



LUND
UNIVERSITY

Course Analysis for MATP33 Group and Ring Theory Spring 2023

Course Information

Lecturer: Gustavo Jasso

Teaching assistants: None.

Number of students: 24 newly registered and 4 re-registered.

7 students answered the course evaluation, 5 of them are enrolled on the Bachelor's Programme in Mathematics, 1 of them is enrolled in the Master's Programme in Mathematics, and 1 of them is enrolled in other program or as a standalone course.

Examination

Oral examination: 9 newly registered students passed.

Written examination: 10 newly registered students passed.

- Ordinary examination 24/05 2023: 13 students participated and 8 of them passed.
- Resit examination 15/08 2023: 3 students participated and 2 of them passed.

Final grades

9 students received their final grade.

6 passed with distinction.

3 passed.

Course Evaluation

Summary of student's answers:

The students comments were mostly positive, although students were critical of the course's workload and of the large amount of material that the course must cover as per the syllabus. See the attached report for a complete overview of the students' answers.

Teachers' comments:

The course was taught during the second period of the Spring term. The lectures took place twice per week, for a total of 18 lectures. Starting on the third week of lectures we held weekly seminars where the solutions to the homework problems were presented by the lecturer. The

course was administered through Canvas, where (extensive) typeset lecture notes for the course were posted shortly before each lecture. The course included a self-study assignment on the semi-direct product of groups and an application of the Sylow Theorems to the classification of finite groups of certain orders.

Changes from the previous course realisation:

The previous course realisation was taught by a different lecturer. For this iteration, the course's structure was completely re-designed within the requirements of the official syllabus. A distinctive feature of the course's design was the focus on concepts of basic category theory as well as on the systematic use of universal properties. The first part of the course was restructured in order to place additional focus on the properties and the classification of G -sets, with the purpose of making the connection to the second part of the course (on rings and modules) more transparent to the students. Furthermore, the detailed study of G -sets should be helpful to students that wish to read the newly-introduced course 'Introduction to Algebraic Topology' in which covering spaces are studied. The literature for the course was also changed from a specific book to a set lecture notes compiled by the lecturer from various sources; these were typeset in \LaTeX and were distributed via Canvas to the students shortly before each lecture.

Suggestions for the next course realisation:

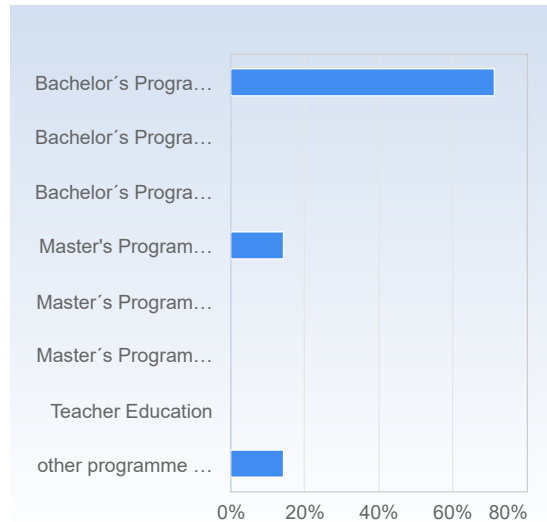
Changes to the course's syllabus to reduce the amount of material that must be covered should be considered. The student's comments suggest that the format of the seminar should be changed in order to offer more interaction. A possibility for addressing this concern is to transform the seminars into discussion sessions and this is something that might be tested in the next realisation of the course. Finally, in future iterations the lecture notes will be made available to the students in their entirety at the beginning of the course, which is possible since the notes have been already typeset.

MATP33 Group and Ring Theory VT 2023

Answer Count: 7

I have studied this course as part of

I have studied this course as part of	Number of responses
Bachelor's Programme in Mathematics	5 (71.4%)
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 (14.3%)
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	1 (14.3%)
Total	7 (100.0%)

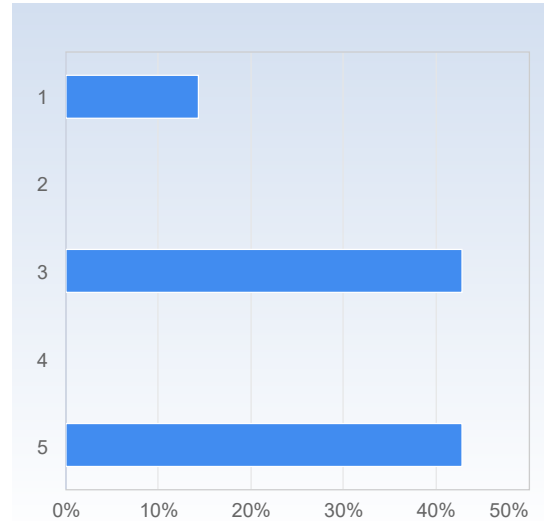


	Mean	Standard Deviation
I have studied this course as part of	2.4	2.7

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.

