



## Environmental geochemistry MV0218, 20092.2122

15 Hp

Pace of study = 100%

Education cycle = Advanced

### Evaluation report

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**Evaluation period: 2022-01-09 - 2022-01-30**

Answers 9

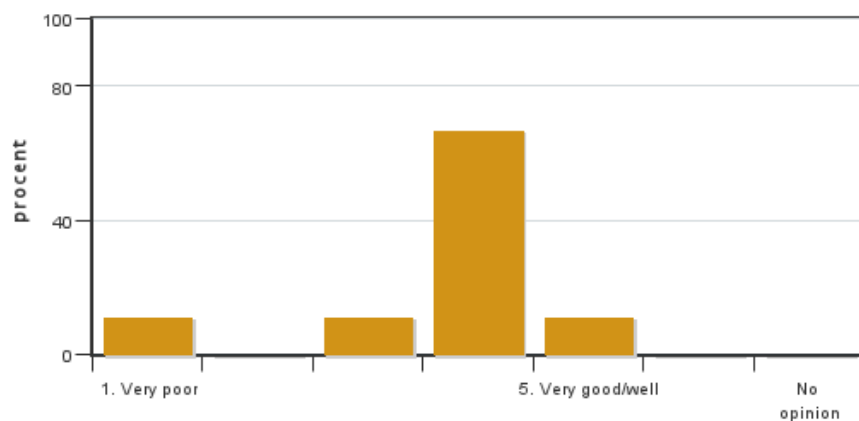
Number of students 15

Answer frequency 60 %

### Mandatory standard questions

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#### 1. My overall impression of the course is:

