Kursbokslut, Course review MATM19, Integration Theory, spring term 2021

Course responsible: Marcus Carlsson
Number of students: 25 in total writing the exam.
Grades: 8 VG, 9 G, 8 U.

Evaluation

This time I tried a completely new concept with flipped classroom, where all lecture material was pre-recorded. During the lectures we instead discussed how to solve selected exercises.

Sammanfattning av kursvärderingen, student evaluation:

9 students did the evaluation. Comments are overall very positive, especially concerning the video material. Main criticism concerns that the help with exercise solving was too limited.

Lärarnas kommentarer, teachers comments:

I agree with the students about exercises, the production of the video material was so time-consuming that I did not have enough time to prepare solutions in a pedagogical manner. Still, due to the overall positive response, I believe this is really a good way to further develop the course, next time I can reuse the video lectures and put more focus on guiding the students in how to solve exercises.

Evaluation of changes:

Flipped classroom technique should be developed further. Especially when restrictions ease and we can return to classroom teaching, I really believe this is the way forward.

Suggestion for changes:

As I wrote last year, it would be good to make it clear to students upon enrollment that the course is very demanding. Help with solving exercises should be further developed.

Evaluator: Marcus Carlsson.

Integration theory spring 2021

I have studied this course as part of

| I have studied this course as part of	Number of Responses
Bachelor´s Programme in Mathematics	6 (66.7%)
Bachelor´s Programme in Physics, Theoretical Physics, Astronomy	0 (0.0%)
Bachelor´s Programme, other specialization	0 (0.0%)
Master's Programme in Mathematics	0 (0.0%)
Master´s Programme in Mathematical Statistics	0 (0.0%)
Master´s Programme, other specialization	0 (0.0%)
Teacher Education	0 (0.0%)
other programme or as stand alone course	3 (33.3%)
Total	9 (100.0%)
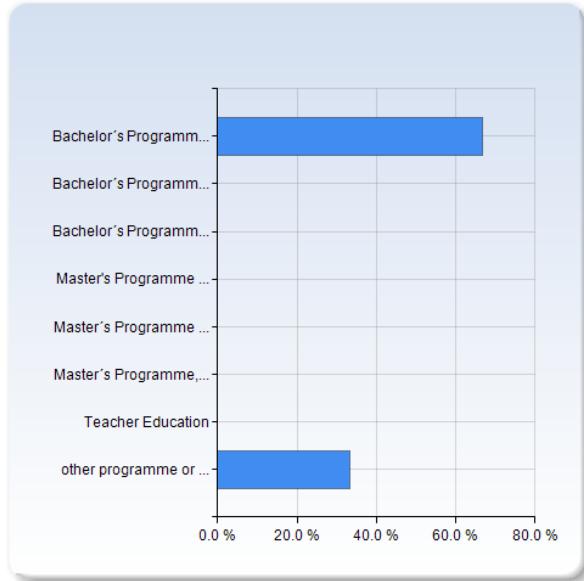
	Mean	Standard Deviation
I have studied this course as part of	3.3	3.5

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	0 (0.0%)
3	1 (11.1%)
4	3 (33.3%)
5	5 (55.6%)
Total	9 (100.0%)
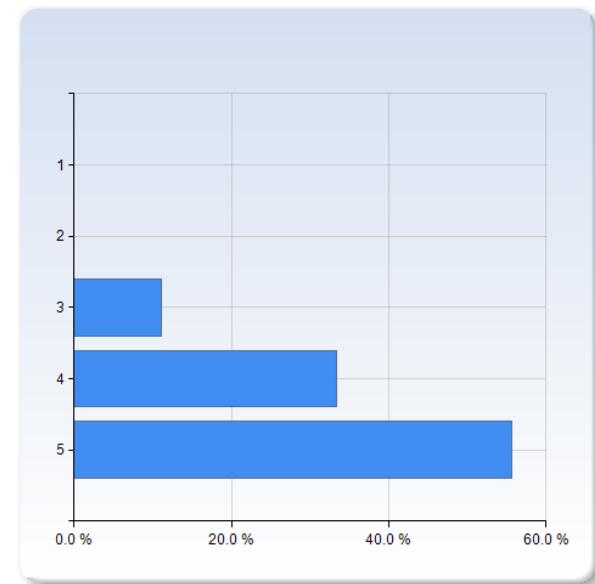
	Mean	Standard Deviation
2. My prior knowledge has been sufficient to assimilate the contents of this course.	4.4	0.7

3. I have participated actively in the course.

| 3. I have participated actively in the course.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	3 (37.5%)
4	2 (25.0%)
5	3 (37.5%)
Total	8 (100.0%)
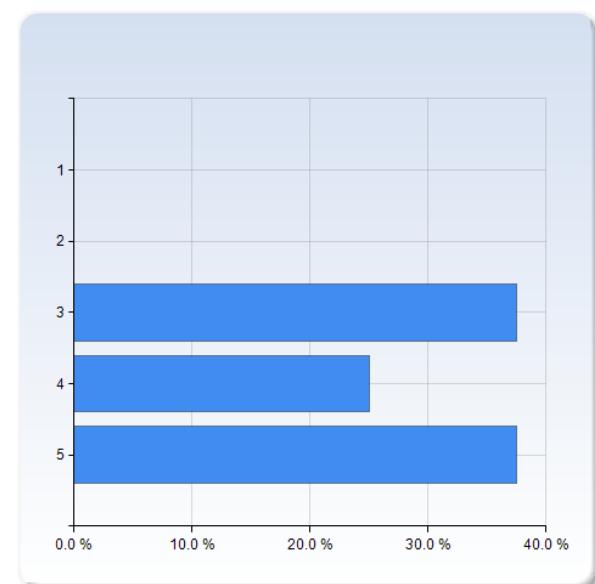
	Mean	Standard Deviation
3. I have participated actively in the course.	4.0	0.9

