



COVID-19 Workspace Safety Plan – Lab Specific

Use of this template: All light italicized grey font are instructional and must be removed before final copy is approved.

This workspace safety plan will assist Principal Investigators who wish to continue or resume research activities in their lab. This plan will include a review of activities to be undertaken in the lab to ensure effective controls are in place to prevent the spread of COVID-19. Principal Investigators are responsible for ensuring this document reflects current government guidance and notices which can be found, along with information about UBC’s response to the pandemic at <https://covid19.ubc.ca/>.

This plan must be reviewed by your Local Safety Team, and signed by your Unit Head/Director. Once complete, the plan can be submitted with your online application to return to research.

Resources to Consult

The following guidance documents and resources were used in the development of this plan:

- [Preventing Exposure](#)
- [Personal Protective Equipment](#)
- [Physical Distancing Guidelines](#)
- [Reporting COVID-19 Exposure](#)
- [Communications Resources](#)
- [UBC Research Resumption webpage](#)
- [WorksafeBC](#)

Section #1: Lab information

Department	ECE
Faculty	Applied Science
Building(s)	Kaiser
Lab(s)/workspace(s)	3075

Introduction to Your Lab

Provide a brief overview of your lab(s) and other used/shared facilities, current size of your group and your general research area (1-2 sentences).

Martin Ordonez is a Professor with ECE and the principal investigator in the Alpha Technologies Laboratory (Kaiser 3075). The program is highly experimental and focuses on power electronics and renewable energy. The experimental research activities aim to explore, implement, and develop the latest technologies and techniques in power conversion. Kaiser 3075 has over \$1.5M in new research equipment for testing power conversion systems providing a unique facility to train HQP. The team comprises 10 graduate students, 4 research associates/PDF, a lab coordinator, and a lab engineer and function as collaborative research environment with links to industrial partners. The team has been highly successful in carrying out complex experimentation that led to multiple top journal and conference papers every year. Each publication contains rigorous experimental validations that allow positioning the program at the forefront and compete with the very best.



While the team has been affected by COVID19, it has maintained a strong team spirit with a focus on continuing to promote a strong lab culture with remote work. The team made a rapid shift to focus on theory and simulation of new ideas, creating a backlog of much needed experimental validation. The next step is to access hardware and testing equipment within Kaiser 3075 so a reduced number of students can finalize their publications, thesis work, and complete R&D deliverables with companies.

Normally, the laboratory requires mandatory electrical safety protocols with its associated training. This document outlines COVID-19 workspace safety plan protocols, which is also mandatory for all team members. The request for access is only for 3 students (17% of the normal capacity).

Section #2 - Risk Assessment

1. Lab/workspace Occupancy (under proposed COVID-19 operations)

List the number of people that will be present in your lab/workspace at the same time. List this by every room/lab/workspace you occupy.

Confirm that you have discussed each employee's comfort level with returning to work and have addressed any concerns, or will require further assistance in doing so. *Any worker (staff, students, faculty, post docs, research associates, technicians and other research personnel) who has concerns about returning to work on campus can request an exemption to his/her supervisor.*

- *Provide actual numbers and percentage of previous i.e. 1/3 of 'normal' operations*
- *Outline who remains working remotely and who you've requested back to work and why*

The maximum occupancy will be 3 people, who have been identified to used the lab during phase I. Over time, other lab members will need to gain access on a rotational basis but the maximum occupancy will remain 3 during phase I. Once the designated students complete their experimental work, a work schedule and prioritization will be coordinated based on expected thesis completion and publication deadlines.

The lab has hosted up to 26 people (permanent members and visiting scholars) but a comfortable operation is approximately 18 people. Currently there are 16 permanent members plus additional undergraduate students working on thesis/coop terms. The lab generally hosts additional students through Go Global and MITACS Globalink during summers but those visits have been cancelled. With a maximum occupancy of 3 students, the laboratory will be at 17% of its nominal capacity (18 people) or 19% of the existing permanent members (16 active members). Occupancy limit signage will be posted on the main entry door.

2. Hazard Identification

Describe what hazards exist in your lab/workspace; both research-related (chemicals, heavy machinery) and COVID-19-related (areas that require closer personal interaction, equipment/instruments that cannot maintain social distancing i.e. that require >1 person to operate)

**Research related:**

Electrical risk and risks associated with the use of soldering stations: power electronics experiments usually performed in the lab involve high current power supplies, which represent some risk. This is a typical risk in the lab and therefore is handled by existing safety protocols. The existing protocol includes safety training for all lab members, the use of safety devices such as kill-switches and shields, and requires a minimum of 2 people working in the lab at the same time. All the equipment in the lab is designed to be used as lab equipment and has built in user protection. In case the lab engineer is needed, he will be contacted remotely to assist students.

Covid-19 Related:

The spreading of the virus can happen if individuals:

- Are too close from each other (less than 2 meters)
- Share equipment/facilities without proper disinfection
- Do not use according PPE

In order to eliminate these risks and thus avoid the virus propagation, Sections 4, 5, and 6 of this document were developed.

3. Employee (HQP, research staff, other) Input/Involvement

Detail how you have involved frontline workers (HQP and research staff) and Joint Occupational Health and Safety Committees (JOHSC) and/or Local Safety Teams (LST) in identifying risks and protocols as part of this plan.

Describe how you will **publish** your plan (online, hardcopy) and otherwise communicate workplace health measures to employees. Guidelines from SRS are available here: <https://srs.ubc.ca/covid-19/health-safety-covid-19/working-safely/>

- *Your plan must be approved by your Head/Director*
- *Final plans will be posted to UBC's COVID-19 Safety Plan website. An alert noting the plan availability and link to this final posting must be included on the main root site of your department or faculty.*

This plan has been developed collaboratively with our team members. Upon approval of the plan it will be distributed and discussed again to review the details/changes. Dr. Ordonez has only provided high-level input and proofread the document – students have developed all the safety protocols independently. Detailed feedback will be provided by Dr. Ordonez (part of the LST) and the safety committee upon submission.

