

CHEM Course Feedback Form

Course: CHEM-E1160 Biomass Pretreatment and Fractionation - in Laboratory, spring 2017; number of students: 13 (12 students in total passed the course, one failed due to misconduct during the laboratory exercises).

Reporter and date: Kyösti Ruuttunen (KR), June 19th, 2018.

Teaching and learning methods: Lectures, workshops, laboratory exercise. Ms. Maria Clavert from Aalto Design Factory (ADF) cooperated in planning, and partially executing, the teaching. Some parts of the teaching were also carried out at ADF. In the beginning, course's theme was presented to the students: carbon fibre (CF) manufacture from wood biomass. Two teams (6 or 7 students/team), one working with softwood and the other with hardwood as a raw material, were formed, and subsequently "hired" to work as specialists for an imaginary company. Firstly, the students studied what kind of possibilities the company would have around CF manufacture, and secondly they had to plan a production scheme according which they would fractionate their raw material, aiming to optimise the yield and purity of especially hemicelluloses and lignin. Alkaline pulping (kraft/soda), with some possible modifications, could be used as the fractionation method, and pine, birch, or eucalyptus could be used as wood raw materials. The laboratory experiments were carried out by methods and equipment available at the Department (air-bath digester, kappa number & viscosity determination, ClO₂ and peroxide bleaching etc.), instructed by KR and Ph.D. students. The student teams reported their results in many different ways, both orally and in written form. In addition, the students gave feedback on each other's work with the I like, I wish method developed at ADF.

Assessment methods: The student teams produced various written documents during the course: Project and Production Plan, Laboratory Report, and Project Report. These accounted for 20%, 40%, and 40%, respectively, of the final grade. The students carried out self and peer evaluation of the team members' input in the team work and based on this, a personal coefficient was calculated for each student. The coefficient's impact on the student's personal grade was limited to ± 1 grade point.

Feedback summary: Feedback was collected both by group discussion (9 replies) with the students and by the standard electronic survey (8 replies; Webropol). Summary on the positive aspects mentioned by the students: lab work, its organisation and very kind instructors (n=7); course format: project work (n=5); informal & relaxed atmosphere, fun and engaging teaching methods (n=8); preparation for presentations in English (by Jaana Suviniitty, n=3); ADF environment and facilities (n=3). See also the attached summary of the Webropol survey.

Summary on the things to develop according to the students: clearer communication, more information on the requirements/assignments/labwork/schedule beforehand, more instruction for the project report and financial assessment (n=7); feedback session (I like, I wish) organised earlier during the course (n=3); mandatory lessons & meetings with the teacher (n=3); better collaboration and coordination with Herbert's course (CHEM-E1150, n=2); no pre-determined roles for the team members (n=2).

Development actions for next year: Although the student feedback was very positive, I will develop some aspects of the course next year. Especially I will improve the methods and principles according to which the teams are formed in the very beginning of the course. In a project-type course, the successful teamwork is of utmost importance for students' learning and success. Therefore, the teams have to be supported better right from the beginning, and actually throughout the course. Moreover, I will improve the communication during the course, and I will try to plan the course together with

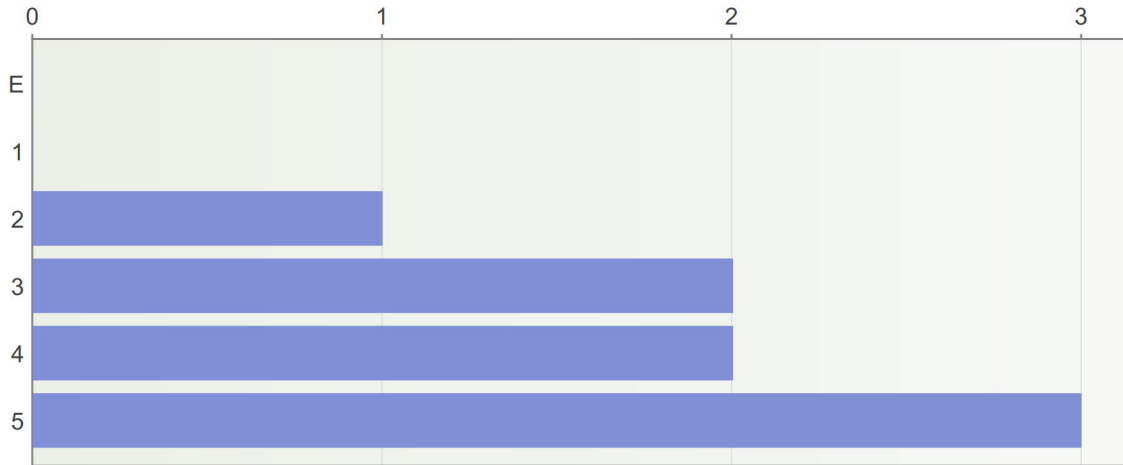
Herbert so that our courses support each other in a better way. I will continue working together with Dr. Clavert and Dr. Suviniitty. I will not increase the amount of compulsory teaching sessions, but I will implement methods for decreasing the total course points from students who are absent unexpectedly and unjustifiably. In addition, I will not require the team members to have pre-determined roles – instead I will give a list of duties, which the team will have to distribute among the members.