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

Average number of hours spent in total on the course per week (including scheduled activities):	Number of Responses
2 - 4	1 (11.1%)
5 - 7	0 (0.0%)
8 - 10	2 (22.2%)
11 - 13	0 (0.0%)
14 - 16	1 (11.1%)
17 - 19	0 (0.0%)
20 - 22	2 (22.2%)
23 - 25	1 (11.1%)
26 - 28	0 (0.0%)
29 - 31	2 (22.2%)
Total	9 (100.0%)
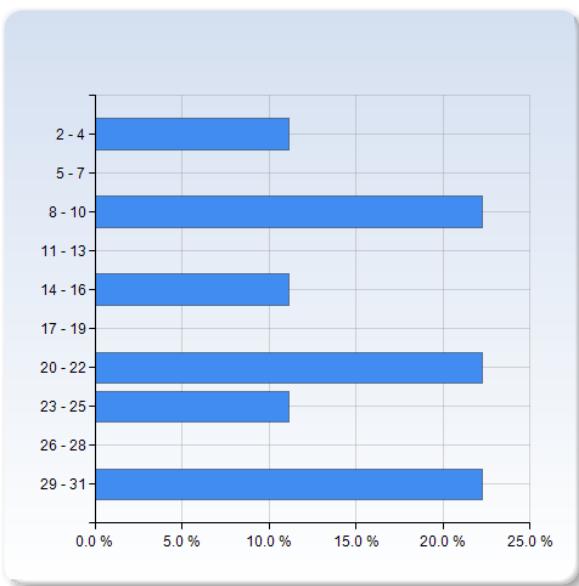
|	Mean	Standard Deviation
Average number of hours spent in total on the course per week (including scheduled activities):	18.2	9.4

The course in general

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

### The way the course was taught and organised suited me.

The way the course was taught and organised suited me.	Number of Responses
1	0 (0.0%)
2	2 (25.0%)
3	1 (12.5%)
4	2 (25.0%)
5	3 (37.5%)
Total	8 (100.0%)
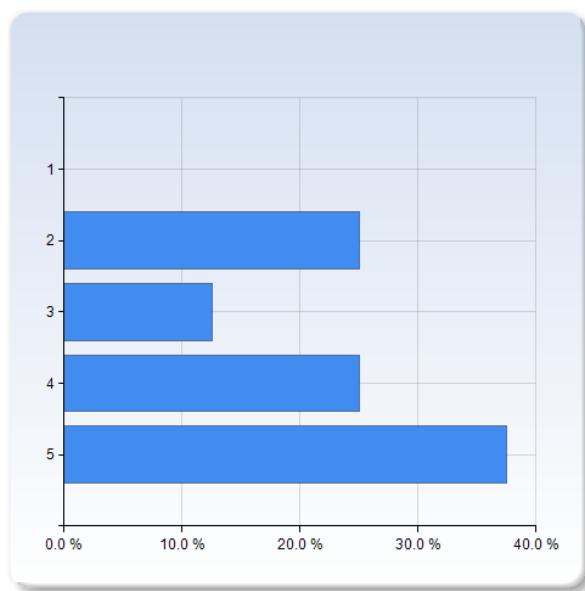
	Mean	Standard Deviation
The way the course was taught and organised suited me.	3.8	1.3

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 (11.1%)
2	0 (0.0%)
3	2 (22.2%)
4	1 (11.1%)
5	5 (55.6%)
Total	9 (100.0%)
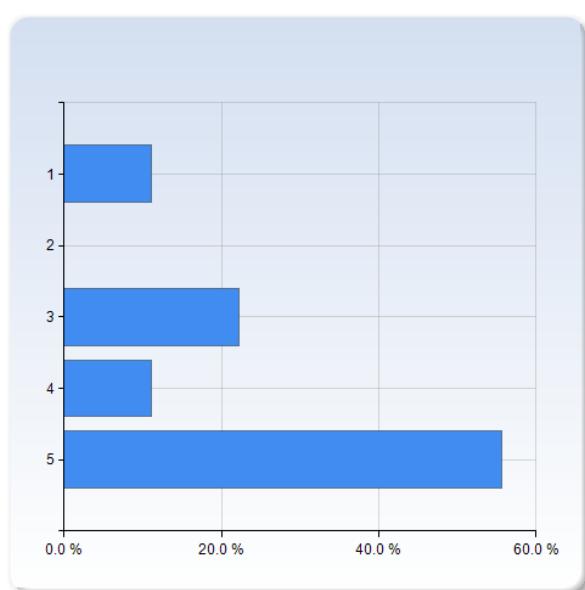
|	Mean	Standard Deviation
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	4.0	1.4

The lectures were valuable for my learning.