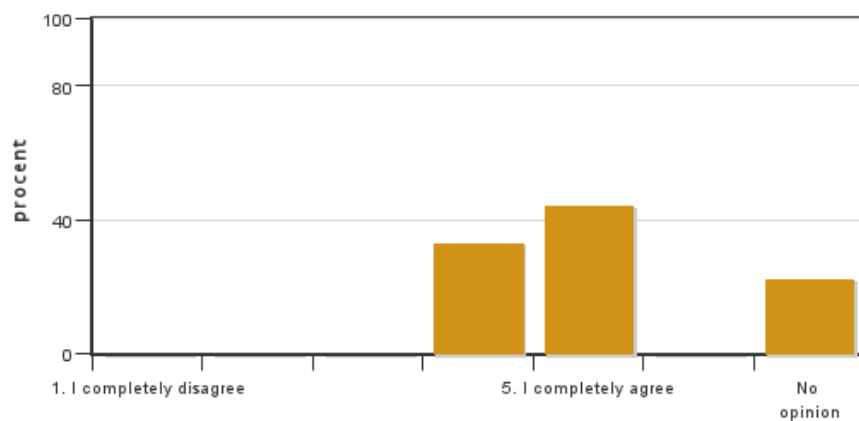


Answers: 9  
Medel: 3,7  
Median: 4

1: 1  
2: 0  
3: 1  
4: 6  
5: 1

No opinion: 0

#### 2. I found the course content to have clear links to the learning objectives of the course.

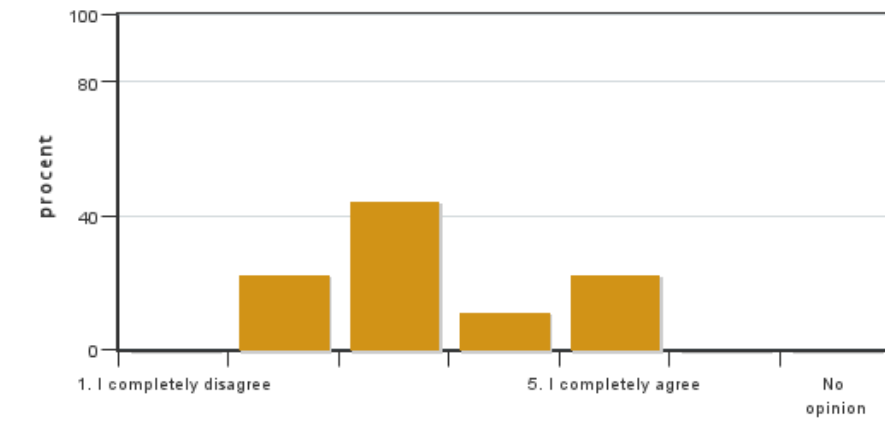


Answers: 9  
Medel: 4,6  
Median: 5

1: 0  
2: 0  
3: 0  
4: 3  
5: 4

No opinion: 2

#### 3. My prior knowledge was sufficient for me to benefit from the course.

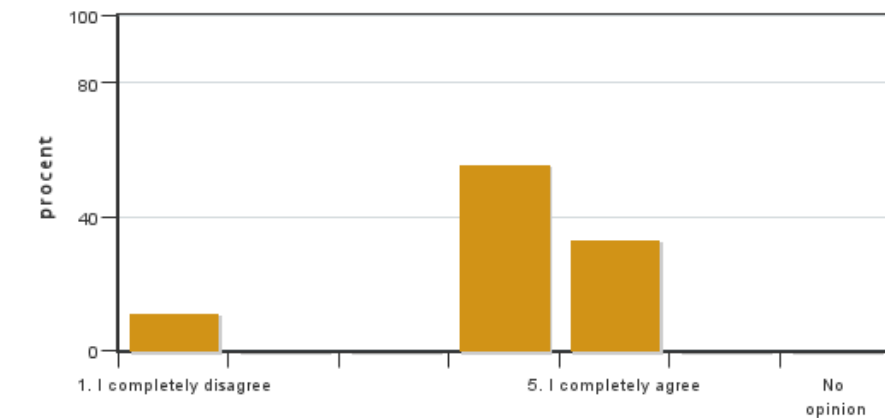


Answers: 9  
Medel: 3,3  
Median: 3

1: 0  
2: 2  
3: 4  
4: 1  
5: 2

No opinion: 0

**4. The information about the course was easily accessible.**

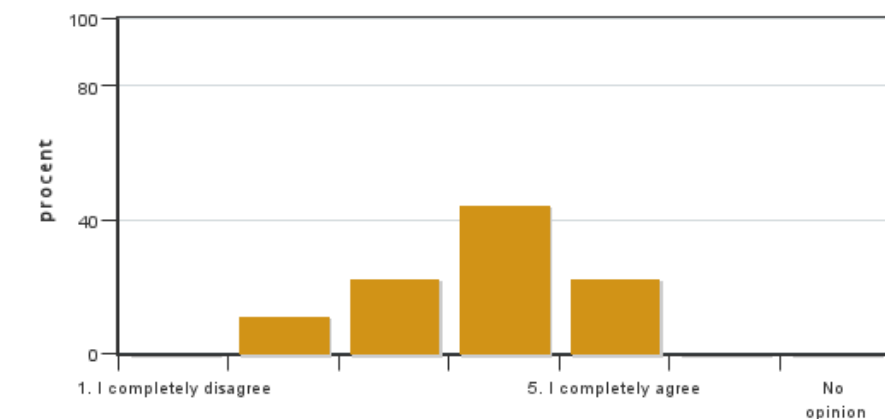


Answers: 9  
Medel: 4,0  
Median: 4

1: 1  
2: 0  
3: 0  
4: 5  
5: 3

No opinion: 0

**5. The various course components (lectures, course literature, exercises etc.) have supported my learning.**

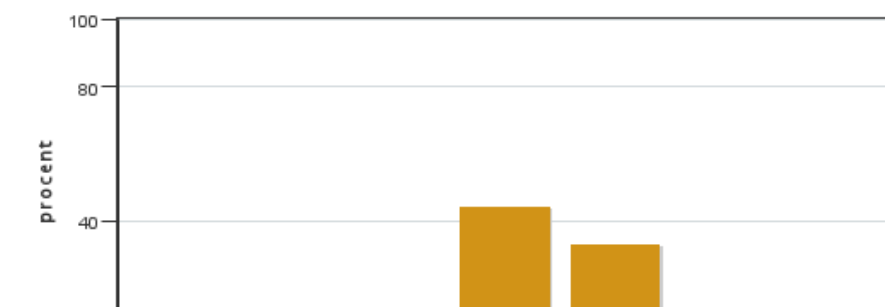


Answers: 9  
Medel: 3,8  
Median: 4

1: 0  
2: 1  
3: 2  
4: 4  
5: 2

No opinion: 0

**6. The social learning environment has been inclusive, respecting differences of opinion.**



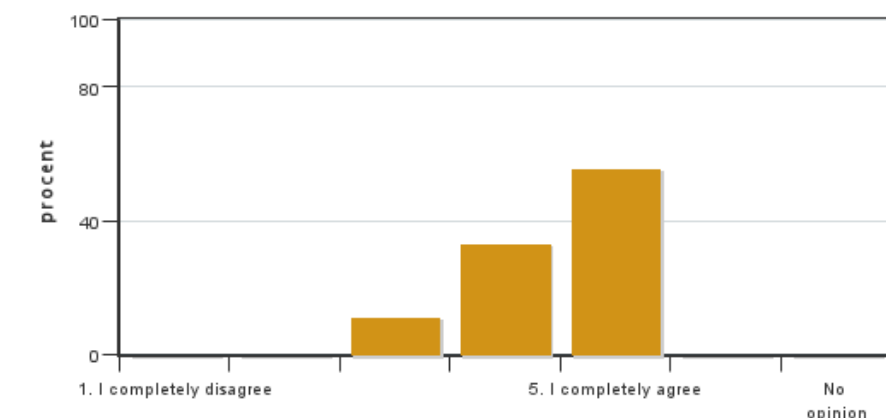
