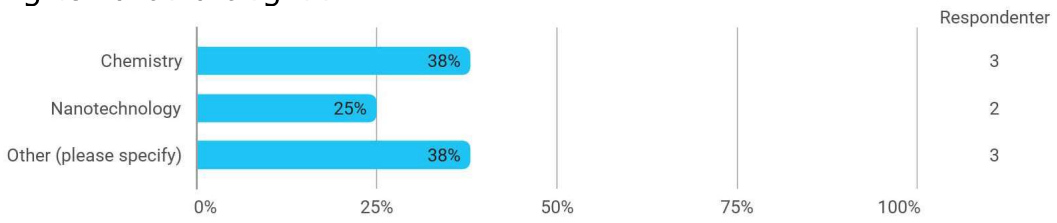
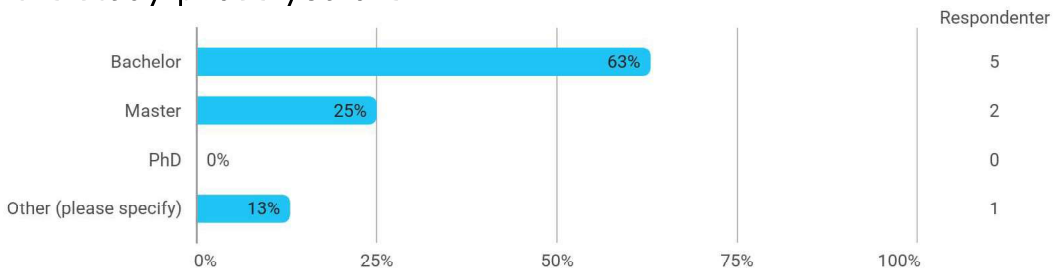
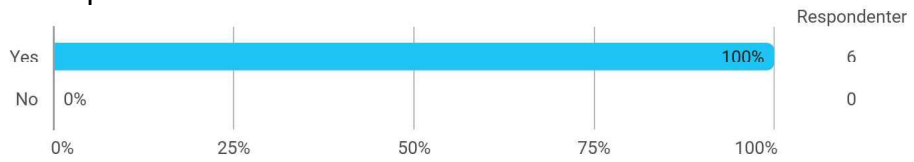
Are you studying towards a degree in



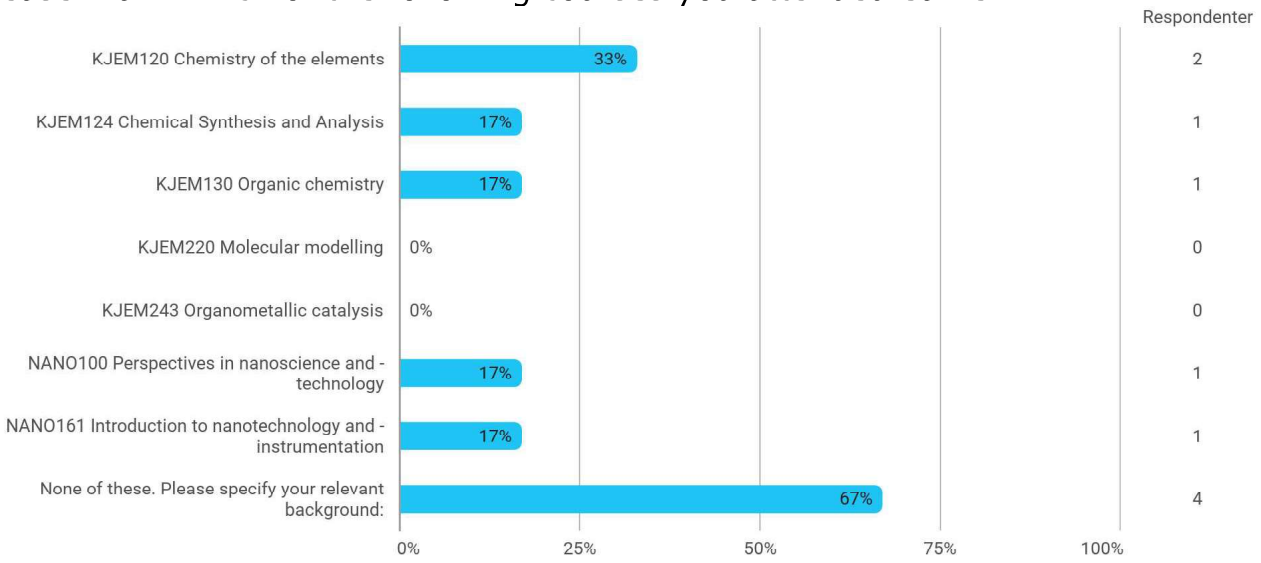
Please identify the study phase you are in:



