

The purpose of this course report is to document the course evaluation, partially for the Chemistry Section's long term follow up of its courses but also it may also act as support in our pedagogical development for the next course.

**- Responsible for Course/ Kursansvarig**

Matthew MacLeod

**- Number of examined students / Antal examinerade**

14

**- Number of passed students / Antal godkända**

13

**- Evaluation of the course / Utvärdering av kursen**

The students opinions and experiences (according to the course evaluation) should be used as a basis of this report.

**- Description of changes since the last time the course was given.**

Anneli Krueve took over teaching the multivariate statistics part of the course that was previously lectured by Pedro Sousa. Anneli reworked much of the material in that section and created new lab exercises. Open source software R was much more extensively used in Part 1 of the course (basic stats) and in Anneli's Part 3, which continued a trend away from proprietary software (eg, Unscrambler) that we started last year. And, we had a new laboratory assistant this year (Kyra Spaan), who supervised and marked about two-thirds of the labs in the course.

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

Students liked: - Real-world examples, especially in Anneli's part 3 of the course. - Gaining useful working knowledge of Excel and R. - That the course was interesting and seemed useful. - Teacher's openness to student questions. - Practical experience solving problems with Excel and R. - Anneli and Jon were specifically cited as being gifted teachers. - Learning by doing. - The labs in general.

**- The weaknesses of the course (based on the students evaluation)**

- Too much assigned reading particularly in Part 2. - One lab in Part 2 where students did not feel adequately prepared (I experimented this year by making the lab more challenging and requiring them to solve a problem on their own based on an example in the textbook. I felt the lab was too easy in previous years! But the experiment did not work as none of the students solved the problem!) - Pace too fast. Too much material in a short time. - Too much requirement for creative problem solving without enough context, especially in Part 2 (Again, probably related to my experiment this year with requiring more independent work rather than giving examples that duplicated problems they would face later in the labs and exams). - Exams were too intense and not enough time to complete. - Slow pace of feedback from the teachers (This was again the case in Part 2 this year especially, unfortunately!)

**- The teachers analysis on the course execution**

I think the course is improving every year! Anneli's contributions this year updated and modernized the multivariate stats section, and were very well received by the students. I experimented with making Part 2 (experimental design) more challenging by giving the students more open-ended problems and not always providing examples that were analogues to problems they faced in the labs and exams. That worked well I think, but in places I pushed it too far and the students felt lost. The addition of Kyra as a teaching assistant helped with providing timely feedback to students compared to previous years. Unfortunately, I was still slow returning one lab and marking exams for Part 2 because Coronavirus hit right at the end of my part of the course and I was subsumed into administrative and planning meetings. Timely feedback will be a priority for next year!

**- Conclusions as well as suggestion on changes**

One student wrote: "In very short time I learnt alot of knowledge, best experience of my educational life ever. All the three teacher were best, they explained in a really great way in very short time. Specially labs were very helpful for understanding the whole course." Another wrote that the course needs: "Better teachers who doesn't just experience but they are able to transfer the knowledge ,more instructed and clear lectures." So a really wide diversity of opinions! I suspect that the critical comments come from students who had poor mathematical and technical (computing) backgrounds and were thus not well prepared for the level and pace of the course. A clear message is that students like the labs and learn a lot by doing them, whereas they do not like the exams. That is a difficult situation to handle given the content of the course... The emphasis on problem solving is good, and this seems to be most readily applied in the labs rather than on exams. Perhaps in the future we can try to re-formulate the exams to require shorter answers rather than in-depth problems...

**- Course administration**

As part of the course report we would like you to share your opinions on how the administration has worked. The answers will be used to optimise our routines around the course. Please comment on what has worked especially well and where we can improve.

### - Booking and list of participants

	Worked well	Worked less well	Not applicable
1. The prebooked lecture rooms and halls			
2. The Course Owner double checked the bookings ahead of the course commencement			
3. The Chemistry Sections Office shared a preliminary list of course participants ahead of course commencement			
4. The Course Owner shared any changes to the participant list with the Chemistry Section Office.			

Kommentar om lokalbokning och deltagarförteckningen

All good! I appreciate the support from Köll! I have been course responsible for several years now, but still have not fully learned the routines and procedures. They make sure I don't miss deadlines by too much and keep things working.

### - Preparations

	Worked well	Worked less well	Not applicable
1. The Course Owner has ensured that the course plan was followed			
2. A schedule was shared with the Chemistry Sections office 4 weeks before course commencement			
3. A planning meeting was held with the Teachers Assistants			
4. TA's and students were informed on when lab reports should be handed in and circumstances surrounding the correction of these.			
5. Grading criteria were shared with the students at the beginning of the course			

Comments on the preparations

All good. We had good meetings and preparation with the new people prior to the course starting.

### - During the course







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

Comments on the admin during the course

These are not major issues, but... A couple of students had problems with their computers during the course and we advised them to get department computers. It seemed to be a problem to sign out the computers in the middle of the term (?).

And, most of the labs were corrected and returned quickly this year, which was a big improvement over the last years and is thanks to the work of Kyra as teaching assistant. But one lab was not corrected and returned for several weeks because I was sucked into Coronavirus related administrative duties at the end of March.

## - Exam and grading

	Worked well	Worked less well	Not applicable
1. Examinations were done anonymously and according to examination rules			
2. The exam (the questions) were shared with the Chemistry Section Office 2 weeks after the course had ended			
3. The exams were corrected less then three weeks after the examination			
4. Th students were offered a exam review			
5. The grades for the practical part of the course was shared with the Chemistry Sections Office and the Director of Studies			
6. The grades for the exam was shared with the Chemistry Section Office and the Director of Studies			

### Comments on the exam and grading


We surveyed the students and they did not care if the exams were anonymized, so we did not do it.

Exam questions have not been shared with the Chemistry Section Office, but I will do that now!

One of the exams (for part 2) was not corrected within 3 weeks.

Exam reviews were offered for the exam from Part 1, but exams from Part 2 and Part 3 were returned after the end of the course period. Students were still invited to ask questions about their mark, but no meetings were scheduled.

## - Follow up

	Worked well Fungerade bra	Worked less well Fungerade mindre bra	Not applicable Ej relevant
1. Course specific questions were developed and shared with the Chemistry Sections Office			
1. Kursspecifika frågor för kursvärderingen formulerades och skickades till expeditionen			
2. The Chemistry Section Office shared the final course evaluation with the Course Owner			
2. Expeditionen skickade en sammanställning av kursvärderingen till kursledaren	