LUND UNIVERSITY
Faculty of Science

Course Analysis for Course MATM30 Probability Theory

Course Information

Lecturer: Tatyana Turova

Number of students:
16 newly registered and 2 re-registered.
1 students answered the course evaluation, Master's Programme in Mathematics.

Examination

The course ends with oral examination only.

Oral examination: 8 students passed.

- Early examination 22/12 2021: 2 students participated and 0 of them passed.

- Ordinary examination 11-14/1 2022: 9 students participated and 8 of them passed.

- Resit examination 27/1 2022: 1 student participated and not passed.

Final grades:

In all, 8 students, including 1 re-registered student, have got their final grade.
6 passed with distinction.
2 passed.

There are 3-5 more students are expected to pass the oral.

Course Evaluation

Summary of student's answers:

Overall there is a very positive attitude towards the course. The comments suggest to incorporate into the lectures (still) more links to other topics and courses in analysis.

Teachers' comments:

All lectures and seminars in Fall 2021 were held on campus. At least 15 people participated lectures regularly. The group was very strong and active. Each student had a chance to make an oral presentation writing on the blackboard. The seminars went vent very vivid. The homework consisted of problems in the course book. All the assigned problems were presented by students at the blackboard with active discussion.

The ratio of time for lectures vs exercises was about 5:2. This seems to be very appropriate now. Although it depends on the activity of the group of students as well.

The criteria for passing the exam was the following:

Grade "G": student demonstrates good knowledge of the notions and results about them stated as theorems, can solve some problems applying these results.

Grade "VG": student demonstrates profound understanding of the results and can prove the theorems from the course. Furthermore, the student can solve problems which bind different parts of the course.

The question to answer at exam is randomly chosen out of some 22 program topics.

Oral examination is a very important part of learning process. It is a conversation on the course and also on general understanding of mathematics. I believe these 1-2 hours are very much appreciated by the students.

Changes from the previous course realisation:

The group of students was very active and strong. This allowed to omit some part related to functional analysis and to add one more topic on probability at the end. There was an ample amount of time for seminars.
This was certainly very positive for the studying process.

**Suggestions for the next course realisation**:

Following suggestion from the students a detailed discussion on the differences and relations between sigma-algebra and topology should be added. When appropriate there should be more clear connections with other courses and methods of proving (standard) theorems in analysis.

Mathematical Foundations of Probability, Autumn 2021

Answer Count: 1

I have studied this course as part of

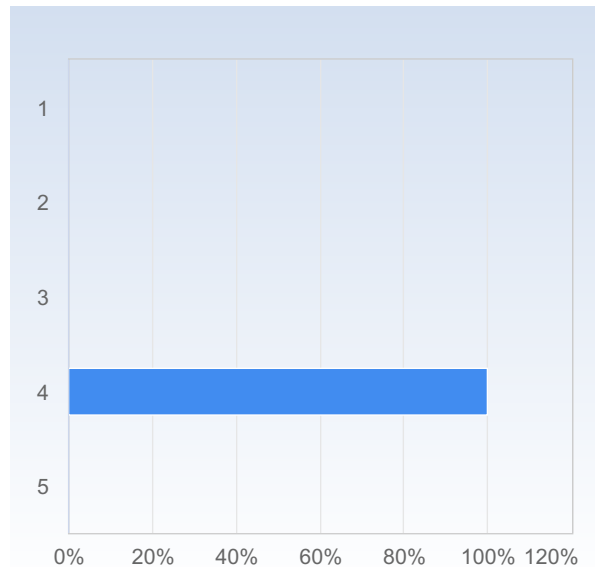| I have studied this course as part of	Number of responses
Bachelor´s Programme in Mathematics	0 (0,0%)
Bachelor´s Programme in Physics, Theoretical Physics, Astronomy	0 (0,0%)
Bachelor´s Programme, other specialization	0 (0,0%)
Master's Programme in Mathematics	1 (100,0%)
Master´s Programme in Mathematical Statistics	0 (0,0%)
Master´s Programme, other specialization	0 (0,0%)
Teacher Education	0 (0,0%)
other programme or as stand alone course	0 (0,0%)
Total	1 (100,0%)
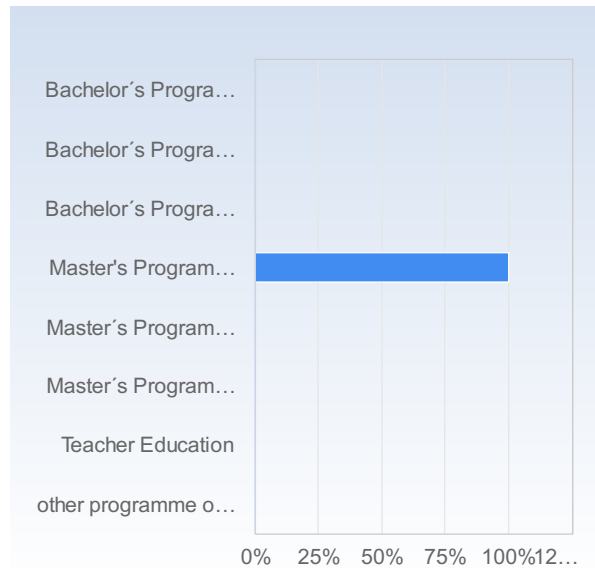
	Mean	Standard Deviation
I have studied this course as part of	4,0	0,0

