

# Evaluatieresultaten: Topologie en meetkunde

Evaluatiebeschrijving:

## Algemene informatie

Uitgenodigd:	49
Aantal reacties:	14
Opkomst:	28.6%
Eigenaren:	<ul style="list-style-type: none"><li>Cavalcanti, G.R. (Gil)</li><li>Pino Gomez, A. del (Alvaro)</li></ul>

## Cursusinformatie Osiris

Cursuscode:	WISB341
Collegejaar:	2019
Periode:	3
Docenten:	
Ingeschreven studenten:	0
Meegedaan aan tentamen	43 (100%)
Geslaagd*:	29 (67.4%, 100% van het totaal)
* = Eindcijfer minstens een 6 of een C-.	

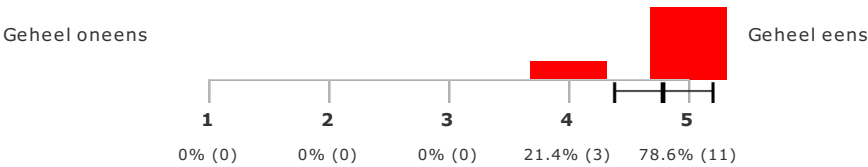
## Behaalde cijfers

10,0	2.3%	(1)	<div></div>
9,5	0%	(0)	
9,0	11.6%	(5)	<div></div>
8,5	2.3%	(1)	<div></div>
8,0	7%	(3)	<div></div>
7,5	18.6%	(8)	<div></div>
7,0	16.3%	(7)	<div></div>
6,5	9.3%	(4)	<div></div>
6,0	0%	(0)	
5,5	0%	(0)	
5,0	0%	(0)	
4,0	4.7%	(2)	<div></div>
3,0	0%	(0)	
2,0	0%	(0)	
1,0	0%	(0)	
NVD	27.9%	(12)	<div></div>
Gemm.:	7.44		
Std. dev.:	1.28		