Answers: 9  
Medel: 4,0  
Median: 4

1: 0  
2: 1  
3: 1  
4: 4  
5: 3

No opinion: 0



**7. The physical learning environment (facilities, equipment etc.) has been satisfactory.**

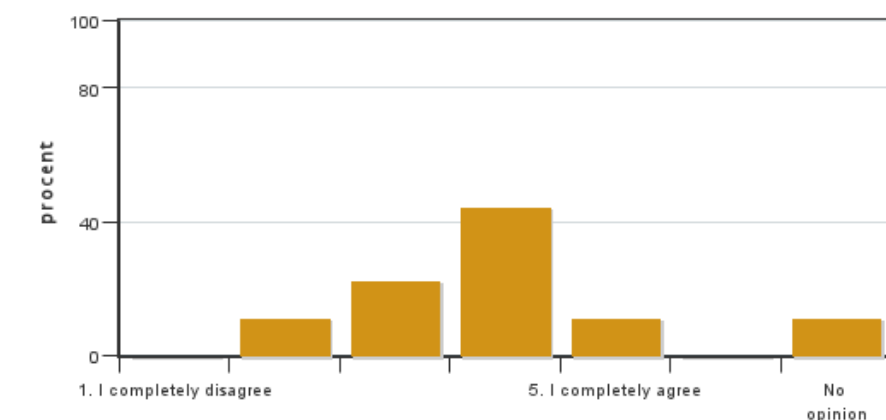


Answers: 9  
Medel: 4,4  
Median: 5

1: 0  
2: 0  
3: 1  
4: 3  
5: 5

No opinion: 0

**8. The examination(s) provided opportunity to demonstrate what I had learnt during the course (see the learning objectives).**

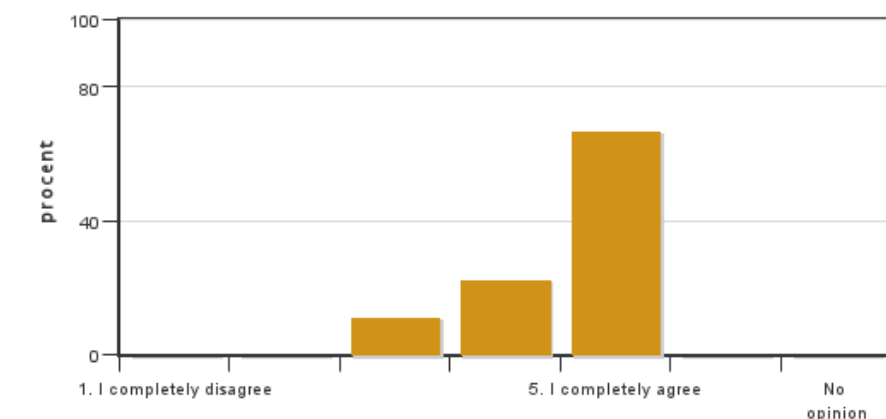


Answers: 9  
Medel: 3,6  
Median: 4

1: 0  
2: 1  
3: 2  
4: 4  
5: 1

No opinion: 1

**9. The course covered the sustainable development aspect (environmental, social and/or financial sustainability).**

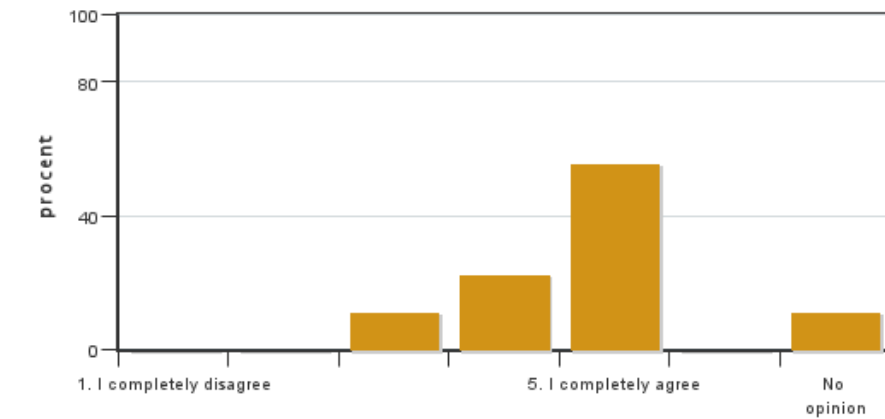


Answers: 9  
Medel: 4,6  
Median: 5

1: 0  
2: 0  
3: 1  
4: 2  
5: 6

No opinion: 0

**10. I believe the course has included a gender and equality aspect, regarding content as well as teaching practices (e.g. perspective on the subject, reading list, allocation of speaking time and the use of master suppression techniques).**