General feedback from the teacher: I enjoyed the course: most of the teaching methods (also the more “experimental” ones) were working very well and received positive student feedback. The student group was mostly very active and motivated – especially during the laboratory sessions – which made the teaching a pleasant experience.

CHEM-E1160 Biomass Pretreatment and Fractionation - in Laboratory (2018-01-11 - 2018-05-17)

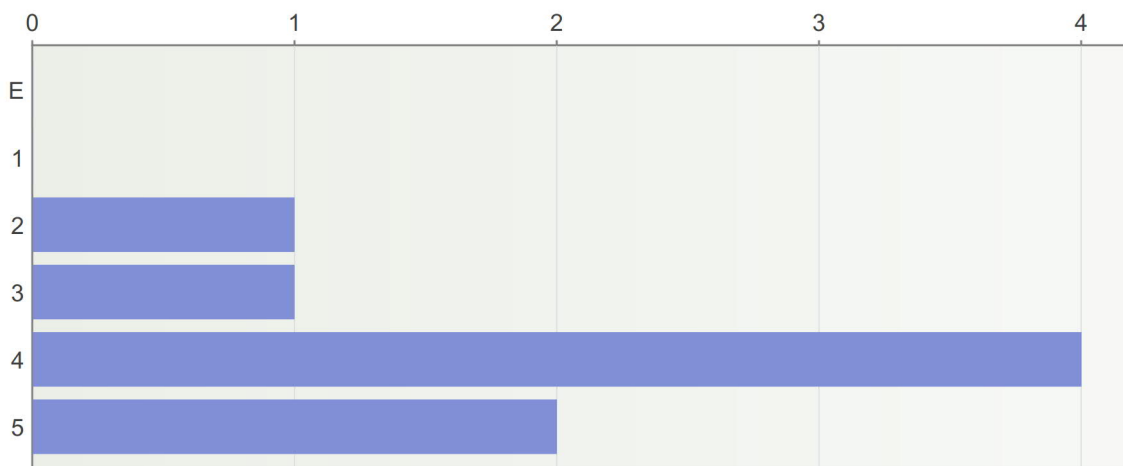
1. My overall assessment of the course E=Not applicable, 1=Fair, 2=Satisfactory, 3=Good, 4=Very good, 5=Excellent

Number of respondents: 8



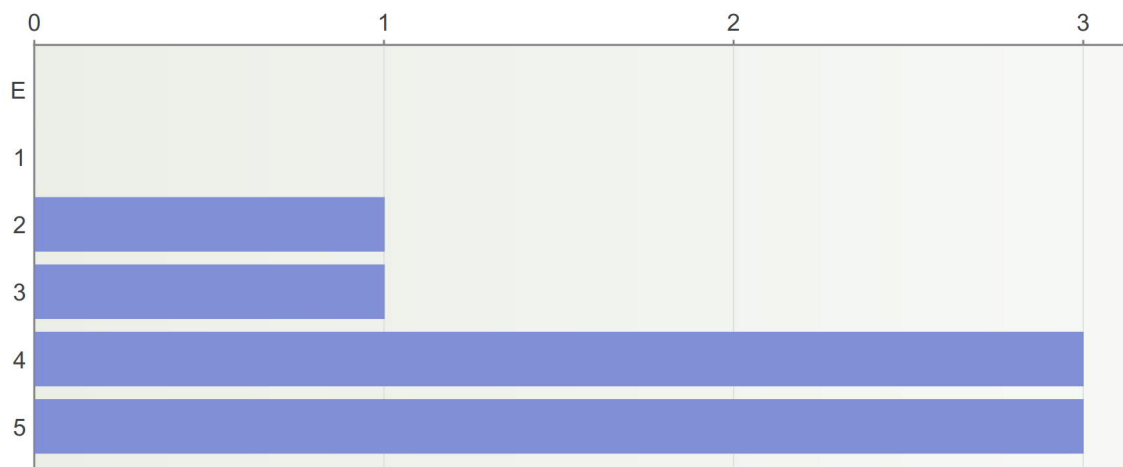
2. The teaching methods (lectures, labs, group work, online study, assignments etc.) supported my learning E=Not applicable, 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Number of respondents: 8