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

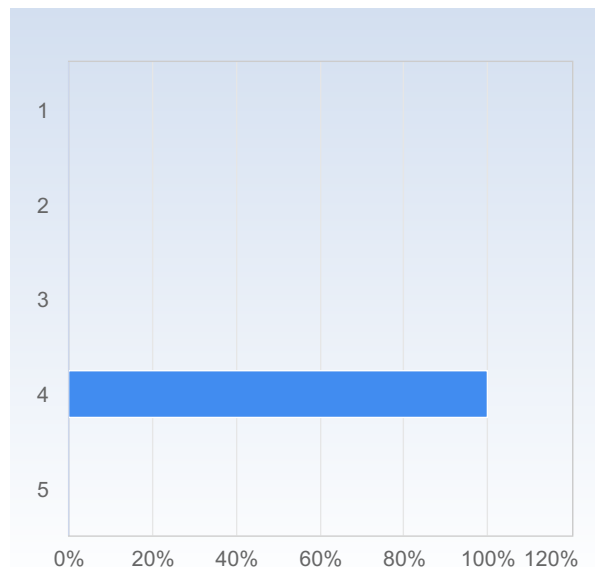## 2.☐My prior knowledge has been sufficient to assimilate the contents of this course.

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	0 (0,0%)
4	1 (100,0%)
5	0 (0,0%)
Total	1 (100,0%)

	Mean	Standard Deviation
2.☐My prior knowledge has been sufficient to assimilate the contents of this course.	4,0	0,0

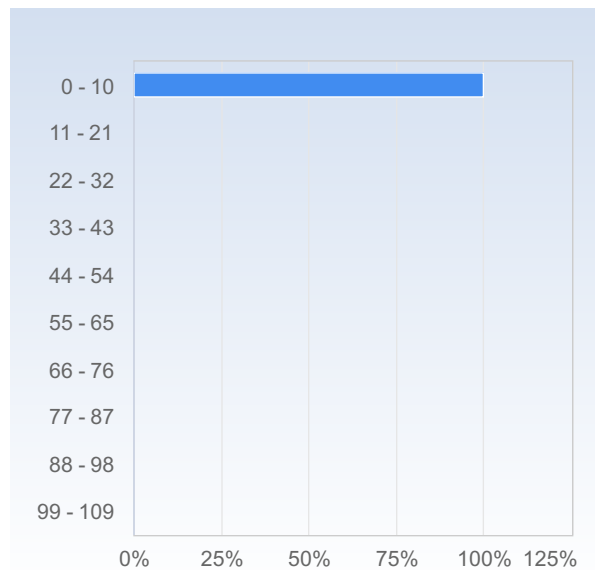## 3.☐I have participated actively in the course.

3.☐I have participated actively in the course.	Number of responses
1	0 (0,0%)
2	0 (0,0%)
3	0 (0,0%)
4	1 (100,0%)
5	0 (0,0%)
Total	1 (100,0%)

	Mean	Standard Deviation
3.☐I have participated actively in the course.	4,0	0,0

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
0 - 10	1 (100,0%)
11 - 21	0 (0,0%)
22 - 32	0 (0,0%)
33 - 43	0 (0,0%)
44 - 54	0 (0,0%)
55 - 65	0 (0,0%)
66 - 76	0 (0,0%)
77 - 87	0 (0,0%)
88 - 98	0 (0,0%)
99 - 109	0 (0,0%)
Total	1 (100,0%)

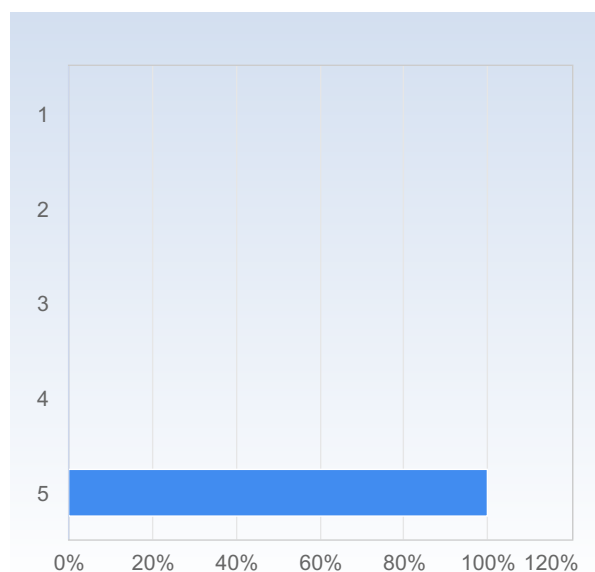|	Mean	Standard Deviation
Average number of hours spent in total on the course per week (including scheduled activities):	4,0	0,0