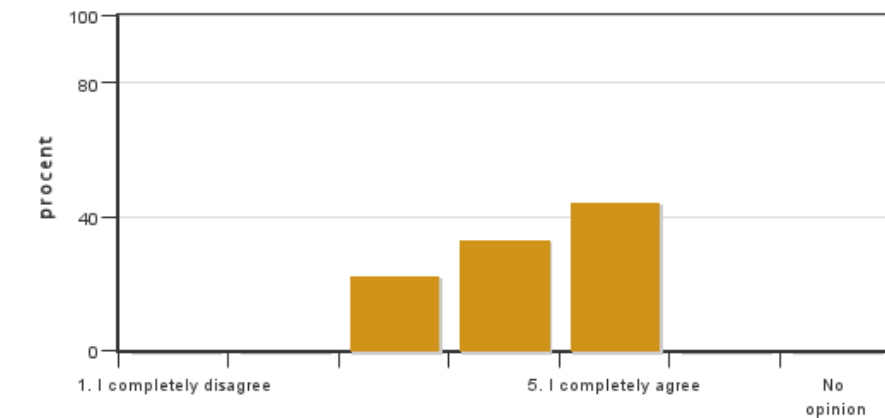


Answers: 9  
Medel: 4,5  
Median: 5

1: 0  
2: 0  
3: 1  
4: 2  
5: 5

No opinion: 1

**11. The course covered international perspectives.**

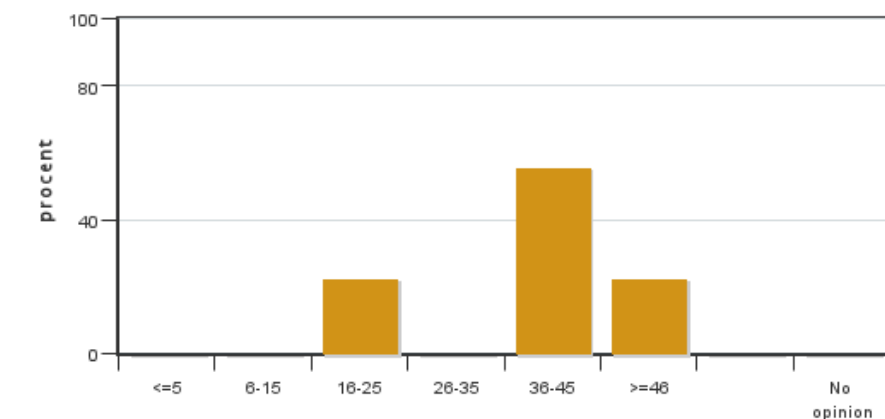


Answers: 9  
Medel: 4,2  
Median: 4

1: 0  
2: 0  
3: 2  
4: 3  
5: 4

No opinion: 0

**12. On average, I have spent ... hours/week on the course (including timetabled hours).**

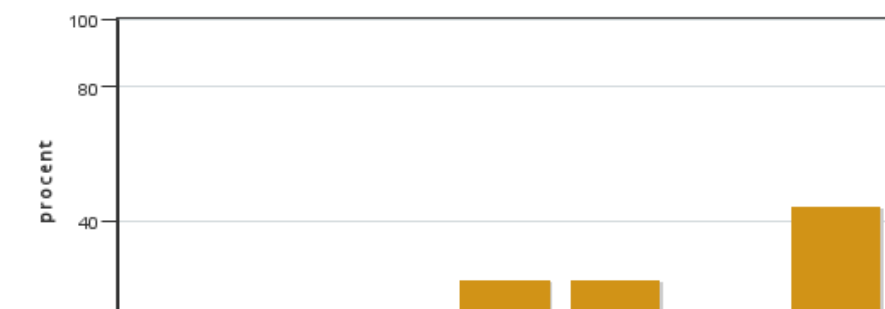


Answers: 9  
Medel: 36,9  
Median: 36-45

≤5: 0  
6-15: 0  
16-25: 2  
26-35: 0  
36-45: 5  
≥46: 2

No opinion: 0

**13. If relevant, what is your overall experience of participating in all or part of your course online?**



Answers: 9  
Medel: 4,0  
Median: 4

1: 0  
2: 1  
3: 0  
4: 2  
5: 2

No opinion: 4

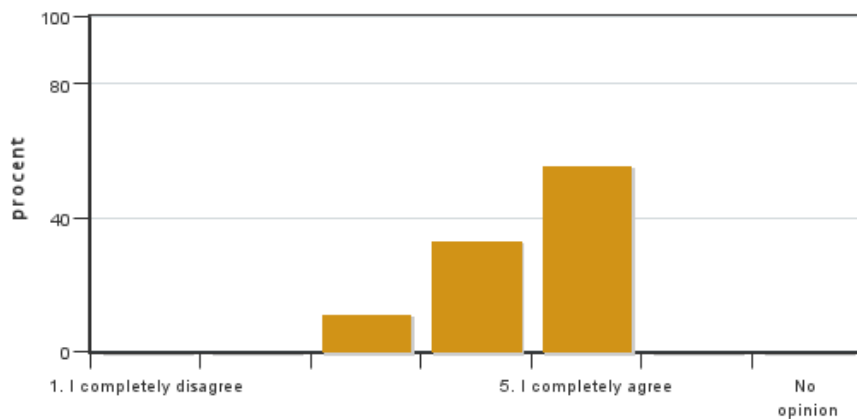


14. If relevant, please share what worked well when participating in teaching on distance

15. If relevant, please share what worked less well when participating in teaching on distance

## Additional own questions

16. An important element of our course is that you do not only learn new concepts of geochemistry but also apply them in a quantitative way. You first