

Evaluation report 2019 autumn

Course code: NANO244

Faglærers vurdering av gjennomføring/lecturers assessment of implementation:

Praktisk gjennomføring/practical implementation

The course gives an introduction into materials chemistry and nanochemistry. Lectures deal in the first part of the course with the foundations in solid state chemistry and materials science. This is essential background knowledge to understand the nanochemistry which is presented subsequently in the second part of the course. The accompanying lectures encompassed 22 lectures (2h).

The course also contain a practical component. The students have to perform three exercises in the laboratory and which introduce them to synthesis and characterization of nanomaterials. Each exercise is accompanied by a double hour introductory lecture. The students submit a report for each exercise. The compound grade for the reports contributes 30 % to the final grade in the course. The exercises were performed in the period from the middle of September to middle/end of October.

The remaining 70 % of the grade for the course were determined in an oral exam at the end of the semester.

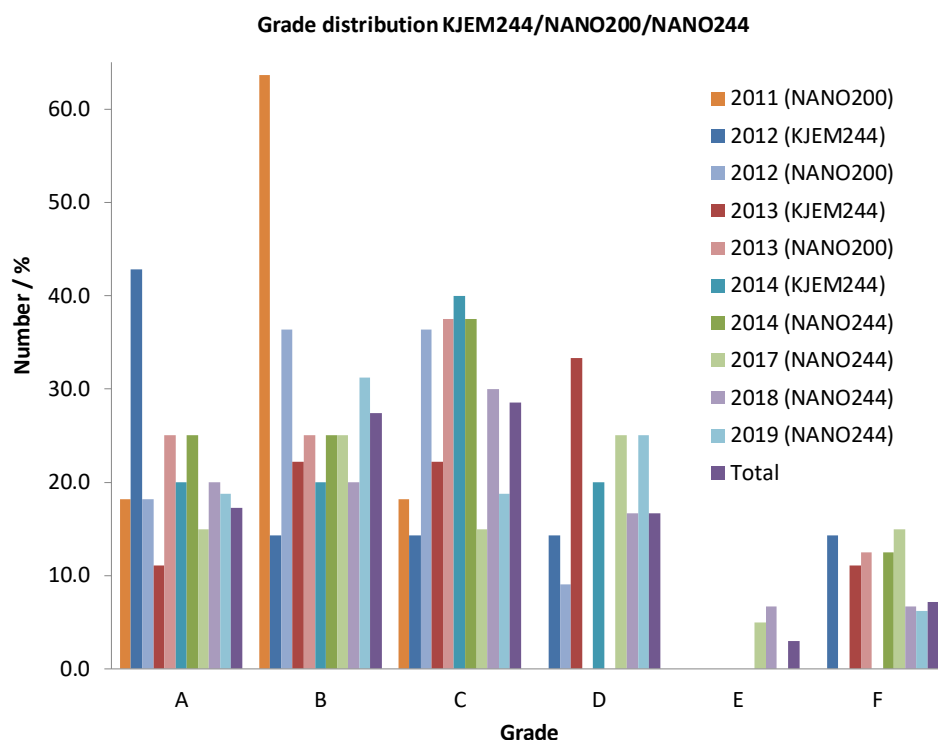
Strykprosent og frafall/failure rate and apostasy

One candidate didn't show up to the final exam. The other 15 all passed.

Karakterfordeling/grade distribution

The grade for the course is an aggregate of the final exam at the end of the semester (70%) and the laboratory excercises (30%). The final exam was in the form of an oral examination. The external censor has been the same since 2012 (in KJEM244, for which the theoretical content of the course was largely similar to) and the grading standard through the years is therefore expected to be consistent.

In 2019, there were 3 A, 5 B, 3 C, 4 D, no E and 1 F (ikke møtt). The average was C+. A comparison to previous results is shown below:



Studieinformasjon og dokumentasjon/information of studies and documentation

MittUiB was used for communication with the participants. Lecture notes were uploaded to MittUiB after the lecture. The site was also used to organize the lab exercises and receive lab reports.

