
Course Report

Course:	KA 7006 Advanced Separation Methods 15 hp
Time:	August 31:st - October 30:th 2020
Course coordinator:	Conny Östman
Number of examined students:	12
Number of students who passed:	9

Evaluation of the course

Description of changes since the last time the course was given

Since the last course the literature project has been incorporated into the two practical projects since these also involves literature search. This was done in order to increase the time in the laboratory for the two practical analysis projects, as well as increasing the time for preparation before the examination. During this course the last week (Monday-Thursday) was scheduled for the students' preparation for the examination. This decreased the workload for the students since one presentation seminar and the report of the removed literature project were eliminated, as well as that specific literature search. Increased workshop training in interpretation of electron ionization mass spectra was also made to facilitate the students learning.

This year the largest change for the course has been that all the theoretical parts of the course was delivered digitally. Lectures and workshops were performed using the Zoom platform. It was done live with the lecturers and assistants presenting/assisting on-line. All lectures were recorded and uploaded to the Athena platform. During the on-line lectures the students were free to interrupt with questions and discussions. To avoid that the students' names and/or pictures showed up in the recordings, the Zoom option "Share Screen - PPT Slide Show" was used. This had to be done in order to follow the GDPR regulations to be able to up-load the recorded lectures to Athena.

To increase the student/teacher contact and to give the students more time for questions, clarifications and feedback, an additional ten hours of on-line question/feedback was scheduled during the theoretical part of the course. Also, an additional four hours on-line in two blocks were scheduled during the last week for questions during the students' preparation for the examination.

The strengths of the course according to the students (based on the students' answers)

Very good teaching (grade 4.6) with a high relevance (grade 4.6) combined with "real life projects" and excellent course assistants (grade 4.9!!) seems to be the strong foundation of the course according to the students' evaluation, giving an over-all grade of 4.8 for the entire course. A good course structure with good course material is also acknowledged in the evaluation (grade 4.2). This is reflected in some student comments such as "*The lectures were very informative and well-structured.*", "*I think that the*

fact that we had the recordings and we could revise what we were being taught helped a lot to understand the theory of the course. I also liked that the course combined both the theoretical courses and experimental aspect.” and “Project work! Thanks to project work it was easier to study, and understand the lecture materials.” Prof. Ulrika Nilsson, the only other lecturer on the course, managed the MS part with large commitment, yielding a student to comment that the best aspect of the course was “*Ulrika’s MS lectures*”.

The weaknesses of the course (based on the students' answers)

The main problems identified by the students in the course evaluation was issues regarding constructive feedback, reflection and finding information, with an average grade of 3.5. Compared to earlier years, my conclusion is that it most likely is a result of the less IRL contact with the students making spontaneous contacts, and “to just go and ask the teacher/assistant” impossible. However, as two students writes as advice to coming students: “*Read the instructions! Most of the things you don't understand or know is usually already written and explained in the instructions for the project work, or examination questions.*” and “*.. listen carefully to the lectures and even repeat them*”.

Another issue that occurred during the course, due to the Covid situation, was the students lacked the contact with each other, especially when they have to work together to plan their two lab projects and do the workshops. Due to this we booked rooms for the students where they could work together IRL on site in their small project groups (2-3 students).

As usual, there are always some instrument problems since the projects lab work depends heavily on gas chromatographs, liquid chromatographs and mass spectrometers. However, this was swiftly and elegantly solved by the course assistants.

The teachers' analysis on the course execution

The “Overall Impression” grading of the course by the students was 4.8 out of possible 5.0, which must be considered as very good. The average grade of the nine students that passed the whole course (of twelve participating) was C which is equal to the outcome of the 2019 ASM course.

The students grading of Course Aims/Teaching Relevance/Expectations /Use of the course had an average of 4.5 which also is high, and it is good to know that the students judge the teaching as well as their future use of the course as highly relevant (grades 4.6 and 4.5 respectively).

The lectures, teachers, labs and assistants, as well as the understanding of the lectures obtained an average grade of 4.6, a very good score indicating a high teaching quality. Especially the assistants should be mentioned, being graded with 4.9 by the students!