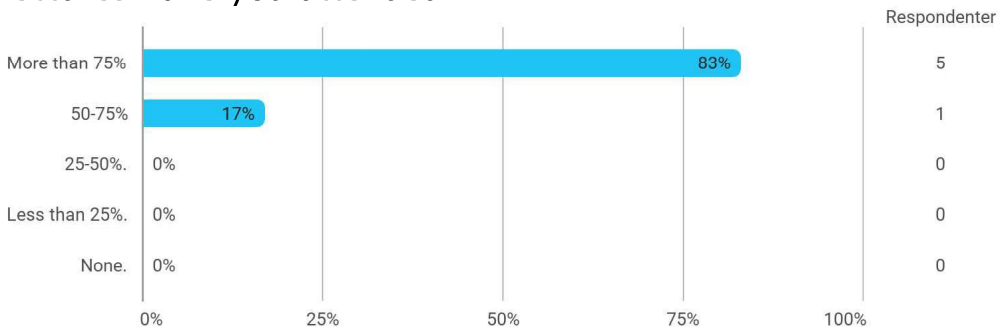
Did the course meet your expectations?



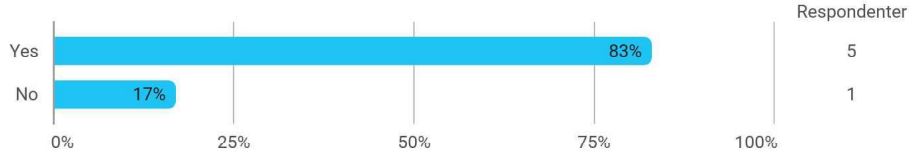
Please mark which of the following courses you attended earlier:



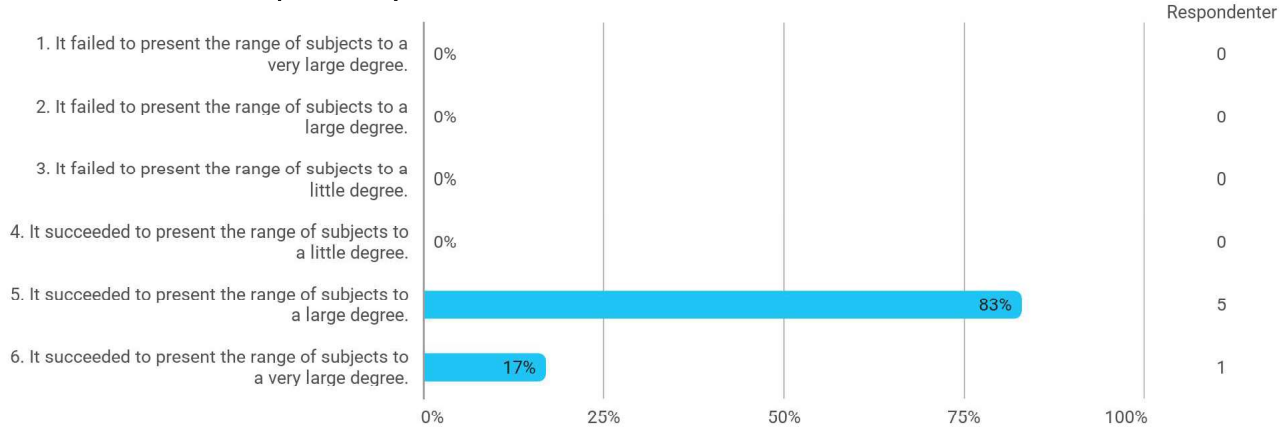
How many of the lectures have you attended?