The course in general

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

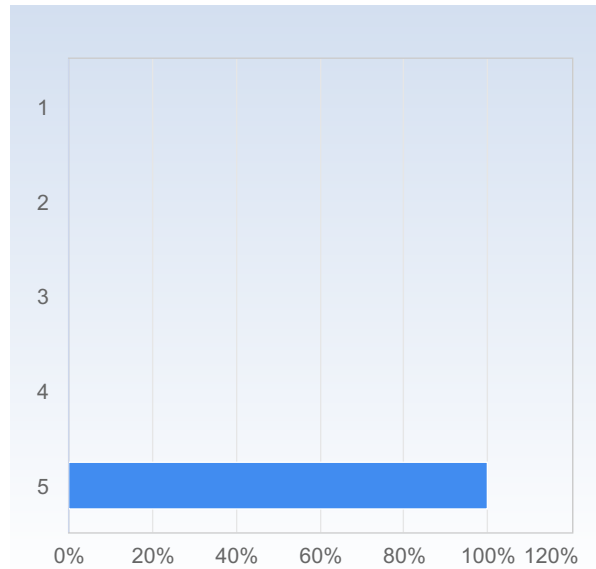**The way the course was taught and organised suited me.**

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

	Mean	Standard Deviation
The way the course was taught and organised suited me.	5,0	0,0

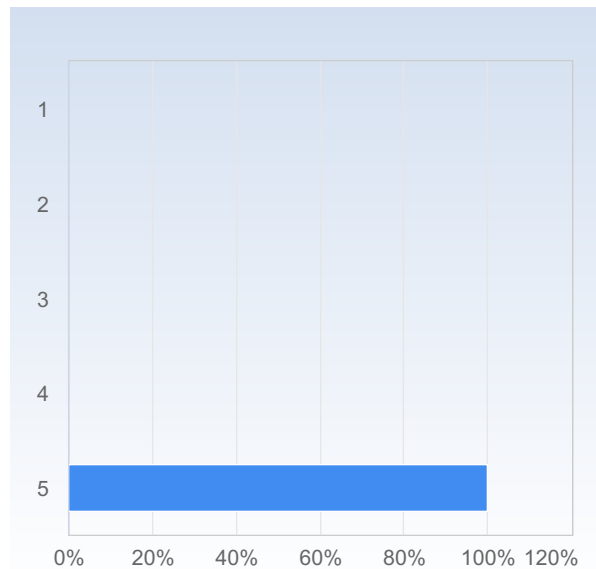# The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.

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

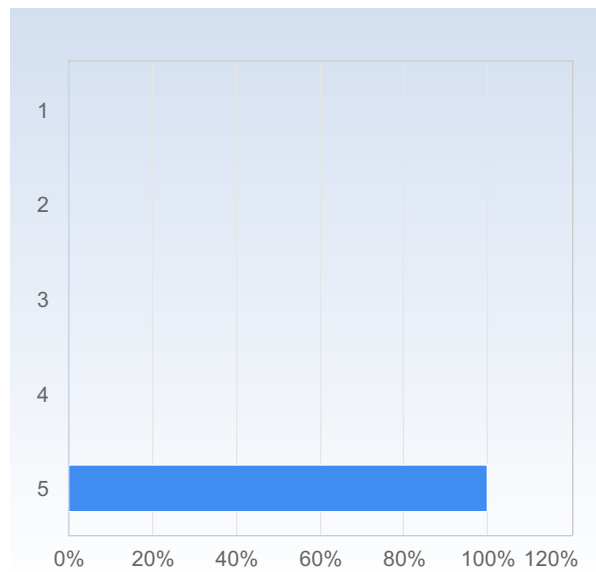|	Mean	Standard Deviation
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	5,0	0,0

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	0 (0,0%)
4	0 (0,0%)
5	1 (100,0%)
Total	1 (100,0%)

	Mean	Standard Deviation
The lectures were valuable for my learning.	5,0	0,0

The seminars were valuable for my learning.