## Overzicht van vragen

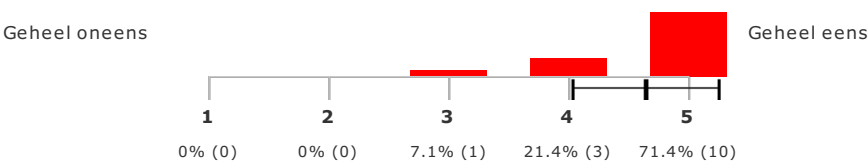
## Cursusinhoud en werkvormen

### Het onderwerp van de cursus was relevant en sloot aan bij mijn beleving



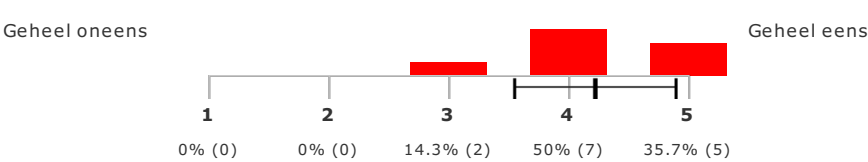
N = 14
Avg. = 4.8
Std. dev. = 0.4

### Mijn interesse in dit onderwerp is door de cursus toegenomen



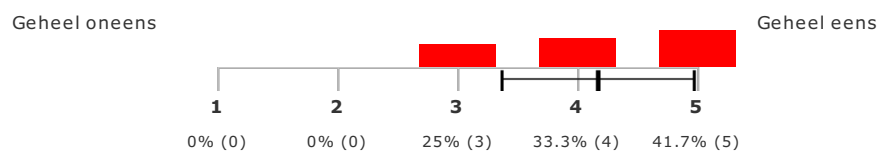
N = 14
Avg. = 4.6
Std. dev. = 0.6

### De werkvormen in de cursus vond ik aansprekend



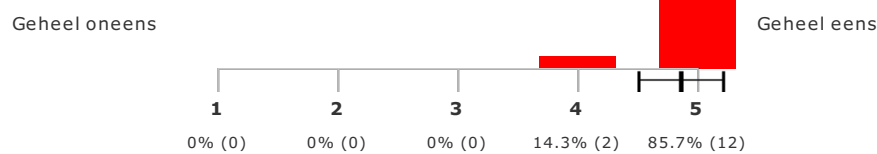
N = 14
Avg. = 4.2
Std. dev. = 0.7

Er was voldoende variatie in werkvormen in de cursus



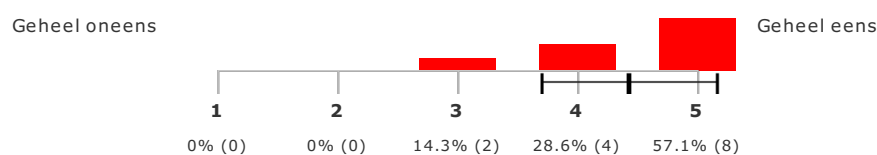
N = 12
Avg. = 4.2
Std. dev. = 0.8

Ik heb veel geleerd in deze cursus



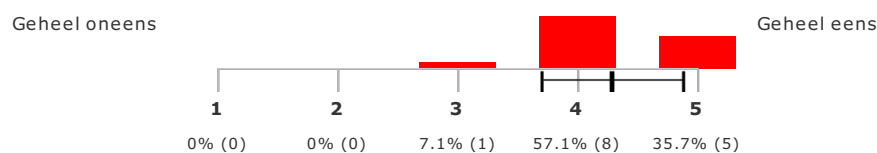
N = 14
Avg. = 4.9
Std. dev. = 0.3

Ik kon de opgedane kennis (hoorcolleges, studiemateriaal) goed gebruiken in opdrachten (o.a. werkcolleges, practica) en discussies



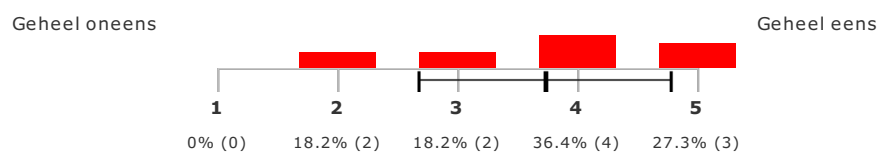
N = 14
Avg. = 4.4
Std. dev. = 0.7

De inhoudelijke aansluiting tussen de verschillende onderdelen in de cursus was duidelijk



N = 14
Avg. = 4.3
Std. dev. = 0.6

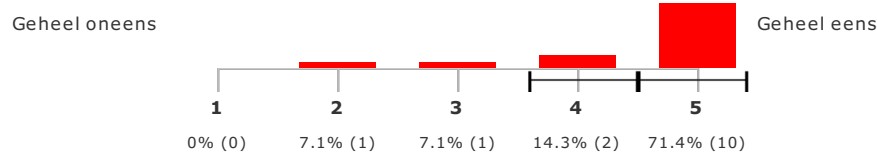
In de cursus werden voorbeelden aangereikt uit onderzoek en/of de dagelijkse praktijk



N = 11
Avg. = 3.7
Std. dev. = 1.1

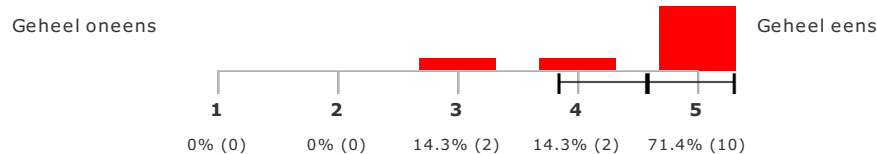
Ingangseisen en leerdoelen

De ingangseisen van de cursus waren voldoende duidelijk voor aanvang van de cursus



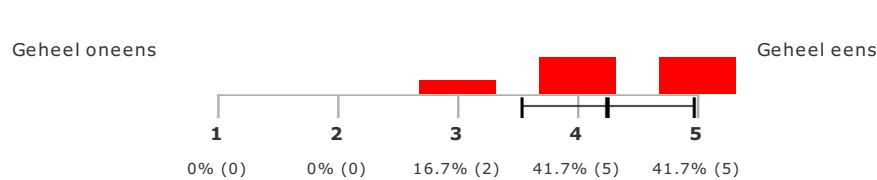
N = 14
Avg. = 4.5
Std. dev. = 0.9

Ik had voldoende voorkennis om deze cursus te volgen



N = 14
Avg. = 4.6
Std. dev. = 0.7

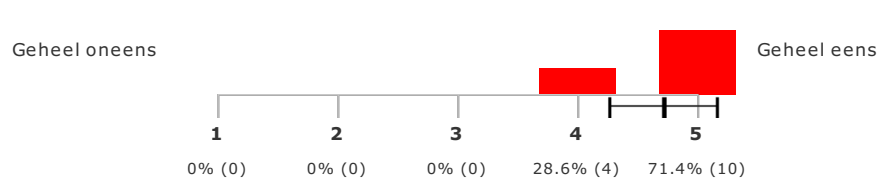
De cursusinformatie inclusief de leerdoelen gaven een goed beeld van wat er van mij verwacht werd in de cursus