The lectures were valuable for my learning.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	3 (33.3%)
4	3 (33.3%)
5	3 (33.3%)
Total	9 (100.0%)
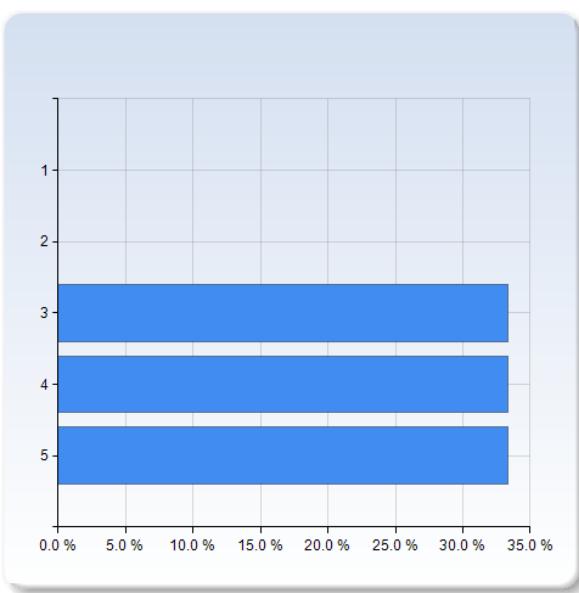
	Mean	Standard Deviation
The lectures were valuable for my learning.	4.0	0.9

Studying on my own was valuable for my learning.

Studying on my own was valuable for my learning.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	0 (0.0%)
4	2 (22.2%)
5	7 (77.8%)
Total	9 (100.0%)
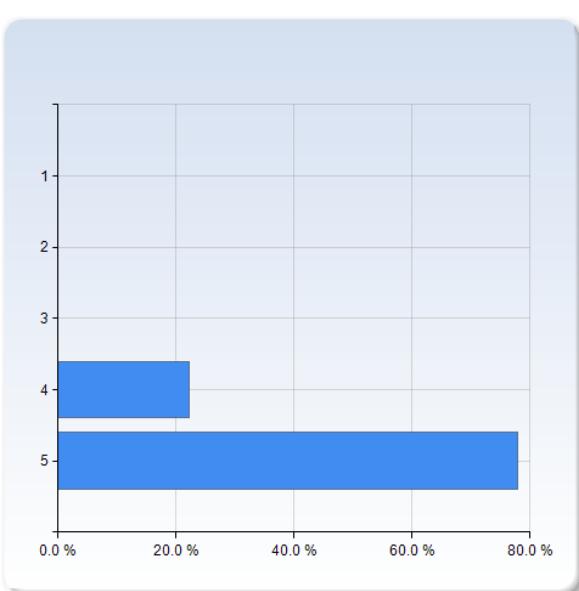
	Mean	Standard Deviation
Studying on my own was valuable for my learning.	4.8	0.4

The course literature/material was a valuable learning resource.

| The course literature/material was a valuable learning resource.	Number of Responses
1	0 (0.0%)
2	1 (11.1%)
3	1 (11.1%)
4	2 (22.2%)
5	5 (55.6%)
Total	9 (100.0%)
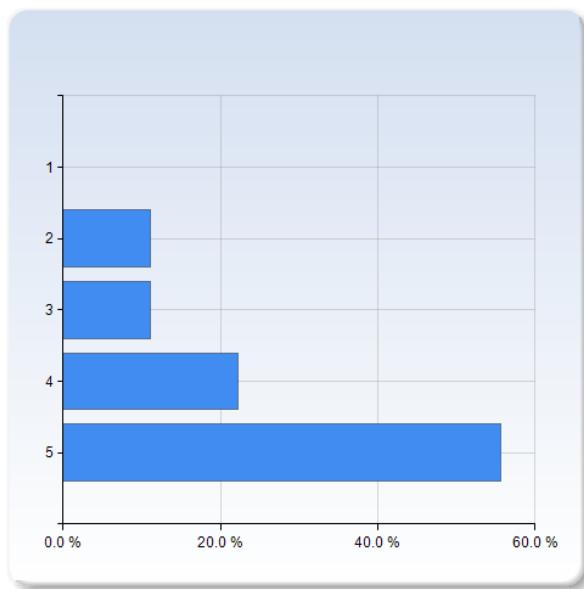
	Mean	Standard Deviation
The course literature/material was a valuable learning resource.	4.2	1.1

## 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	0 (0.0%)
3	1 (12.5%)
4	3 (37.5%)
5	4 (50.0%)
Total	8 (100.0%)
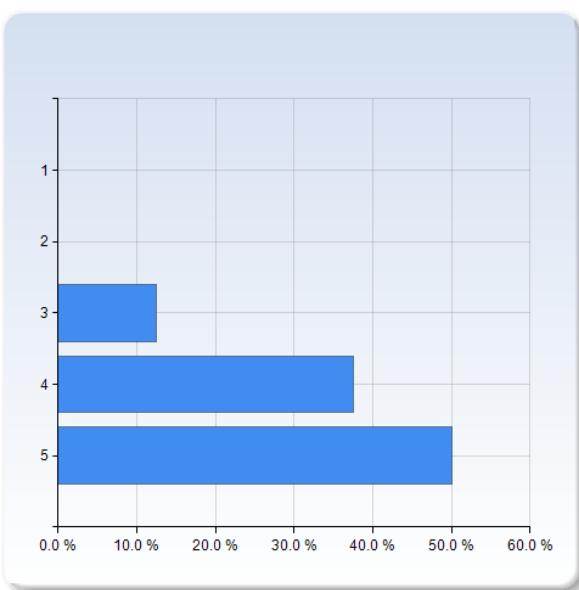
	Mean	Standard Deviation
The information I received before the course start was satisfactory.	4.4	0.7