solved limited problems on paper in various exercise sessions and then used Visual Minteq modelling on complex problems. How do you evaluate this quantitative approach and more particular the initial step of solving limited systems on paper. Do you agree it is important to your learning or not at all?

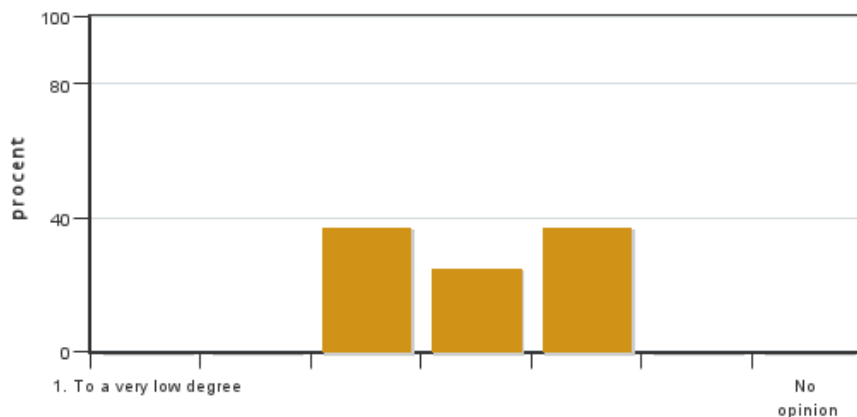


Answers: 9  
Medel: 4,4  
Median: 5

1: 0  
2: 0  
3: 1  
4: 3  
5: 5

No opinion: 0

17. We have shortened the exercise sessions, but have often scheduled them on two separate days with time in between to allow you to work independently. This independent time was also scheduled, mostly for us to plan in this much needed time. Can you share if you like/not like this arrangement and could you comment how would have liked to see it differently.

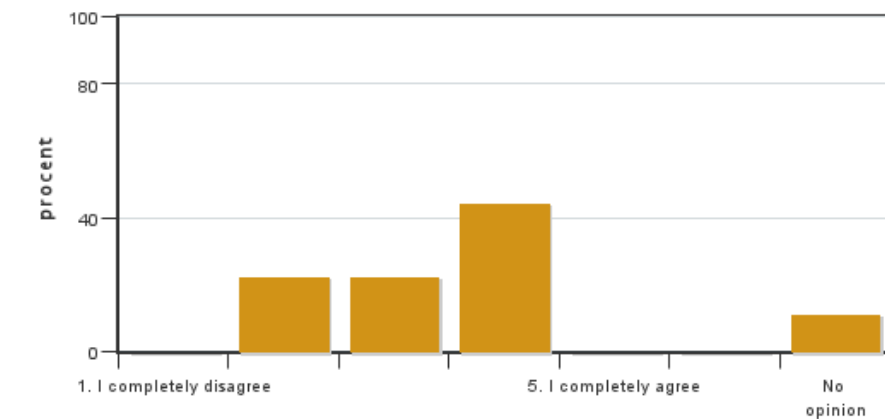


Answers: 8  
Medel: 4,0  
Median: 4

1: 0  
2: 0  
3: 3  
4: 2  
5: 3

No opinion: 0

18. "Soil formation" is a course moment we added to better couple the mineral component of the course to the inorganic geochemistry component of the course. To which extent do yo agree that "Soil formation" has been successful in achieving just that?

