Course analysis CH2014 Chemical and Microbiological Risk Management in the Work Environment

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1. Description of the course evaluation process

The course evaluation is based on a course evaluation inquiry, answered by 7 students in combination with feedback from the students during the course and the teachers reflections and experiences from the course.

2. Description of meetings with students

No meetings with students were arranged for evaluation of this course. Some students have submitted positive reflections after the course.

3. Course design

The course covers a broad field, as chemical hazards occur with tens of thousands of different substances and even more chemical products. The course focus on strategies on how to deal with chemical risks.

The course provides knowledge within the following topics and ability to use the knowledge in problem-solving:

- Legislation concerning chemicals and microorganisms.
- Impact on health and safety.
- Risk assessment including measurement of air contaminants
- Control measures that reduce exposure and risks of accidents, through technical and organisational design of work, and workplaces.
- Adaptation of control measures to the workplace.

By the end of the course, the students should be able to:

- Describe, exemplify, and explain how all the above-mentioned factors affect safety, health, wellbeing, and performance.
- Perform measurements and risk assessments relating to all the above-mentioned factors in order to assess exposure and to be able to propose control measures that eliminate or reduce the exposures. The capability to perform measurement involves knowledge about measuring methods as well as measurement strategies
- Describe, discuss, and critically analyse the advantages and limitations of different measuring strategies and be able to interpret and draw conclusions from measurement results.
- Propose work environment improvements according to the hierarchy of prevention and control concerning the above-mentioned factors
- Critically discuss risk assessments and control measures in relation to relevant work environment regulations.
- Describe the EU regulations and Swedish legislation and provisions for all the above-mentioned factors.
- Find and interpret information about health hazards with chemical products and substances and use this information in risk assessment of handling of and exposure to chemicals.
- Describe common microbiological risks, in what environments they occur, how such risks can be assessed and how they can be controlled.
- Describe the demands on employers regarding chemical risks and be able to support organisations and adapt the methods to the organisation's needs and prerequisites.
- Be able to identify barriers and facilitators for implementation of work environment improvements and to discuss pros and cons of different control measures and strategies.

Variations of the course has run for almost fifteen years and has been developed continuously. The last years, focus has been on developing distance learning for parts of the course and maintain a few days on campus for practical parts of the course.

4. Students' workload

The workload varies a between students, but seems proportionate o the content of the course and the intended workload for a 7,5 hp course. Some students participate seldom in the lectures. Additionally some students (mainly those not participating in the lectures) tended to be late or miss out on assignments.

5. Students' results on the course

11 students did the written examination. All students except three have passed, (re-examination not included).

The grades after the first examination are:

A	0
B	6
C	
D	1
E	1
F	3

The students failing the first examination were the same students that had a low participation in lectures.

6. Students' answers to open questions

Some comments about the course:

What was the best aspect of the course?

- "The many examples, and the discussions.
- The guest lecturers brought interesting information and views on the topic.
- Learning the value of taking notes of the details, because there is were the devil is.
- Efficient teaching using a mix of videos, discussions and questions.
- The mix of activities during the course was fun and added to the learning.
- Layout in Canvas was great. The final exam covered most of the key learnings.
- Bra upplägg med filmer. För mig var det även bra med de svenska versionerna på inspelningarna. Bra nivå och en utbildning som jag känner att jag kommer kunna omsätta i praktiken på en gång
- engaging the student with discussion in a group and relevant assignment"

What would you like to improve?

- "Do actual measurements (diffusive sampling) in a lab.
- The videos and recorded lectures was really helpful. But the overall quality (production value) of the videos could be better by taking away distractions in the background, like other talking, door bells and telephones going of.
- The group project.
- Det som man kanske bör tänka på är att det är en internationell utbildning och många företag tar inte emot från vissa länder. Kan vara svårt vid projekt. Kanske ska finnas några företag som är tillfrågade innan. Det kan ta mycket tid innan man hittar ett företag annars.
- If we could measure in the work environment in project work , it would make our training more comprehensive"

What advice would you like to give to future participants?

- "Really fun and interesting course - take it!
- Before doing the CO_2 laborations, gather together in the whole class and synchronize the instruments and the start and stop of the instrument.
- This could get a whole other, and much more interesting, evaluation of the data in the lab report.

- Keep up the reading, use the tools on Canvas.
- Mycket att läsa i början, gör det för det har man nytta av under resten av kursen."

Is there anything else you would like to add?

- "Great learning experience and great teachers! One of my favourite courses so far! Thanks a lot!
- Snabb och tydlig feedback, Lätt att nå via mail vilket uppskattas."

7. Summary of students' opinions

There are several aspects of the course that the students appreciated. Comparing to the last years student fee3dback, several changes have been made and seems to have given a good result and eliminated some problems.

The mix of lectures, quizzes and group discussions seems to be appreciated and work as intended, developing the understanding of the topic.

8. Overall impression

Compared to the result of last years examination, grades have increased for those passing the exam. However, the exam has not changed, why the conclusion is that the teaching has improved. E.g. the examination was a bit too long last year and is now back to the previous length. In addition, the exam was prepared this time with a short lecture pointing out topics which are tricky and the students need to be aware of

Access to recorded lectures in Swedish seems to be appreciated by the Swedish students and facilitate their learning.

There has been several comments about the recorded videos, mostly very positive. The recorded videos are quite short lectures (usually less than 15 minutes). They are almost always followed by quizzes or group discussions. The group discussions and quizzes are important as they contribute to a deeper understanding of the lectures. Giving lectures IRL, will take more time and leave less time for the discussions. For future courses, the intention and benefits with recorded lectures will be presented at the beginning of the course.

9. Prioritized course development

The following changes were made for this course (compared to the previous one);

- ✓ The benefits with recorded lectures will be presented at the beginning of the course. Those students who want to will be able to look at recorded lectures before the scheduled lectures.
- ✓ The length of the examination will be reduced to the previous length.
- ✓ We will consider a short lecture as a preparation of the exam, pointing at aspects, which we can see were missed out on when the students did the exam in this course. (The students doing the re-examination were offered a similar lecture/discussion as a preparation for the re-examination, all students passed the re-examination and two students increased their grades to A).
- ✓ At the beginning of the course, the students are asked to inform as soon as possible if there are difficulties in finding a suitable project work, in order to avoid unnecessary stress at the end of the period.
- ✓ The instructions for the measurement lab will be improved and describe how to measure in more detail.
- ✓ To reduce the students workload during the first weeks, information will be added about the course literature. The schedule should not be interpreted as detailed instructions requiring students to read everything the first weeks.

Based on this year's course evaluation, one change is planned for next year. The Syllabus will be changed, requiring students to participate in the first lectures, as that will facilitate planning of the project work.

In addition, there have been some technical problems that needs to be solved for courses to come. And the organisation of the project work has to improve as well as how assignments are programmed in Canvas.

Some students are asking for IRL measurements. However, this is not possible in this course due to time restrictions. However, there is a follow-up course about advanced measurements that include IRL measurements. If measurements should be introduced in this course, other topics would have to be omitted.