N = 12
Avg. = 4.3
Std. dev. = 0.7

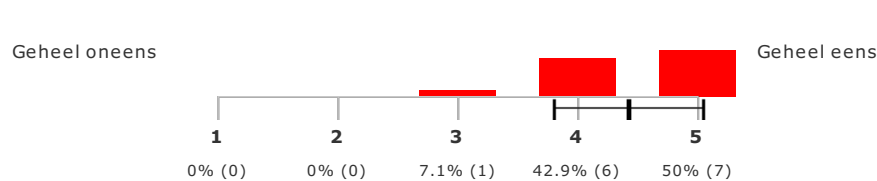
De docent(en)

De docent/cursuscoördinator moedigde mij aan om actief aan de cursus deel te nemen



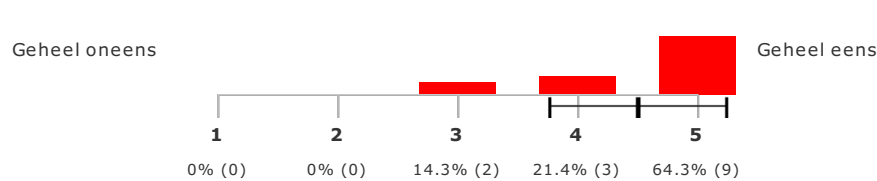
N = 14
Avg. = 4.7
Std. dev. = 0.5

De overige docent(en) moedigde(n) mij aan om een actief aan de cursus deel te nemen



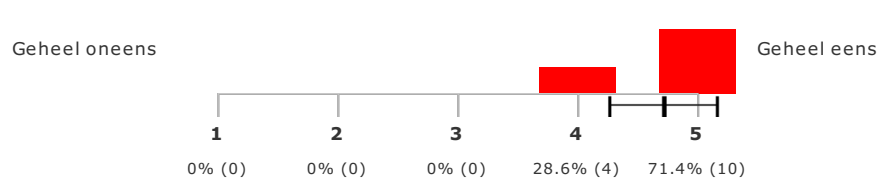
N = 14
Avg. = 4.4
Std. dev. = 0.6

De werkcolleges/opdrachten werden goed begeleid



N = 14
Avg. = 4.5
Std. dev. = 0.7

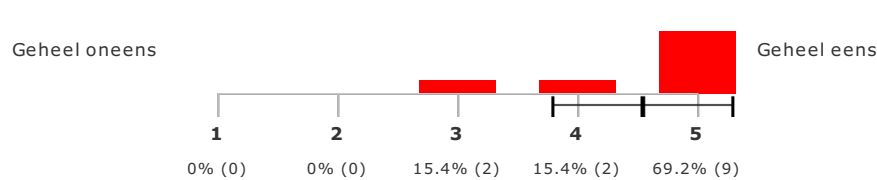
De docent vond ik goed



N = 14
Avg. = 4.7
Std. dev. = 0.5

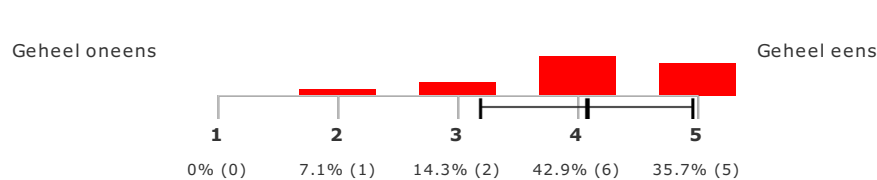
Organisatie

De cursus was goed geroosterd.



