

# Course Analysis for MATA31 Analysis in One Variable, Autumn 2024

## Course information

**Lecturer:** Jan-Fredrik Olsen

**Teaching assistants:** Thomas Munn, Alex Bergman, Erik Troedsson, Frej Dahlin

### Number of students:

96 newly registered and 0 re-registered.

39 students answered the course evaluation. An additional 5 responded to an 'old' version of the course evaluation form that was erroneously available for a short time following the written exam. (Reports from both are attached.)

## Examination

- **Written assignment on communication:** 86 students passed.
- **Computer test:** 86 students passed.
- **Oral presentation:** 86 students passed.
- **Mid-term examinations (ordinary + re-sit):**
  - o 2024-10-31: 78 out of 87 attending passed.
  - o 2024-12-05: 9 out of 11 attending passed.
  - o In total: 87 out of 89 (?) attending passed.
- **Written examinations (ordinary + re-sit):**
  - o Course code MATA31:
    - 2025-01-14: 78 = 39 VG + 27 G + 12 U
    - 2025-02-01: 12 = 2 VG + 7 G + 3 U
    - 85 total = 41 VG + 34 G + 10 U
  - o Course code MATA21:
    - 2025-01-14: 30 = 1 VG + 5 G + 24 U
    - 2025-02-01: 21 = 3 VG + 8 G + 10 U
    - 31 total = 4 VG + 13 G + 24 U
  - o Course code ÄMAD01:
    - 2025-01-14: 2 U.
- **Overall grade on course (VG requires oral exam):**
  - o Course code MATA31:
    - 73 total = 40 VG + 33 G
  - o Course code MATA21:
    - 9 total = 9 G

## Teacher's comments

- The number of newly registered students passing the course was encouraging (75 out of 85 passing).
- Out of the newly registered students, 41 had the option of doing an oral exam for the grade VG. 40 accepted the challenge. The students who did not get VG (5) on the oral were offered a second attempt. All succeeded.
- Students were required to use generative AI for the written assignment for communication: "Collaborate with a generative AI on solving a problem that you do not think you could have solved on your own." The purpose was to have students gain experience in engaging with AI in solving mathematical tasks. Part of the task was to reflect on the learning gain – if any – from engaging with the AI. The students seemed happy about the task.
- Seminars were in a workshop style, with worksheet handed out at start of seminars with problems students had not seen before. Worksheets split up into 3 parts: warm-up problems, main problems, epilogue (optional problems for thinking about afterward). TA's were active during seminars, and engaged in 1-1 or group discussion when needed. The seminars were fairly well-visited, with number of students attending stabilizing around 50 per session.
- The mid-term and final exams were in the same format as the seminar worksheets. As the number of students failing was low on the mid-term, students that did not pass the mid-term were offered the chance of oral follow-ups. Students within 10 points of passing on the final exam were also offered oral follow-ups.

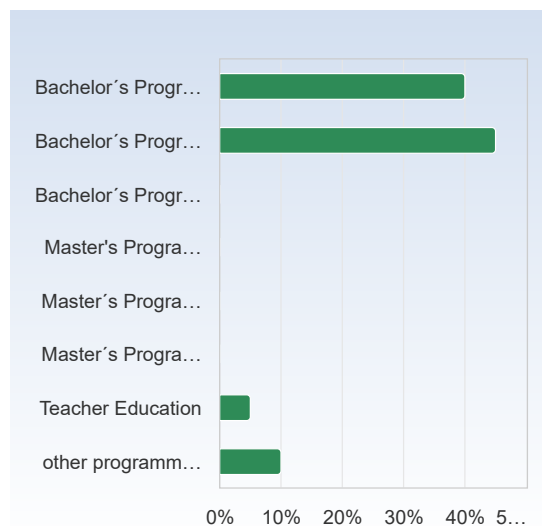


## MATA31HT24 Analysis in One Variable

Respondents: 135  
Answer Count: 39  
Answer Frequency: 28.89%

### I have studied this course as part of

I have studied this course as part of	Number of responses
Bachelor's Programme in Mathematics	16 (42.1%)
Bachelor's Programme in Physics, Theoretical Physics, Astronomy	18 (47.4%)
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	0 (0.0%)
Teacher Education	2 (5.3%)
other programme or as stand alone course	4 (10.5%)
Total	40 (105.3%)



	Mean	Standard Deviation
I have studied this course as part of	2.4	2.3

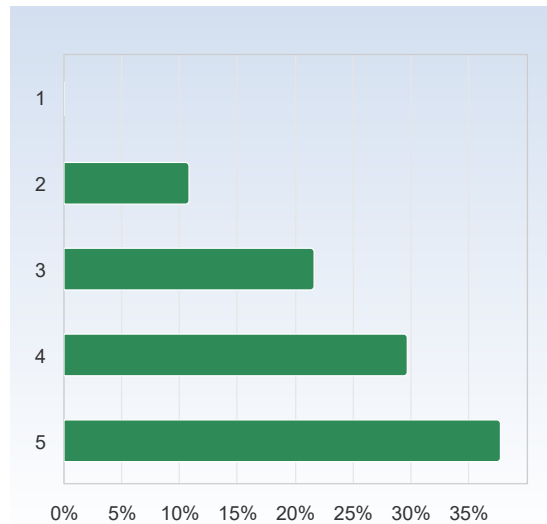


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On the scale 1-5 select the option that best matches your opinion: 1= disagree completely → 3= partly agree → 5= agree completely

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

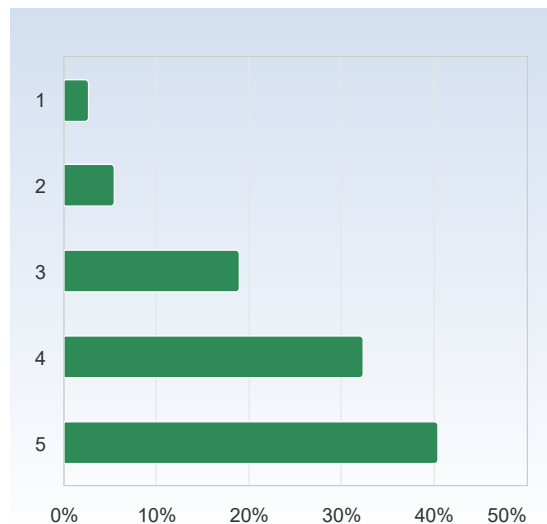
2. My prior knowledge has been sufficient to assimilate the contents of this course.	Number of responses
1	0 (0.0%)
2	4 (10.8%)
3	8 (21.6%)
4	11 (29.7%)
5	14 (37.8%)
Total	37 (100.0%)



	Mean	Standard Deviation
2. My prior knowledge has been sufficient to assimilate the contents of this course.	3.9	1.0

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

3. I have participated actively in the course.	Number of responses
1	1 (2.7%)
2	2 (5.4%)
3	7 (18.9%)
4	12 (32.4%)
5	15 (40.5%)
Total	37 (100.0%)



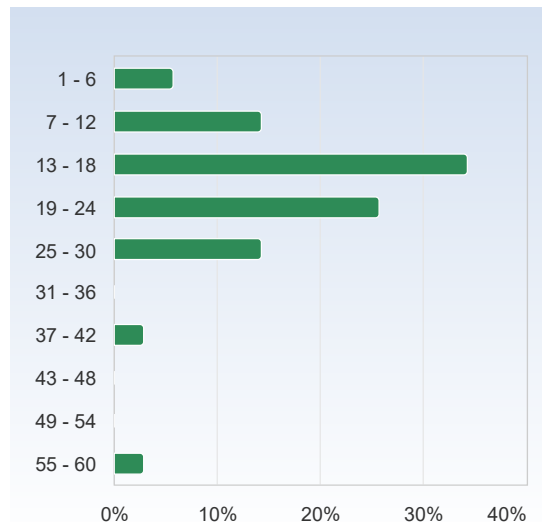
	Mean	Standard Deviation
3. I have participated actively in the course.	4.0	1.0



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### 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
1 - 6	2 (5.7%)
7 - 12	5 (14.3%)
13 - 18	12 (34.3%)
19 - 24	9 (25.7%)
25 - 30	5 (14.3%)
31 - 36	0 (0.0%)
37 - 42	1 (2.9%)
43 - 48	0 (0.0%)
49 - 54	0 (0.0%)
55 - 60	1 (2.9%)
Total	35 (100.0%)



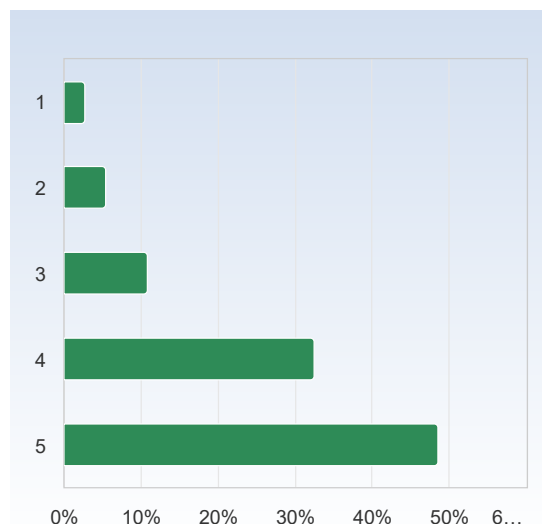
	Mean	Standard Deviation
Average number of hours spent in total on the course per week (including scheduled activities):	19.2	10.4