Tilgang til relevant litteratur/access to relevant literature

Two textbooks with a focus on the two focus areas of the course were used as pensusum literature to give a solid introduction to the subject: L. E. Smart, E. A. Moore, Solid State Chemistry: An Introduction, Fourth Edition (ca. 450 pages, of which 350 pages are part of the curriculum) and L. Cademartiri, G. A. Ozin, Concepts of Nanochemistry (250 pages). In addition, a seminal teaching article about electronic band structures is part of the required literature for the course (R. Hoffmann, "How Chemistry and Physics Meet in the Solid State", Angew. Chem. Int. Ed. 1987, 30 pages) and an excerpt from an Oxford Chemistry Primer on surfaces is recommended reading (~13 pages). Some chapters or parts of chapters of the text books are not explicitly covered in the lectures but are required self-reading. A few articles and excerpts from other text books are recommended reading for the lab exercises. All of these articles were available to the students either through access through the University library or through the literature kiosk.

Faglærers vurdering av rammevilkårene/lecturers assessment of frame terms

Lokaler og undervisningsutstyr/locals and teaching equipment

Lectures were given in room 2018. It had enough black board space available next to the projection screen to be able to flip between powerpoint presentations and using the black board, which the lecturer does frequently.

Faglærers kommentar til student-evalueringen(e)/lecturers comments to student evaluation

Metode – gjennomføring/method – implementation

The composition of the poll took into account some of the special characteristics of how the course was implemented. It included questions on the two textbooks, written using rather different concepts and style, how the attempt by the lecturer to entice students to participate in the lecture through intermittent questions and discussion were received, and the lab exercises. 10 students handed in the questionnaire, with most questions receiving answers from 8-9, i.e. the feedback percentage is somewhere in the 50-67 % range in respect to the number of students who took the final exam.

Oppsummering av innspill/summary of input

A whopping 100 % of respondents said the course met their expectations. Individual statements that allowed to elaborate on the choice to this question covered that they were pleased with the selection of different subjects covered in the course and the quality of the lecture. All of the respondents also thought that their background knowledge was adequate to follow the course, even though a few did also identify a few areas where they might have benefitted from more prior knowledge (e.g. organic chemistry and thermodynamics).

The course covers a quite wide range of different subjects within fundamental solid state chemistry and nanomaterials. The respondents think it managed to integrate and present this variety in a coherent manner (88 % said it succeeded to do so to a large or very large degree, both in respect to organization of the lecture content and clarity of the presentation, 77 % said the presentation of the lectures in MittUiB was good or very good). They rate the overall learning outcome in the better half of the scale. The attempts by the lecturer to introduce an element of interaction in the lecture were considered to be useful by a majority of respondents (to a large (50 %) or little (38 %) degree). Regrettably, nobody appears to have prepared for the lectures in advance. The number of hours spent on self-study given by most respondents were in the 1-4 h range; one gave 12 h. Contact with the lecturer was

considered good or very good by 88 %. All of the respondents said the selection of the two main textbooks for the course achieved the aim of presenting the scope of the subjects treated in the course, and both books were considered good (to varying degree).

The course included three practical exercises. 100 % of the respondents agreed that the exercises were useful for their understanding of the subject. In individual statements one would have preferred more advanced exercises, several would have preferred to have some of the course lectures with useful theory for the exercises to take place before the exercise rather than after. The respondents state that they used between 10 and 20 hours for writing the lab report, which corresponds well to the anticipated effort required (16 h).

44 % of the respondents considered the work load of the course to be similar to that in their other classes; another 44 % considered it more demanding, and 11 % less demanding.

All of the respondents thought the knowledge learned in this course will be relevant to their further students, thesis or research activities.

Ev. underveistiltak/*eventual underway measures*

Not necessary.

Faglærers samlede vurdering, inkl. forslag til forbedringstiltak/*lecturers overall assessment, including suggestions for improvement measures*

The course has been running in this form for some time and appears to work out quite well.

