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Teaching Laboratory Classes in the Natural Sciences (4)

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4. Lab Safety

Safety considerations are vital when you teach laboratory classes that contain hazardous substances or require dangerous procedures. In addition to general lab safety procedures, these include specific safety instructions for individual experiments. When preparing a lab class, think of potential dangers that could occur during the experiments. If you are new to teaching or to your department, familiarise yourself with the available safety equipment (emergency shower, first-aid kit, fire extinguisher, telephone). Even in the case of diligent deliberation, not all safety hazards can be predicted.

Standard procedures for making lab work safe include:

- **Safety instructions** at the beginning of class.
- **Demonstration** of steps of a procedure that contain safety hazards.
- **Safety test** that students must pass before they begin an experiment.
- **Leading by example:** Teachers, TAs, and tutors follow all safety requirements (e.g. wear safety goggles and closed shoes at all times, i.e. even in the summer when it is hot, etc.).
- **Expulsion** of students from class if they do not follow the rules.

Additional ways to make students aware of safety issues and prevent accidents include:

- Make sure that students **familiarise themselves with the material and working procedures** before conducting potentially dangerous experiments for the first time.
- Explain the (chemical, physical, medicinal) reasons for possible hazards so that your students can develop a **deeper understanding of the safety requirements** and do not perceive them as arbitrary lists of dos and don'ts.
- In addition to demonstrating correct procedures, consider the feasibility of **demonstrating a case of emergency** of specific security risks under controlled conditions (e.g. a controlled explosion).^[1]
- Use **videos**, as well as texts. For example, you can also use available material and provide links to first-aid videos by the Red Cross.
- Have students take the **safety test online**, before they come to class.^[2]
- Consider **substituting hazardous substances with less dangerous ones** if they achieve similar reactions in experiments.

If, despite all precautions, an **accident** happens that involves students, file an accident report within five days. See the Teaching Manual (https://intra.univie.ac.at/fileadmin/download/Teaching_Manual.pdf), chapter 11 Safety in the Lecture Hall, for more information.

Pregnant or nursing students who (wish to) participate in lab classes, can be exposed to strains or dangers (affecting both the students and their children). Pregnant students have a right to a leave of absence. If they do not claim this right, the principles of maternity protection apply analogously to expecting mothers for their and their unborn children's safety. A summary of the rules and good practice (<https://studieren.univie.ac.at/en/pregnant-students-and-nursing-mothers/>) is available for students and teachers at the University of Vienna. We recommend that teachers of lab classes discuss a new pregnancy with the course instructor and perhaps also with the responsible study programme director—especially if you have little to no experience with these types of situations.

Continue reading

Laboratory Classes (5): Assessment & Grading (</en/start-page/course-types-disciplines/teaching-laboratory-classes-in-the-natural-sciences/5-assessment-grading/>)

References

[1] For further ideas see Senkbeil, E.G., and P. Crisp. "Demonstrations for teaching laboratory safety." *Chemical Health and Safety* 11, Nr. 4 (July/August 2004): 17-24.

[2] In this video „Laborlehre und praktischer Übungsbetrieb: Wie machen Sie das?“ (<https://infopool.univie.ac.at/videos/laborlehre/#c337068>)(starting at 06:56; in German) you can see how teachers of the department of nutritional sciences use Moodle for different tasks.

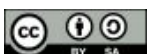
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