

Guiding Principles for Fall 2020 Course Adaptations

Area of Focus - Recommendations for Laboratory Education during Interim Remote Teaching Due to COVID19

Claudia Krebs, Chair. Co-contributors: Joseph Anthony, Mercedes Chan, Brett Couch, Christine D'Onofrio, Jon Festinger, Gillian Gerhard, Kathryn Gretsinger, Patricia Hingston, Joss Ives, Paul Kennedy, Maya Kopylova, Agnes Lacombe, Suzie Lavallee, Stephen Michaud, Dave Oliver, Patrick Pennefather, Manuel Pina, Gabriel Potvin, Lindsay Rogers, Navid Shahnaz, Rachel Wilson, Matt Yedlin.

These recommendations are the result of discussions with representatives from across Faculties at UBC to guide decision making for the continuity of laboratory education during public health restrictions due to COVID19. We included consideration of a large variety of labs, including science-based laboratories, music performance, art studios, moot court in our discussions and recommendations below.

Statement of Principles

1. Laboratory teaching provides experiential, hands-on, team-based and community-based learning which is critical for a full education and in some cases subsequent professional accreditation. UBC remains committed to providing these experiences to students.
2. UBC is committed to providing a world class educational experience to students regardless of mode of delivery.
3. In the long term, online delivery should not replace in person teaching in labs, except where it can be empirically established that on-line teaching of labs produces better student learning.
4. At the present time and with current technologies the transition to online will result in loss of some learning experiences as some lab experiences cannot be replicated virtually.
5. Face-to-face teaching in labs preserves the human experience of learning, including peer-to-peer interactions among students, and immediate mentorship by instructors. Ultimately, these components are important to student mental health and they are key drivers for creating a sense of academic and scholarly identity for our students. We need to be mindful of the impact that this loss of experience will have on our students' sense of identity, academic development, and wellbeing.
6. The transition to interim remote learning has and will continue to result in an increase in workload for faculty and staff; this has implications for their wellbeing and puts them at risk for burnout.
7. Attendance policies, the decision whether sessions are synchronous or asynchronous, and lab deliverables should be communicated clearly in the syllabus and be informed by an approach of flexibility and compassion taking into account the individual circumstances

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learners may find themselves in, including different timezones, changed personal responsibilities and mental health challenges.

Recommendations

1. **Transition to online and remote learning:** Elements of a lab experience that can be moved into an online and remote setting need to be transitioned to this.
 - A **return to teaching plan** will need to include access to UBC facilities for faculty and staff so that learning materials can be created for the online and virtual lab experiences.
 - Ensure the centralized **support hub** and support hubs within faculties are established to help transition lab experiences online and including the UBC Library, UBC Studios and the Emerging Media Lab
 - Where possible, **cloud computing** applications are available to allow for equal access to computing power and software packages as well as additional support for:
 - Robust VPN for remote access to the UBC network
 - Upgrades of the IT infrastructure at UBC (e.g. servers) to improve capacity.
 - Bursaries need to be made available to students for computer hardware.
 - Evaluation of new [commercial tools](#) need to be explored in collaboration with faculty end users and students.
 - Include on the LTHub website the products available together with faculty and student reviews.
 - Consideration of additional funding requirements for the purchase of products as necessary to deliver comprehensive online teaching.
 - At home experiential packages (course package or lab kits) may be considered as alternatives to online or virtual labs.
 - These could include objects/specimens that can be mailed, or perhaps taking turns with certain objects? Alternately, using things found outside your door, in-depth use of everyday materials, i.e. found in your kitchen, etc. (might be interesting considering some students might be abroad so their collections will be of a different geography)
 - Additional funding may be required to create these packages and send them to students.
 - An outline of simulation resources for a broad range of labs is available at [Lab/Simulation Resources](#).