### 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	1 (2.7%)
2	2 (5.4%)
3	4 (10.8%)
4	12 (32.4%)
5	18 (48.6%)
Total	37 (100.0%)



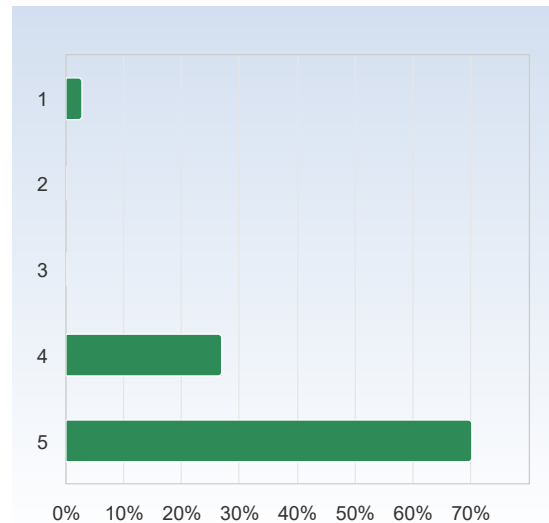
	Mean	Standard Deviation
The way the course was taught and organised suited me.	4.2	1.0



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

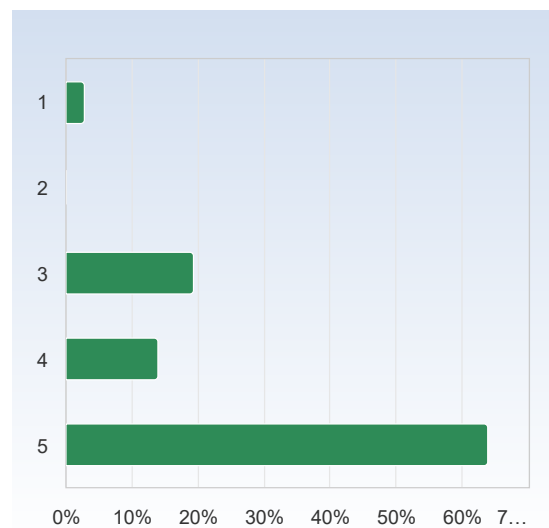
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	Number of responses
1	1 (2.7%)
2	0 (0.0%)
3	0 (0.0%)
4	10 (27.0%)
5	26 (70.3%)
Total	37 (100.0%)



	Mean	Standard Deviation
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	4.6	0.8

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

The lectures were valuable for my learning.	Number of responses
1	1 (2.8%)
2	0 (0.0%)
3	7 (19.4%)
4	5 (13.9%)
5	23 (63.9%)
Total	36 (100.0%)



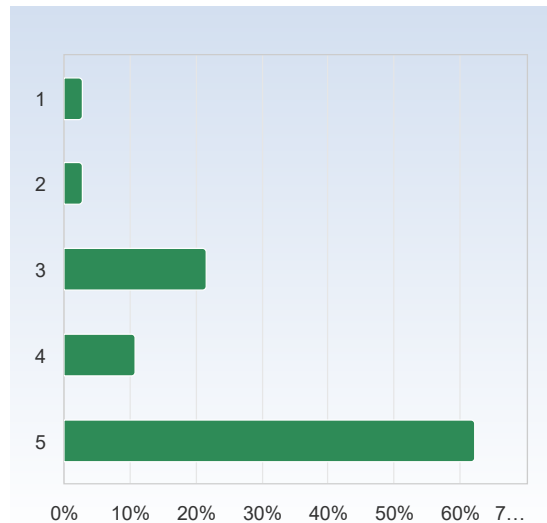
	Mean	Standard Deviation
The lectures were valuable for my learning.	4.4	1.0



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### The seminars were valuable for my learning.

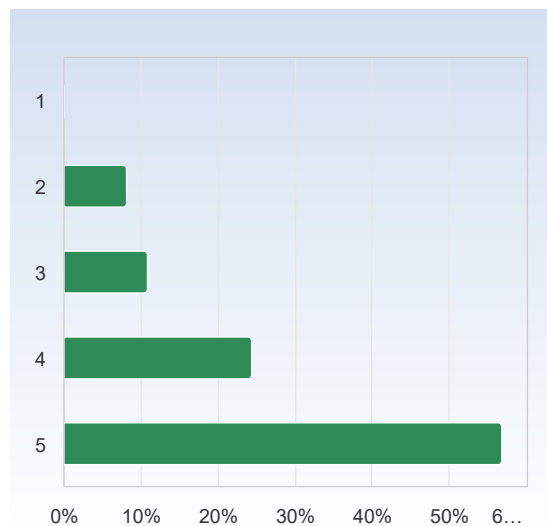
The seminars were valuable for my learning.	Number of responses
1	1 (2.7%)
2	1 (2.7%)
3	8 (21.6%)
4	4 (10.8%)
5	23 (62.2%)
Total	37 (100.0%)



	Mean	Standard Deviation
The seminars were valuable for my learning.	4.3	1.1

### 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	3 (8.1%)
3	4 (10.8%)
4	9 (24.3%)
5	21 (56.8%)
Total	37 (100.0%)



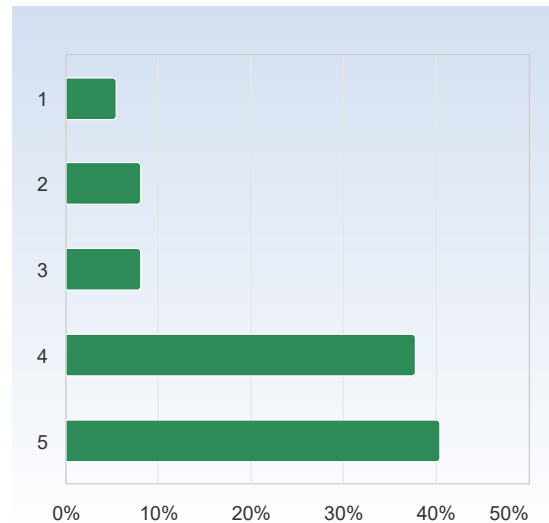
	Mean	Standard Deviation
Studying on my own was valuable for my learning.	4.3	1.0



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

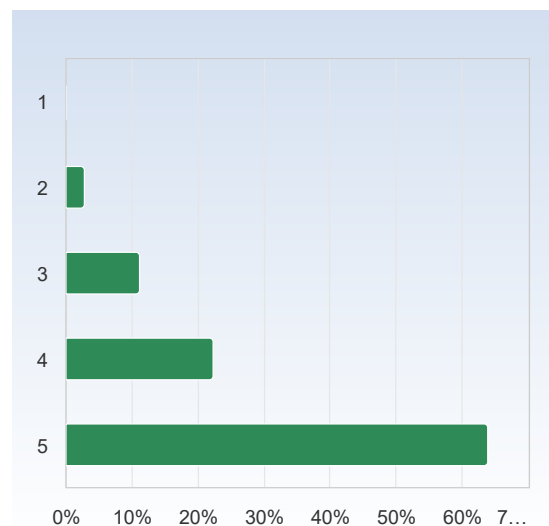
The course literature/material was a valuable learning resource.	Number of responses
1	2 (5.4%)
2	3 (8.1%)
3	3 (8.1%)
4	14 (37.8%)
5	15 (40.5%)
Total	37 (100.0%)



	Mean	Standard Deviation
The course literature/material was a valuable learning resource.	4.0	1.2

**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 (2.8%)
3	4 (11.1%)
4	8 (22.2%)
5	23 (63.9%)
Total	36 (100.0%)



	Mean	Standard Deviation
The information I received before the course start was satisfactory.	4.5	0.8

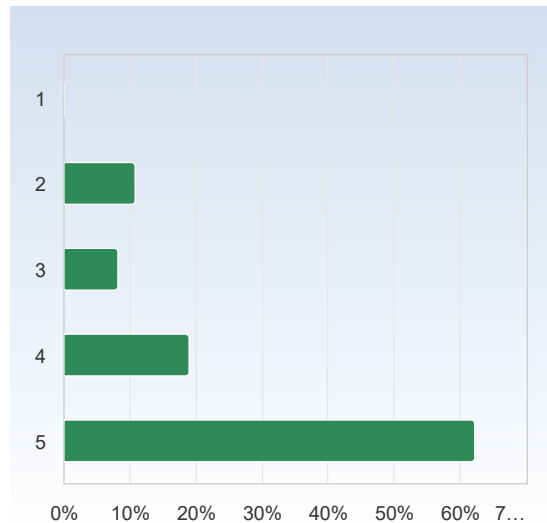




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**The communication with the teaching staff during the course was good.**

