

GUIDE FOR PRACTICULS - CORONA

FACULTY OF SCIENCE

10 July 2020

BACKGROUND

In the light of the drastic measures relating to the coronavirus, consideration is being given by the faculty about the conditions under which the teaching of practicals can be continued in the immediate future. It has been decided that all lectures in the first semester of the new academic year will be made available online, while other forms of education in Periods 1 and 2 will be delivered in hybrid form: mostly online, but on campus when possible. Priority has been given to the teaching of practicals in determining which educational activities should take place on campus.

Since the Covid-19 measures make it impossible to schedule all practicals on campus, this guide is intended to give you ideas and to inspire you to come up with creative solutions for how to approach and organize the teaching of practicals.

FOR WHOM

This guide has been put together for the whole of the Faculty of Science. The starting points given will be familiar to many. At the same time, we realize that each domain (and within any domain, each degree programme) has challenges of its own to face. However, those in charge of degree programmes should remain critical as to whether there is any scope for creative solutions, and continue to explore options. For many students, there will be options available. If this is not case, individual-based solutions will be used.

GUIDE

What components do practicals consist of?

In general, it is a mix of:

- a) carrying out an experiment (creating, measuring, and gathering data) in a safe manner; (in a lab) / IS: mostly programming;
- b) data processing and analysis, including defect analysis;
- c) discussing results, conclusion, suggestions for follow-up research;
- d) communications (lab journal, reports/measurement reports/IS: explanation of code/presentation);
- e) Sometimes a literature survey;
- f) Sometimes drawing up a research proposal;
- g) Sometimes drawing up an experiment plan;

The four components, a-d, are generally dealt with in chronological order and as a coherent entity.

What is the purpose of practicals?

The purposes of practicals at the Faculty of Science are many. As well as clarification of the theory, applying scientific method, and learning to deal with uncertainty, an important part is that of gaining laboratory skills (including dealing with safety regulations and working in such a way that the work is reproducible).

Alternative route, and how it may be implemented

Dealing with the seven components as relatively autonomous units, with no chronology, does offer alternative ways of doing practicals. The following steps and alternatives are advised.

Steps

- Check whether the components (a-g) really are necessary for the purpose of reaching the learning objectives of the subject
- If necessary, look at the learning objectives and see whether they can be achieved in another way.
- Establish the very minimum requirements that a student needs to meet. Normally, we welcome it if students acquire extensive (or more extensive) knowledge and skills. However, the current exceptional circumstances compel us to restrict ourselves to the precise final attainment levels.

Alternatives for each component

- carrying out an experiment and gathering data in a safe manner
Actual experiments and the gathering of data that goes with them should of course be part of a practical lesson. This could be deferred to a later time.
- data processing and analysis, including defect analysis (jointly or individually);
Although the experiment and data gathering can be deferred to a later time, students are nonetheless able to start processing data. After all, nowhere is it stated that students should analyse the data they have themselves gathered. The analysis skill could be demonstrated by analysing existing datasets. The processing of data is of course accompanied by a presentation of data (tables, graphs) and reliability. Discussion of the reliability of the work done would not then be possible, although it would be possible vis-à-vis the statistical reliability. Thought should perhaps be given as to what should be done with the data gathered under a). One option could be for the data to be analysed by other students later.
- discussing results, conclusion, suggestions for follow-up research
Following on from b), and work could be done using a dataset provided.
- communications (lab journal, reports/measurement reports)
Maintaining a lab journal can only be done in a) Students can compile measurement reports or other reports themselves, at home. If the conclusion of a subject includes an oral presentation and a discussion, this could be done using Skype, for example. See the faculty guidelines relating to alternative assessment methods.
- sometimes a literature survey
In all cases, students can start their literature surveys at home.
- sometimes drawing up a research question
In all cases, students can start drawing up their research questions at home.
- sometimes drawing up an experiment plan
In all cases, students can start drawing up their experimental plans at home, with the help of LabBuddy if necessary.

Working on this principle, students can do b-f themselves at home (with remote supervision and the correct instructions), thereby keeping the need to attend on-campus sessions to a minimum.

What does this require of the supervisor?

The more traditional structure of the teaching of practicals is being dispensed with. We realize that lecturers will need to spend a lot of time devising all of this, but we are keen to do all we can to prevent students falling behind schedule in their studies as much as possible.

- Determine critically what the minimum requirements are for meeting the learning objectives.
- Check what activities are needed (and in what form) in order for the final attainment levels to be demonstrated. For example, could the lab time be shorter, or fieldwork approached differently?

Could the literature survey be extended? Is there greater scope for more flexibility and can more consideration be given to trial structures (proposition, blank, reference, safety, etc.)

- Remote supervision when drawing up research question, literature survey, and data analysis.

Making appropriate existing datasets available to students; possible examples include previous work by students, your own work, literature, fictitious data. Modifying the form of the reporting/presentation of the final project. See the faculty guidelines relating to alternative assessment methods. Accept differences of emphasis in each subject and put them to good use, where possible.