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

	Mean	Standard Deviation
The seminars were valuable for my learning.	5,0	0,0

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	0 (0,0%)
5	1 (100,0%)
Total	1 (100,0%)
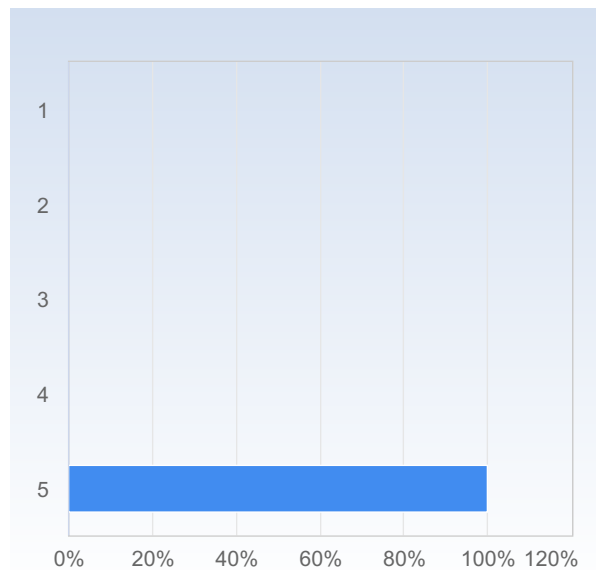
	Mean	Standard Deviation
Studying on my own was valuable for my learning.	5,0	0,0

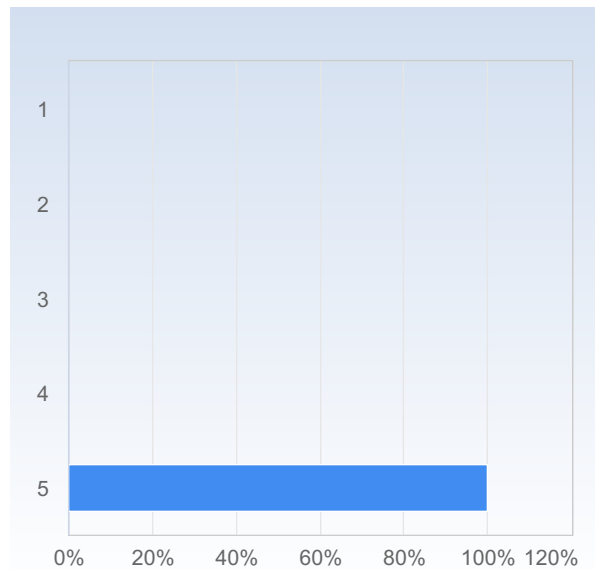# The course literature/material was a valuable learning resource.

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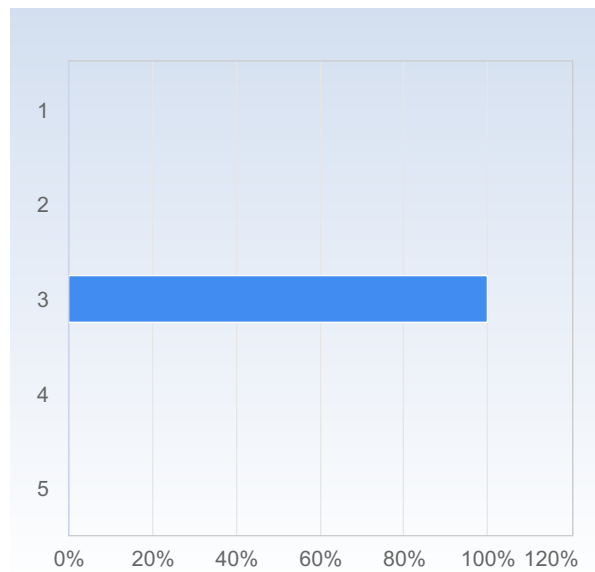
	Mean	Standard Deviation
The course literature/material was a valuable learning resource.	3,0	0,0

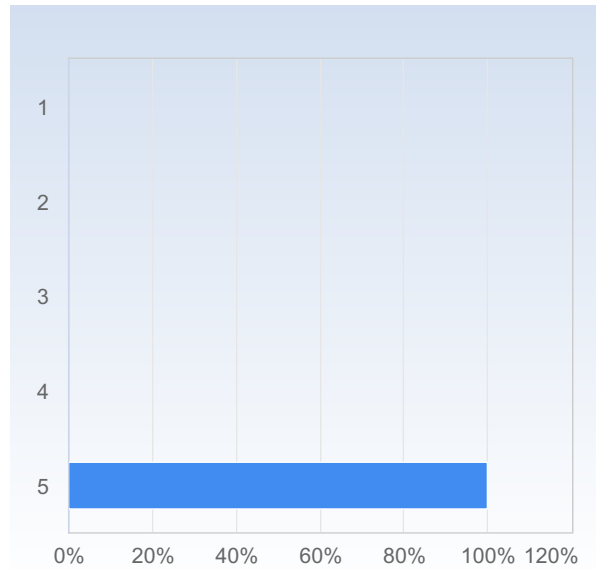# The information I received before the course start was satisfactory.