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

The communication with the teaching staff during the course was good.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	3 (37.5%)
4	1 (12.5%)
5	4 (50.0%)
Total	8 (100.0%)
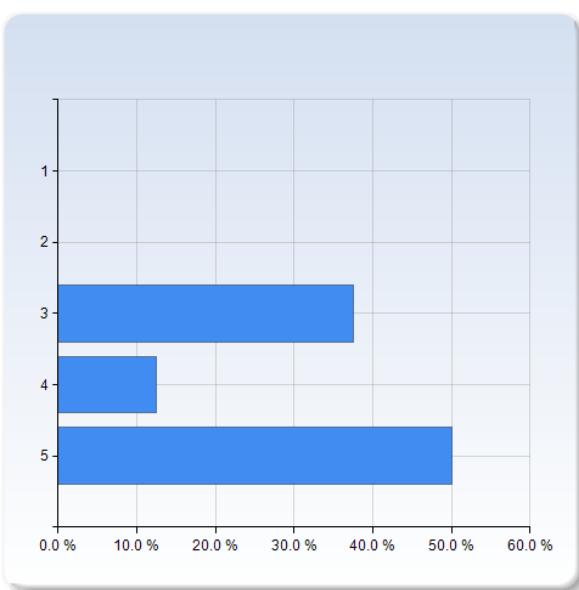
	Mean	Standard Deviation
The communication with the teaching staff during the course was good.	4.1	1.0

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	0 (0.0%)
2	3 (37.5%)
3	0 (0.0%)
4	2 (25.0%)
5	3 (37.5%)
Total	8 (100.0%)
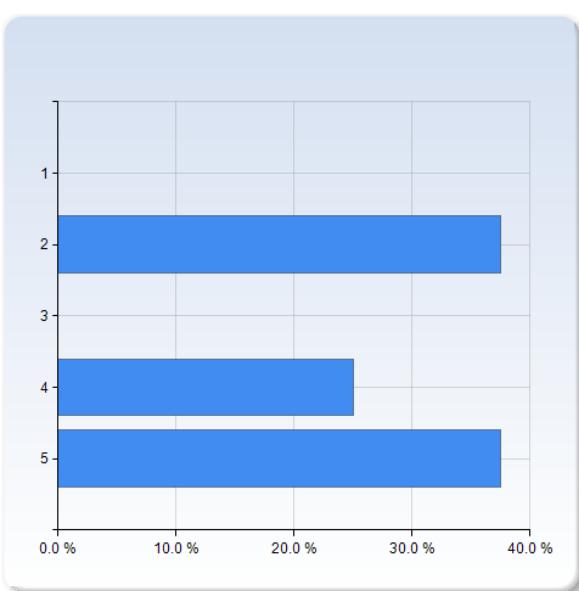
	Mean	Standard Deviation
It was clear throughout the course what was expected of me.	3.6	1.4

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 (37.5%)
2	1 (12.5%)
3	4 (50.0%)
4	0 (0.0%)
5	0 (0.0%)
Total	8 (100.0%)
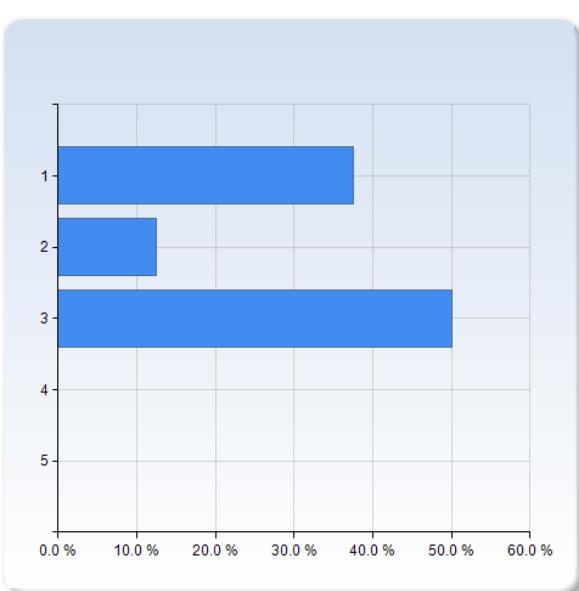
	Mean	Standard Deviation
I have received valuable feedback from my teacher/teachers during the course.	2.1	1.0

The course had a reasonable workload.

| The course had a reasonable workload.	Number of Responses
1	1 (11.1%)
2	0 (0.0%)
3	1 (11.1%)
4	5 (55.6%)
5	2 (22.2%)
Total	9 (100.0%)
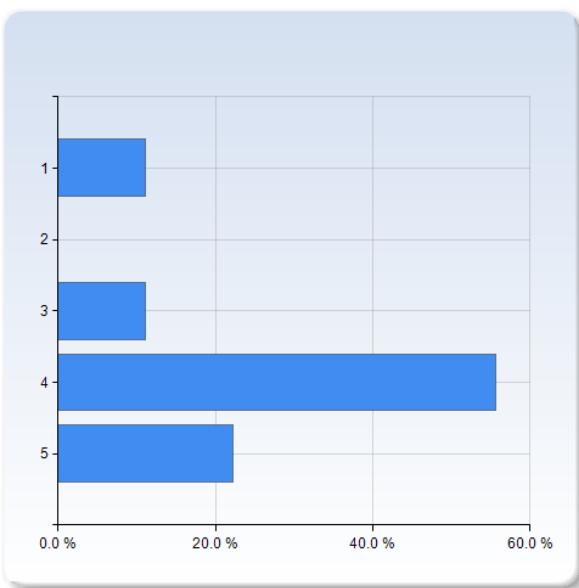
	Mean	Standard Deviation
The course had a reasonable workload.	3.8	1.2

The workload was evenly distributed throughout the course.