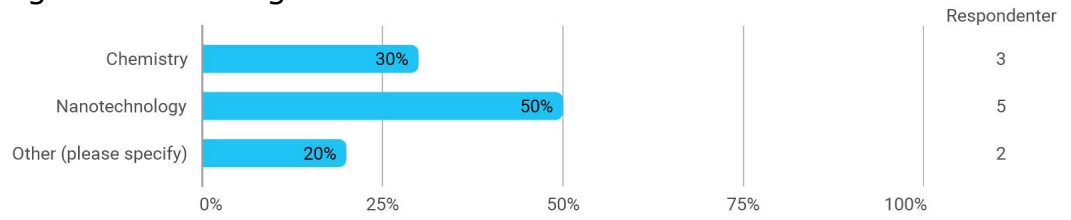
Two issues that were mentioned are related to the lab exercises. One concerns the scheduling of the lecture that gives an introduction to the lab exercise. It was usually given in the week before the exercises (in past semesters this often was a Friday), but this year it happened earlier in the week where the first groups of students had to perform the lab work. In the future, this lecture should be scheduled again so that the students have more time to assimilate the lecture and prepare for the lab work.

The other comments concerns the timing of the lab exercises in respect to the overarching theoretical lectures. Some relevant content in the lectures is reached only after the exercises have been performed. The lectures introducing the specific lab exercise contain all of the necessary basic information, but more in depth discussion occurs later. The scheduling of the lab exercises in relation to the

progression in the course content in the lectures has always be a problem (see comments on previous evaluation). The course responsible attempts continuously to optimize this, but it can't be avoided entirely if one wants to perform the lab exercises in the period middle of September to (latest) early November.

Overall, the course responsible thinks the feedback by the students indicates that they are satisfied with the course.

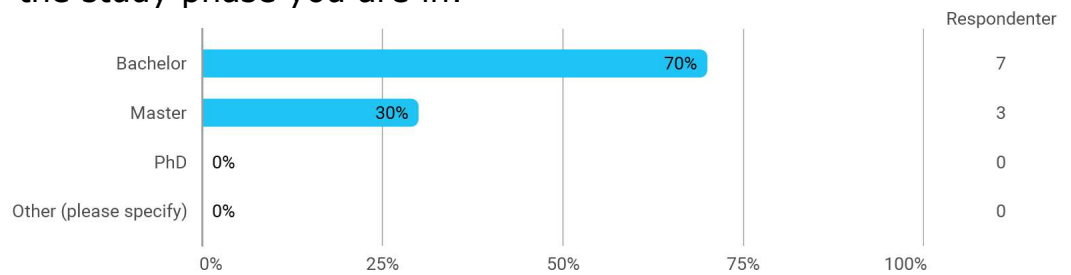
Are you studying towards a degree in



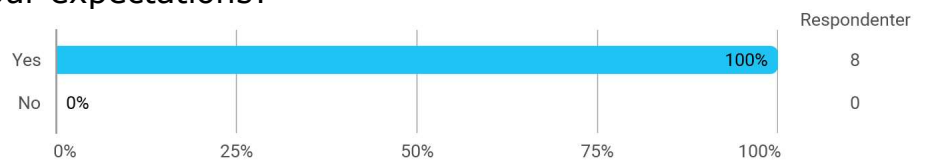
Are you studying towards a degree in - Other (please specify)