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

	Mean	Standard Deviation
The information I received before the course start was satisfactory.	5,0	0,0

# 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	0 (0,0%)
4	0 (0,0%)
5	1 (100,0%)
Total	1 (100,0%)

	Mean	Standard Deviation
The communication with the teaching staff during the course was good.	5,0	0,0

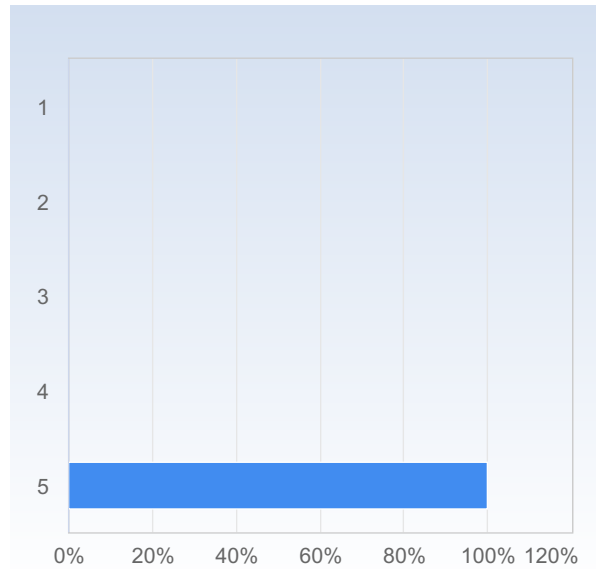# It was clear throughout the course what was expected of me.

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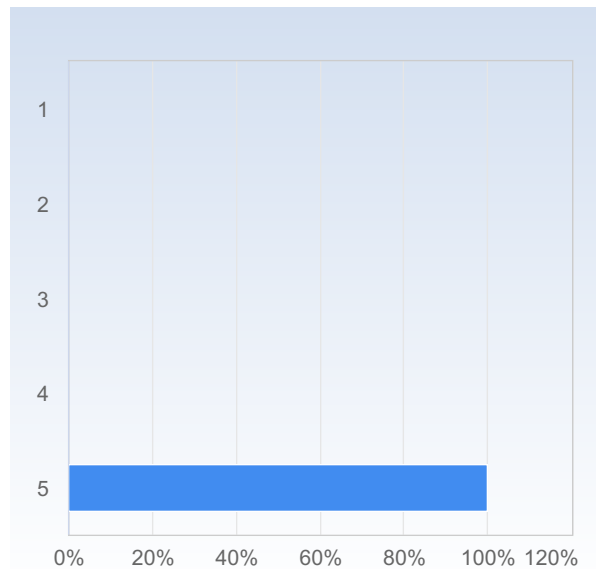
	Mean	Standard Deviation
It was clear throughout the course what was expected of me.	5,0	0,0

# 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	0 (0,0%)
2	0 (0,0%)
3	0 (0,0%)
4	0 (0,0%)
5	1 (100,0%)
Total	1 (100,0%)

	Mean	Standard Deviation
I have received valuable feedback from my teacher/teachers during the course.	5,0	0,0

The course had a reasonable workload.

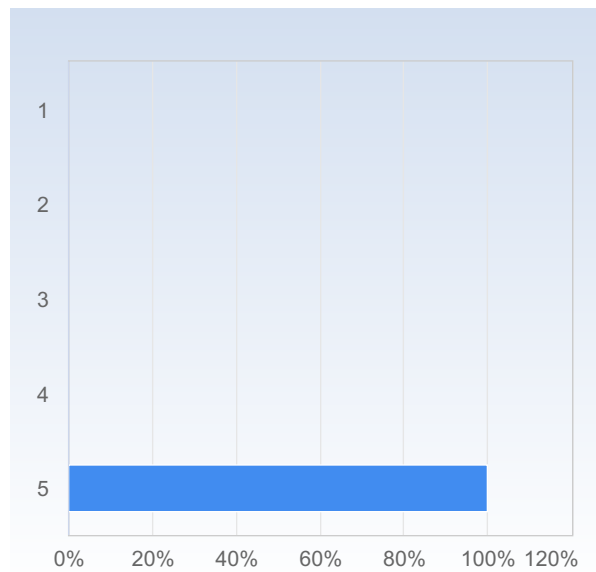| The course had a reasonable workload.	Number of responses
1	0 (0,0%)
2	0 (0,0%)
3	0 (0,0%)
4	0 (0,0%)
5	1 (100,0%)
Total	1 (100,0%)
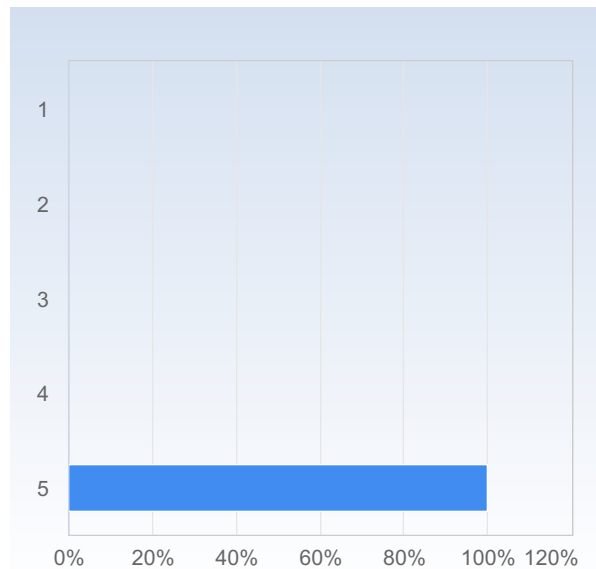
	Mean	Standard Deviation
The course had a reasonable workload.	5,0	0,0