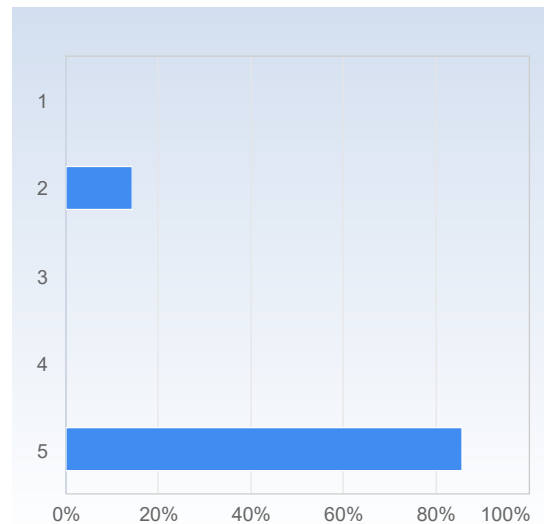
	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	3 (42.9%)
4	0 (0.0%)
5	3 (42.9%)
Total	7 (100.0%)



	Mean	Standard Deviation
2. My prior knowledge has been sufficient to assimilate the contents of this course.	3.6	1.5

3. I have participated actively in the course.

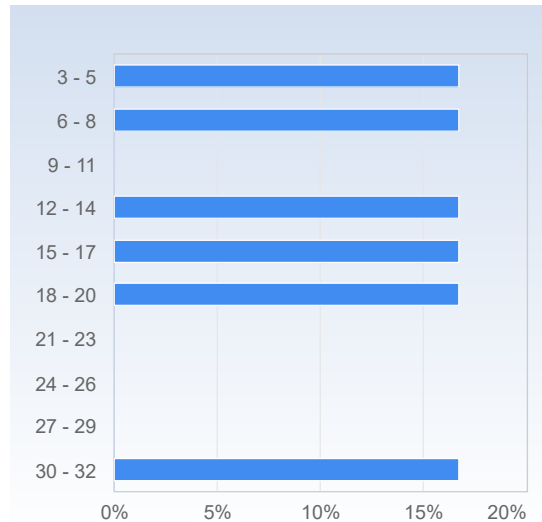
	Number of responses
1	0 (0.0%)
2	1 (14.3%)
3	0 (0.0%)
4	0 (0.0%)
5	6 (85.7%)
Total	7 (100.0%)



	Mean	Standard Deviation
3. I have participated actively in the course.	4.6	1.1

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

Average number of hours spent in total on the course per week (including scheduled activities):	Number of responses
3 - 5	1 (16.7%)
6 - 8	1 (16.7%)
9 - 11	0 (0.0%)
12 - 14	1 (16.7%)
15 - 17	1 (16.7%)
18 - 20	1 (16.7%)
21 - 23	0 (0.0%)
24 - 26	0 (0.0%)
27 - 29	0 (0.0%)
30 - 32	1 (16.7%)
Total	6 (100.0%)



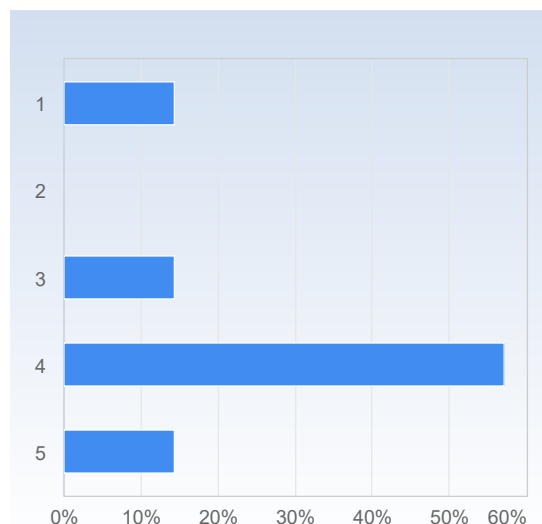
	Mean	Standard Deviation
Average number of hours spent in total on the course per week (including scheduled activities):	14.7	9.0

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.

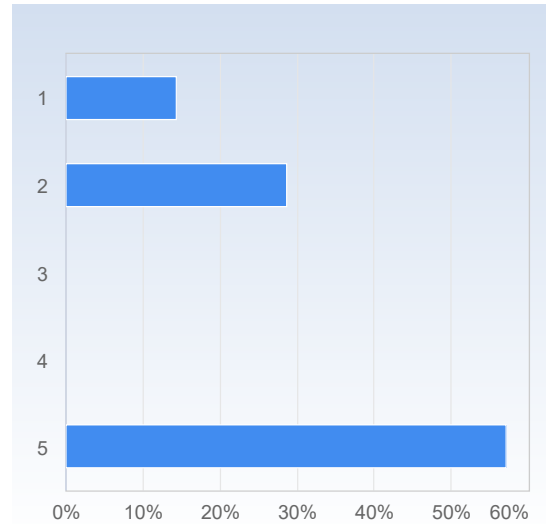
The way the course was taught and organised suited me.	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	1 (14.3%)
4	4 (57.1%)
5	1 (14.3%)
Total	7 (100.0%)



	Mean	Standard Deviation
The way the course was taught and organised suited me.	3.6	1.3