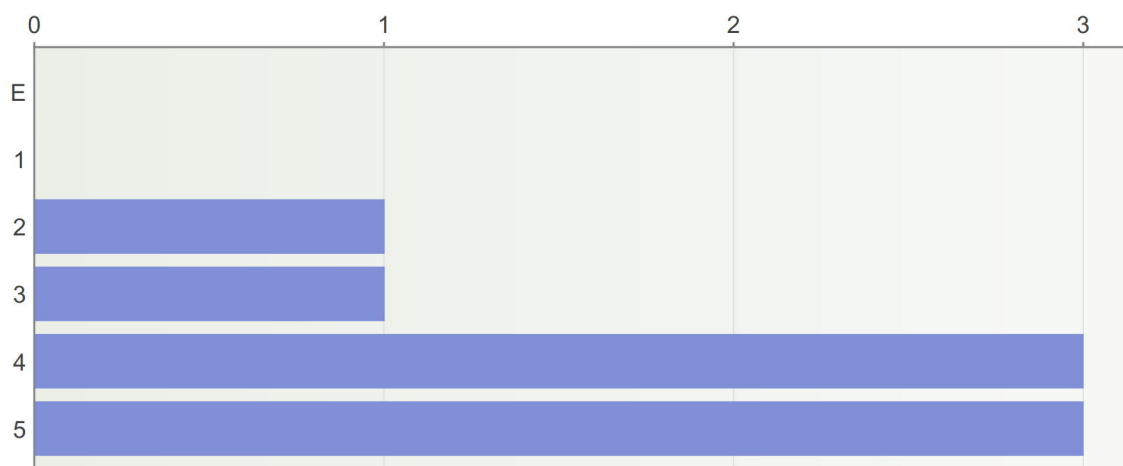
3. I am pleased with my study effort on this course E=Not applicable, 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Number of respondents: 8



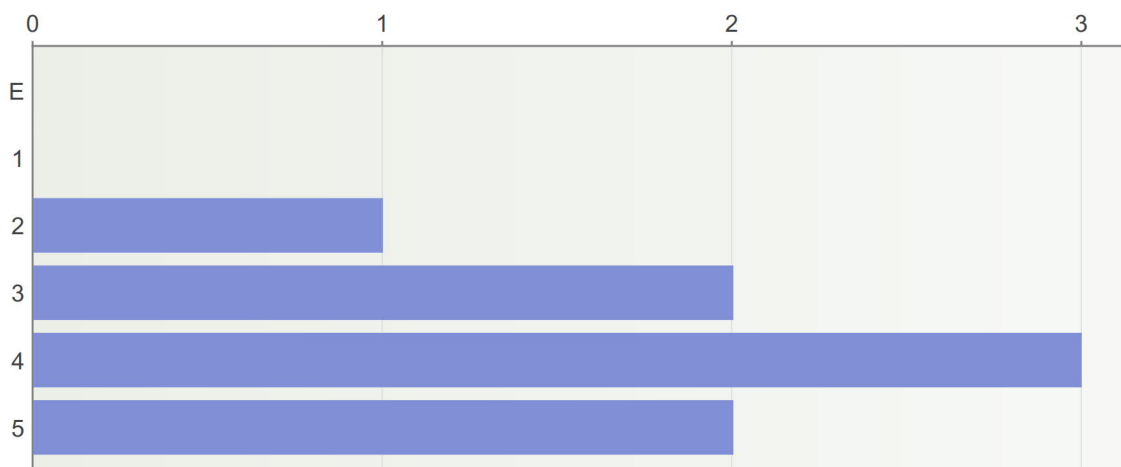
4. According to the guidelines, one credit (ECTS) requires 27 hours of student work. Compared with this, the completion of the course required E=Not applicable, 1=Considerably less time, 2=Slightly less time, 3=The right amount of time, 4=Slightly more time, 5=Considerably more time