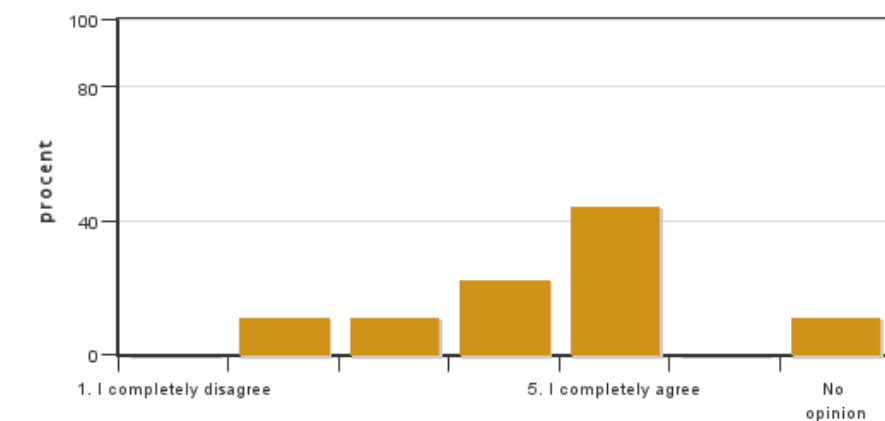


Answers: 9  
 Medel: 3,3  
 Median: 3.5

1: 0  
 2: 2  
 3: 2  
 4: 4  
 5: 0

No opinion: 1

**19. For this year, we decided to have the four main course components (i.e. mineralogy, inorganic geochemistry, organic geochemistry, applications) "out of phase" i.e. they did not occur chronologically. Did you experience this as an improvement (i.e. "agree") or would prefer a sequential structure again (i.e. 1. mineralogy 2. inorganic geochemistry 3. organic geochemistry 4. applications) (i.e. "disagree")**

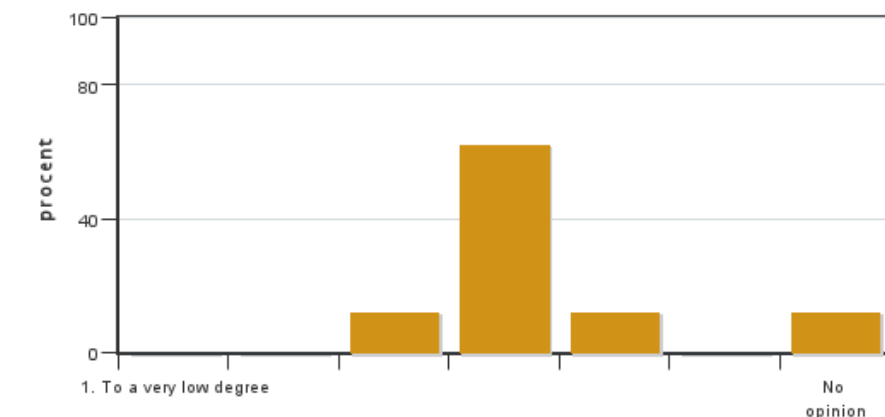


Answers: 9  
 Medel: 4,1  
 Median: 4.5

1: 0  
 2: 1  
 3: 1  
 4: 2  
 5: 4

No opinion: 1

**20. How well do you feel the component organic chemistry is relevant and an important part of the course. Could you also comment whether you feel that you now got a sufficient basis in organic geochemistry? If yes, what part did you like most. Maybe you were expecting more. If so, what were you expecting?**



Answers: 8  
 Medel: 4,0  
 Median: 4

1: 0  
 2: 0  
 3: 1  
 4: 5  
 5: 1

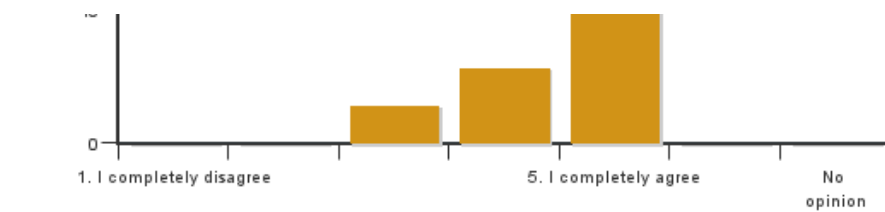
No opinion: 1

**21. Another reform we did was to have three more applied course moments. Do you agree that "Microplastic fate in environmental systems" was an interesting and relevant new course moment?**