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

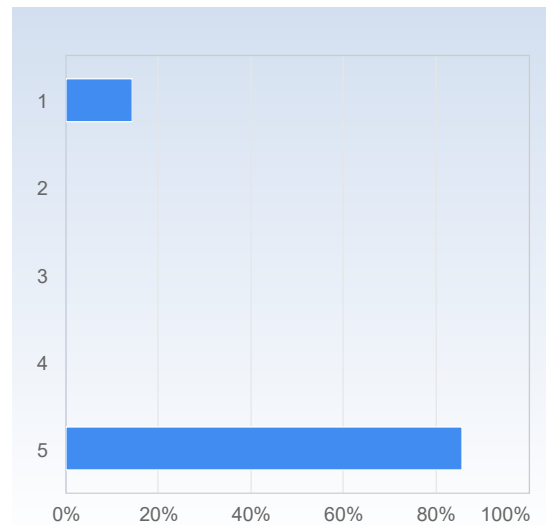
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	Number of responses
1	1 (14.3%)
2	2 (28.6%)
3	0 (0.0%)
4	0 (0.0%)
5	4 (57.1%)
Total	7 (100.0%)



	Mean	Standard Deviation
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	3.6	1.8

The lectures were valuable for my learning.

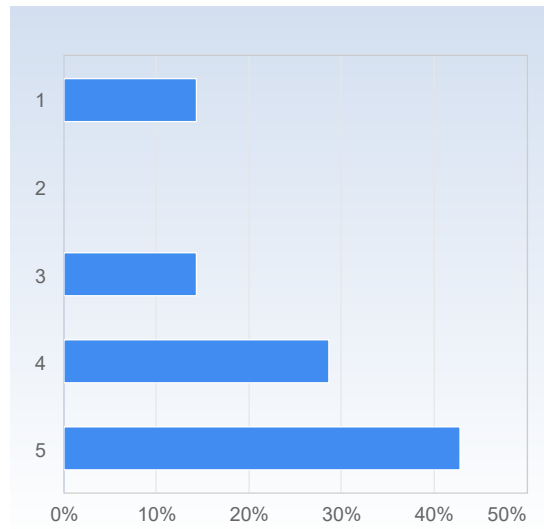
The lectures were valuable for my learning.	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	0 (0.0%)
4	0 (0.0%)
5	6 (85.7%)
Total	7 (100.0%)



	Mean	Standard Deviation
The lectures were valuable for my learning.	4.4	1.5

The seminars were valuable for my learning.

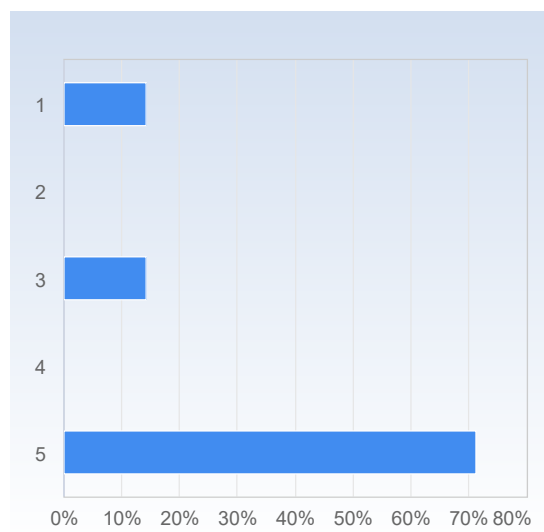
The seminars were valuable for my learning.	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	1 (14.3%)
4	2 (28.6%)
5	3 (42.9%)
Total	7 (100.0%)



	Mean	Standard Deviation
The seminars were valuable for my learning.	3.9	1.5

Studying on my own was valuable for my learning.

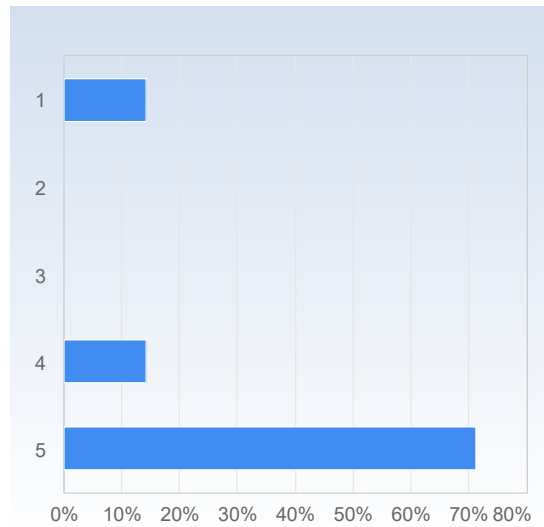
Studying on my own was valuable for my learning.	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	1 (14.3%)
4	0 (0.0%)
5	5 (71.4%)
Total	7 (100.0%)



	Mean	Standard Deviation
Studying on my own was valuable for my learning.	4.1	1.6

The course literature/material was a valuable learning resource.

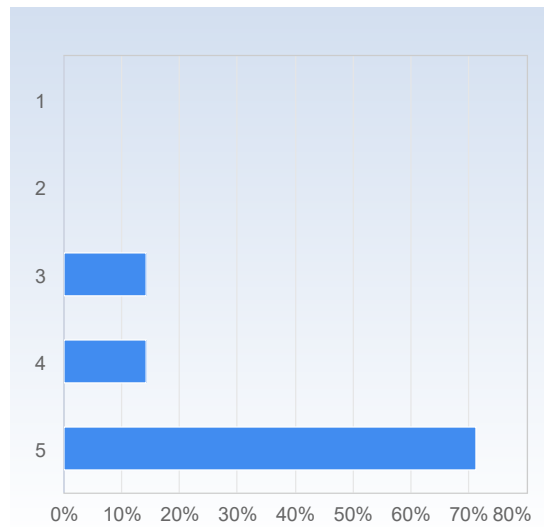
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Total	7 (100.0%)



	Mean	Standard Deviation
The course literature/material was a valuable learning resource.	4.3	1.5

The information I received before the course start was satisfactory.