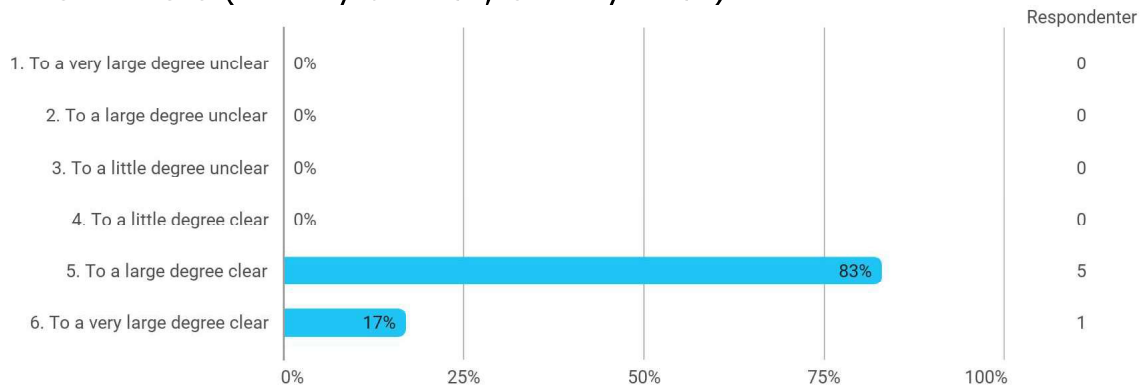
Did you feel your background knowledge was adequate to follow the content of this course?



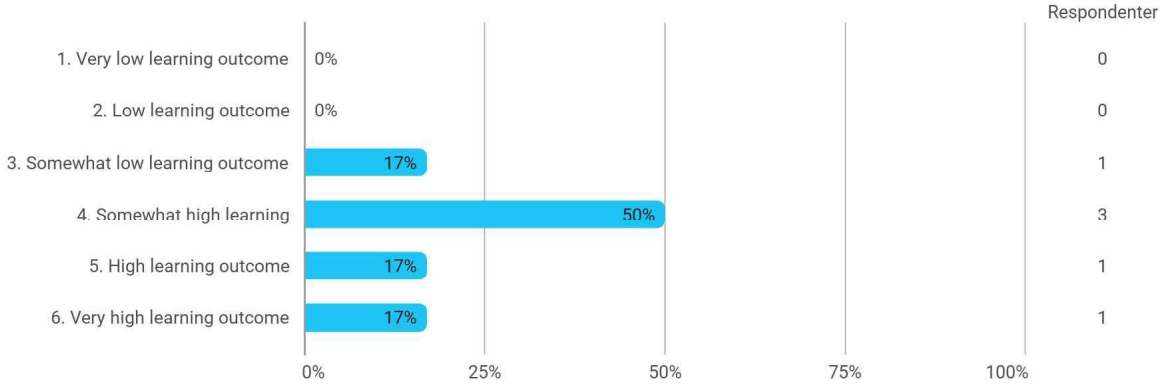
The course encompassed a wide range of subjects from fundamental solid state chemistry to nanomaterials. How well do you think it managed to integrate this variety and present it in a coherent manner (1=very much failed, 6=succeeded very much)