Number of respondents: 8



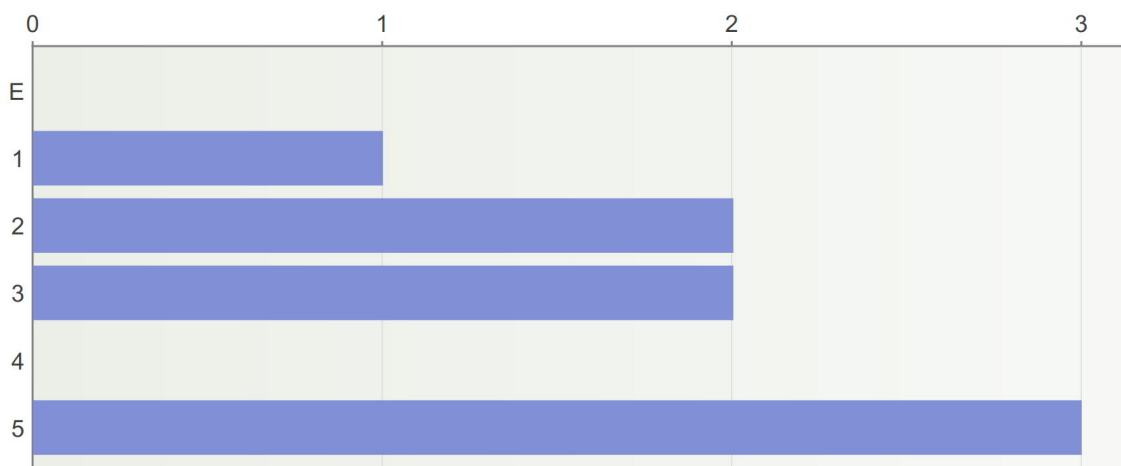
5. The course content and objectives corresponded to those of the course description. E=Not applicable, 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Number of respondents: 8



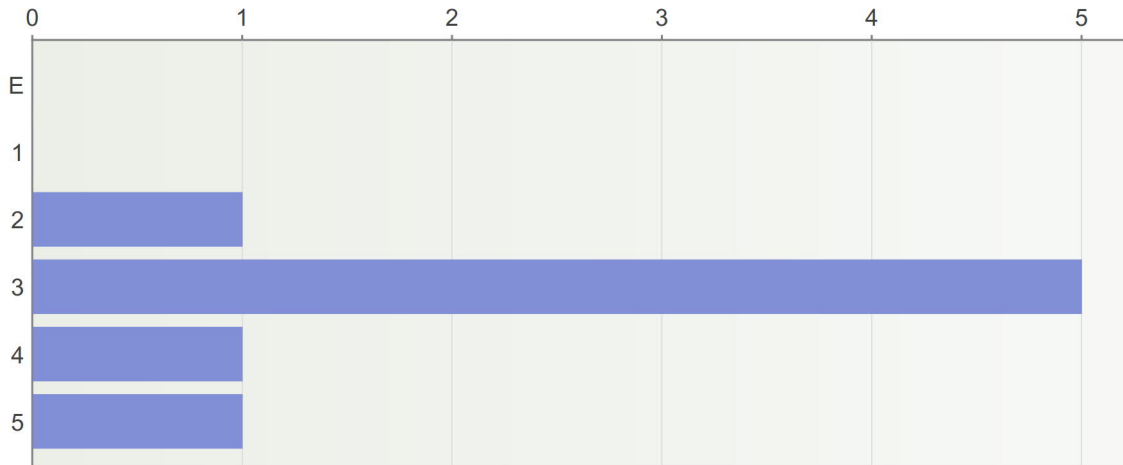
6. How was your study motivation affected by the course? E=Not applicable, 1=It suffered notably, 2=It suffered slightly, 3=It was not affected by the course, 4=It improved slightly, 5=It improved notably