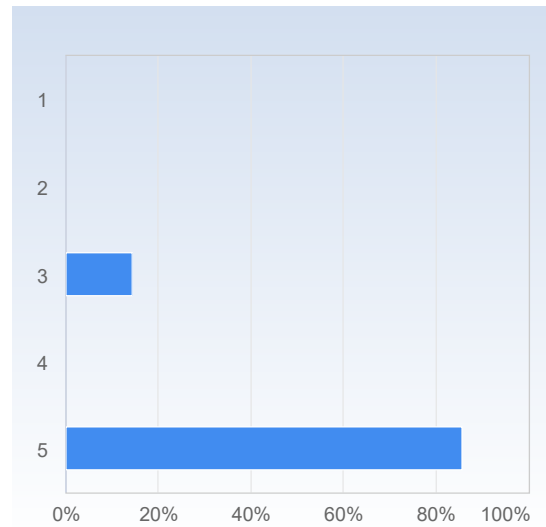
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	Mean	Standard Deviation
The information I received before the course start was satisfactory.	4.6	0.8

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

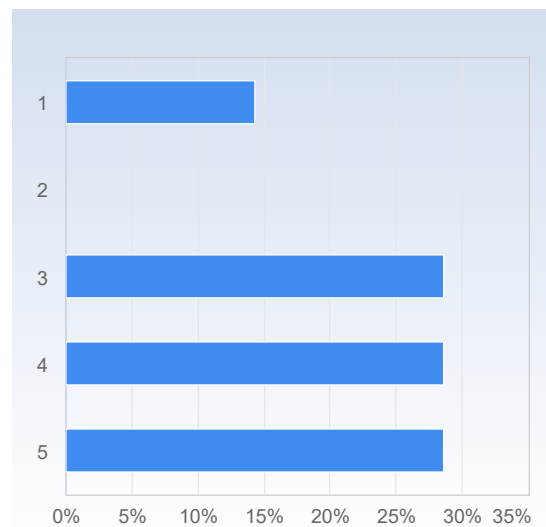
The communication with the teaching staff during the course was good.	Number of responses
1	0 (0.0%)
2	0 (0.0%)
3	1 (14.3%)
4	0 (0.0%)
5	6 (85.7%)
Total	7 (100.0%)



The communication with the teaching staff during the course was good.	Mean	Standard Deviation
	4.7	0.8

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

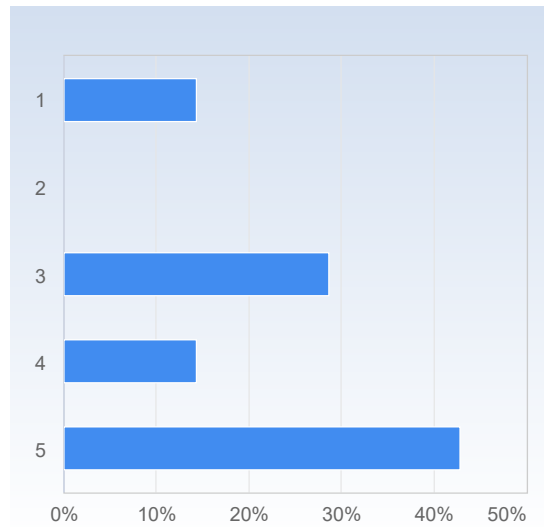
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It was clear throughout the course what was expected of me.	Mean	Standard Deviation
	3.6	1.4

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

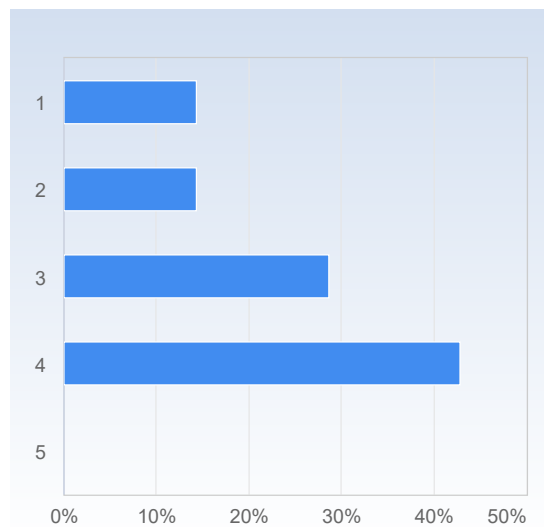
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I have received valuable feedback from my teacher/teachers during the course.	Mean	Standard Deviation
	3.7	1.5

The course had a reasonable workload.