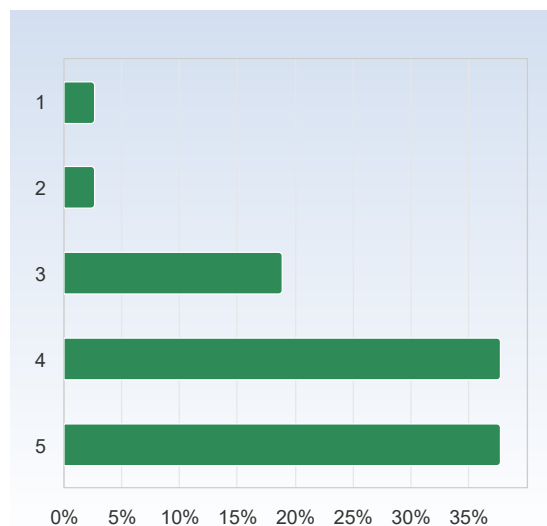
The communication with the teaching staff during the course was good.	Number of responses
1	0 (0.0%)
2	4 (10.8%)
3	3 (8.1%)
4	7 (18.9%)
5	23 (62.2%)
Total	37 (100.0%)



	Mean	Standard Deviation
The communication with the teaching staff during the course was good.	4.3	1.0

**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 (2.7%)
2	1 (2.7%)
3	7 (18.9%)
4	14 (37.8%)
5	14 (37.8%)
Total	37 (100.0%)



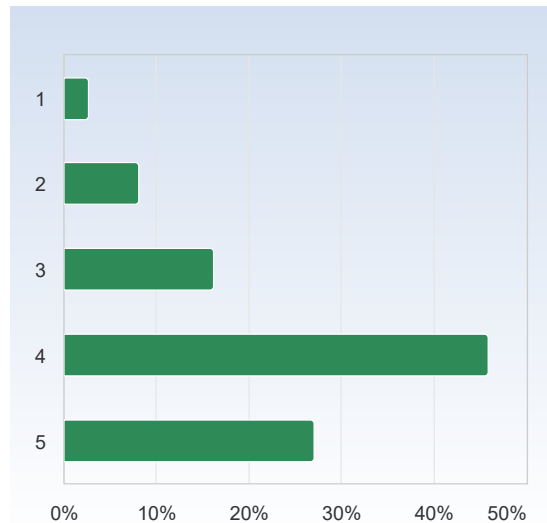
	Mean	Standard Deviation
It was clear throughout the course what was expected of me.	4.1	1.0



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

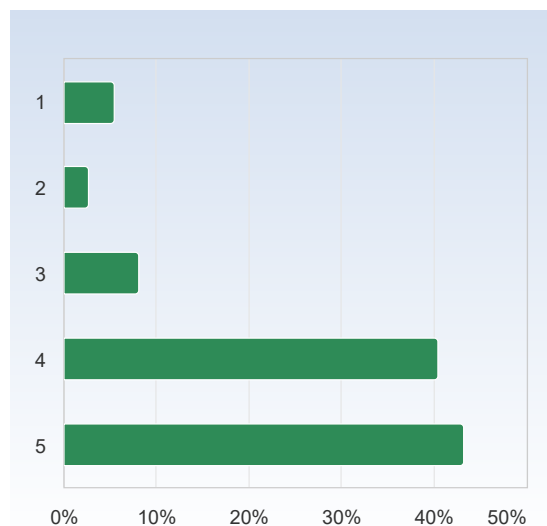
I have received valuable feedback from my teacher /teachers during the course.	Number of responses
1	1 (2.7%)
2	3 (8.1%)
3	6 (16.2%)
4	17 (45.9%)
5	10 (27.0%)
Total	37 (100.0%)



	Mean	Standard Deviation
I have received valuable feedback from my teacher/teachers during the course.	3.9	1.0

**The course had a reasonable workload.**

The course had a reasonable workload.	Number of responses
1	2 (5.4%)
2	1 (2.7%)
3	3 (8.1%)
4	15 (40.5%)
5	16 (43.2%)
Total	37 (100.0%)



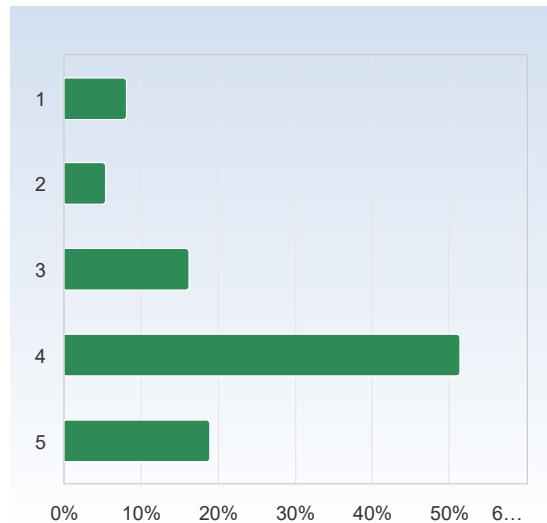
	Mean	Standard Deviation
The course had a reasonable workload.	4.1	1.1



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

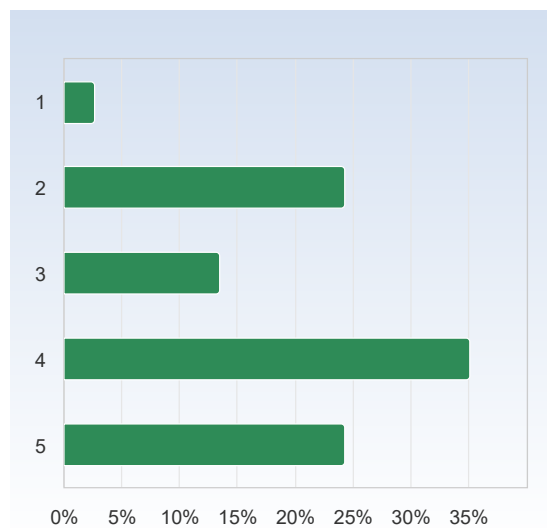
The workload was evenly distributed throughout the course.	Number of responses
1	3 (8.1%)
2	2 (5.4%)
3	6 (16.2%)
4	19 (51.4%)
5	7 (18.9%)
Total	37 (100.0%)



	Mean	Standard Deviation
The workload was 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	1 (2.7%)
2	9 (24.3%)
3	5 (13.5%)
4	13 (35.1%)
5	9 (24.3%)
Total	37 (100.0%)



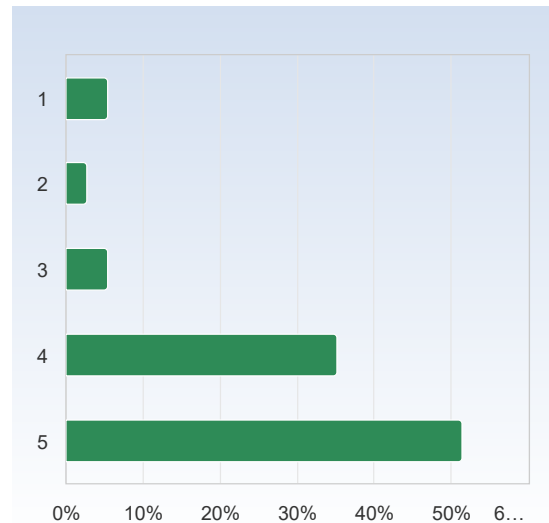
	Mean	Standard Deviation
The examination matched the contents and level of the course.	3.5	1.2



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

Overall, I am satisfied with the course.	Number of responses
1	2 (5.4%)
2	1 (2.7%)
3	2 (5.4%)
4	13 (35.1%)
5	19 (51.4%)
Total	37 (100.0%)



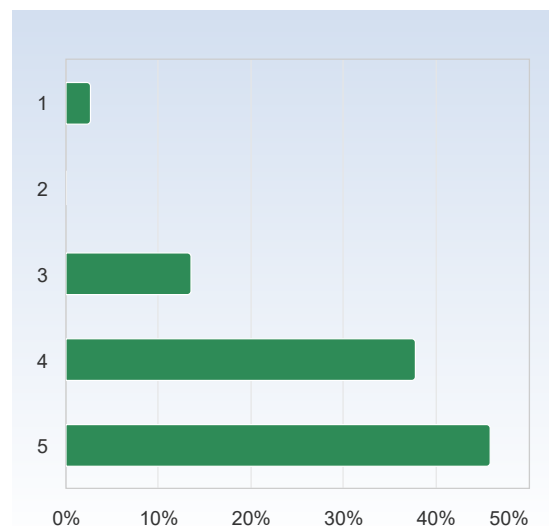
	Mean	Standard Deviation
Overall, I am satisfied with the course.	4.2	1.1

**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 (2.7%)
2	0 (0.0%)
3	5 (13.5%)
4	14 (37.8%)
5	17 (45.9%)
Total	37 (100.0%)



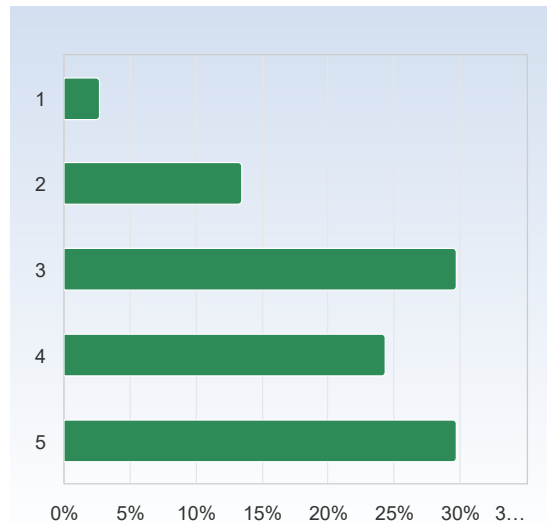
	Mean	Standard Deviation
The course has increased my ability to read a mathematical text.	4.2	0.9