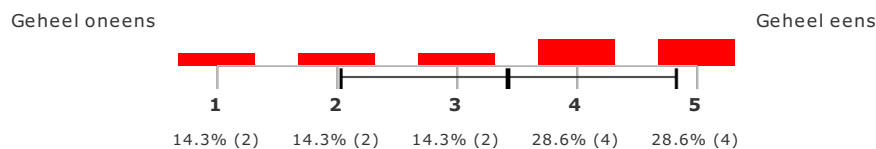
N = 13
Avg. = 4.5
Std. dev. = 0.7

Alle (cursus)informatie werd tijdig aangereikt



N = 14
Avg. = 4.1
Std. dev. = 0.9

## De leslocatie was op orde



N = 14
Avg. = 3.4
Std. dev. = 1.4

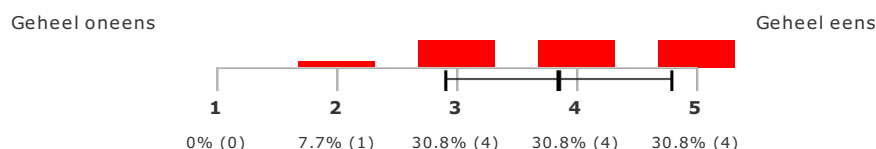
## Studiebelasting

### Hoeveel uur per week heb je aan deze cursus besteed (inclusief contacturen)?

(2)		14.3%	10
(4)		28.6%	15
(7)		50%	20
(1)		7.1%	25
(1)		7.1%	30

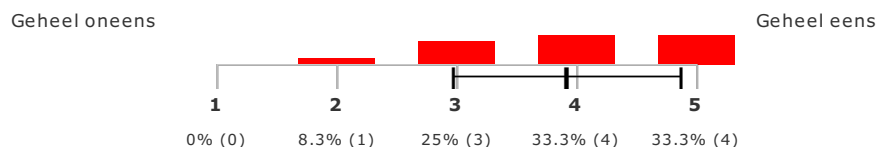
## Toetsing en feedback

### De feedback heeft mij geholpen om mijn resultaten te verbeteren



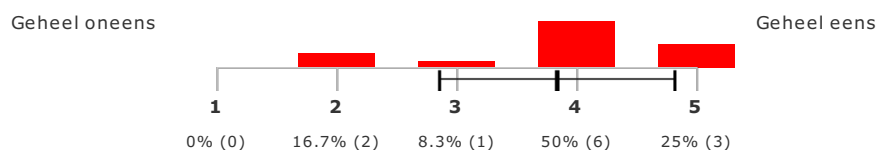
N = 13
Avg. = 3.8
Std. dev. = 0.9

### De toetsing was een goede afspiegeling van de inhoud van de cursus



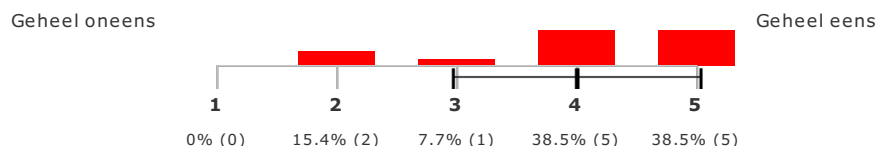
N = 12
Avg. = 3.9
Std. dev. = 1.0

### De moeilijkheidsgraad van de toetsing was in overeenstemming met de oefeningen van de cursus



N = 12
Avg. = 3.8
Std. dev. = 1.0

### De wijze van toetsing, de te leren stof, beoordeling, etc waren duidelijk



N = 13
Avg. = 4.0
Std. dev. = 1.0

## Open vragen

Door de coronacrisis is de huidige vorm van het onderwijs aangepast. Ook de toetsing zal aangepast worden. Kun je omschrijven hoe je het on-line onderwijs (eventueel inclusief de on-line toetsing) ervaren hebt?

- the online lectures were well organized. We had two video lectures a week to ask questions which went quite well, it was also nice that microsoft teams could record the video calls.