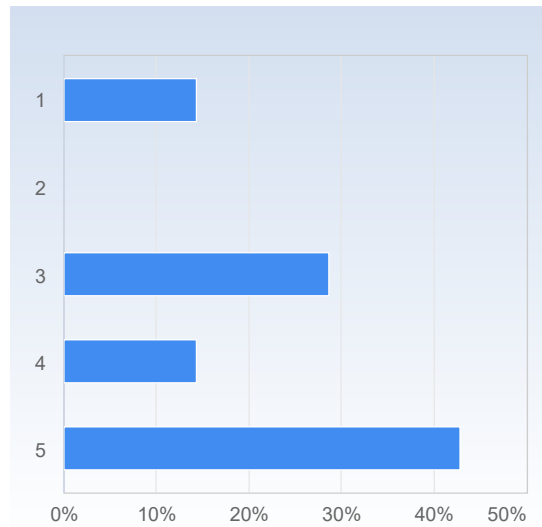
The course had a reasonable workload.	Number of responses
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4	3 (42.9%)
5	0 (0.0%)
Total	7 (100.0%)



The course had a reasonable workload.	Mean	Standard Deviation
	3.0	1.2

The workload was evenly distributed throughout the course.

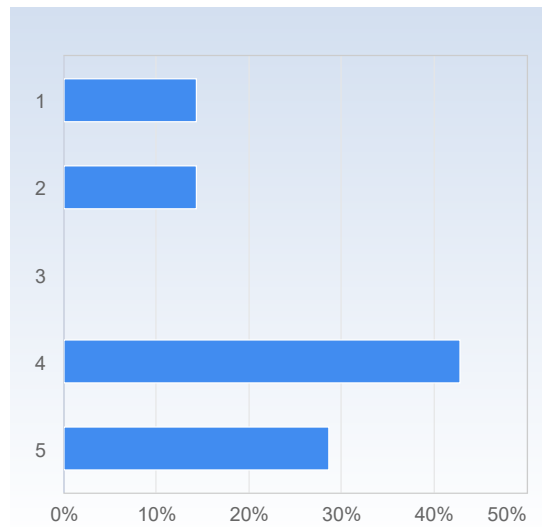
The workload was evenly distributed throughout the course.	Number of responses
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3	2 (28.6%)
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5	3 (42.9%)
Total	7 (100.0%)



	Mean	Standard Deviation
The workload was evenly distributed throughout the course.	3.7	1.5

The examination matched the contents and level of the course.

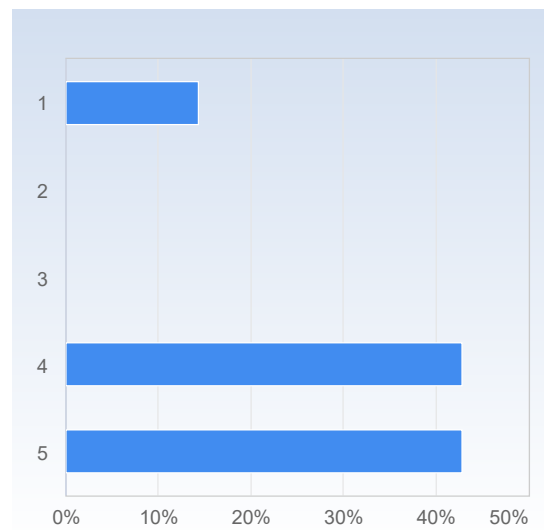
The examination matched the contents and level of the course.	Number of responses
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Total	7 (100.0%)



	Mean	Standard Deviation
The examination matched the contents and level of the course.	3.6	1.5

Overall, I am satisfied with the course.

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1	1 (14.3%)
2	0 (0.0%)
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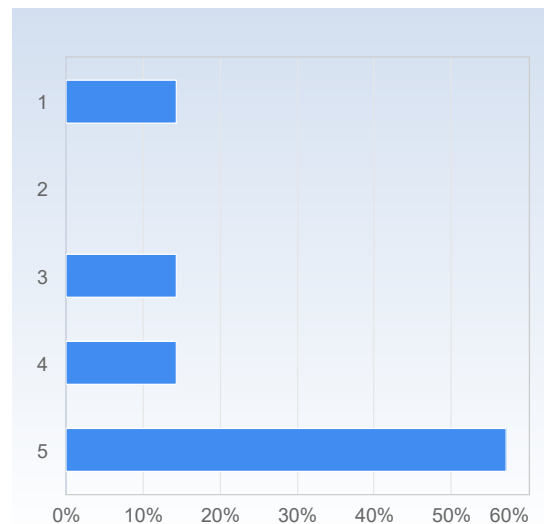
	Mean	Standard Deviation
Overall, I am satisfied with the course.	4.0	1.4

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.