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

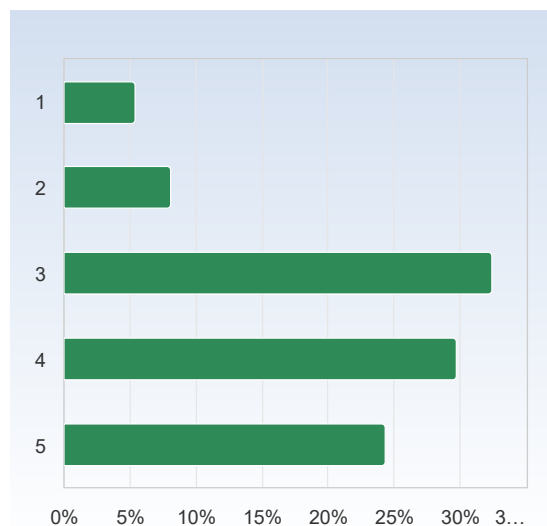
The course has increased my ability to communicate the subject in writing.	Number of responses
1	1 (2.7%)
2	5 (13.5%)
3	11 (29.7%)
4	9 (24.3%)
5	11 (29.7%)
Total	37 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to communicate the subject in writing.	3.6	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	2 (5.4%)
2	3 (8.1%)
3	12 (32.4%)
4	11 (29.7%)
5	9 (24.3%)
Total	37 (100.0%)



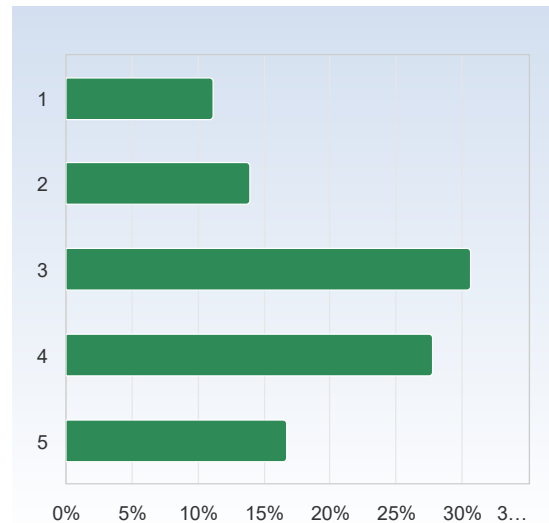
	Mean	Standard Deviation
The course has increased my ability to communicate the subject orally.	3.6	1.1



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

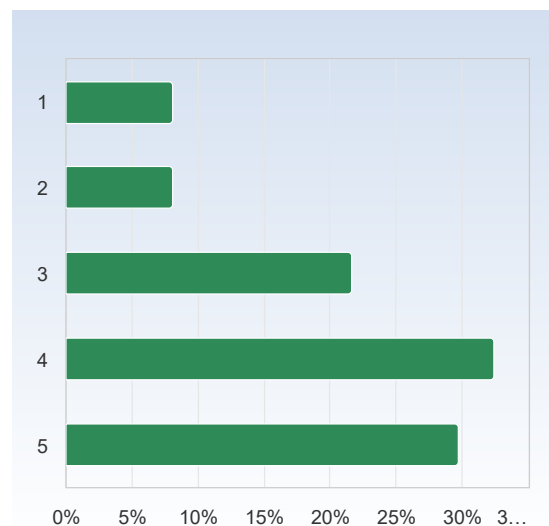
The course has increased my ability to cooperate.	Number of responses
1	4 (11.1%)
2	5 (13.9%)
3	11 (30.6%)
4	10 (27.8%)
5	6 (16.7%)
Total	36 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to cooperate.	3.2	1.2

### 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	3 (8.1%)
2	3 (8.1%)
3	8 (21.6%)
4	12 (32.4%)
5	11 (29.7%)
Total	37 (100.0%)



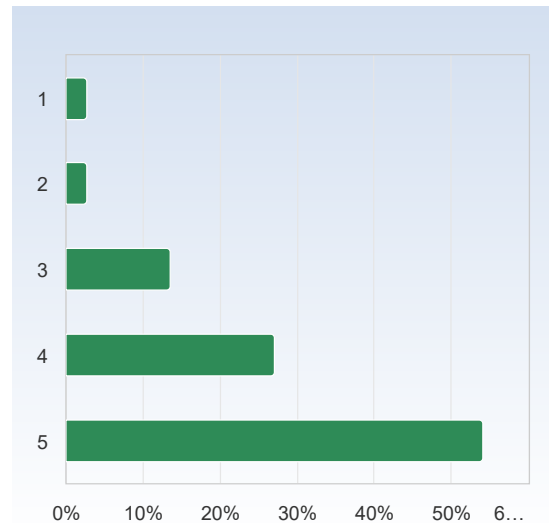
	Mean	Standard Deviation
The course has increased my ability to search and process information.	3.7	1.2



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

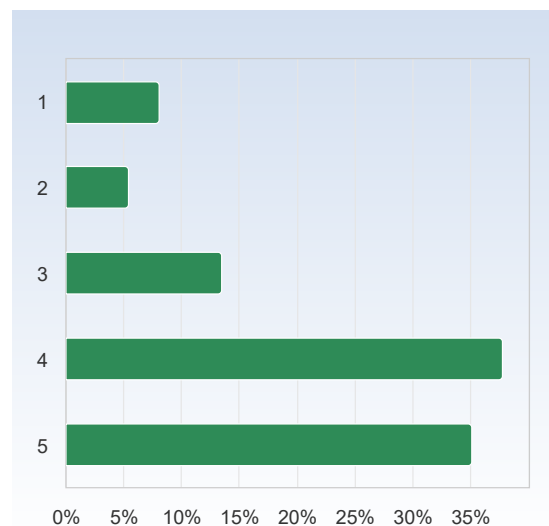
The course has increased my ability to analyze and solve problems.	Number of responses
1	1 (2.7%)
2	1 (2.7%)
3	5 (13.5%)
4	10 (27.0%)
5	20 (54.1%)
Total	37 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to analyze and solve problems.	4.3	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 (8.1%)
2	2 (5.4%)
3	5 (13.5%)
4	14 (37.8%)
5	13 (35.1%)
Total	37 (100.0%)



	Mean	Standard Deviation
As a result of this course, I feel confident about tackling unfamiliar problems.	3.9	1.2



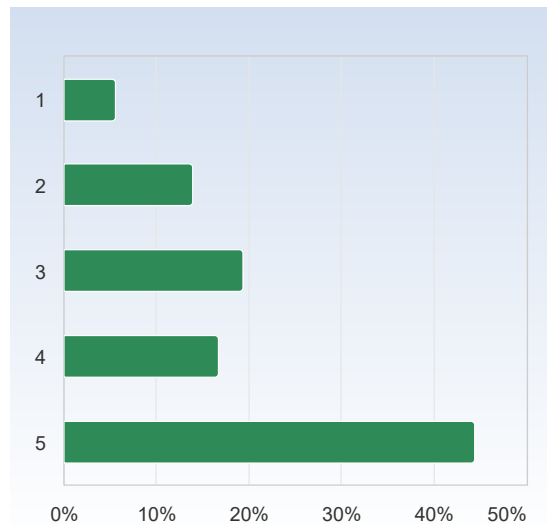
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## Course specific questions

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

### Watching recorded lectures was valuable for my learning

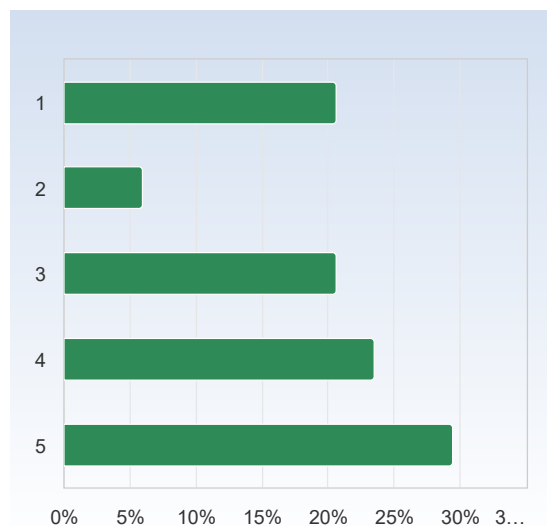
Watching recorded lectures was valuable for my learning	Number of responses
1	2 (5.6%)
2	5 (13.9%)
3	7 (19.4%)
4	6 (16.7%)
5	16 (44.4%)
Total	36 (100.0%)



	Mean	Standard Deviation
Watching recorded lectures was valuable for my learning	3.8	1.3

### My mentor group was valuable for my learning

My mentor group was valuable for my learning	Number of responses
1	7 (20.6%)
2	2 (5.9%)
3	7 (20.6%)
4	8 (23.5%)
5	10 (29.4%)
Total	34 (100.0%)