- Apart from things found online throughout the course (exercises, homework and lecture notes) the teacher recorded the 'lectures' (that is explanation of the material) and put them on Youtube. This was a good solution, though the clips were really fast so you had to pause a lot so it took twice as much time to watch a video than the actual length, and there were quite some videos (more explanation is good but it might have been a bit too much material in too short of time). What I really liked where the 'werkcolleges' via Teams, where the teacher or aio would explain the exercises we had troubles with (we posted them on blackboard or Teams) and any questions we would have during those live sessions (usually a bit more than 2 hours). The discussion board on Blackboard was also well used and well received. All in all I think this was a great way to continue the course and for me was just as good as (or even better) than before. One thing I missed was interaction with my fellow students. Usually I do a lot of exercises in a group or with one other student and I found it hard to do it by myself (both solving the exercises and getting myself to start working on them). I should have tried harder to find a group with good internet to work together on exercises.
- De filmpjes op YouTube waren fijn. Volgende keer zou ik liever hebben dat er tijdens de filmpjes bewegend beeld is.
- Online colleges en werkcolleges zijn minder fijn. Voor mij voelt het alsof het meer tijd kost om dingen op te pakken daardoor
- De docent heeft ipv hoorcolleges video's gemaakt die heel duidelijk waren, en waar duidelijk veel tijd en moeite ingestoken is! Ook werden er online vragenuren gehouden ipv werkcolleges, wat gezien omstandigheden een goede oplossing was. Ook hier werden vragen goed beantwoord, en ook al heb je zelf geen vragen is het altijd nuttig om naar vragen van anderen te luisteren.
- I think the transition went very well. I particularly liked the discussion board on blackboard. The biggest problem with not being able to see your teachers is the lack of opportunity to ask questions. In this way I could still ask individual questions. There was usually a reply within 24 hours which was great! The lecture's were going a bit faster in comparison to the physical. I think this was because the note's were already written. I had to watch certain parts multiple times or pause the video because I could not follow it otherwise. The upside is that this is possible in video lectures. One thing that I did not like was the video submission after the exam. It took me around two full days after the exam to finish it, which seems like quite a lot compared to the 10% it counts towards your grade. I did think it was meaningful to "correct" your own exam.
- Alvaro did a great job adapting to this new situation, having his online video lectures up and running in no time. The only difference with real life lectures is that with the real life lectures, you are bound to the speed of the chalkboard, where with the online lectures the lecture notes were all written down beforehand, making it tempting to speed up a bit. I might recommend writing the lecture notes out as you present, to ensure the pace is good. Other than that the lectures were great!
- The teacher acted very proactively. I really liked the format in which we could first watch the lecture on our own, and then ask questions in a meeting. I think my participation even went up after the course went online.
- In this course the teacher has put a lot of extra time and effort to make very good video lectures and to organise online tutorials via Teams twice a week. Thanks a lot for that. It was harder to study at home for me though, but this was certainly not due to lack of effort of the teachers. The assessment was not that different from a regular exam, we could print the exam, write on paper and scan it in order to hand it in. There were different versions so that it would be harder to communicate about it for in case students would try to cheat. The exam was a bit too long for me, but that did not have anything to do with the online format. What was different was that in the days after the exam we had to make a video of 10 - 15 minutes in which we went over the exam that would count for a small percentage of the grade. We had to explain the correct answers to the questions and point out our own mistakes that we made during the exam itself. In a sense I really like the fact that we have the chance to make up for mistakes we made due to time pressure. But it turned out difficult to fit a correct answer to all questions including a correction of mistakes within 15 minutes. It took a long time to make this video since I had to prepare in detail everything I was going to say (and not going to say) and I had to do many takes before I got something that fits. The time needed to improve my answers from the exam was nothing compared to the time needed to compress the explanation for the video.
- The videolectures were very nice. It was a clear explanation, the only problem was that a video goes way faster than a normal lecture. This means you need to pause the video, which is not a big problem. The only thing is that it takes more time (like 1,5 till 2 times more), so it would be nice if teachers make video's with half to 2/3 of the time of a normal lecture. The live sessions were a nice addition, but totally different from a normal werkcollege. The online assessment worked well, the different versions were a good idea to prevent teamwork. But if you really want to let that work, it is better that people don't know who has to make which version. The additional time to make scans was really needed.
- De hoor- en werkcolleges waren online goed georganiseerd. Alleen wist ik niet dat tijdens het tentamenweek ook online werkcolleges waren, maar dat kan aan mij liggen.

**Beviel de manier van onderwijs in het laatste deel van de cursus? (Oftewel, de theorie individueel bestuderen met behulp van de videos/college aantekeningen. Tezamen met de afspraken met de docent/assistenten waar vragen beantwoord worden.) Zou je deze lesvorm ook kunnen waarderen onder normale omstandigheden?**