The workload was evenly distributed throughout the course.	Number of Responses
1	0 (0.0%)
2	1 (12.5%)
3	2 (25.0%)
4	2 (25.0%)
5	3 (37.5%)
Total	8 (100.0%)
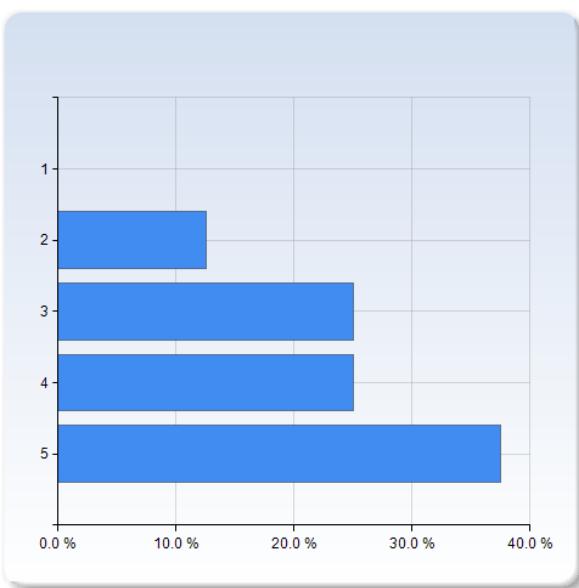
	Mean	Standard Deviation
The workload was evenly distributed throughout the course.	3.9	1.1

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 (12.5%)
2	1 (12.5%)
3	0 (0.0%)
4	1 (12.5%)
5	5 (62.5%)
Total	8 (100.0%)
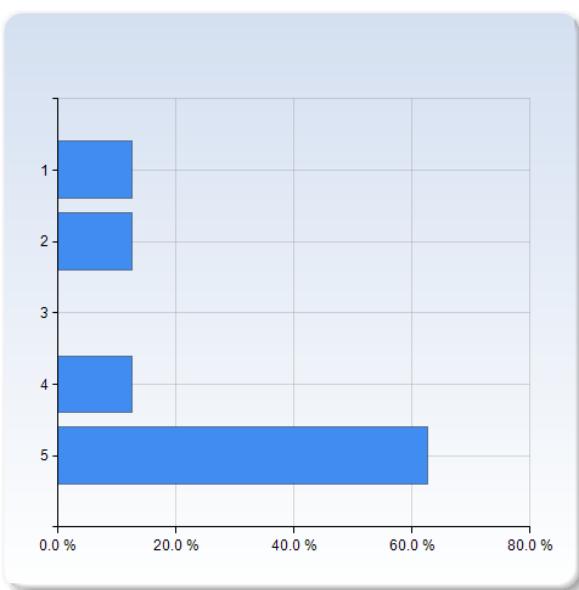
	Mean	Standard Deviation
The examination matched the contents and level of the course.	4.0	1.6

The video material was produced in a pedagogical manner.

The video material was produced in a pedagogical manner.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	0 (0.0%)
4	4 (44.4%)
5	5 (55.6%)
Total	9 (100.0%)
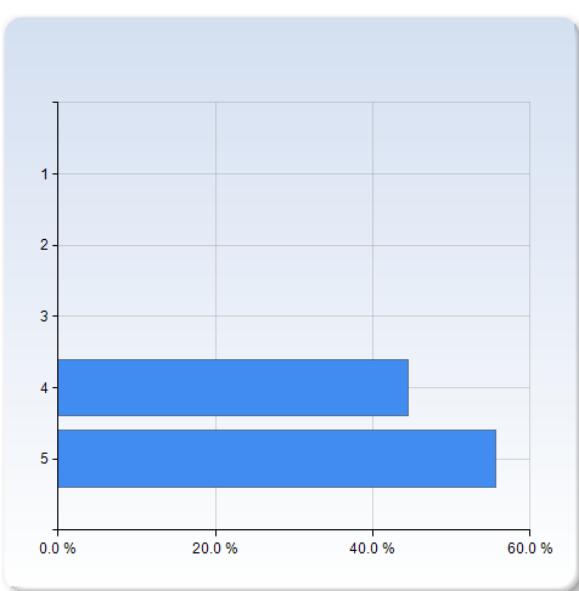
	Mean	Standard Deviation
The video material was produced in a pedagogical manner.	4.6	0.5

## I prefer swapped classroom to traditional teaching (pre-recorded lectures and free discussions during class)

I prefer swapped classroom to traditional teaching (pre-recorded lectures and free discussions during class)	Number of Responses
1	2 (22.2%)
2	3 (33.3%)
3	1 (11.1%)
4	0 (0.0%)
5	3 (33.3%)
Total	9 (100.0%)
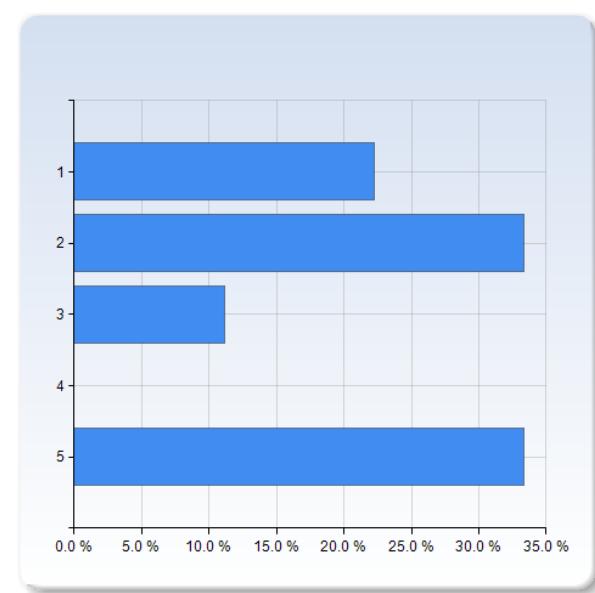
	Mean	Standard Deviation
I prefer swapped classroom to traditional teaching (pre-recorded lectures and free discussions during class)	2.9	1.7