	Mean	Standard Deviation
My mentor group was valuable for my learning	3.4	1.5

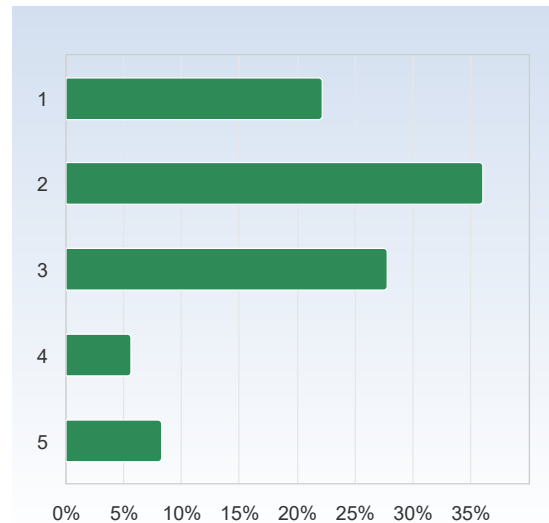




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### My ability to use Python was valuable for my learning

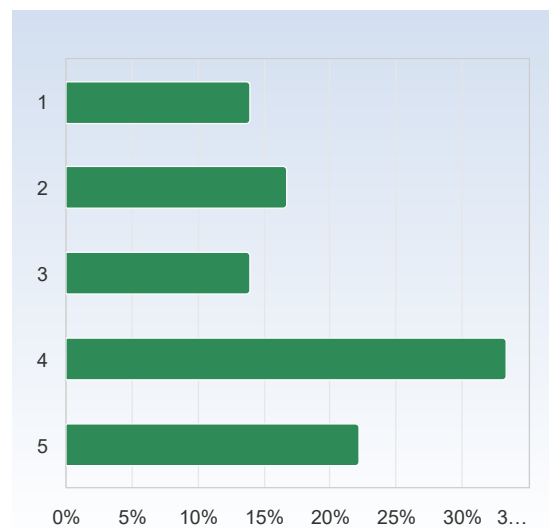
My ability to use Python was valuable for my learning	Number of responses
1	8 (22.2%)
2	13 (36.1%)
3	10 (27.8%)
4	2 (5.6%)
5	3 (8.3%)
Total	36 (100.0%)



	Mean	Standard Deviation
My ability to use Python was valuable for my learning	2.4	1.2

### The YouTube films linked in the lecture notes was valuable for my learning

The YouTube films linked in the lecture notes was valuable for my learning	Number of responses
1	5 (13.9%)
2	6 (16.7%)
3	5 (13.9%)
4	12 (33.3%)
5	8 (22.2%)
Total	36 (100.0%)



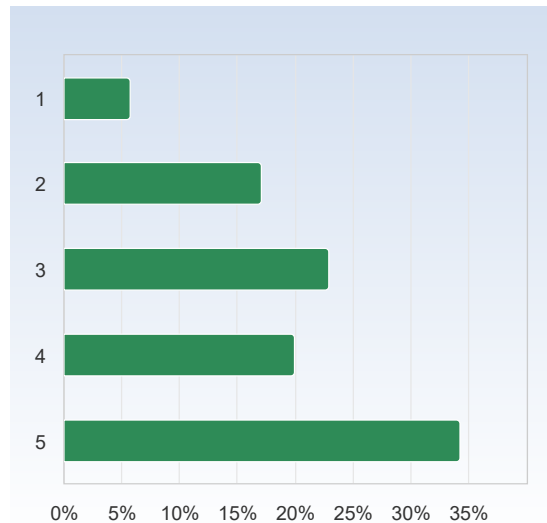
	Mean	Standard Deviation
The YouTube films linked in the lecture notes was valuable for my learning	3.3	1.4



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### The online computer tests were valuable for my learning

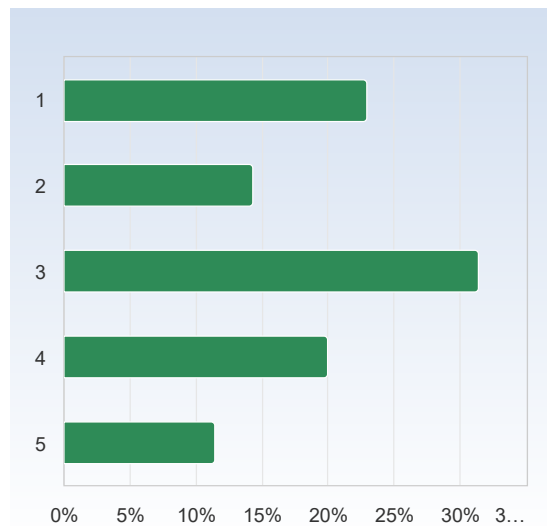
The online computer tests were valuable for my learning	Number of responses
1	2 (5.7%)
2	6 (17.1%)
3	8 (22.9%)
4	7 (20.0%)
5	12 (34.3%)
Total	35 (100.0%)



	Mean	Standard Deviation
The online computer tests were valuable for my learning	3.6	1.3

### The obligatory oral presentation was valuable for my learning

The obligatory oral presentation was valuable for my learning	Number of responses
1	8 (22.9%)
2	5 (14.3%)
3	11 (31.4%)
4	7 (20.0%)
5	4 (11.4%)
Total	35 (100.0%)



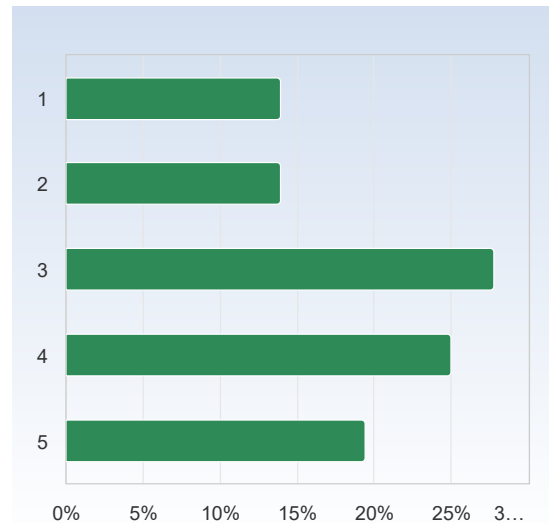
	Mean	Standard Deviation
The obligatory oral presentation was valuable for my learning	2.8	1.3



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### The AI hand-in assignment was valuable for my learning

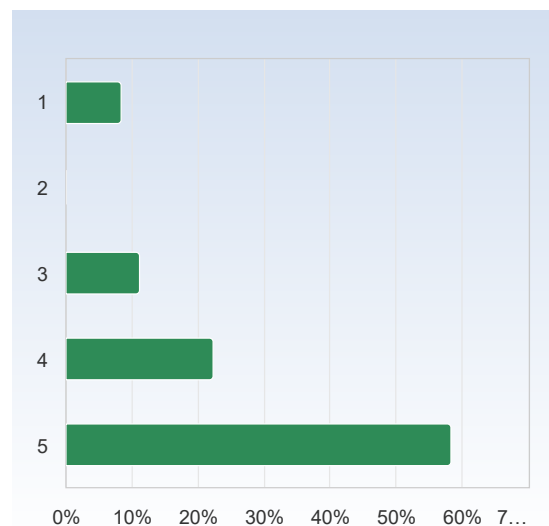
The AI hand-in assignment was valuable for my learning	Number of responses
1	5 (13.9%)
2	5 (13.9%)
3	10 (27.8%)
4	9 (25.0%)
5	7 (19.4%)
Total	36 (100.0%)



	Mean	Standard Deviation
The AI hand-in assignment was valuable for my learning	3.2	1.3

### I have used AI (such as ChatGPT) actively as part of my learning

I have used AI (such as ChatGPT) actively as part of my learning	Number of responses
1	3 (8.3%)
2	0 (0.0%)
3	4 (11.1%)
4	8 (22.2%)
5	21 (58.3%)
Total	36 (100.0%)



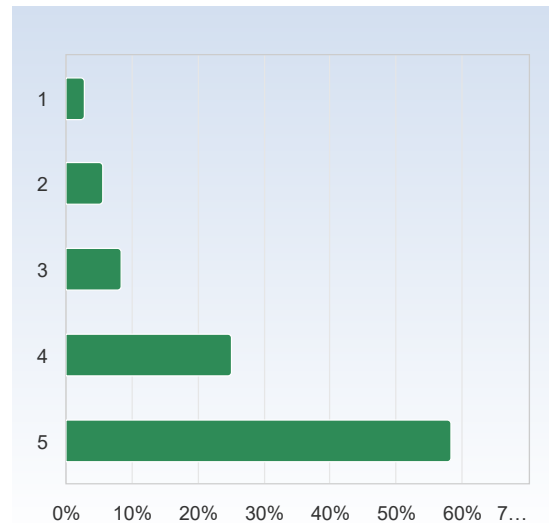
	Mean	Standard Deviation
I have used AI (such as ChatGPT) actively as part of my learning	4.2	1.2



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### The course has stimulated my overall interest for mathematics