- Energy
- Physics

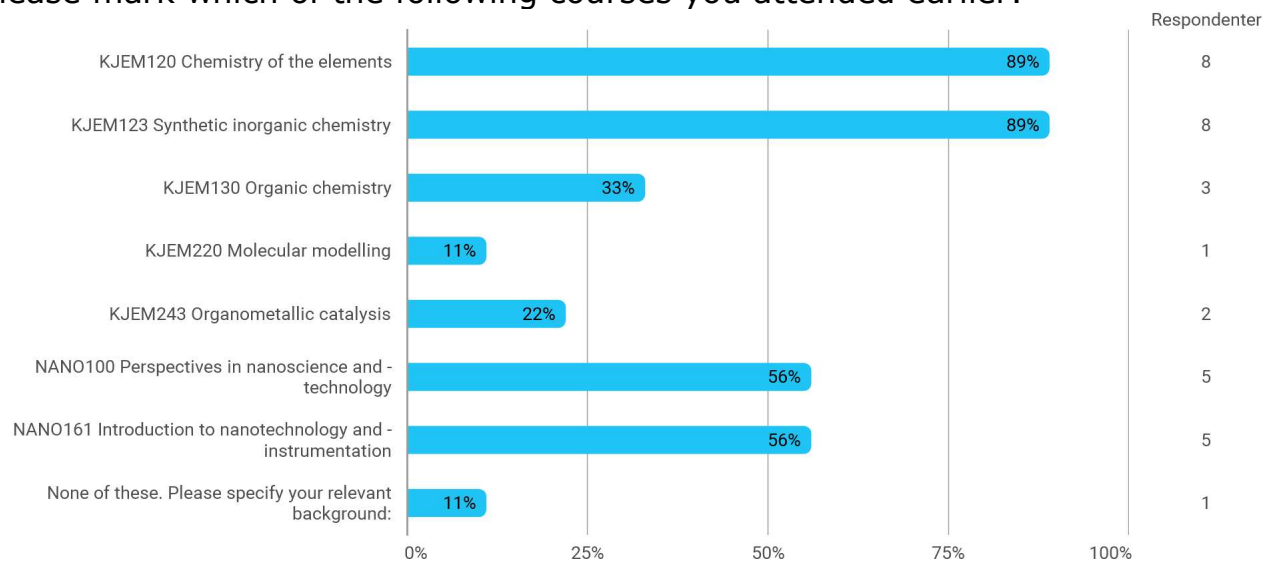
Please identify the study phase you are in:



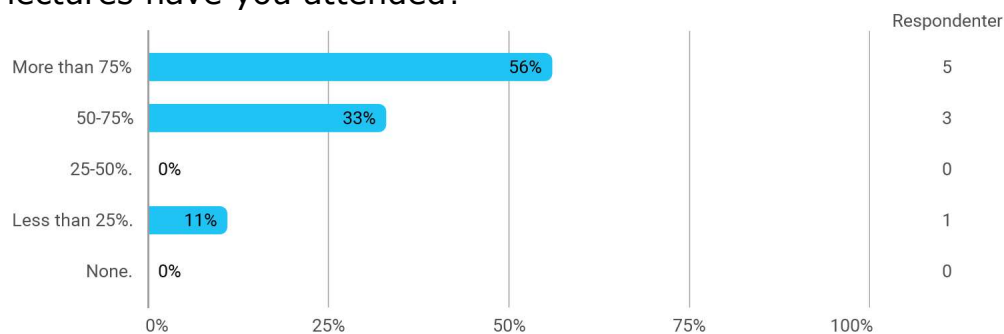
Did the course meet your expectations?



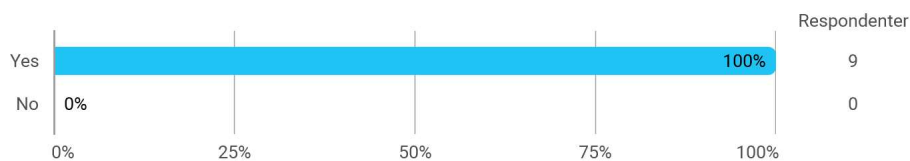
Please mark which of the following courses you attended earlier:



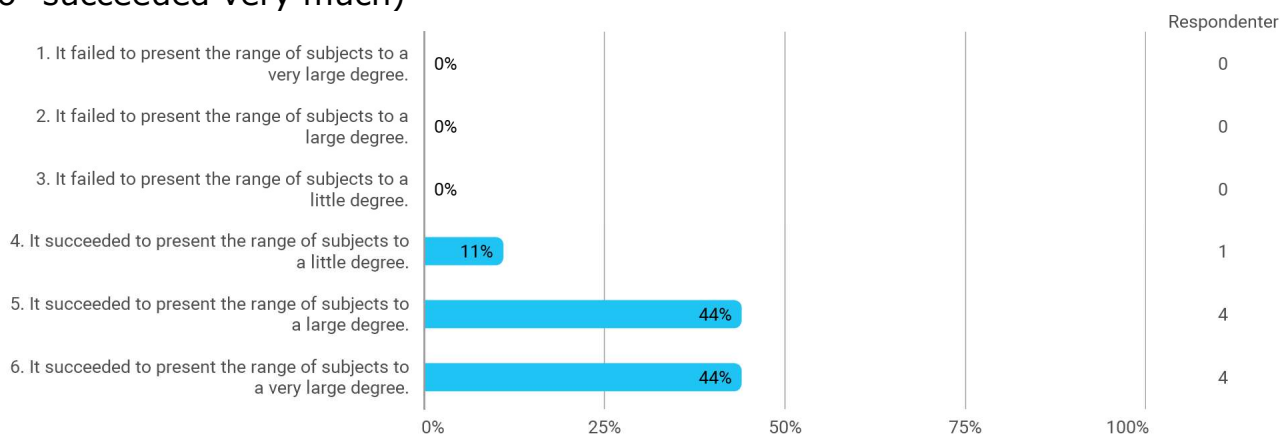
How many of the lectures have you attended?



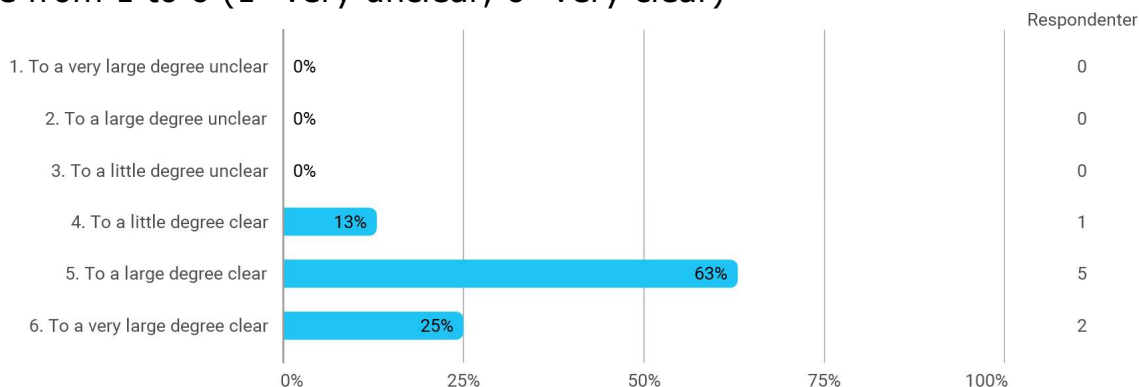
Did you feel your background knowledge was adequate to follow the content of this course?



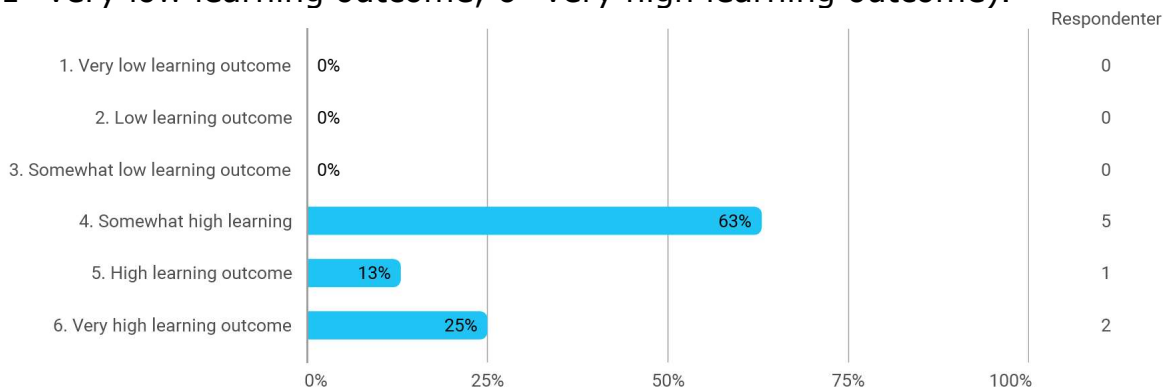
The course encompassed a wide range of subjects from fundamental solid state chemistry to nanomaterials. How well do you think it managed to integrate this variety and present it in a coherent manner (1=very much failed, 6=succeeded very much)



