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 9 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.

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.

The course has run for more than ten 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 lot between students. From the inquiry, it seems as students using less hours for the course are more dissatisfied. And those who have used many hours are more satisfied and find the theme of the course more interesting.

5. Students' results on the course

19 students did the written examination. All students except one have passed, two after a re-examination (one of them did not do the first examination). Two students did the examination to increase their grades in the course.

The grades after re-examination are:

A	3
B	3
C	2
D	6
E	4
F	1

6. Students' answers to open questions

Some comments about the course:

What was the best aspect of the course?

- "Interesting field
- The quizzes
- The recorded videos in both English and Swedish. It helped to watch them over again to repeat and understand better
- The topic is very intressant and lectures and specially the practical examples that was provided were very good and educational.
- The group work was very stimulation and important way of learning how to make a risk assessment.
- (Teachers) extensive knowledge and clear way to convey it to practical situations.
- The very practical issues we were taught to deal with in workplaces such as exposure assessment strategies etc.
- Group discussions
- Inspelade föreläsningarna och att material fanns på svenska. (Såå såå bra med inspelade föreläsningar! Äntligen en kurs/lärare som har förstått hur värdefullt det är för inlärningen att kunna titta om igen och repetera)
- Understanding how to apply chemical safety regulations, carrying out a risk assessment of a workplace, and dealing with and overcoming challenges involved in real risk assessment.
- Doing a literature review on chemical safety and situating that to a particular context.
- Manipulating sampling equipment and carrying out real-time measurement"

What would you like to improve?

- "Perhaps a summary lecture before the exam on relevant topics
- I think in this course it seemed harder to recrute a worksite for the project work, therefore I would suggest that groups are formed and able to contact companies at an earlier stage.
- The way the written examination was designed was a bit too hard for most of the students (you will see it while marking the exam) and lengthy and tough."

What advice would you like to give to future participants?

- "Read more and take readable notes
- Trust (the teacher) when she says that the devil is in the details
- Be prepared with project ideas
- Active participation during the lectures makes studying interesting"

Is there anything else you would like to add?

- "I really enjoyed (the teachers) style and the way the course handles real life scenarios. It is ideal training for our work as safety professionals!"

7. Summary of students' opinions

There are several aspects of the course that the students appreciated. However, there are also aspects of the course that can be improved or explained. This is further discussed under Analysis below.

Some students found the course requiring too much work, especially the first weeks.

8. Overall impression

Almost all students have passed the course, and after the re-examination, grades have increased. However, the students have been ambitious and higher grades could be expected. The prioritised course development described below, will hopefully contribute to this. Access to recorded lectures in Swedish seems to be appreciated by the Swedish students. One comment from a Swedish student: "Jag är mycket mycket glad att det mesta av materialet fanns på svenska, det underlättade enormt att ta in kunskaper. Svåra begrepp på engelska."

There has been several comments about the recorded videos, both very positive and negative. 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.

For the first time in this course (for more than ten years), one project group had difficulties recruiting a company to serve as practical case in their project work. The first day of the course, the project work is presented and the students are asked to start identifying a suitable project work. However, there is a need to follow up on how this works (which was done, but the students seemed to want to cope with finding a case themselves) which requires students to inform about difficulties.

The written examination was increased with one question, compared to previous years. Almost all students were ready before end time of the exam. All but two students passed the first exam, though the grades could be higher. For future courses, the exam will be reduced to the previous length. And we will consider a special preparation for the exam, pointing at difficulties in chemical risk management discussed during the course.

9. Prioritized course development

For future courses;

- ✓ 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.