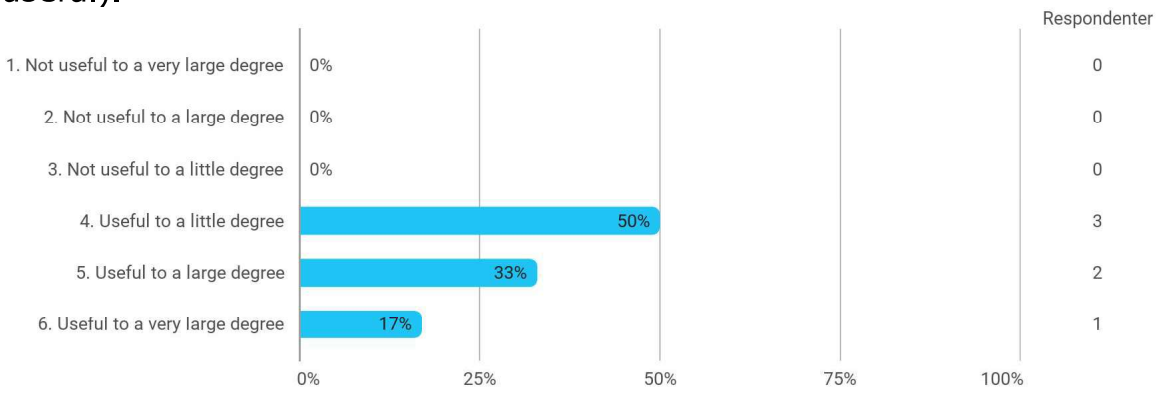
How clear was the presentation of the different topics during the lectures? Rate on a scale from 1 to 6 (1=very unclear, 6=very clear)



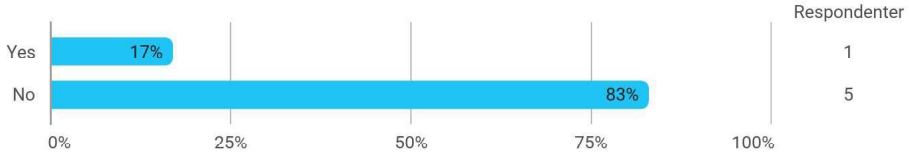
How do you rate the learning outcome from the lectures? Rate on a scale from 1 to 6 (1=very low learning outcome, 6=very high learning outcome).



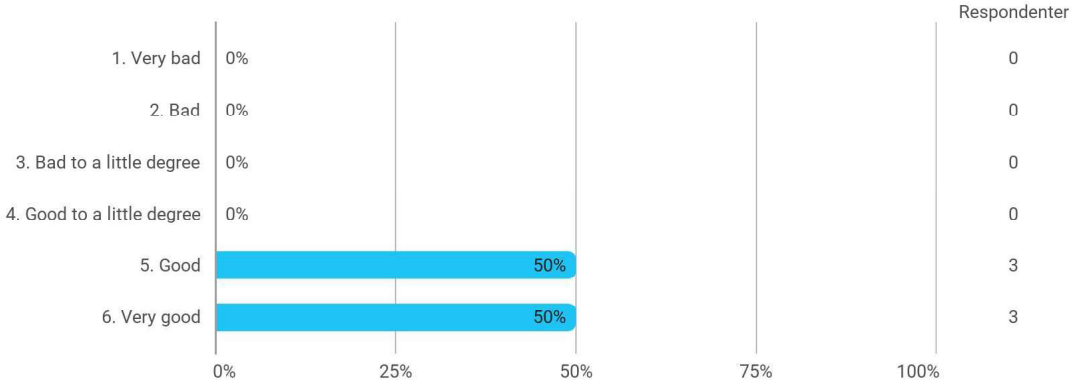
The lectures were to a certain degree meant to be interactive with intermittent questions being posed by the lecturer. Do you think this approach helped you in your learning progress? Rate on a scale from 1 to 6 (1=very little useful, 6=very useful).



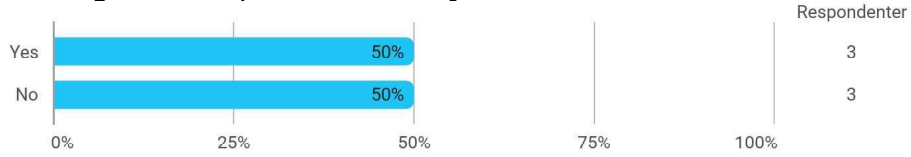
Did you prepare for the lectures in advance?