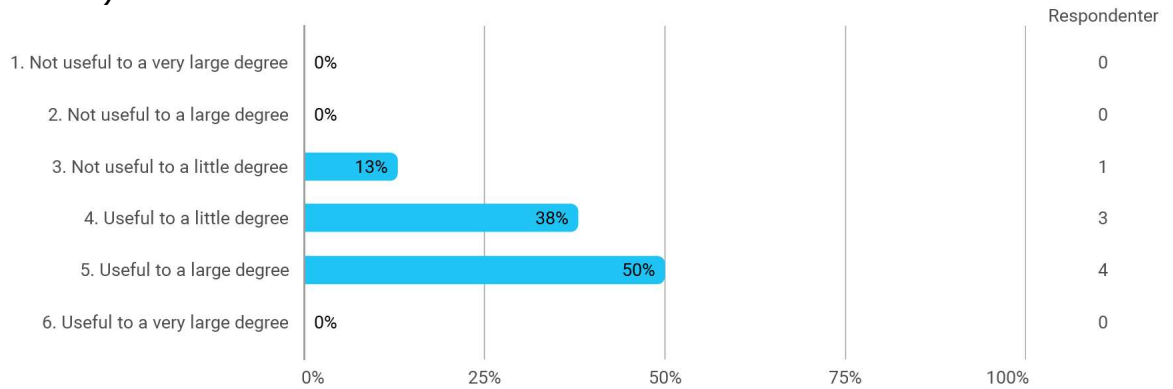
How clear was the presentation of the different topics during the lectures? Rate on a scale from 1 to 6 (1=very unclear, 6=very clear)



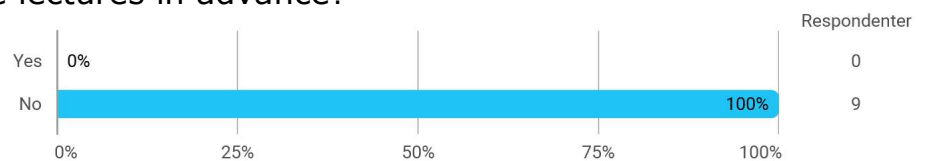
How do you rate the learning outcome from the lectures? Rate on a scale from 1 to 6 (1=very low learning outcome, 6=very high learning outcome).



The lectures were to a certain degree meant to be interactive with intermittent questions being posed by the lecturer. Do you think this approach helped you in your learning progress? Rate on a scale from 1 to 6 (1=very little useful, 6=very useful).