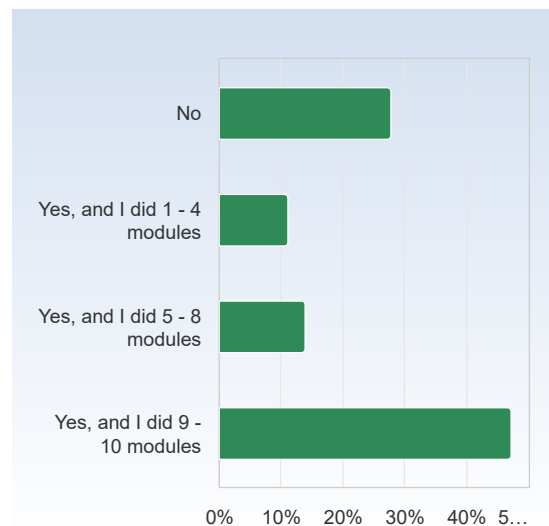
The course has stimulated my overall interest for mathematics	Number of responses
1	1 (2.8%)
2	2 (5.6%)
3	3 (8.3%)
4	9 (25.0%)
5	21 (58.3%)
Total	36 (100.0%)



	Mean	Standard Deviation
The course has stimulated my overall interest for mathematics	4.3	1.0

### Did you work on the refresher course MNXA21 before starting this course?

Did you work on the refresher course MNXA21 before starting this course?	Number of responses
No	10 (27.8%)
Yes, and I did 1 - 4 modules	4 (11.1%)
Yes, and I did 5 - 8 modules	5 (13.9%)
Yes, and I did 9 - 10 modules	17 (47.2%)
Total	36 (100.0%)



	Mean	Standard Deviation
Did you work on the refresher course MNXA21 before starting this course?	2.8	1.3



**This term, we have organised the seminar in MATA31 in a new way (the old was more similar to that of the Algebra and Vector Geometry course). Which of the two seminar formats do you find promotes your learning the most, and why?**

This term, we have organised the seminar in MATA31 in a new way (the old was more similar to that of the Algebra and Vector Geometry course). Which of the two seminar formats do you find promotes your learning the most, and why?

The MATA31 seminars were more interesting and valuable for my learning

I prefer mata31

Mata31: I appreciate getting to work in a guided way to learn new concepts, and personally find that more valuable than practicing presenting.

Didn't mind either

The new one was much better, because during that time you were meant to work on problems.

I preferred the algebra and vector geometry one, give us the responsibility of doing questions, lets you see how far behind you are and motivates you.

The new format was much more productive for me. For one, sometimes I didn't have time for all of the preparation beforehand which made it easier to keep up with the new format and learn something in the process. Another factor was that working with my peers helped me a lot and I found it much more productive. It helped me prepare for solving problems on the exam in a way, because it was more on-the-spot, time-constrained experience.

I prefer the new one since we do the problems on the spot, but I would like if we could present the problems as well like we did in algebra seminars, so I think a mix of those two would be the best :)

The new seminar was a lot better compared to the seminar in MATA32. I feel like it helped me a lot with the intuitive understanding of the subject. Because of its nature of problem tackling and being lead to a solution as supposed to the MATA32 seminar, which was basically comparing solutions for which I struggled to find motivation for.

Mata31

I believe seminars are most effective when they serve as an option to address specific questions or problems, rather than a daily activity. A biweekly schedule would be more efficient, allowing time between sessions for rest, recovery, or leisure, which helps the brain recharge and function better. This format promotes deeper learning and better focus during the seminars themselves.

I have absolutely loved the seminars and would be more than delighted if all seminars in mathematics courses were organised in the same way!!

The analysis one, without doubt. The material is well-organized and helpful with getting the lecturer's train of thought. Actually doing math during the seminar is much more helpful than just checking the work done by myself.

Both are good, maybe a mix would be nice

I did not attend many seminars so I think my opinion here is not very grounded.

The new style suited me more, since it actively made me think about problems and made an easy transition to new topics.

MAT31 100%. I think these seminars was were I learned the absolute most. It was a very good way to ease in a new topic before a lecture, or consolidate what we had worked with. The structure of the MATA31 seminars got refined with time and at the end they were really good and streamlined between time on the blackboard vs time given to work on problems. The difficulty between each seminar varied quite a lot, so maybe use the Menti results to take that into account for future courses. Too much computation in the warm-up always got some people stuck for too long.

This one is better by far in my opinion. I feel like it helped me get a intuitive understanding of the material. And not just aid me with problem solving which I can do just fine on my own.

Definitely the new one. I was looking forward to every single seminar, and felt engaged. I didn't attend more than three seminars of the MATA32 course, because it didn't bring me any benefits.

I cannot emphasise enough how much better the MATA31 seminars were in comparison to the ones in Algebra and vector geometry. I unfortunately only went to a handful of Algebra seminars because I realised pretty quickly that the time spent there would be better spent doing individual work for me. I felt like I would just sit in the seminar room passively and listen to students who already had good understanding of the course material "steam roll" through the solutions. This in comparison to the MATA31 seminars where I actually got to work on new material with the help of seminar teachers was super helpful. I also feel like the attendance rates for the respective courses speak for themselves, by the middle of the semester the seminar rooms for Algebra where basically empty...

I can confidently say, that the Analysis seminars were more useful to my progression, than the Algebra ones, as the Algebra seminars were only really useful, when you had actively engaged with the specific tasks, that we had to do that week, which I wasn't always able to do. In analysis you always had a non-zero takeaway from the seminars as they focused on building intuition and didn't rest on you being caught up on every task.

The normal Seminar format was great! Being forced to work on problems together was really good.

The new one was phenomenal. So much better than the Algebra way. I made it a point to never miss these seminars because of how good they were but I cannot say the same for the Algebra ones

Seminars for Analysis were much better because I had to solve tasks on the go instead of watching people how they solved smth without explaining (in algebra course).

The new one. It felt more interactive and less like the traditional seminars. And gave us chance to solve both textbook and extra problems.

Mata31 the algebra seminars are pretty worthless if you know what you're doing whilst you still learn a lot even if you know what's going on on the mata31 seminars because of the challenges and extra problems that you otherwise wouldn't be exposed to

The MATA31 seminars were clearly the best! In the Algebra course, the seminars felt more like gatherings for people who already knew the answers to the selected questions. If you didn't understand the answers, there wasn't enough time to fully grasp the solutions.

In contrast, the MATA31 seminars were organized in a way that encouraged learning. You had the time to understand both the problems and the answers thoroughly.

I didn't have Algebra and Vector geometry so I wouldn't know the difference between the two formats.

I definitely prefer the new format to the old one. I couldn't find much motivation to attend the seminars for MATA32 if I had already completed the exercises myself at home. But for the MATA31 seminars I would be given new exercises and the ability to cooperate with other people and the opportunity meet new friends.

Definitely MATA 31. I skipped Algebra and Vector Geometry seminars because it was not helpful to watch smart students solve exercises I did not understand. In MATA31 the seminars were mostly actually useful to understanding of the mathematical concepts. I do think sometimes it could have been made more clear about what is expected of us and some seminar teachers should have been more active in explaining the concepts (or explain them in a more understandable way). I am also not sure if starting the topic with a seminar and then going to a lecture is the right way around because I feel some introduction to what is going on in the seminar could have been useful. But these are I guess minor things that did not stop me from benefiting from the seminars and overall my impression is positive. Especially when the seminars were led by Tom, who really improved a lot as a teacher over the course of 2 months and was really helpful and explained stuff in simple, understandable way.

The new one because it allows you to work on your intuition more

Have not attended.



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**This term, you were encouraged to use AI tools (such as ChatGPT) to support your learning of the course material. Please describe briefly how you have, if at all, used AI tools in your learning process. Additionally, share whether you believe using AI has enhanced, hindered, or had no impact on your learning experience, and why.**



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AI has helped

I used ChatGPT to get extra problems and explanations. Not always quantitative stuff sometimes asking why a definition is the way it is because if historical reasons is helpful. Overall I think it enhanced my experience.

enhanced only reason i passed algebra

I primarily used AI when solving problems that I didn't have the solution for. I also used it as a "study partner" to bounce ideas of concepts in the course (like the difference between pointwise continuity and uniform continuity) and it helped a lot. A part of me feels a bit spoiled that I can just ask ChatGPT anything and get the correct answer (especially when asking the o1 model). This has possibly decreased my critical thinking abilities, but I feel like this is a small negative compared to the otherwise huge positive.

If I didn't understand the coursebook or the lecture I often asked ChatGPT to help me explain concepts in a different way. I asked ChatGPT to check my results of tasks, to find out if I actually know how to solve tasks.

I have used AI to find different ways to solve problems where I saw myself very stuck in the thinking process, asking AI helped me find new ways to experiment or try new things until finally finding a right solution on my own.

For this course, I only played around with AI to explain some context, but didn't use it heavily. I think though that a big reason for that is that I felt up to speed with the course, so I felt no need to get 'extra help'.

While I have experienced AI to be quite bad at actually solving problems. It has been invaluable as a tool to understand and explain different concepts.

In the future I see myself using AI alot for my further education within math.

I used AI a decent amount since I would work alone at home. So having a digital buddy to ask questions or have resummarize stuff was really great. I feel like it helped, but I need to make sure to not rely on it too much.

I asked gpt to explain hard concepts most of the time.

I've used ChatGPT to check my answers to problems. I have as well used it to help me understand problems and give me a push in the right direction in how to solve certain problems.

I used AI quite a lot at the beginning of the course and I feel like it was very useful in helping me get accustomed to mathematics at a universal level.