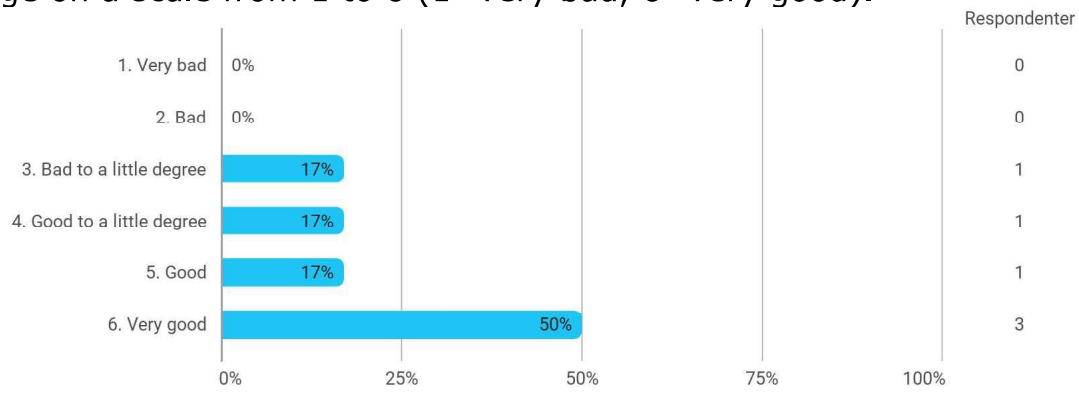
How has the contact with the lecturer been? Range on a scale from 1 to 6 (1=very little contact/inaccessible, 6=very good contact/accessible



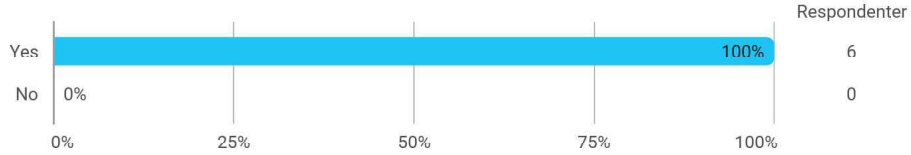
The course used two different textbooks. Do you think the combination achieved its aim of presenting the scope of the subjects treated in the course?



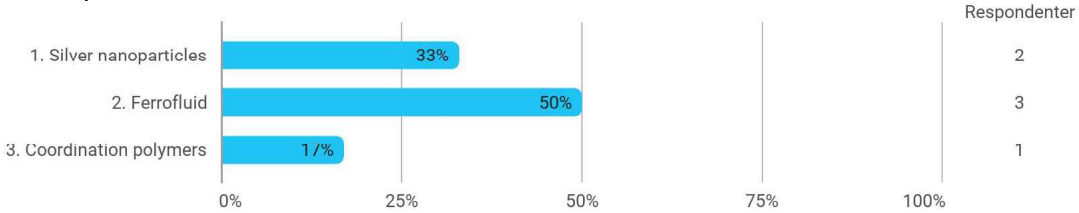
What do you think about the presentations of the lectures presented on MittUiB? Range on a scale from 1 to 6 (1=very bad, 6=very good).



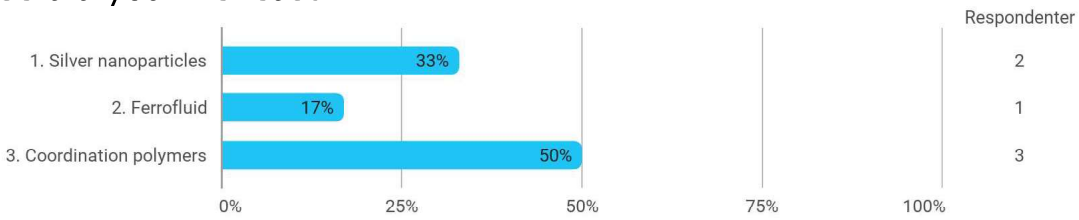
The course included several practical exercises. Do you think the exercises were useful in your understanding of the subject?