- I enjoyed the online part more than I thought, I found that by reading the lecture notes beforehand yourself, the time for the lectures could be used more efficiently to ask more interesting questions. Also you can listen to what everyone else is thinking about and so you learn from each other. However I found that asking questions was more difficult via video, and is not yet a full replacement to the exercise class. This is because you cannot see body language so it can be easier to misunderstand each other and conversations are slower. Moreover via video you cannot ask questions in parallel, but you have to wait for your turn in the question queue. So all in all, I would still prefer physical lectures over virtual lectures.
- I really liked the 'werkcolleges'. The videos were a bit quick, but the teacher told us he tried to do slower where he wrote as well but that didn't really work out as well and pausing videos is a good solution. I found now that the 'hoorcolleges' and 'werkcolleges' were full of explanation that I had to invest a lot more time in solving exercises by myself than I'm used to and that was a bit of a problem. Under normal circumstances I would like to have normal 'hoorcolleges' where you can write your own notes, but some of these 'werkcolleges' would be nice. Normally the feedback on how you solve an exercise is very personal/private but it really helps to hear what others found difficult and tried. It would be nice to have a bit more interactive 'werkcolleges' where you try to solve an exercise as a group with some help from the TAs. Although of course it requires more active students in class (so maybe for later timeslots it is not as useful) and students to do more preparation at home. I think the use of the BlackBoard forum was a bit too much for me (too many places to look for info) and a mix between normal and interactive 'werkcolleges' might make that redundant.
- Nee, ik vind normaal onderwijs veel fijner. Ik mis het kunnen overleggen met mensen.
- Nee, liever normaal onderwijs
- Soms was het moeilijker om motivatie te vinden om zelf te gaan studeren, daarom was het wel fijn dat de werkcolleges nog steeds op dezelfde tijdstippen gehouden werden, en ook de filmpjes standaard op bepaalde momenten geupload werden. De filmpjes kon ik zeker waarderen! Omdat als je dan iets niet snapt je het dan nog even terug kan kijken, dus evt hoorcolleges opnemen vind ik zeker geen slecht idee. Werkcolleges vind ik wel fijner gewoon zoals het normaal gegeven wordt, op die manier is er toch meer individuele aandacht.
- I think this is the format we always use.
- No probably not. For me the real life lectures and tutorials have a considerable advantage over the online ones. The only thing I did enjoy was the opportunity to explain your exam after you handed it in. This was a move touch (even though it was a bit time consuming)
- I think my participation only went up after the course went online. Meeting with people also went really well. However, if you don't know any other people following a course, finding people to work on exercises together could be more difficult.
- I think video lectures have a lot of advantages. You can go through them in your own speed watch them when you think it is a good idea to watch them and rewatch them if necessary. The video's can be a lot better than a recorded lecture since the teacher can make use of the medium in this way. The screenshared blackboard experience is much more readable than a blackboard recorded from far away for example. Also pictures from internet can be used easily. The screenshared explanations in the tutorials allow many people to profit from other peoples questions (more at a time than in physical tutorials). It was also a good idea to ask students to think of questions beforehand (which could be applied in physical tutorials as well). However, the lack of rhythm in this isolated corona life has negative effects. I think regular physical meetings (like lectures and tutorials) at university where material of the course is discussed helps students a lot with staying on track. (In general it is good for people to have weekly meetings with the same people at the same place in order to live a healthy life.) Replacing lectures by video's needs compensation for this aspect I would say. But meetings do not necessarily have to have the format of lectures. Once the video's are made, the time that is not spent on lectures can be used for more personalised education/education in smaller groups with all the well-known advantages that this has.
- It works for this quarantine, but I like the normal way a lot more.
- De theorie van het laatste deel vond ik erg lastig. Vooral over deck transformations kon ik moeilijk volgen en inbeelden. Ik vind de hoorcolleges in deze lesvorm fijn, maar de werkcolleges niet zo.