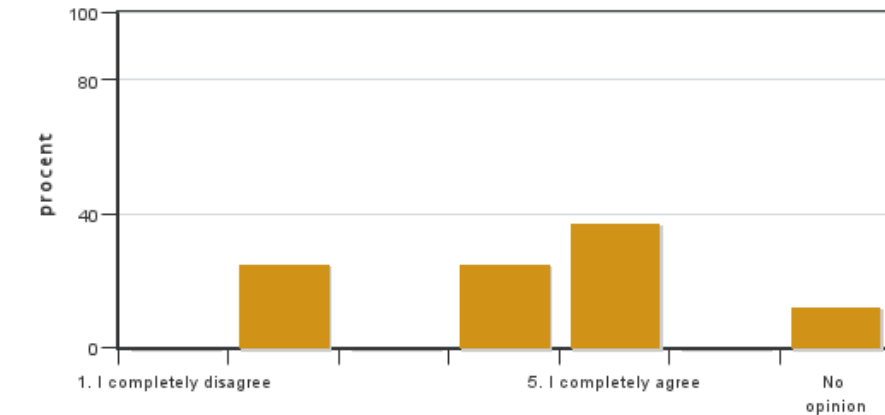
Answers: 9  
 Medel: 4,6  
 Median: 5

1: 0  
 2: 0  
 3: 1



4: 2  
5: 6  
No opinion: 0

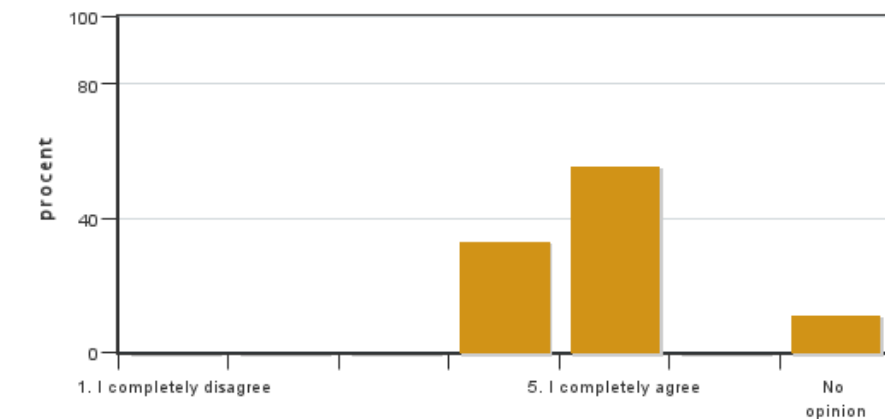
**22. Another reform we did was to have three more applied course moments. Do you agree that "Effects of climate change on mineral weathering" was an interesting and relevant new course moment?**



Answers: 8  
Medel: 3,9  
Median: 4

1: 0  
2: 2  
3: 0  
4: 2  
5: 3  
No opinion: 1

**23. Another reform we did was to have three more applied course moments. Do you agree that "Phosphate: yield versus eutrophication" was an interesting and relevant new course moment?**



Answers: 9  
Medel: 4,6  
Median: 5

1: 0  
2: 0  
3: 0  
4: 3  
5: 5  
No opinion: 1

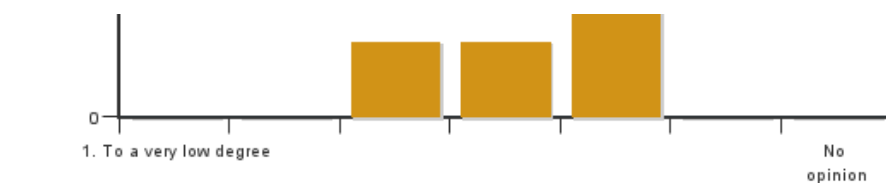
**24. We use to only have "Remediation of contaminated soils", "Risk assessment", "PFAS in drinking water", "Soil acidity and countermeasures" as applied course moments and have added the three new moments you evaluated above. Any suggestions about what to add to or remove from this list? Which one did you prefer most/least. Feel free to share any other thoughts about the applied moments.**

**24. Did you experience the geochemistry lab, including preparation and seminar, as useful and relevant? We made significant changes to the lab. For instance, we removed a lab focussed on mineral identification and have put all emphasis on the geochemical lab instead. There used to be only one soil (Gyttorp) done by all students instead of the 4 different soils. We are also using Visual Minteq on real data now and have introduced the lab seminar to ensure that all groups learn from each other. Start-up problems aside, how do you feel we have achieved that objective and can you suggest improvements?**