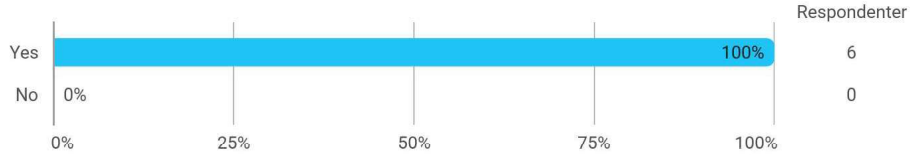
Which exercise did you like most?



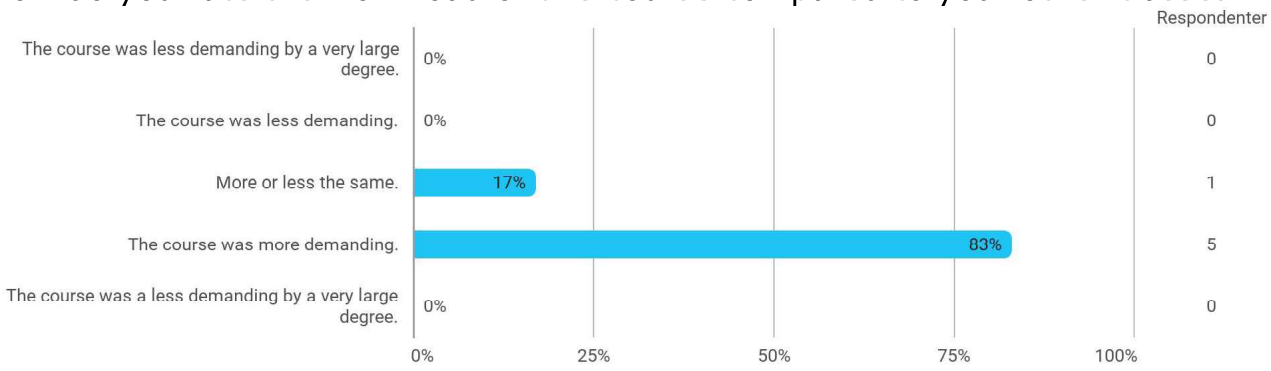
Which exercise did you like least?



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?



Emnerapport 2024

høst

Emnekode / *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 25 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.

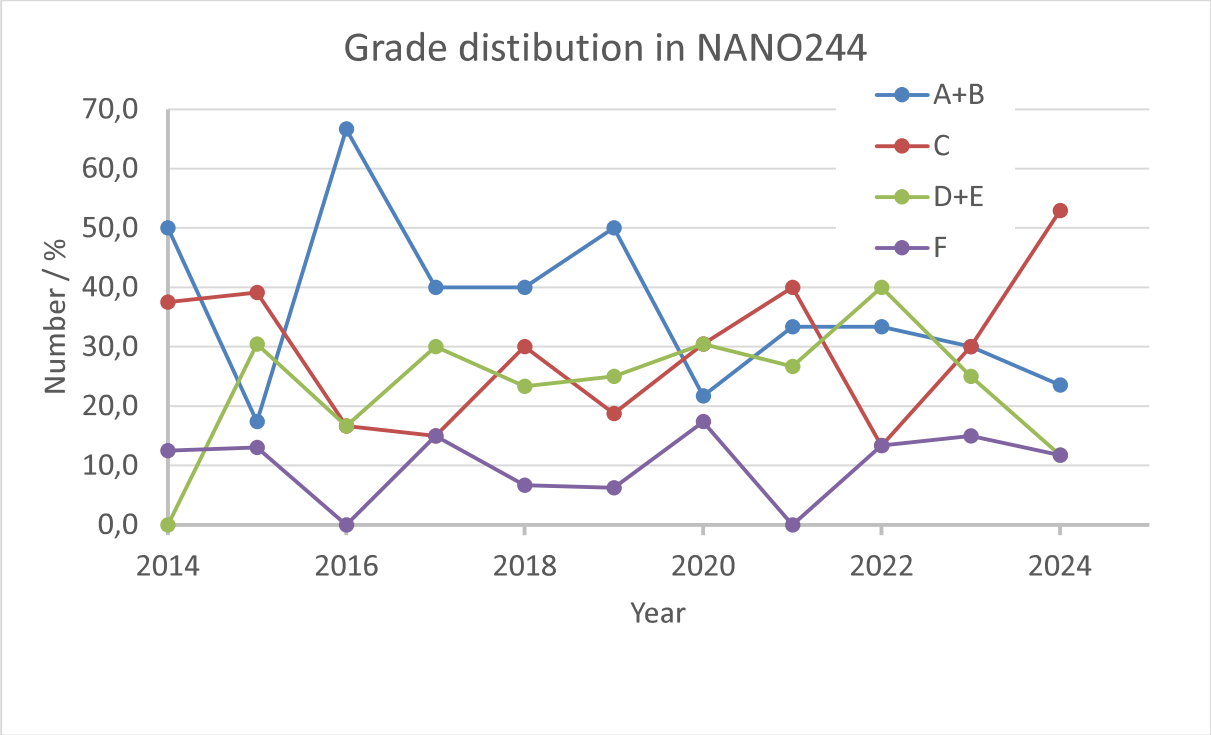
Strykprosent og frafall/*failure rate and apostasy*