## Wat ging volgens jou in deze cursus goed en wat moet zeker behouden blijven indien deze cursus wordt aangepast?

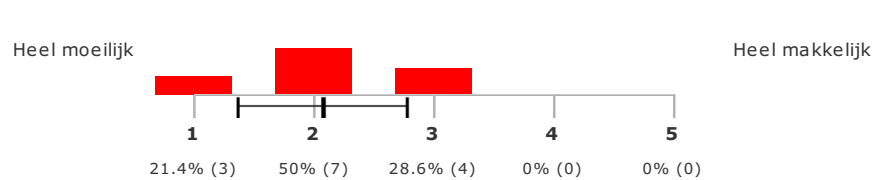
- The groupoids should be kept in my opinion, and even expanded because they feel less ad-hoc than fundamental groups. Also the lecture notes were of high quality so should be kept.
- The teacher and TAs were really great! Álvaro is really enthusiastic and also very involved with us students. He learned and used a lot of our names which I haven't experienced much before but appreciated very much. I felt free to come to him with any questions and concerns, which I also did various times inside and outside lectures. His lecture notes are also very useful and well-organised (where sometimes the lectures, especially the interactive werkcolleges, were a bit chaotic because of his enthusiasm). He was also very involved at the werkcolleges, he was usually around for the first hour and the online werkcolleges were mostly run by him. Pepijn was also very visible on the Teams discussion board.
- De opdrachten, in het bijzonder inlevers, waren soms door de docent niet gemaakt en bleken niet te kloppen of zeer lastig te zijn. Zorg dat de docent de opdrachten ook zelf maakt.
- De structuur is heel goed. Alvaro is een goede leraar en Pepijn en Pascal hielpen goed bij de werkcolleges
- Ik vond de hoorcolleges heel interessant en goed gegeven! Ook de video's waren heel fijn tijdens het laatste deel van het blok. Ook was het fijn dat na de hoorcolleges de aantekeningen van de docent op blackboard kwamen te staan, hierdoor kon je daarna nog wat dingen opzoeken.
- Overall I am really happy with the course as can be seen in my evaluation above. It was maybe the most interesting one so far. One of the things I really liked was the interaction with the class during lectures. You really stopped to check if everybody understood the material and took time to answer questions. I think you were not able to cover some of the material you wanted because of this, but I think this is better than rushing through things that only a few students get.
- Considering this was the first time Alvaro gave the course, it went really well! I enjoyed the lecture notes being posted, and there was more than enough exercise material.
- The teacher was great, as was the material. Please keep this amount of algebra, don't make it any more topological.
- The intuitive explanation with pictures for all topics was super helpful and should stay in the course. The lecture notes are very good in general. The teacher was very approachable. He checked very well if what he explained was coming across during the lectures and he did usually not continue if he realised that a group of people was lost.
- I liked that the teacher really asked if we understand and gave more explanation when we didn't. The TA's gave nice explanations when you asked something. They also gave you hint's when you were thinking totally in the wrong direction, so that helped also.
- Ik vond de inleveropdrachten en de opgenomen hoorcolleges erg fijn.

## Wat kan er volgens jou anders en hoe?

- I found the theory of classification of covering spaces a bit confusing because there were a lot of variations like: basepoints/no basepoints, normal subgroups and conjugation classes of subgroups and quotient groups and deck transformation groups etcetera and it was a bit hard to follow how all of those things were related.
- Honestly it was a great course, but the question before about applications and daily life got me thinking I don't recall a lot of real life applications being discussed (I might have missed them though), while I think there are a lot (we briefly discussed the vertices-edges+faces=constant rule). I think that might also be due to the fact this was the first year for the new teacher, so I'm sure next year he will be a bit more relaxed in the subjects he plans to discuss and might find some time to discuss (or make some exercises about applications).
- De stof van de laatste week was voor mij moeilijk op te pakken op de een of andere manier. Misschien zouden meer voorbeelden daar helpen
- Ik had het idee dat sommige inleveropgaven strenger na gekeken werden dan anderen? Ook had ik het idee dat soms de inleveropgave zelf niet helemaal goed was uitgedacht van tevoren, waardoor het heel veel meer werk bleek te zijn dan verwacht. Dit was wel een beetje vervelend vooral omdat het dicht op het tentamen zat.
- First of all the university should make sure that all classrooms with mathematics lectures have at least two functioning blackboards (not whiteboards), this is the only thing needed to do mathematics but without it you really can't give a lecture properly. I think the hand-in assignments were a bit long. It takes a lot of time to write down 5 exercises properly in latex. I would rather have 2 extremely hard questions that take less time to work out but more time to solve, than have a couple of questions in each homework that are fairly straight forward, but then take a lot of time to workout in latex. Secondly there were exercises from the exercise sheets that were hand-in assignments so you could not ask questions about them, but they were given as questions in class, so this was frustrating since you could not ask how to solve them if you could not figure them out. Lastly there was a lot of extra work given during the lecture's. I quite like it when you have to do part of a proof of a theorem yourself, since you really get to understand the material. But some lecture's there were very many results that you still needed to look at and in combination with the exercises on the exercise sheets and hatcher this was too much. I did not have time to look at Hatcher and couldn't even solve all the exercises from the sheets and the once given during the lecture. Sometimes exercises that look easy like giving an explicit homotopy can take up a lot of time.
- I would recommend Alvaro and the TA's fully working out the hand-in exercises, to ensure they are at the correct level. Also managing time during the course was a bit of an issue some times, but this is understandable for a first run.
- As this was his first edition of this course, it sometimes was a bit messy, and could be more structured.
- The physical tutorial groups were very big (when we still had them). Maybe it would be good to remark something at the end of the course about the higher fundamental groups and cochain complexes without doing it in detail. Then remarking that homology groups are easier to compute and can serve to answer similar kind of questions would be a logical follow up. If there is no time to treat homology entirely, making these remarks without proofs does not have to be very time consuming and it provides the student with the perspective of what topics this course is related to. Some small remarks for the lecture notes: - It was nice that the first sets of notes were numbered with "Day .." so that we could refer to it in the homework, that disappeared for the last few sets of notes. - Maybe the statements can be numbered per set of notes, so that we can refer to them more specifically. - In general it is pleasant if the (very few) statements that are given in the text are given as formal statements, so that one can refer to it. - There were a lot of observations in the lecture notes about universal covers. Maybe some of them could be given as statement. - It would be nice if the Euler characteristic, the genus and the standard form of oriented and non oriented surfaces are also defined in the lecture notes for in case students miss a lecture. - The definitions of simplicial complexes and triangulations was a bit vague in the lecture notes. It was because of the examples that I knew what was meant by it.
- The planning could be a lot better. Sometimes the plus that the teacher asked questions made it that we didn't got everything covered, so this is a hard balans. Also the homeworks were most times very long. This means that I had 2 times that I just couldn't finish them, because I was running out of time. It would be nice if they were shorter. (And if there were no questions that aren't true, but were we don't know any real counterexample.) And the classrooms in the BBG don't fit with such a course, because there is not enough blackboard and if you were late, you couldn't sit in the first few rows, so you couldn't read the blackboard. The one in minneart worked fine.
- Het online tentamen vond ik niet zo fijn. Vooral onder tijdsdruk vond ik het tentamen erg lastig. Ik zou liever meer inleveropdrachten hebben gehad.