Number of respondents: 8



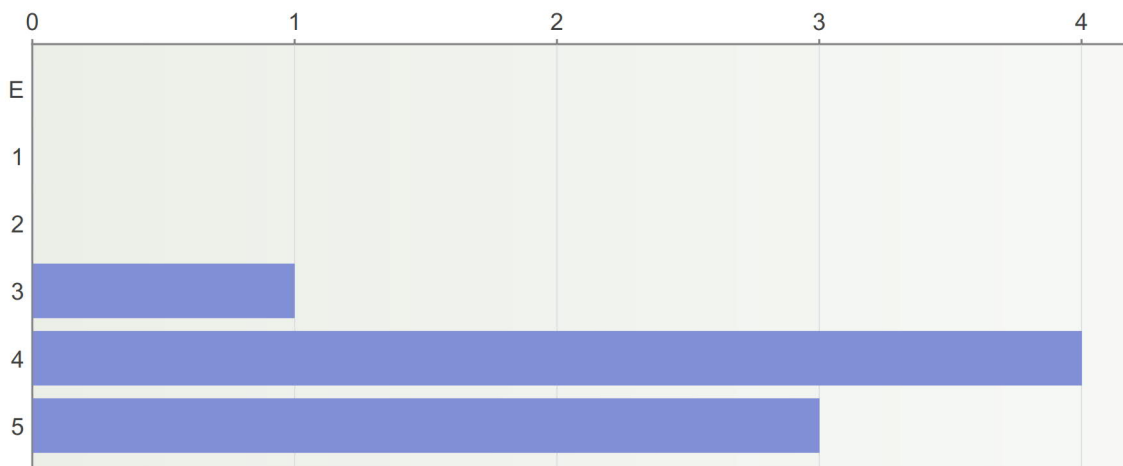
7. Compared with other courses of similar level that I have completed at the school, the course was E=Not applicable, 1=Considerably easier, 2=Slightly easier, 3=Equally challenging, 4=Slightly more challenging, 5=Considerably more challenging

Number of respondents: 8



8. The course enhanced my general skills (such as teamwork skills, writing skills, problem-solving skills and a systematic working approach). E=Not applicable, 1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree

Number of respondents: 8



9. General comments and suggestions (on such matters as course material, teaching methods, course arrangements, ways of completing the course/examinations and unnecessary overlaps with other course contents, or other matters).

Number of respondents: 6

- The teaching approach was really motivating and innovative. It is great that the groups can choose their week for labwork.
- The course management was a bit lacking, since we we're at a loss on what we should be doing and the mycourses environment was quite unorganized. Different schedules popped up at the final possible time and no clear evaluation criterion were given. Also, differences in interpretation lead to people arguing and since there is no one reliable (written) source other than "I heard it was this way" things can go too complicated quickly.
- It would be great if the lab sessions could be planned according to the other courses in the same major such as Catalysis (E1130 & E1140) and BPF - in Class (E1150).
- Maybe less lecture about the project, but more on the lab instructions!
- I think there was just way too much "pöhinä" in this course: all the carbon fibre stuff and Design factory lectures were quite irrelevant if the only purpose in the course was to teach basic kraft pulping. Lab groups were too big and objectives of the lab project were quite vague right from the start. It felt almost like that group work was supposed to be made hard by purpose, even though labs itself were very straightforward.
- Instructions and hidden agenda should fit

10. Name one thing in this course, which you think is worth preserving for next year.

Number of respondents: 7

- Audio presentation
- The feedback sessions.
- I liked the Aalto Talk, it was really good and relaxing experience.
- The fact that the course was given a context in the form of a sort of role play was funny and teasing.
- The Inocell-F process should be preserved.
- Intensive lab schedule.
- English lecture

11. Name one thing, which you think should be removed from the course for next year.

Number of respondents: 7

- Shorten the teaching time
- The first presentation, which is for answering questions about carbon fibers, might not be necessary. It could be done as preliminary work.
- The titles, secretary, safety manager etc. This is because of the innate differences in approach of the titles. I know we decided them, but it is still a system where people assume different positions and won't fulfill them and in the end, the CEO gets too much responsibility.
- The course was complete and coherent thus I don't know of something that should be removed.
- The first two lectures.
- First part of the course (3rd period) didn't support the learning at all so the project plan could be removed completely.
- Overlapping lab sections