This term, I used AI tools like ChatGPT occasionally to support my learning, primarily for clarifying concepts or generating explanations. However, I found that AI tools offered almost no ability to identify my real problems, challenge my thinking, or create opportunities for meaningful idea exchange. They required me to phrase questions in ways they could handle, which often didn't align with the areas where I truly needed help. As a result, the impact of using AI tools on my learning experience was minimal and did not significantly enhance my understanding of the material.

In a way it was definitely a big help when trying to find solutions to problems where no solutions were provided. Also to help to understand certain topics it was quite helpful, but also for the same reason a little bit hindering to use my own brain in some occasions.

I sometimes used it to check some limits or taylor expansions because wolfram didn't register my screenshots and it was alright but it made plenty of mistakes.

Was good for making new questions but felt limited in getting questions similar to the ones on the final, going the extra step to make the questions new and challenging instead of just the same reformatd.

To serve as a guide with a lot of my stupid questions chatbots were really helpful. When actually tackling problems I think its important to resist the temptations of using it too quickly.

It had a certain amount of impact, it was used mostly for certifying that my answers were correct when the question-answer was not in the book

I used AI to verify my own calculations or sometimes to go through a solution to a task or a part of theory I hadn't understood yet in detail. I found, that the AI was very good at summarizing important information and going into detail on the exact points I asked for, that I had trouble getting before.

I kind of started over-using it near the end, as panic set in and I wasn't able to concentrate on studying. If I were able to approach it calmly, I could've used it more effectively for the purposes listed above.

Using AI as a part of my learning has been very positive, mostly because I could have a sparring partner and breakdown complicated subjects in a simple way. I use AI every day, not only for mathematics but also in my personal life. AI has helped me stay motivated when encountering roadblocks in my learning and pushed me forward. The only downside that AI has is that it can give false answers and has flawed mathematical logic. It has a tendency to always assume that I am right and is afraid of disagreeing with me, which can be very confusing if I ask if a mathematical calculation that I provide is correct. AI can also be lazy in reading documents thoroughly.

But overall, I have an incredibly positive experience with using AI for this course!

I have used chatgpt a lot. Mostly to explain theory or work through problems without concrete numbers (ie with no actual computations as ai tends to screw those up a whole lot). It has helped my learning immensely since I spent less time trying to find a person online (through a YouTube video, etc) that could give me an alternate explanation of the theory and had a study buddy I could always ask about anything, whenever.

Absolutely enhanced. GPT o1 is like a private tutor that is always available.

AI was a big help in studying the course, helped me whenever I had a block in a problem or didn't understand a topic clearly

I have used Copilot to help me understand stuff I was stuck on or to check if my thinking is correct (or help me understand why it's wrong). I don't think I would have been able to get where I am without using the AI, maybe just because I get stuck a lot. It also helped me to not feel desperate when I could not figure something out as I knew there's always an opportunity to ask about it. And so in a way it decreased my stress and anxiety caused by the course (and also other courses).

I have mainly used ChatGPT for helping me with exercises and for answering some lingering questions I had after listening to the lectures. Overall it has enhanced my learning experience by helping me clarify specific doubts and confusions more quickly.

I seldom use AI. The only occasion is asking it of some unfamiliar terms. As far as such use, AI has is helpful.

I used AI all the time. Its really good at explaining concepts but is bad at computations.

I would definitely have used AI even without the course strongly encouraging it. Though I think that the fact that AI was so supported throughout the course made using it more efficient and also made it feel more acceptable to use. I think I would say that feeling comes from AI being relatively new and feels like "cheating" (for lack of a better word). But the way this course was taught removed all of those concerns and mental barricades. All in all AI was probable the most integral part of my learning but definitely not the only important thing.

The use of AI tools has had a ( in my opinion ) positive impact on my ability to process and learn the course material. I have often used it to summarize and simplify content in different modules.

I used it mostly when practicing tasks on my own. It was a really good way to compare solutions and have someone to explain problems to me, if I was stuck and there was no TA around for example.

I used Copilot for learning pretty regularly. It enhanced my learning experience because it was better at explaining difficult topics in a consumable manner.



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**What did you appreciate most with the course?**





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What did you appreciate most with the course?

The lectures

I appreciated the trusting dynamic between the professor and the students. Also, having the Menti surveys were GREAT!! It really alleviated any stress about giving complaints in person.

The teachers being nice, funny, engaging and good at explaining things :)

The seminars felt very well constructed and thought out and the professor is one of the best teachers I have ever had. The lectures are both very informative and easy to follow as well as very enjoyable.

The lecture notes were also very well constructed.

I appreciate the honesty

The recorded Lectures.

The seminars where great and I also feel like it was very well paced. And although it was difficult at times, in hindsight I really enjoyed the emphasis on visual interpretation of the different concepts.

The way Jan-Frederik tried to make it as chewable as possible. I am grateful to him that he put all that effort.

I was extremely surprised at how much effort our lecturer ( Jan-Fredrik ) put into this course and appreciate that a lot. In the future I hope to be able to match that effort myself.

I loved the seminars they were so fun and the teacher was very great, much love Erik.

Instead of being served the information, we worked our ways to the information, meaning we have 'gained' the theorems most of the time which helps to connect the topics and learn them easily.

The balance between the intuitive stuff and the computation. I think I will appreciate this more and more in coming courses. It seems like where the best mathematicians are the best (switching between intuition and rigor), and learning that as soon as possible at uni seems like a very worthwhile investment.

What I appreciated most about the course was the provision of sufficient information in advance. However, at times, it felt like there was too much detail, which could be overwhelming. It would be better to focus on key points and essentials, leaving room for us to explore and make our own choices.

The teacher. I loved his way of thinking when it comes to math which I find to be of utmost importance.

I would say my favorite part of the course was the professor :)

Especially the approach to teaching. I loved the focus on the intuitive understanding of math and how it was conveyed. And the perfect amount of humor always kept it interesting and even fun.

That all the material were available online!

Visualizing

Passing it :)

Everything. I honestly don't really know if this course can be improved upon. Maybe some more optional theory on say Riemann's integral and linear differential equations.

I loved the format with having the seminars then lectures, it just worked really well regarding learning. I also loved Jan-Fredrik's lectures, the best I've had this term :)

The help I got in the seminars and from the mentor/TAs and the geometric focus on problems.

Coming from an environment, where I felt like my teachers did not care, whether I succeeded and also did not seem to care whether their students understood, what they were talking about, it was quite refreshing to see all the ways the lecturer, as well as the TAs and other staff were ready to help me understand the material and find ways to learn, that suited my style and ambitions. It really felt like we weren't left alone, seen as numbers on attendance sheets, but students eager to learn (or at least ready to try).

Where do I even begin... I could begin my review with a keyword: passion. Compared to other courses, classmates, teachers etc. that I've experienced, this course really showed me how much passion can make a difference for everyone in a learning environment. A passionate teacher willing to go the extra mile for the benefit of all students – while being a bit unorthodox – leads to more students feeling more joy in their academic workload and journey. Encouraging discussions and a helping hand between students and showing the path available for the students after this course also helps with maintaining passion and enthusiasm for future studies. Why make mathematics boring when you can make it fun! The lecture notes should be Akademibokhandels bestseller, recorded lectures are saving lives, the in-person lectures filled me with happiness, the amount of tools available for help and guidance in Canvas were amazing...

All students begin the course with a sort of blank canvas and during the course we are given tools and colours to paint with. Mathematics is the potential image that we could paint; a depiction or interpretation of reality. But how does one paint as a beginner?? This is where Jan-Fredrik comes in, like a mathematical version of Bob Ross (a famous painter). Jan-Fredrik doesn't paint just to show how good he can paint, but he paints to show how good of a painter one can be. He takes us step-by-step in all of the parts of One Variable Analysis that we need to know and is eager to respond to both simple and complex questions. Jan-Fredrik is the kind of professor that explicitly and implicitly helps you become more mathematically confident. Also adding humour in his lectures, Jan-Fredrik has set the bar for the courses to come.

This course is difficult for a reason, but a difficult journey doesn't have to be lonely, and this course has shown me exactly that.

Thank you, from the bottom of my heart, for this amazing semester!!

Seminars

I appreciate that the professor cares a lot about the course and his students and is very responsive to student feedback. The lectures and seminars altogether made the subject a lot less intimidating and more manageable than it otherwise would've been.

Jan-Fredrik's engaging lectures and well thought out seminars.

Your focus on fun and intuition. That's gonna stay with me much longer and have a bigger impact than any technical skill. I learned to like the contents of this course, and pure mathematics in general.

Lectures

The professor and the visual part

The lecturer is energetic and the seminars are well-organized. Thanks to Jan-Fredrik's work.

The quantity of resources, available for us all the time.

The way seminars were formatted and the professor.

A lot of things. The lectures were really fun and engaging and explained stuff in a way that was comprehensible. Even if I felt a bit lost after the seminars, I always left the lectures feeling that it's not actually that difficult and that I can do what I missed at home. I also really appreciate the recordings of lectures. For me it's sometimes difficult to focus in class, and knowing that I can look back at the recording just takes away the stress of missing something important. It's also a great tool to have during revision and I really do not understand why it's not a standard to record lectures in all courses (but maybe the lectures in the other courses aren't that helpful so it doesn't really matter...).



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**What do you think should be improved?**



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What do you think should be improved?