The workload was evenly distributed throughout the course.

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

	Mean	Standard Deviation
The workload was evenly distributed throughout the course.	5,0	0,0

The examination matched the contents and level of the course.

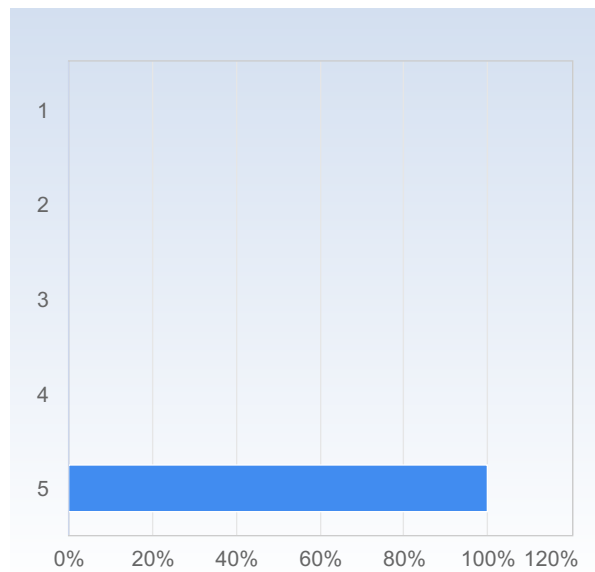| The examination matched the contents and level of the course.	Number of responses
1	0 (0,0%)
2	0 (0,0%)
3	0 (0,0%)
4	0 (0,0%)
5	1 (100,0%)
Total	1 (100,0%)
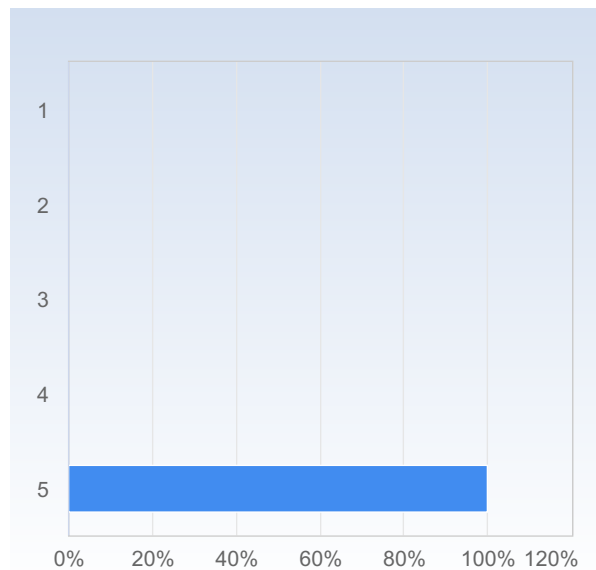
	Mean	Standard Deviation
The examination matched the contents and level of the course.	5,0	0,0

Overall, I am satisfied with the course.

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

	Mean	Standard Deviation
Overall, I am satisfied with the course.	5,0	0,0

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

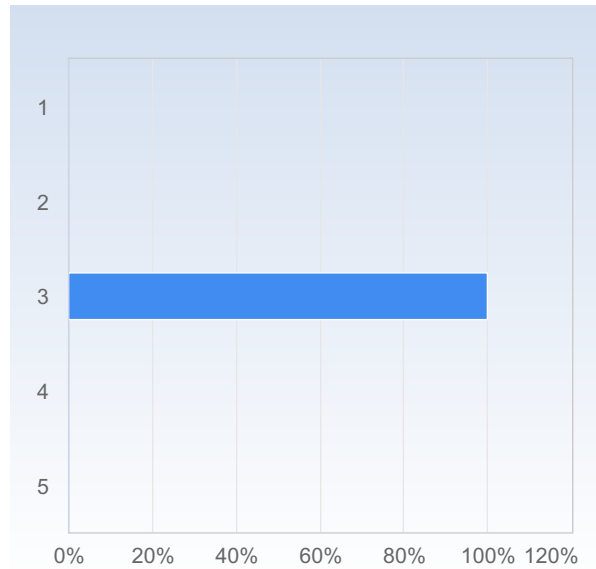## The course has increased my ability to read a mathematical text.