Answers: 9  
Medel: 4,3  
Median: 5

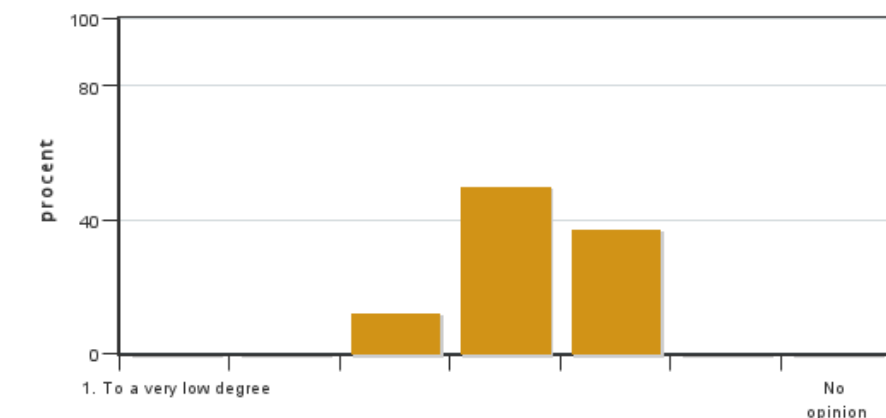
1: 0  
2: 0  
3: 2  
4: 2



5: 5

No opinion: 0

## 25. Do you experience the literature seminar, at the end of the course as useful and relevant?



Answers: 8

Medel: 4,3

Median: 4

1: 0

2: 0

3: 1

4: 4

5: 3

No opinion: 0

## Course leaders comments

This course was the first to be given again fully live after a year of zoom lectures. Both the teachers and students have appreciated this which resulted in a more relaxed atmosphere. By and large the group was very motivated and attendance to all lectures was high. We have changed the course structure quite a bit this term. In part, this was to address some of the previous student's concerns but also some of our own. The evaluation was designed to find feedback on these changes. We were pleased to see the positive evaluation of our course by the students. We were also very pleased to see a good response rate and can thus regard the evaluation as representative. Some lessons are still to be learned though, especially with regards to the most recent changes to the course:

**Better coupling between mineralogy part and rest of course:** our course has 4 pillars: mineralogy, inorganic geochemistry, organic chemistry and applied courses. We aimed to better couple to mineralogy part to the remainder of the course by planning in a course on soil formation. Surprisingly, students did not realise these 4 parts existed, which likely attests to that they were well integrated. The soil formation course was seen as highly relevant, but should be condensed more.

**Mixing 4 pillars:** Previously the 4 main pillars were planned chronologically. Now we mixed them so overlap existed. This may explain why students did not realise the 4 main parts existed. When asked, there were mixed opinions whether the non-linear planning fashion was good or not. We will maintain this structure.

**Planning in independent time:** We have split up exercise moments in two instead of running them consecutively. Independent time was scheduled in between. This was for us to ensure enough time was given for independent work in between two exercise sessions, but also to stimulate students to spend that time on specific exercises. Positive was that indeed the students felt stimulated and the split up actually allowed them to think deeper on how to solve exercises. Negative was that there was often too little time for exercises. We should either increase contact time or find ways to reduce exercise load in the course.

**Planning in only one lab:** We have removed the mineralogy lab and have integrated lab 2 (geochemistry) more within the course. The assignment was diversified and this choice of problems was appreciated. We also installed a seminar so students could learn from each other and this seemed appreciated. A problem we and to some extent the students also saw is that writing reports and the seminar ended up in the most busy period, i.e. at the end of the course, with very little time to write the report. We will make sure that the lab is planned in earlier, at least giving students more time to write the report. The seminar and final report writing requires visual minteq skills and can therefore not be planned any later. a possible solution is to integrate the lab and visual minteq even more.

**More applied courses:** We bundled some applied courses together where the purpose was to frame the theory in current, "hot" issues. Most of these moments turned out with very high scores, in particular the PFAS part, microplastics and phosphorous course moments. The PFAS part had an excursion to a drinking water plant, which was especially well-received. Some other applied courses need a bit more work to be less chaotic.

On a more general level, the course is still experienced as demanding, i.e. large in content and thus in required effort. We are aware of this and we in turn invest quite a bit of teacher contact time in the course with reasonable exam success rates as a result. Students also feel as they learned a lot. Some closer analysis and discussion with



Carl Andås revealed that more support on the mathematics of exercises may help a lot. Carl has made concrete suggestions that are very helpful and I want to thank him for his efforts.

## Student representatives comments

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Based on written and oral opinions from the students, this course was considered intense and time consuming but rewarding, giving the students good knowledge of potential pollution chemicals, how to quantify them and remedy them.

The comments the students have had on the execution of the course have been welcomed by teachers, course leader and examiner, who arranged an oral evaluation before Christmas and a course analysis (where the student representative and the course leader orally went through the written evaluation together) after the course. During these occasions, improvements to the course have been discussed and agreed upon by both parties. The most relevant changes were as follows;

- Adding the laws of logarithms and the pq-formula to the compendium of formulas
- Reducing the number of exemplary exercises somewhat.
- Considering the priority of the tasks (lab report, seminar submission and presentation) before Christmas.

On behalf of the students, I thank the course management for putting such effort in hearing the students' opinions.

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Kontakta support: [support@slu.se](mailto:support@slu.se) - 018-67 6600