Overall, I am satisfied with the course.

| Overall, I am satisfied with the course.	Number of Responses
1	0 (0.0%)
2	2 (22.2%)
3	1 (11.1%)
4	2 (22.2%)
5	4 (44.4%)
Total	9 (100.0%)
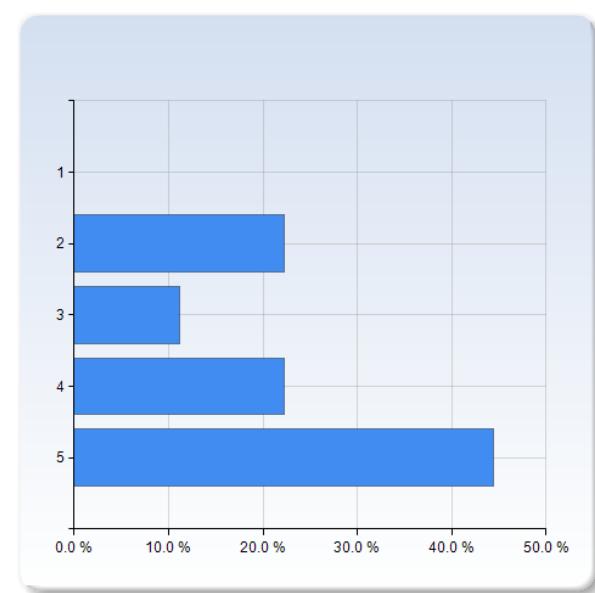
	Mean	Standard Deviation
Overall, I am satisfied with the course.	3.9	1.3

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	0 (0.0%)
2	1 (11.1%)
3	1 (11.1%)
4	2 (22.2%)
5	5 (55.6%)
Total	9 (100.0%)
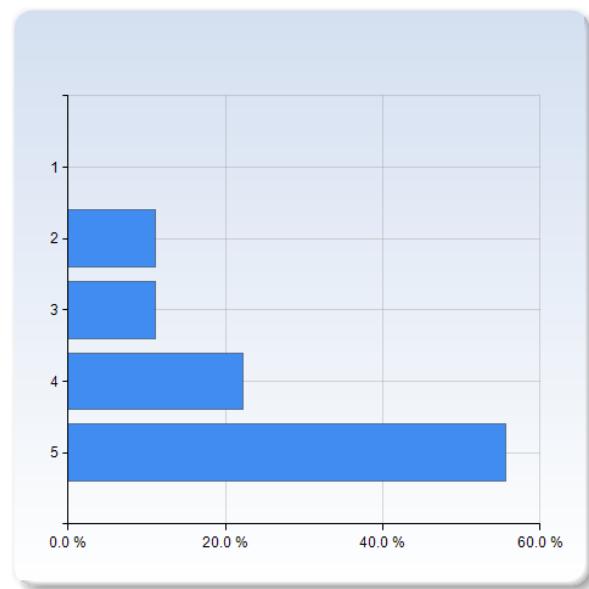
	Mean	Standard Deviation
The course has increased my ability to read a mathematical text.	4.2	1.1

## 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 (22.2%)
2	0 (0.0%)
3	0 (0.0%)
4	1 (11.1%)
5	6 (66.7%)
Total	9 (100.0%)
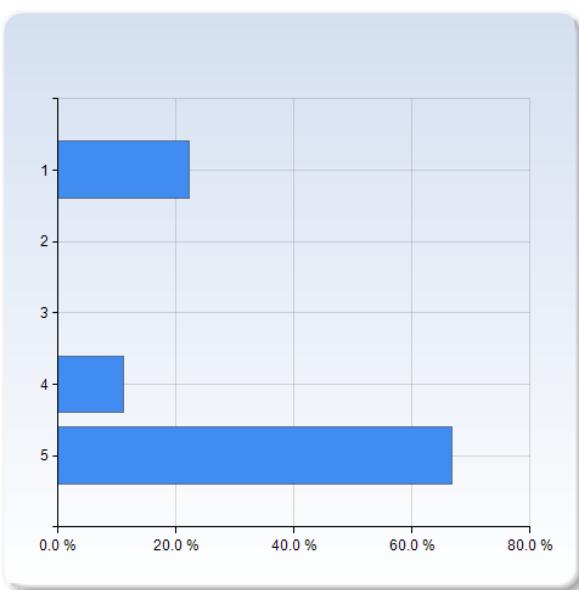
	Mean	Standard Deviation
The course has increased my ability to communicate the subject in writing.	4.0	1.7