One candidate was sick for the final exam. 2 of the 17 candidates who took the exam failed (12%).

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 2024, there were 2 A, 2 B, 9 C, 1 D, 1 E and 2 F. 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 pensum 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 3069 and group teaching room 6. It is not optimal to have to switch between rooms. The group room didn't have a periodic table of elements that was visible for the attendants, and one usually had to rearrange the seating before the lecture. There was also a connection problem in that the screen in the room and the notebook didn't recognize each other. (Similar problems have been reported by colleagues for other rooms with similar TV models, so there appears to be some compatibility issues.)

Andre forhold / *Other conditions*

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. 8 students handed in the questionnaire, with most questions receiving answers from 6 students. This corresponds to approximately 1/3 of the students who took the final exam.

Oppsummering av innspill/*summary of input*

Students in the course have a diverse background, coming from study programs in biotechnology, chemistry, nanoscience, and teacher education. 2/3 of the respondents were enrolled in a bachelor program. All of the respondents said the course met their expectations. In individual statements, they praised that they learned much more than expected about many different things, from concepts of chemistry, to applications of compounds and experimental techniques, and that the course was "really complete". Most of the respondents also thought that their background knowledge was adequate to follow the course.

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 (100% 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). One student further stated he/she had hoped for more focus on materials chemistry of bulk materials instead of nanomaterials.

The respondents rate the overall learning outcome predominantly 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, to varying degree on the scale from little over large to very large degree. Individual comments indicate, the interactive elements can be improved even more to make them more accessible for more participants. Unfortunately, almost nobody answered that they had prepared for the lectures in advance. The number of hours spent on self-study given by most respondents were in the 1-2 h range; one replied 8-10 h. Contact with the lecturer was considered good or very good by all the respondents. The respondents were evenly divided on whether the selection of the two main textbooks for the course achieved the aim of presenting the scope of the subjects treated in the course.

The course included three practical exercises. All of the respondents agreed that the exercises were useful for their understanding of the subject. The time stated by most respondents for writing the lab report corresponds well to the anticipated effort required.

5 out of 6 respondents considered the work load of the course more demanding than their other classes, and the remaining one considered it to be similar to that in their other classes.

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, incuding suggestions for improvement measures*

The course has been running in this form for some time and appears to work out quite well. The feedback by the students indicates that they are satisfied with the course.

Traditionally, there was a very high level of attendance at the lectures for this course. However, since the pandemic, the course responsible has observed a worrying significant drop in attendance, which appears to correlate to a decrease in the number of top grades. While the course responsible has always tried to include

interactive elements in the lectures, he has been thinking about deepening and formalizing such elements in a form that leads to stronger incentives for presence at the lectures and a better learning outcome.