The course has increased my ability to read a mathematical text.	Number of responses
1	0 (0,0%)
2	0 (0,0%)
3	0 (0,0%)
4	0 (0,0%)
5	1 (100,0%)
Total	1 (100,0%)
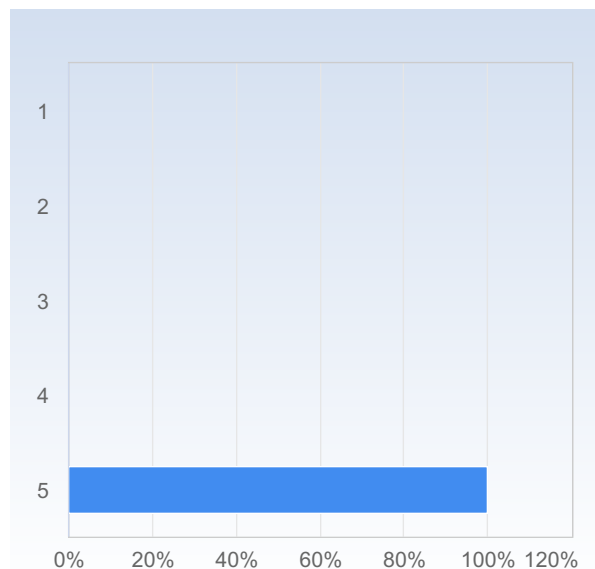
	Mean	Standard Deviation
The course has increased my ability to read a mathematical text.	5,0	0,0

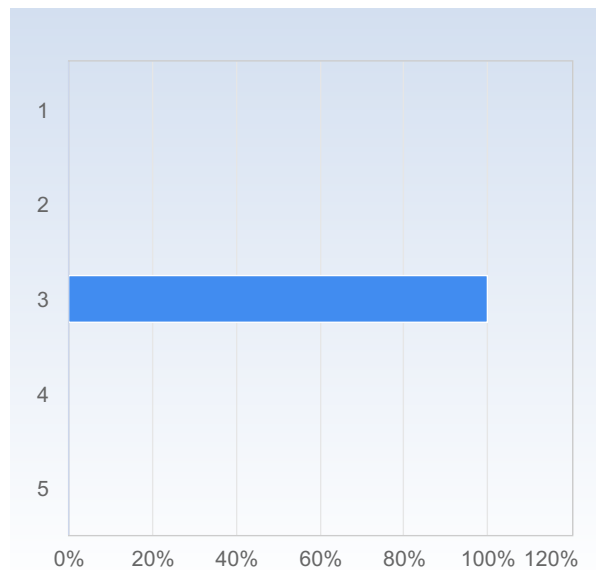# The course has increased my ability to communicate the subject in writing.

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

	Mean	Standard Deviation
The course has increased my ability to communicate the subject in writing.	3,0	0,0

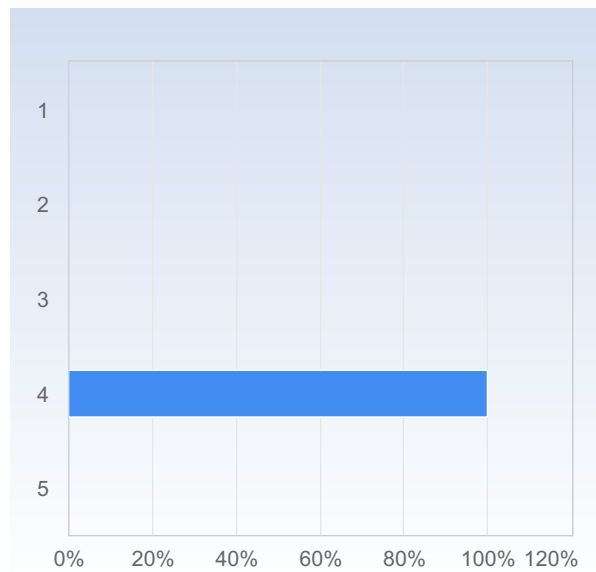# The course has increased my ability to communicate the subject orally.

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

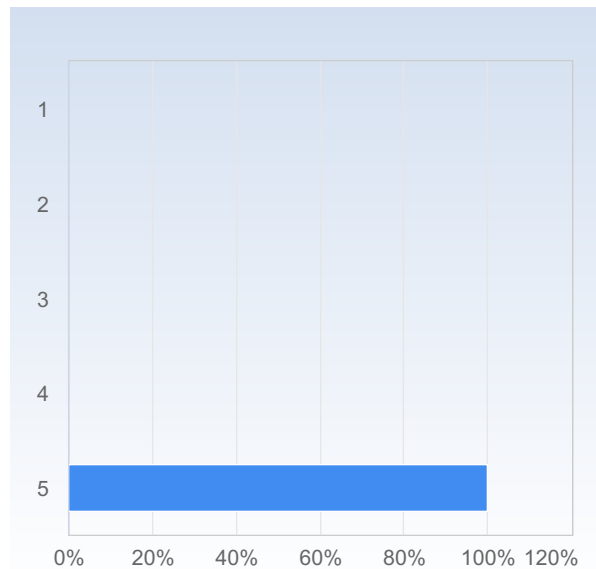|	Mean	Standard Deviation
The course has increased my ability to communicate the subject orally.	3,0	0,0

The course has increased my ability to cooperate.