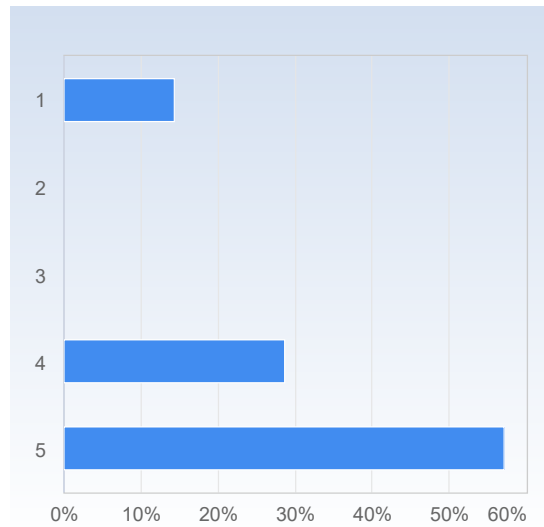
The course has increased my ability to read a mathematical text.	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	1 (14.3%)
4	1 (14.3%)
5	4 (57.1%)
Total	7 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to read a mathematical text.	4.0	1.5

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

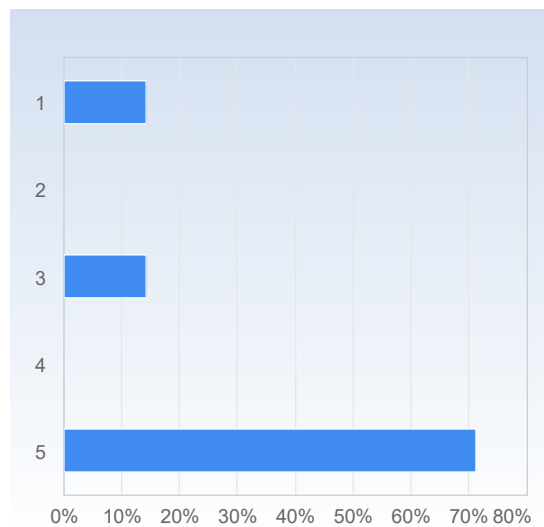
The course has increased my ability to communicate the subject in writing.	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	0 (0.0%)
4	2 (28.6%)
5	4 (57.1%)
Total	7 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to communicate the subject in writing.	4.1	1.5

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

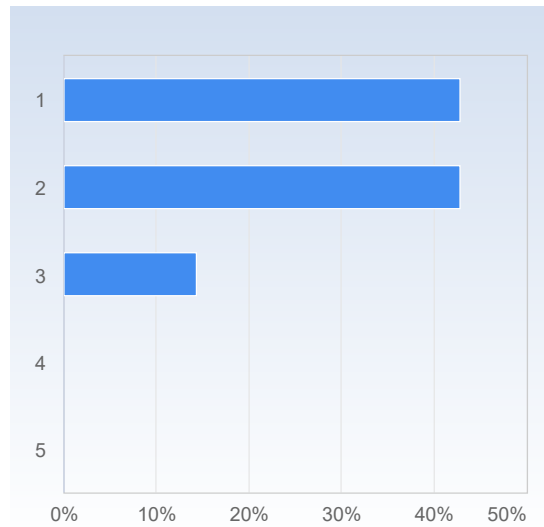
The course has increased my ability to communicate the subject orally.	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	1 (14.3%)
4	0 (0.0%)
5	5 (71.4%)
Total	7 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to communicate the subject orally.	4.1	1.6

The course has increased my ability to cooperate.

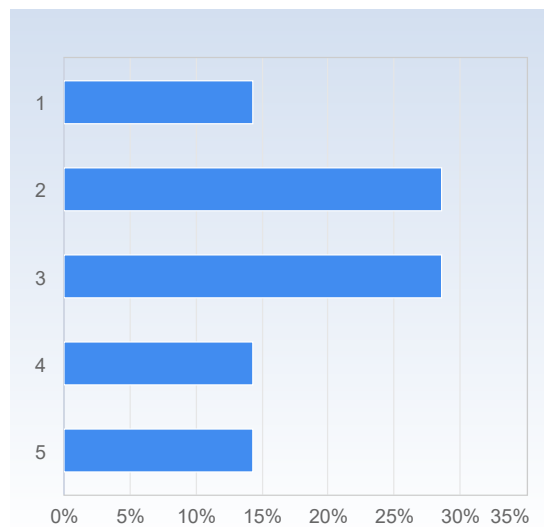
The course has increased my ability to cooperate.	Number of responses
1	3 (42.9%)
2	3 (42.9%)
3	1 (14.3%)
4	0 (0.0%)
5	0 (0.0%)
Total	7 (100.0%)



The course has increased my ability to cooperate.	Mean	Standard Deviation
	1.7	0.8

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

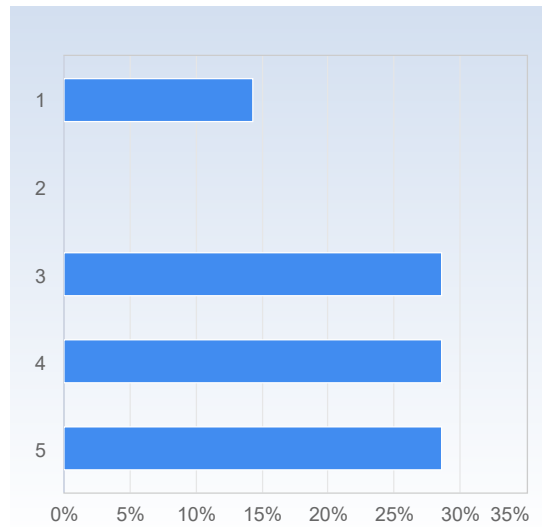
The course has increased my ability to search and process information.	Number of responses
1	1 (14.3%)
2	2 (28.6%)
3	2 (28.6%)
4	1 (14.3%)
5	1 (14.3%)
Total	7 (100.0%)



The course has increased my ability to search and process information.	Mean	Standard Deviation
	2.9	1.3