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 (25.0%)
2	1 (12.5%)
3	0 (0.0%)
4	1 (12.5%)
5	4 (50.0%)
Total	8 (100.0%)
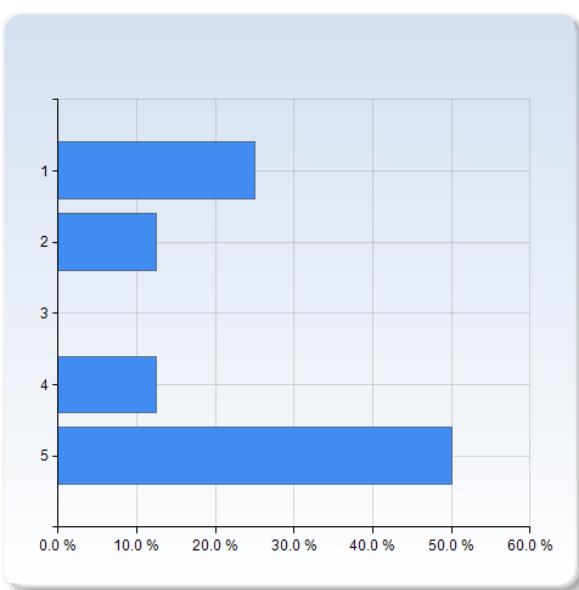
	Mean	Standard Deviation
The course has increased my ability to communicate the subject orally.	3.5	1.9

## The course has increased my ability to cooperate.

The course has increased my ability to cooperate.	Number of Responses
1	2 (25.0%)
2	1 (12.5%)
3	2 (25.0%)
4	1 (12.5%)
5	2 (25.0%)
Total	8 (100.0%)
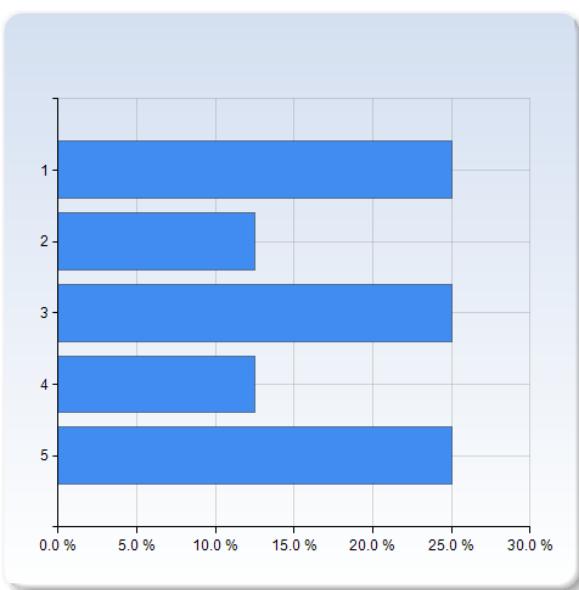
	Mean	Standard Deviation
The course has increased my ability to cooperate.	3.0	1.6

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

The course has increased my ability to search and process information.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	2 (25.0%)
4	3 (37.5%)
5	3 (37.5%)
Total	8 (100.0%)
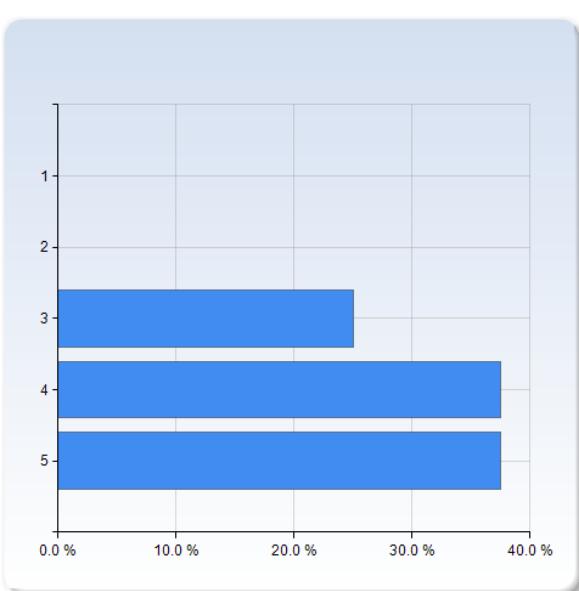
	Mean	Standard Deviation
The course has increased my ability to search and process information.	4.1	0.8

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

| The course has increased my ability to analyze and solve problems.	Number of Responses
1	0 (0.0%)
2	1 (11.1%)
3	1 (11.1%)
4	2 (22.2%)
5	5 (55.6%)
Total	9 (100.0%)
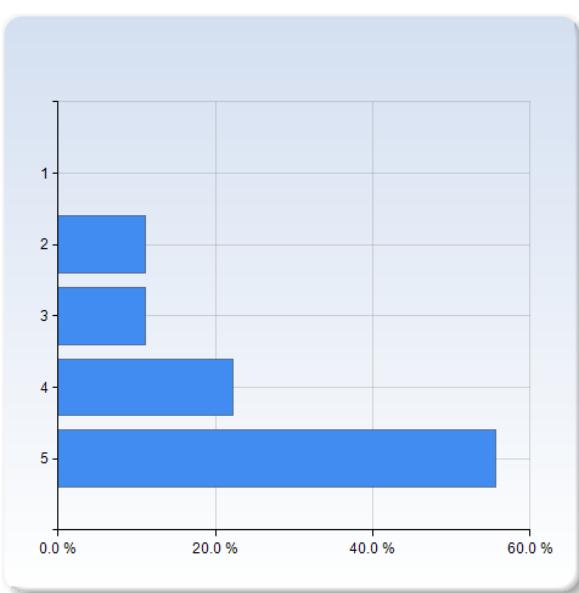
	Mean	Standard Deviation
The course has increased my ability to analyze and solve problems.	4.2	1.1