Having the lectures on Zoom was an unexpectedly good experience for me as a teacher, which on this course have almost all lectures. Using two screens, one showing the screen the students see and the second for having access to supporting material (noting student attendance, compendia, etc) was very efficient. I got a much better feeling for what the students see on the screen, as well as what and how I need to explain compared to when standing beside a screen/monitor in a lecture hall. Due to this I also get more “inside/into” the lecture feeling, and I can easily draw and sketch on the screen, use the laser pointer, show extra material etc. Also, the possibility to record the lectures is a very good option according to the students as well as to me.

Conclusions as well as suggestion on changes

Taken together, the high grades for almost all parts of the course, very high “Overall Impression” grade from the students, as well as a similar average grade for the students compared with the previous year, shows that the course has been successfully delivered using the digital platform.

I think that lectures very well could be given digitally in the future (after the Covid pandemic) with a good outcome. A specific advantage with digital lectures is that they very easy can be recorded and the students can go back and look at the lectures over again. A combination with IRL lectures is preferred to obtain a fellowship between the students as well as towards the teaching staff. It is important that the students can work together in their project groups and other activities IRL. It is good that they learn to know each other, as well as for having peers to discuss with, avoiding alienation.

Comments of high workload such as *"Maybe to have just one project that you could plan and execute in more detail."* and *"The schedule is very tight"* are always present. During the years this have resulted in several changes in the course, such as removing a number of lectures and focusing the course on separation methods and the Analytical Chain. Also, from previously three lab projects, it has been decreased to one literature project and two lab projects, and now this year down to only two lab projects, removing a lot of work for the students (one literature search, one presentation seminar and one written report) and instead increasing the time in the lab for each of the remaning two lab project with two days, as well as giving the last week free for studies.

Break-out rooms in the Zoom platform can be used for obtaining better digital workshops where the students can work together in their groups with a teacher leading the workshop and being present for questions and assistance. I have tested this in practice during teaching at KI with very good results.

Course administration

Booking and list of participants

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| 1. The pre-booked lecture rooms | Not applicable due to Covid |
| 2. The course coordinator double checked the bookings ahead of the course commencement | Not applicable due to Covid |
| 3. The Chemistry Section's Office shared a preliminary list of course participants ahead of course commencement | Worked well |
| 4. The course coordinator shared changes (if any) to the participant list with the Chemistry Section Office. | Worked well |

Comments: *We use our own lecture hall which we book ourself. I.e. 1 & 2 Not applicable in normal cases.*

Preparations

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| 1. The course coordinator has ensured that the course plan was followed. | Worked well |
| 2. A schedule was shared with the Chemistry Sections office 4 weeks before course commencement. | Worked well |
| 3. A planning meeting was held with the teachers assistants | Worked well |
| 4. Assistants and students were informed on when lab reports should be handed in and circumstances surrounding the correction of these. | Worked well |
| 5. Grading criteria were shared with the students at the beginning of the course. | Worked well |

During the course

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| 1. Necessary equipment was available and worked. | Worked well |
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| 2. The study counselor was informed on students who were experiencing learning challenges. | Not applicable |
| 3. Lab reports were corrected in a timely manner after being handed in. | Not applicable |

Comments: *We don't have lab reports in that sense since we are running the labs as projects. It is mainly discussed in the project presentations.*

Exam and grading

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| 1. Examinations were done anonymously and according to examination rules. | Yes, done by us |
| 2. The exam questions were shared with the Chemistry. Section Office 2 weeks after the course had ended. | No <i>(Have no such instructions!)</i> |
| 3. The exams were corrected less then three weeks after the examination. | Worked well |
| 4. The students were offered an exam review. | Was made upon individual request |
| 5. The grades for the practical part of the course were shared with the Chemistry Sections Office and the Director of Studies at the department. | Worked well |
| 6. The grades for the exam were shared with the Chemistry Section Office and the Director of Studies. | Worked well |

Comments: *An exam review was scheduled but the students were not able to attend due to the drastic rearrangements of the schedules due to Covid restrictions.*

Follow up

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| 1. The Chemistry Section's Office was informed if you wanted to add course specific questions (and if so; what questions) to the course evaluation or not at least a week before the course ended | Not applicable |
| 2. The Chemistry Section Office shared the final course evaluation with the course coordinator. | Worked well |

Conny Östman

Professor
Course Director