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

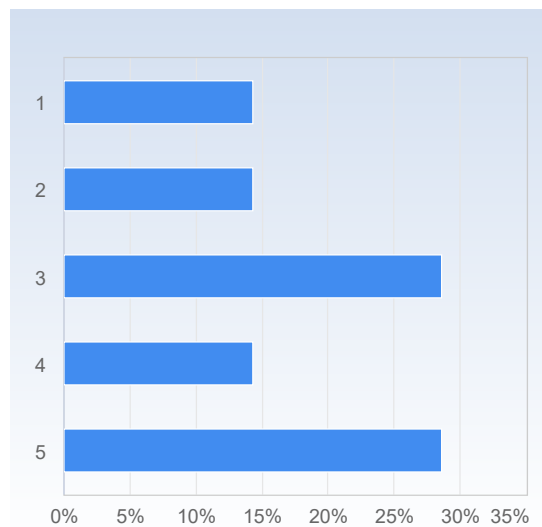
The course has increased my ability to analyze and solve problems.	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	2 (28.6%)
4	2 (28.6%)
5	2 (28.6%)
Total	7 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to analyze and solve problems.	3.6	1.4

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

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1	1 (14.3%)
2	1 (14.3%)
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Total	7 (100.0%)



	Mean	Standard Deviation
As a result of this course, I feel confident about tackling unfamiliar problems.	3.3	1.5

What did you appreciate most with the course?

What did you appreciate most with the course?

I really appreciated how the lecturer was very open to feedback and to discuss problems/questions/other things regarding the course after each lecture. Learning this course felt like a cooperative effort between me and the lecturer, which was a really good feeling.

Hard to limit to a single thing, but perhaps the excellent lecture notes, that in a clear and concise way communicated both the intuitive ideas and the formal steps in the course together with some rewardingly difficult exercises.

The communication and the high number and variety of exercises on the notes

The new ideas. Not being afraid to teach category theory and stuff just because its not in the syllabus.

What do you think should be improved?

What do you think should be improved?

There should be a tentative schedule of the material covered in the lectures, which is standard. It was unclear when which material would be covered or which exercises would be presented.

In the lecture notes there is a disclaimer that we should consult other textbooks, but throughout the lecture notes there are little to no hints as to where to find more information in textbooks. Looking for the corresponding passages takes a lot of time and often the notation is very different or the textbooks use results we did not cover.

There was too much material for a 7.5 credit course. The workload was absolutely not justified. Given the amount of material, Gustavo just rushed through proofs in the lectures, which was too fast for me to follow. It would have helped to see the proof beforehand and then ask questions in the lecture, but the lecture notes were only published 5 minutes before each lecture. It was entirely unclear which material would be covered in the lecture, so I couldn't read up in textbooks either. There were even chapters that we were expected to study on our own since the lectures did not suffice.

In the seminars Gustavo presented selected exercises on the blackboard. We never got any feedback on our solutions.

A mock exam was published, that was supposed to give us an idea of the real exam. The real exam however was much harder, and there were more part exercises than in the mock exam. In that sense, the mock exam was misleading. The grading felt arbitrary at points.

Sometimes it felt like the course tried to cover too many different topics, and it often felt like the lectures were struggling to meet the pace demanded by the course plan. Some topics it felt like we didn't have time to go in-depth at all, but rather they were introduced, some basic results were shown, and then they were left behind since we simply wouldn't have enough time otherwise. It feels like the course would benefit from some of the material (tensor products? Noetherian/Artinian rings/modules?) being moved to a separate course so this one can feel like it has more time to go even more in depth in the things it focuses on.

One last thing, sometimes there was a mismatch between what the lecturer assumed we knew from previous courses and what we actually knew (erring on the side of assuming we knew more than we did), but I assume this will get better as time goes on and Gustavo teaches the course more times.

The seminars seemed a little bit disorganized at times. I find that most courses have a difficult time of making the seminars work well, so I don't really know how to improve them, but to in some way increase interactivity might be worthwhile.

The amount of material covered in this course is too much. The amount of material is also the reason for there being to few examples, which makes it difficult to take everything in. So it would probably be beneficial to not cover all proofs and theorems in the lectures. Also it is very unreasonable to have entire self-study chapters which was the case. Also it is really weird to me that the last lecture covering new material that is tested on the exam is just two working days prior to the exam, this is quite unacceptable I think.

The substitute was not a very good lecturer. He wrote to small and stood in the way of his own writing, and assumed the class to have too high an understanding, and seemed irritated when people did not understand what he was trying to explain.

Seminars felt like less organized lectures. Maybe be slower then and solve easy problems.

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.