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	1 (11.1%)
2	1 (11.1%)
3	0 (0.0%)
4	4 (44.4%)
5	3 (33.3%)
Total	9 (100.0%)
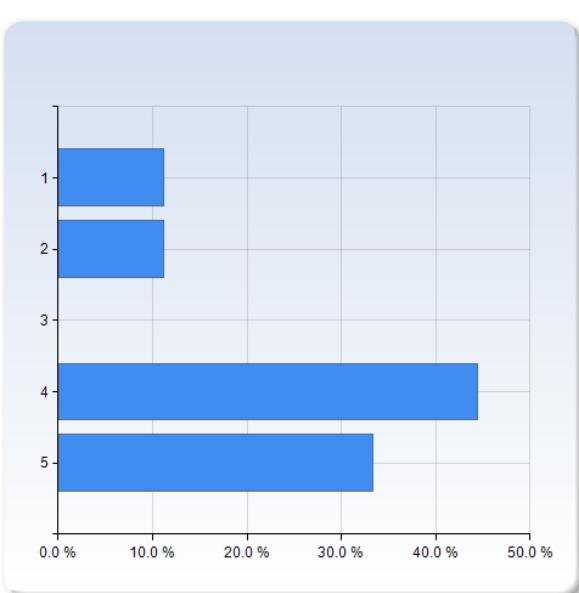
	Mean	Standard Deviation
As a result of this course, I feel confident about tackling unfamiliar problems.	3.8	1.4

What did you appreciate most with the course?

What did you appreciate most with the course?

Videos and not live lectures, especially during these corona times.

The lecturer took time to give intuitive explanations/examples in each topic which greatly helped with intuition.

Good discussions in class, well-structured lectures, and good communication between the students.

book is good

Pre-recorded lectures were amazing, as they, due to editing, planning, and the option to speed up and down and pause, allowed me to learn the material so much faster than traditional lectures. Book was also good as I felt like everything was presented properly and completely.

Very beautiful area of mathematics

I really appreciated the "swapped classroom". I really believe modern teaching should utilise modern technology. For instance I really appreciated the pre-recorded material (which you could revisit at any time). The content gave a good intuition for the topic and was entertaining. It lacked a little bit rigour, but it was a good complement to the book (which was also a fantastic book). I hope this material (recordings) will be used in the future as well. I really think students will benefit from it, if then instead lecture and seminar times are used much better than they were in the course.

I appreciated that there was an introduction to the motivations behind many definitions in measure theory, particularly that of Lebesgue measure, which is, to me, perhaps the most abstract of any definitions I have seen. It would not have been clear to me, otherwise, why there should be anything but Borel measure on Euclidean spaces.

What do you think should be improved?

What do you think should be improved?

We need to have solutions to selected exercises. The book barely gives any hint, and these exercises are presented as "routine" while they are not. Hence we nearly always had to rely on other courses to get answers to our questions.
More generally, the course literature should be changed.

Personally I prefer live over prerecorded lectures.

Information for the exam could have been given a bit earlier on the canvas page.

teacher skips a lot of details in class. Sometimes we have theorems that we discuss in class that the teacher says are easy, so he skips the details, while in reality we need 3 previous lemmas in the book that he has never mentioned in class. This happens quite often i feel like.

Along the way I would have enjoyed hearing why the things we were learning were useful. Even if I knew that everything was relevant, having no idea how things fit together before the end made it at times feel like I was just learning random facts about random things, making the course a bit less enjoyable and motivating.

A take-home exam with increased time and difficulty is prefered to a monitored exam. Monitored exams add a lot of extra complications, like making sure the camera is stable, has battery, etc.

Marcus spent so much time on the videos that he seemed disinterested in going through the hard and interesting questions from the book and the extra material. This lack of support made the course very difficult, in the sense that if you are studying other courses at the same time and want to grind the material really well (understanding it in depth), it takes longer than the period of the course. It also becomes really hard to transition when everything is building on top of each other.

Marcus in general seems to also have the "this is trivial", "this is not interesting" attitude, which I can understand if you have taught the course for years. But I think he should have an understanding that for most students this is all new concepts that takes time to appreciate and understand well.

The pace of the course was also uneven and there were a lot of jumps. It was slow pace in the beginning and then sped up too fast. This again reflects back on things he found trivial but that actually were given a substantial place in the book, which I really preferred following in detail.

1) Use the lectures to give more rigour and go through specific questions students have in detail.
2) Have dedicated seminar times to go through the problems.
3) Answer questions without giving a hand-wavy answer because he doesn't find it important/interesting enough. Clearly it is for the student asking!
4) Keep an even pace, maybe start faster in the beginning and don't make too many jumps; the book is beautifully written - why not follow it?

I really hope that Marcus keeps using this format after Corona and puts more emphasis on points 1)-3) for in class/blackboard action. Because if those point were better fulfilled, I think this would've been one of the best courses I would have had in my bachelor's in terms of content, but primarily pedagogically.

I struggled to follow the course because I felt that there were many early concepts left unjustified. I think of limsup and liminf; I think just a short introduction to what exactly they are and some of their properties would have helped a lot. I also did not like Cohn's book. I feel that it is too dense, and I found the way they wrote proofs to be very very difficult to understand from an intuitive standpoint.

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

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No

No.

No.

no

No

No

No