi har blivit utmanade. Kursen har haft hög nivå, vilket jag tror kommer hjälpa framtida kurser som vi kommer läsa.
The focus on series and how they are connected to integration.
Lectures being at 10 am, I know this is supposed to be about the course material (it's the lectures. Jan Fredrik made the material really enjoyable).
Recorded lectures and recommended videos on youtube
Actually learning how math is proven.
The lectures!
The mentor-meetings
A good lecturer who really tried to engage us students on the lectures. Learning to really tackle problems on my own.
A deeper understanding of mathematics, as well as a greater understanding of how to solve differential equations

What do you think should be improved?

What do you think should be improved?
Fler youtube-videos. Fanns nästan inga till andra halvan. Hade definitivt uppskattat det för bestämda integraler och taylorpolynom
I did not like the "slides" presentation style. It was improved with the use of the pen but generally, I like the white/blackboard more, because it is easier to take notes when it is that way. It also encourages the lecturer to have prepared classes that focus more on the theory and definitions, rather than examples, which don't further my knowledge of the material that much.
Tyckte inte att workshoppsen var så lyckade för att de blev mest föreläsning vilket då var lite jobbigt för att det blev två timmar längre än de andra föreläsningar.
Have more complete solutions for questions in the beginning chapters so you get the correct mindset how to approach mathematical evidence questions.
I think that some tasks that are like the exam question should be handed out for each part of the material and should be graded like we had in the Linear Algebra course.
Everything. This course was so bad. I was looking forward to it before the course, I put a lot of time and effort, and still that just wasn't enough. The lectures are messy, it is difficult to understand what is going on, the writing is too small and the text is illegible. The questions in the book are impossible, there are no solutions, no solution exemples and they just aren't on the same level as the ones we are expected to be able to solve. The seminars are worthless, improve or replace with something actually useful. The mentor meetings are good sometimes, but the mentors dont know how to teach. The teaching assitants are good sometimes, they try their best. However they don't kno how to teach either and often explain things in a way that is impossible to understand.
Having done all exercises in the course book except for the ones in the appendices I can say that while they are in general very good, there are some exercises that are at times too vague e.g. Exercise 5.16 about associativity and Grandi's series.
I think there should be more focus on the completeness axiom in chapter 1, as it is very important for some of the biggest theorems in this course, leading up to the intermediate value theorem that we get to in the second half of the course. It was pretty difficult to get a grasp of the proofs for these theorems since I hadn't gotten the time to build up intuition about the real number line.
Organising and structure when giving examples.
I didn't enjoy the expectation of managing the course with only 1 supervised "räkneövning" however this changed with the course. I also think that the workshops can be very overwhelming as they are a lot longer and you have less time with questions to comprehend what you've learnt.
In some of the last chapters in the course literature, there are some proofs and lemmas that don't have a video that explains them. This can be a problem if you don't understand the proof, since they are usually required for understanding the rest of the chapter.
We did nothing of what came on the test. Do more examples, please.
The seminars maybe, also I found some of the programming during the lectures a bit excessive.
Give answers too the proof questions in the book, like 12.13, 12.15. If one can not complete the proofs the rest can be harder to understand and it can be hard to find a the proof for some of them. Another problem with both having the proof is that it can be hard to check if one’s proof is correct.
Jag tycker dock att det är väldigt mycket som vi behöver kunna inför tentamen. Speciellt då kapitel 12-13 är stora och svårts kapitel som gicks igenom väldigt sent. Det blev därför svårt att hinna smälta informationen innan tentamen.
I don't think that lecturing on a digital slide is always the best. It was difficult to follow and take notes at times, and going back to rewatch was not a good enough argument for this alternative. I prefer use of the black board when doing proofs and general definition writing etc. The digital lecture tool was very nice when showing animations and code however. Maybe a mix would be nice.
There was a pretty large difference in the difficulty between the midterm and the final. Although the difficulty of the midterm might have further motivated me to study for the final.
This course is probably a great starting course for mathmaticans but it is not really made for student that needs to learn math to use "in the real world", as in problemsolving. This might need some adjusting.
No clue.
I do not think there was anything in particular that needs to be improved but the workshops overall did not help me as much.
The seminars
Usually the first half of every lecture is easy to listen to since it is thorough. However, the second half have a good start, but then in the last 10 minutes it is to fast to comprehend since we are on a time schedule. Better time planning perhaps for the lectures!
I felt like the exam was more theory heavy than the "ex-tentor" which meant I felt like I studied for the wrong thing a little bit. However, I still passed.

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
Nej
No
No
No, I did not think anyone was discriminatory, though I don't know if it's appropriate to say that mathematicians don't/cant believe in God and such things as it's not true and it gives an image that religious people can't succeed in math and physics.
No.
No
Not really. The religious jokes were more fun than offensive.
no
no
No
No.
No.
No
No.
no

What further opinions about the course would you like to share?

What further opinions about the course would you like to share?
I think that teaching something like calculus is really hard and I think you did a good job overall. I will go back to the things I learned here for the rest of my life, and I am thankful for that.
Nothing.
It feels as if you had to have had taken multiple extra courses during high school to be able to succeed in this course. I am highly dissappointed.
I think the course has served as an excellent stepping stone for further mathematical studies and I think future me will be very happy that I took the time to do every exercise and really try to understand the theory behind every chapter.
Very fun :D
really happy overall, inspired me to further my education within mathematics.
Jan Fredrick was great, if you're reading this, hope you have a good time in Oslo
It was fun and engaging.
The lectures were very entertaining and educational and "Don't panic" was very helpfull.
Same as 13. The exam was not too hard, but I felt that the old exams did not accurately represent how the exam would look like. Would I have known this I would've studied in a different way. However, Jan-Fredrik has been a fantastic lecturer, and both the "book" and the online material and recorded lectures have been essential to my learning during the course. I could not say anything that he could've made any better.