

ACD teaching labs in pandemic conditions

This is a summary of the June 12th 2020 zoom meeting of analytical chemistry instructors in Canada.

In person labs:

Current state of the situation.

Instructors reported that they anticipate running the labs with between 25% and 50% capacity, the use of PPE such as masks, hand sanitizing, hand wash, walking corridors, maintaining 2 m, and the preparation of videos to minimize in person presence in the laboratory. There were talks of limiting the number of experiments and their duration, to develop only the essential skills. Primarily undergraduate colleges reported that a minimum number of lab hours will be required to maintain the possibility to transfer to graduate level. Some institutions reported an increase of the number of TAs. Honour students are expected to be considered as researchers and maintain lab access.

Lab reports should go all digital. Have a practice submission at the beginning of term for bonus marks to teach students how to combine files and pictures into a single readable document.

Need to consider how to accommodate students that become ill.

PPE:

In addition to the usual PPE worn in labs, it is expected that TAs should wear face-shields, students may be required to wear mask (ideally from flame-retardant materials). Keyboards should be covered with plastic (food wrap works well), and clear cleanup procedure should be implemented for shared lab equipment. Students should have a “lab-only” mask as well as an everyday out-of-lab mask. Both should be washed after each use.

Face-shields: <https://www.lefebvrebenoit.com/produits/visiere-protection-lb-20-pqt/>

Issues with glasses fogging:

Wearing a mask causes glasses to fog. Discussion evolved around tricks to prevent that:

<https://www.zmescience.com/other/feature-post/how-to-prevent-your-glasses-from-fogging-when-wearing-a-face-mask/>

Applying anti-fog sprays or applying shampoo can help preventing fog.

Make-up labs and leaves of absence:

Ideas of make-up labs were proposed. The idea of booth camps was proposed for chem majors (maybe not necessary for engineers, pre-meds, etc.) in cases that a hard confinement is put in place this Fall or for institutions that are going fully online this year. In case of a punctual absence, in-semester make-up is preferred by readjusting the schedule.

Email Kate Stuttaford (kstuttaf@uoguelph.ca) if you would like to be added to the Canadian chem lab instructors' listserve.

Remote labs:

The idea of providing kits was abandoned as too complex to implement and the fact that exclusively online universities have not implemented those for analytical labs, are strong indications that instructors should not go this route.

Alternative labs are therefore proposed:

Activities such as interpretation data, literature reports, and rethinking the skills developed are proposed

Virtual simulation and videotaping

For example, it was proposed that gen chem video would be provided with no audio and TA/instructor will do live commenting; lab demos using instruments with autosamplers; remote control of the equipment were also discussed. Ways to implement that using IP connection on campus was discussed for older generation instrument and computers. Resources are necessary to videotape, and one should expect 3 person and 1 to 1.5 days to shoot and prepare one video. In making the videos, PPE should be worn at all times to demonstrate good safety practice, audio must be postrecorded to avoid loud background noise, and videos should be kept short (under 10 minutes) to maintain attention. Many institutions are hiring TAs to shoot the videos. **Google doc:** please list the videos you are planning in the google doc (<https://docs.google.com/document/d/1xGINCVqYkuMjnrDPkeTnFsyNOz0stRm2EI2D-vUqJc4/edit?usp=sharing>), and be willing to share with other institutions.

The use of calculation labs will also be implemented; i.e. hplc simulator; metabolomics simulators; use online videos; GC-MS simulation;

Videos available on the anchem.ca/online-teaching-resource webpage

Reminder to log online experiments at

https://docs.google.com/document/d/1oNFtiSN23jD_pFxCcUo_y23DPZPWjr-O4ftehDgod8Q/edit (need to start coordinating national efforts)

Providing datasets from previous years were suggested to augment the benefits from online labs.

Increasing online availability should be implemented to engage students. The use of polls, clickers, quizzes, group discussions, participation points, use timely topics (renewable energy, plastic bags, etc) were proposed.