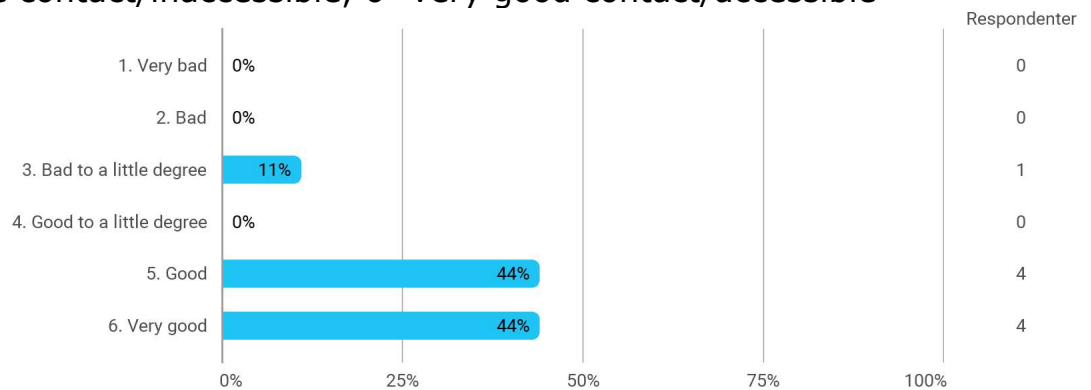
Did you prepare for the lectures in advance?



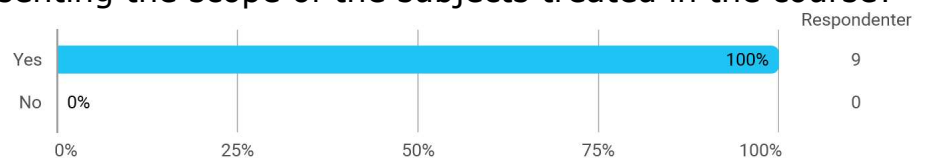
How many hours of self-study have you spent for this course? Give an average number per week.

- 4
- 1
- 3
- 2
- 12
- 3

How has the contact with the lecturer been? Range on a scale from 1 to 6 (1=very little contact/inaccessible, 6=very good contact/accessible)

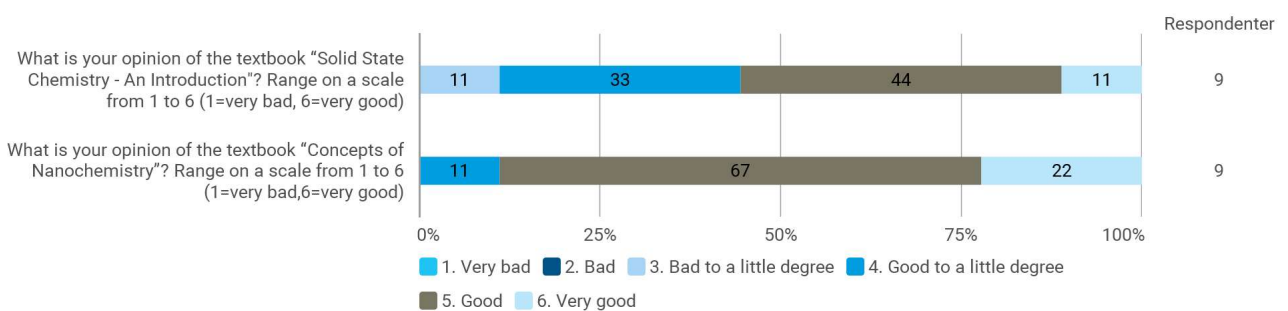


The course used two different textbooks. Do you think the combination achieved its aim of presenting the scope of the subjects treated in the course?

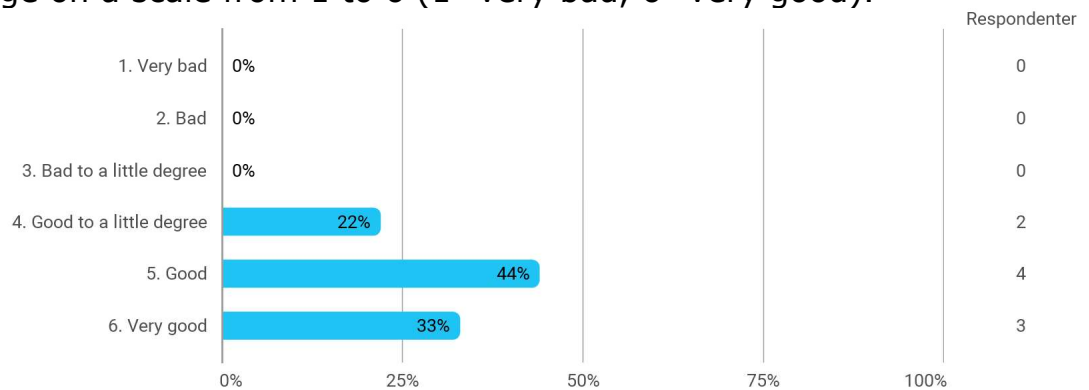


If you wish you can further explain your choice:

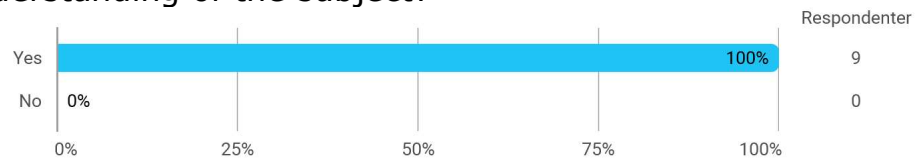
- Two books give different perspectives, which can be helpful. At the same time, it makes it difficult to look up the relevant subject, when it may only be present in one of the books.



What do you think about the presentations of the lectures presented on MittUiB? Range on a scale from 1 to 6 (1=very bad, 6=very good).



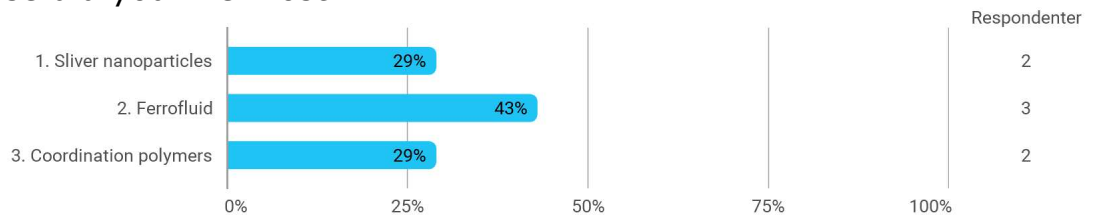
The course included several practical exercises. Do you think the exercises were useful in your understanding of the subject?



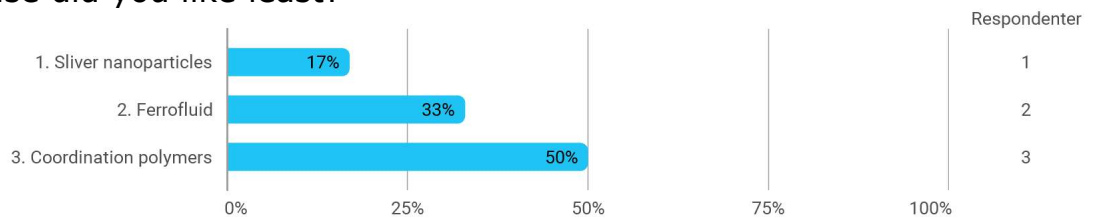
How much time did you spend on average per exercise for analysis of the data and writing the report?

- 10 Hours
- 20
- 1-2 days
- About 20 hours per report
- 15-20 hours
- 12
- 11
- 25
- 12-15h

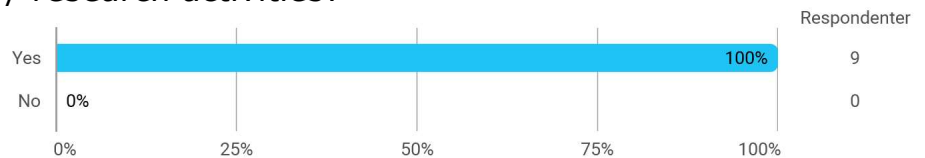
Which exercise did you like most?



Which exercise did you like least?



Do you think the knowledge you learned in this course will be relevant to your further studies / thesis / research activities?



How do you rate the work load of this course compared to your other classes?