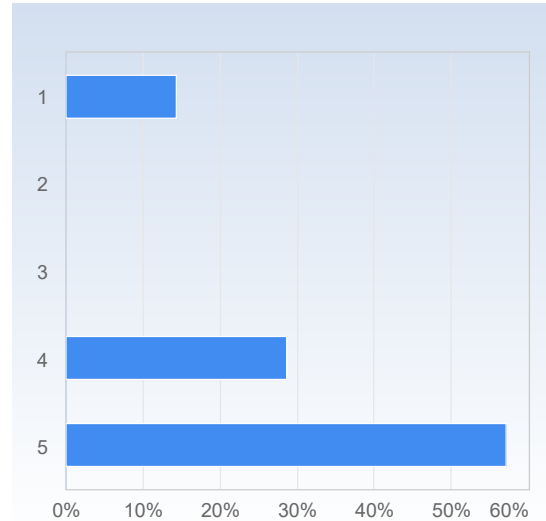
No, the lecturer was always very thoughtful!

no

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

The exercises included in the lecture notes were valuable for my learning

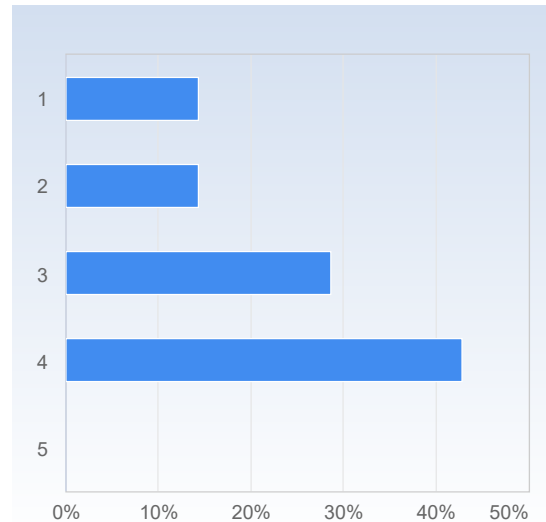
The exercises included in the lecture notes were valuable for my learning	Number of responses
1	1 (14.3%)
2	0 (0.0%)
3	0 (0.0%)
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5	4 (57.1%)
Total	7 (100.0%)



	Mean	Standard Deviation
The exercises included in the lecture notes were valuable for my learning	4.1	1.5

The extra material included in the lecture notes was valuable for my learning

The extra material included in the lecture notes was valuable for my learning	Number of responses
1	1 (14.3%)
2	1 (14.3%)
3	2 (28.6%)
4	3 (42.9%)
5	0 (0.0%)
Total	7 (100.0%)



	Mean	Standard Deviation
The extra material included in the lecture notes was valuable for my learning	3.0	1.2

Comments on the exercises and the seminars

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more interaction would have been good

The exercises in the book were excellent, and I enjoyed the seminar format. Nothing to comment here really, except maybe that I'm used to seminars being two hours rather than one in most courses. Not sure how much that would have changed, however.

Nice blend of some easy and some difficult exercises, and many felt unusually well-connected to the material. As for the seminars, they felt a little bit too much like extended lectures, which on one hand is nice -- lectures are often more interesting -- but it's perhaps not the main idea of the seminars. If there is a way of increasing interactivity without turning them into just "students present some solutions to exercises instead, but in a less enlightening manner", that might be interesting.

They were great!

I would have appreciated to have more seminars

Exercises probably should not be harder than exam questions. (even if you want to show us something interesting.)

Comments on the typeset lecture notes and the extra material included therein

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there were many typos and just way too much material

It felt like the lecture notes couldn't help but to mention some other application/direction we could go down but don't have the time for, which I appreciated. The lecture notes sometimes referred to named theorems by their number instead, which sometimes felt a little frustrating. I liked the extra material, but it was a little strange how the "extra" material on injective modules ended up being important to prove the decomposition of fin.gen. modules over a PID. Not sure how to structure it differently while the course is under so much time pressure, however.

Very good, especially that they included both a few larger picture/historical notes as well as extra comments on some finer details, without either of them becoming overwhelming.

The typeset lecture notes were very good. I did not really have the time to take part of the extra material, but it was nice knowing that is was there.

very clear and complete

Lecture notes are fantastic! maybe uploading them before the lecture could be useful so that we can prepare more before the lecture. reading what will come will make it easier to understand fast lectures

A distinctive aspect of the design of this course was a focus on basic category-theoretic concepts and the systematic use of universal properties. Please comment on how the emphasis on these affected your learning of the course contents.

A distinctive aspect of the design of this course was a focus on basic category-theoretic concepts and the systematic use of universal properties. Please comment on how the emphasis on these affected your learning of the course contents.

The category theory parts were interesting but I think one could have done without. It did not help me that every other proposition was named "universal property", without elaborating why this was coherent.

I think the focus on basic category theory and universal properties was a good idea. Often in algebra courses I've experienced that it can be hard to explain even something very intuitive in a proper way, and universal properties helped bridge that gap, making maps to/from products/coproducts/direct sums easy to handle. Also I think basic category theory is probably a good thing to know for people taking an algebra course at this level.

I think it was a good addition. At first, it was difficult to see the need for it, then the universal properties became slightly overwhelming (but not central enough to adversely affect the learning of the rest of the material) but gradually, and after a little bit of work, everything started to fit together -- and at the end of the course, the more category theory-flavoured parts of the course were among the most intuitive, and I feel that the universal properties ended up improving my understanding greatly (in addition to just being interesting on their own). So the category theory probably increased the difficulty in the beginning, but simplified things in the end in a way that made you learn more. This also feels pedagogically sound, as the group theory part of the course generally had a lighter workload.

i didnt understand that UVP are the same (shape?) in different categories and that they give us the definition of (eg) products in these categories. and i didnt understand why we get a bijection at first. (from the composition function)