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

	Mean	Standard Deviation
The course has increased my ability to cooperate.	4,0	0,0

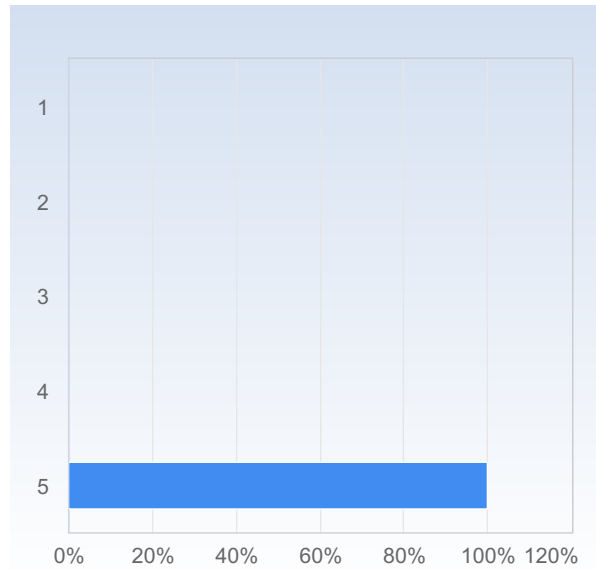# The course has increased my ability to search and process information.

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

	Mean	Standard Deviation
The course has increased my ability to search and process information.	5,0	0,0

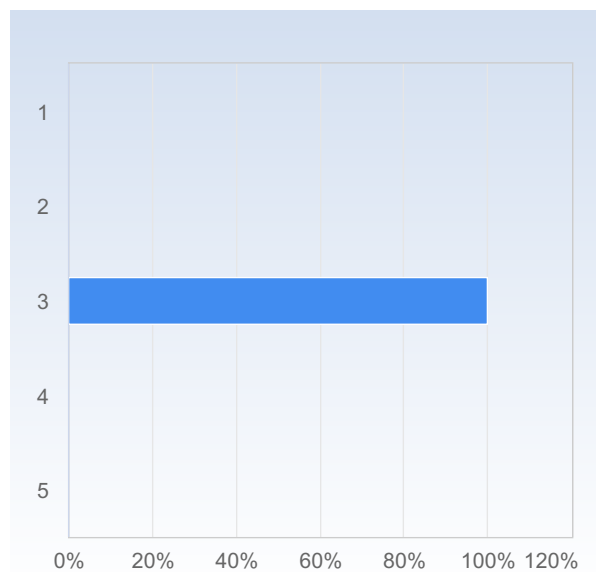# The course has increased my ability to analyze and solve problems.

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

	Mean	Standard Deviation
The course has increased my ability to analyze and solve problems.	5,0	0,0

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	0 (0,0%)
2	0 (0,0%)
3	1 (100,0%)
4	0 (0,0%)
5	0 (0,0%)
Total	1 (100,0%)

	Mean	Standard Deviation
As a result of this course, I feel confident about tackling unfamiliar problems.	3,0	0,0

What did you appreciate most with the course?

What did you appreciate most with the course?
Seeing the connection between probabiltiy theory and measure theory laid out explicitly was fun.

What do you think should be improved?

I think that when defining the Borel sigma-algebra, it can be helpful to those who know some topology to mention that B(X)=sigma(topology on X), even if this is only mentioned for intuition rather than stated as a proposition.

I also think that there are some things that could benefit from having a more general version explained. For example, the theorem on how when checking that a function X->R is measurable, it it enough to check on intervals; I think this should be phrased in the general case rather than only for maps X->R, that is I think it's more helpful to prove this theorem for maps X->Y, where the sigma algebra on Y is generated by some given set. Since the proofs are identical, this isn't much harder to include either.

Another example is that I think it would be helpful to include a theorem on checking that two probabilities are equal; for example, a theorem stating that two probabilities are equal if they agree on a generating algebra (as a consequence of the monotone class theorem, which is already used by Shiryaev in some proofs in the book, so I think it's fair to use it). Having such a theorem available makes some proofs significantly easier (e.g. the theorem on random variables being independent iff a distribution function factors---indeed, the proof Shiryaev presents for this consists of checking equality on a generating algebra (unions of intervals) and then showing that this implies equality everywhere).

In general, though, the course is quite good.

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

No.