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- A breakdown of the session by learning outcomes and learning objectives can be a helpful tool to find appropriate approaches and media. [See the Labs Appendix.](#)
 - Video-conferenced labs where students interact with faculty and TAs who are in the lab and interact with them as they perform live experiments.
 - Consideration should be given to the development of horizontal channels of student to student communication within UBC course contexts. As important as Professor/TA/Student communications along a vertical axis may be, student to student communication is arguably even more important to learning, and is also potentially helpful in a student mental health context.
2. **Criteria for face-to-face labs:** Some components of lab teaching cannot be moved to a remote and online setting. In person face-to-face labs may be necessary to meet required learning objectives for programs and professional accreditation.
- In-person labs may be run in small sections following [provincial guidelines with PPE](#) and social/physical distancing. UBC may need to provide sufficient PPE for all students, faculty and staff. This could require at a minimum gloves, eye protection and masks, as well as administrative measures such as increased cleaning schedules in labs, and sign-in/sign-out forms for rooms.
 - Criteria for exemptions to include:
 - lab is critical for accreditation and/or graduation requirements
 - equity of access—all students have access to the lab
 - physical distancing can be maintained at all times
 - where physical distancing cannot be maintained, PPE is available for all students, TAs, faculty, staff.
 - clear communication that only a small subset of labs will meet rigid criteria for in-person meetings.
 - We may be able to offer lab bootcamps when provincial guidelines permit for face-to-face teaching conditions at a future time. Provisions will need to be made for those students who will graduate before the end of the pandemic.
 - Developed around a set of 2-3 standalone modules delivered a few times over the summer, to teach specific skills. Allowing students to choose modules based on their schedules and needs rather than having to progress sequentially.
 - Modules could cross disciplines where skills are similar in requirement, i.e. microscope use.

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- Bootcamps will be offered with no additional tuition as short intense sessions covering skills that can only be accomplished in person.
 - Instructors need to develop a contingency plan and clearly communicate this to students, in the event a student is unable to attend or there is a change in provincial guidelines. For example: decoupling lab and lecture components combined with bootcamp option.
3. **Clarity around funding:** There needs to be clear, transparent and consistent information about funding sources, allocations, and distribution to support delivery of online and any face to face laboratory components.
 4. **Support for Teaching Assistants:** Mentorship and guidance of students is critical for all remote and online experiences – the TA budget will need to be robust and TAs need to be hired earlier in the summer so that they can have the necessary training in this new setting. For more information and consideration refer to the section on [Guidelines for TA's](#).
 - Teaching assistants are an essential component of the teaching teams for lab and lecture courses. TA workload, duties and hours allocated to duties must be clear to prevent TAs being overworked and to abide by the terms of the collective agreement with CUPE 2278.
 - CTLT can help to develop online professional development courses for TAs specific for experiential lab teaching, similar to courses being run in the May TA Institute.
 - Departments will need to offer clear guidance and support to TAs for course specific outcomes.
 - TA led lab groups or class sizes should be smaller than their normal capacity, as they take more work and time to conduct online. The number of TAs per student will need to be increased.
 5. **Support for faculty:** Learning from the working group that supportive collaboration across disciplines will be key to ensure the exchange of knowledge and experience across the institution. We recommend the creation of a **community of practice** for different kinds of online and remote lab instruction.

Concrete examples of what has worked:

- **Lab/Simulation Resources:** See an [outline of simulation resources for a broad range of labs](#).
- Remote Lab success in Electrical and Computer Engineering: Senior Instructor, Jesus Calvino-Fraga, in March 2020, successfully implemented a remote lab for **ELEC291/292**. They needed oscilloscopes, so he suggested an \$80 USB oscilloscope.

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For those who could not be created a device they could build at home using their parts kit. **RESULTS:** The vast majority of students finished their project work successfully.

- Use of three-dimensional virtual objects to provide interactions with items normally found in labs. These 3D assets can be found on openly accessible websites such as [eSkeleton](#), [Morphosource](#), [TurboSquid](#), or [SketchFab](#).
- UBC examples include:
 - [UBC MedIT Educational Media Sketchfab](#)
 - [Bear skull](#) and [rat](#)
- Search on 3D asset websites will give access to models available for use in education.
- Augmented reality (AR) and virtual reality (VR) to provide interactive experiences with objects and environments, for example:
 - Faculty of Arts:
 - [KAMBE project](#)
 - An [augmented reality app about the Syrian Civil War](#)
 - Faculty of Medicine: [Holobrain project](#)
 - Faculty of Forestry: [How Virtual Reality Can Aid Forest Operations](#)
- Here are examples of labs that were created in March 2020 that incorporate various media to meet the learning objectives:
 - [Upper Airways Lab](#)
 - [Neroanatomy Syllabus](#)

UBC and other Resources

- [Labs Appendix](#)
- [Student Facing Videos for Multimodal Projects](#) (further updates taking place over the summer)
- [BCcampus curated online lab options](#)