Though I thought the course was well paced I do feel like the Taylor polynomial section was a bit rushed. I would have liked a bit more time in lectures for understanding and computing. The way I experienced it a lot of learning was supposed to happen through seminars but since I didn't grasp the concepts in the first place I honestly got more confused.

Maybe a little more lecture time? Or seminar time?

I think that for the last week before the exam, you should switch back to a more standard teaching style, and just let us work through many mock exams, in the seminars, lectures and at home. In Anna-Maria's course, we had access to about six mock exams that were exactly like the actual exam, and I missed that in this course. To solidify all the knowledge, I want to just work with it nonstop for a bit.

This is really complaining at a high standard, but sometimes in the lectures the last part was a little fast. But I think that might have been a byproduct of the nice teaching style and taking the time to make sure we understand what's going on. I would have liked to have one or two more mock exams for preparation.

Nothing comes to mind right now.

Sometimes important content was only briefly mentioned in the lectures and thus it was quite hard to learn it by yourself.

Everything was great, maybe just hire more experienced students for the mentor meetings since I didn't quite find them as helpful as they should have been and also rely slightly less on visual tasks such as slope fields.

Maybe the course should have been more organised and we would need more mock exams!

I know it is a bit difficult to manage, but since the difficulty curve felt pretty steep in the end, it would be nice if we could fix the focus of the course appropriately. Of course, there's no point moving on to Taylor polynomials and the intricacies of integrability, when we are barely even able to integrate, and I wouldn't want to support rushing through these earlier topics. However, with the Christmas break right after the final lectures, it is pretty difficult to stay on track with studying. I would maybe suggest having 1 or 2 catch up lectures/seminars before the exam in January, but I don't know how realistic that is.

I believe that while LaTeX does make assignments look more polished, it also consumes a lot of unnecessary time that could otherwise be used for deeper thinking. Similarly, the current level of AI assistance in mathematical reasoning feels inefficient and unhelpful. It often provides excessive, irrelevant information without fostering meaningful insight, and it takes extra time to phrase questions in a way it can understand.

Regarding the seminars, I feel that having them daily, especially at the expense of sleep, is not the most efficient approach. A biweekly frequency, where students can bring specific questions to discuss, would be more effective. This would also allow for longer and better-quality sleep, helping us think more clearly and perform better. I kindly suggest starting classes after 10 a.m. to align better with this. Thank you for considering this feedback.

I don't really have anything I can think of.

The new format of the final exam was not the best. Where the past exams relied more on computational skills this exam relied a lot on mathematical intuition which may be for a first semester course a bit inappropriate. Mostly the fact that 2 questions were connected on the exam. If you weren't able to do one of them the other one was not to be solved which accounted to a loss of around 1/5 of the total points. At least a solution given in the second problem that you could work with would have been helpful.

Maybe the examination should be more "standard"

Nothing I can think of really, I think it was pretty good.

Formatting of questions was tough and especially after 4 hours on the final I simply could not process the final question.

Like I mentioned, I guess the seminars could be adjusted a little bit, but overall I have no complaints.

The last examination format, please go back to the old way, I missed the epsilon delta proofs and the series convergence tests :( free points

Time management haha :) Also, more clear agenda that just quickly (max 2 minutes) goes through what was done in previous lecture, or give background to what will be discussed in the current lecture (like brief history, introduction of a new chapter with an example). Although this was done for some lectures, I think there is some room for improvement to improve the quality of the first five minutes of the lecture.

Perhaps solutions to some of the more difficult textbook exercises should be discussed.

The organization of the modules and the lectures should be improved to some extent.

I didn't feel like the mid term gave an accurate idea of how the course was like

Don't know. I think my failing grades are a more of a me problem than a course problem.

The warm up part of the exam was more of a crux than the main part. Also questions being linked feels like bad exam design as you automatically lose a lot of points if you didn't manage the first parts (or rather the other tasks). Generally this exam felt a lot harder than the old exams probably because those warm up questions require you to have a deep understanding of the topic and cannot be easily studied for with normal exam questions.

The final exam really messed you up if you had a wrong idea on the warm-up and then used that wrong idea in the problem connected to it in the main part. Definitely felt like there was no way to salvage any points in the main part if you had the wrong idea in the corresponding warm-up problem.

Otherwise, at the start of the course, I had a really hard time grasping what was the core content of the course and what was extra challenges for the extra ambitious. Also, I thought that the axiom stuff would turn out to be way more important than they were, but that was just maybe since it was at the start and it seemed so overwhelming to begin with.

Although I am grateful for it now, I think that the tests could have been a bit more advanced.

Some optional theory on Riemann's integral, linear differential equations.

More engagement with the important proofs in analysis. But I have already found it done better than any course I attended.

The textbook was not suitable for the exercises in the exam. The exam formats are confusing and you do not know what is expected of you in the visual exercises. Old exam formats are much clearer and should be considered again.

After writing both the exams, I don't really like the structure of them. I feel that the questions build too much on each other. For example a lot of questions take the answers of previous questions for granted as a step in the solution. This has at many times made me feel like I can't demonstrate everything that I know on the exams. Even though I know the process required for solving a problem, I am sometimes unable to as a result of having failed to understand a previous question.

Not much!

I thought we could've solved more past papers or mock exams during the final classes



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**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.

Not at all!

No

No, I felt good.

No

No.

No way! This uni is peak!!!!

No.

No

Not at all.

No

No

No.

No, I have not experienced any form of discrimination in the course literature, staff, or teaching methods.

No, I have personally not experienced any of the above-mentioned.

No!

No

No

I didn't perceive any discrimination from course literature, staff or teaching methods, but also feel like I would be an unlikely target. I cannot speak for more disadvantaged groups.

No

No

No, I felt like it was a very nice atmosphere!

No

No.

No.

No

No

## Course evaluation summary

The following summary is the exact response from the following sequence of prompts to ChatGPT-4o based on the responses data on the course evaluation:

1. Attached are course evaluations from a course in one variable analysis (MATA21) from the Fall of 2023 and the Spring of 2024 (also called MATA21). I now want to write a similar course evaluation for the course for Fall of 2024 (called MATA31). Please write a course report for the course in Fall 2024 that is of the same format as those for the courses Fall 2023 and Spring 2024. Base the course evaluation on the statistics submitted for MATA31. The evaluation text should be fairly minimal, and it should point out what seems to be working well, and what seems to be working less well. It should also point out notable differences with the course over previous terms.
2. Also include some highlights from the free text responses in the evaluation.
3. Please include mention on the impact of AI in the course, as this was a new phenomenon. You do not have to rewrite the entire report, just suggest a text to be added.

### *Course Evaluation Summary*

- **General Satisfaction:** Students rated their overall satisfaction with the course at 4.2 out of 5, indicating a positive reception similar to previous terms.
- **Teaching Methods:** The organization and teaching methods of the course were well-received, earning a favorable rating of 4.2.
- **Lectures and Seminars:** Lectures were highly valued, scoring 4.4, while seminars also received strong positive feedback with a score of 4.3.
- **Self-study:** Self-directed study continued to be a crucial component, rated at 4.3.
- **Course Material:** Course materials were found to be valuable, reflected by a score of 4.0.

### *Highlights from Free Text Responses*

- **Positive Feedback:**
  - Students praised the seminar's new format, noting it encouraged active problem-solving and enhanced their understanding of complex concepts.
  - Many respondents found the interactive nature of lectures beneficial, highlighting the lecturer's ability to engage and clarify difficult topics.
  - The accessibility and relevance of course materials were frequently mentioned, with students appreciating the practical applications presented.
- **Constructive Criticism:**
  - Some students expressed concerns regarding the alignment of the examinations with the course content, suggesting a need for better reflection of the lectures and seminars in the exams.
  - A few respondents desired more opportunities for feedback on assignments and assessments to gauge their understanding throughout the course.

### *Key Observations*

- **Strengths:** The structure of teaching and the new seminar format were significant strengths. Effective teaching methods and engaging course materials also contributed to high student satisfaction.
- **Areas for Improvement:** Examination content needs better alignment with course teachings, as highlighted by student feedback. More consistent and detailed feedback mechanisms could enhance learning outcomes.
- **Comparison with Previous Terms:** There's a noticeable improvement in the response rate and overall satisfaction. Innovations in seminar format and consistent quality in teaching are key improvements over previous terms.

### *Recommendations for Future Courses*

- **Examination Review:** Consider revising examination questions to more closely mirror the content and skills emphasized in lectures and seminars.
- **Enhance Feedback Mechanisms:** Implement more robust feedback systems to provide students with timely and constructive responses to their work.

### *Impact of AI on Learning*

- **Integration and Usage:** This term marked the first integration of AI tools like ChatGPT into the course curriculum. Students actively used AI to assist with homework, generate practice problems, and gain deeper insights into course topics. The overall feedback on AI utilization was highly positive, with a notable score of 4.2 out of 5.
- **Student Feedback:** Students appreciated the AI's role in enhancing their understanding and providing instant feedback. The ability to interact with AI for clarifying concepts and exploring various mathematical approaches was particularly valued. However, some students noted challenges in relying on AI for deeper, theoretical insights, which sometimes led to discrepancies in problem-solving techniques discussed in class.
- **Recommendations:** Continued refinement of AI integration is recommended. It may be beneficial to provide specific guidelines on how to effectively use these tools to complement traditional learning methods and to address any gaps in understanding that may arise from AI interactions.