## Jouw oordeel

Wat vond je van de moeilijkheidsgraad van de cursus?



N = 14
Avg. = 2.1
Std. dev. = 0.7

Welk cijfer geef je de cursus als geheel?

(0)		0%	1
(0)		0%	2
(0)		0%	3
(0)		0%	4
(0)		0%	5
(1)		7.1%	6
(1)		7.1%	7
(4)		28.6%	8
(5)		35.7%	9
(3)		21.4%	10

N = 14
Avg. = 8.6
Std. dev. = 1.1

## Reacties

**Pino Gomez, A. del (Alvaro)**

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Dear all: Thank you for your comments, they are very much appreciated. I found your enthusiasm towards the subject very encouraging and I am very happy about the level of understanding/proficiency you have shown in your assignments and exams.

I would like to address some of the concerns you raised (many of which I was aware of, but I did not manage to address properly):

- Some of you remarked, after our transition to online classes, on the "lack of interaction with fellow students". I can see indeed how this is an issue (a lot of math is done by bouncing ideas off one another!). As a lecturer this is hard to tackle, but maybe I should have asked you to get in touch with me so that I could group you in some form (or maybe give group assignments). This is certainly something to be explored if the present situation continues (see also the next item).
- Along similar lines, some of you missed the standard werkcollege setting where you can talk privately about very concrete issues with the TAs (or other students). Although the response to the online counterpart has been quite positive, it is true that its function is a bit different (it worked as a public problem solving session). It would make sense to schedule some time every week to working in small groups (by gathering separately in Teams) on some problems from the problem list (with the TAs and myself available on chat for questions).
- Several of you commented on the difficulty/length/inconsistency of the homeworks. This is indeed something I was very worried about and I can only apologise for. I spent a long time preparing the lecture notes, long lists of exercises for you to practise, and the homeworks. The result of this was that the final products were, at times, not properly polished. Indeed, on 2-3 occasions we found out after uploading that one item in an exercise was possibly too hard for you to solve or it was incorrectly stated. All I can say is that next year these issues should not happen again (because I will have most of the material prepared beforehand). Hopefully I was able to minimise the damage by grading your efforts fairly.
- Most of you seemed happy about the lecture notes, but there were some comments about the lack of numbering in the statements/definitions (making it hard to refer to them later on). This would certainly be something to work on for next year. They probably need a careful revision to spot typos as well.
- Lastly, there was the issue of the videos being rather fast (needing therefore to pause/continue often). It is worth exploring a bit more other formats for next year (maybe shorter videos with a slower pace, kennisclip style). With that said, I am happy that the videos (with their flaws) will be available in future years to complement the lectures.

As I said: I had a lot of fun teaching this course for all of you. Thank you for your comments/suggestions!