Celeste Garcia, PhD student coordinated the development of this plan and solicited input/feedback from every team member in the lab. Once approved, Dr. Ordonez will communicate with each approved student prior to access to ensure that the protocols for the workspace are well understood.

A printed copy of the plan will be available in the Lab.



All lab personnel MUST complete the UBC “preventing COVID 19 infections in the workplace” issue by SRA.

As required by UBC, the Safety plan will be submitted for posting to UBC’s Safety Plan website.

The plan will be sent by email to all lab members requiring confirmation of receipt, and a video call presentation will be arranged to review it in detail. Furthermore, thorough knowledge of the safety plan will be orally verified before authorizing access to students on an individual basis.

A hard copy of the plan will be also available at the entrance of the lab in case a student has any doubt. Lab members in charge of the safety aspects will be available over the phone/video call while students are performing experimental work.

Section #3 – Hazard Elimination or Physical Distancing

The following general practices shall be applied for all UBC buildings and workspaces:

- *Where possible, workers (HQP, research staff, others) are instructed to work from home.*
- *Anybody who has travelled internationally, been in contact with a clinically confirmed case of COVID-19 or is experiencing “flu like” symptoms must stay at home.*
- *All employees are aware that they must maintain a physical distance of at least 2 meters from each other at all times*
- *Do not touch your eyes/nose/mouth with unwashed hands*
- *When you sneeze or cough, cover your mouth and nose with a disposable tissue or the crease of your elbow, and then wash your hands*
- *All employees are aware of proper handwashing and sanitizing procedures for their workspace*
- *Supervisors must ensure large events/gatherings (> 50 people in a single space) are avoided*
- *Supervisors must ensure that all workers have access to dedicated onsite supervision at all times; via their own presence, members of safety committees, campus security or other. When working alone, HQP and staff must be aware of working alone procedures and how these have been adapted for COVID-19.*
- *All staff wearing non-medical masks are aware of the risks and limitations of the face covering they have chosen to wear or have been provided to protect against the transmission of COVID-19. See [SRS website](#) for further information.*
- *Note transportation/vehicle guidelines if applicable: 1 Person per vehicle, unless the vehicle is large enough to maintain 2m between occupants.*

4. Scheduling

For those required or wanting to resume work at UBC, detail how you are rescheduling employees (e.g. shifted start/end times) in order to limit contact intensity at any given time at UBC.

Discuss your **working alone procedures** and how they will be adapted for this safety plan. Also describe how you will track those entering/leaving work i.e. sign in/sign out process



- *At this time shift-work is not permitted*
- *Sign in/out processes can range from paper sign up sheets on lab door to 'fob' system with online tracking*
- *Coordinate starts/ends within shared labs (e.g. lab shared with two other research groups) to remain below the lab's maximum occupancy*

A total of 3 lab members have been identified to access the lab due to the urgent need for experimental work. Other lab members will continue to develop ideas, analysis, and simulation stages from home until the need for experimental result arises. When access to the lab is needed the requestor will submit a detailed description of the experiments they need to do and how they will be carried out, the required equipment with an estimated number of hours needed to complete. A lab access schedule will be created based on the level of urgency of all students that need to go to the lab so the number of people at the same time in the lab does not exceed 3. The lab access scheduled will be coordinated and published by a designated student.

Due to electrical risks and use of specific equipment, at least 2 people will always be present in the lab at the same time while doing experimental work. As a general policy, the laboratory does not allow work alone. The schedule will ensure that there are always a minimum of 2 and a maximum of 3 at any given time.

5. Occupancy limits, floor space, and traffic flows

APSC recognizes that labs are dynamic environments and it may be challenging to adhere to physical distancing guidelines. Nonetheless, controls must be in place to keep personnel spaced at least 2m apart at all times. Clear communication of this to employees, monitoring of implementation, in addition to physical controls (signage) are needed.

As such: Using floor plans and/or photographs of your lab/workspace:

- 1) Identify and list the rooms and **maximum occupancy** for each workspace/area;
- 2) Illustrate a 2 metre radius circle around stationary workspaces/benches/instruments and common areas or equivalent approach to social distancing; and
- 3) Illustrate one-way directional traffic flows

- *Set up directional movements so people are moving in one direction of travel if possible*
- *Where fire code and function allow, prop doors between communicating spaces open to limit the need to touch doorknobs. Alternatively, consider installing hands-free door foot openers, auto door sensors, or door openers that can be activated by elbow.*
- *How have you reduced occupancy in your workspace/lab, especially high-traffic areas such as hand-washing areas? Did you use the 25-33% range?*
- *Are you able to separate incoming and outgoing worker entry/exit?*
- *Consider changes to accommodate 2m distancing on shared instruments, frequently-used materials & reagents, common areas, offices.*

The power electronics laboratory is located in room 3075 at the Kaiser building. A maximum of three people will be allowed at the lab at the same time, and they will work in their designed workstations indicated by the red 2-meters areas shown in **Fig. 1**. The working areas will be delimited by crowd control barriers (in violet) to block individuals to go into them and thus reduce unnecessary contact.

In this figure, the entrance and the three exits are also shown, in this way we can separate the incoming and outgoing students to avoid unnecessary contact. Moreover, every working area has its own exit, which in addition to complying with the Building Emergency Response Plan (BERP) for the Kaiser building (Section 5.11), also helps to establish a one-directional flow of people in the lab.

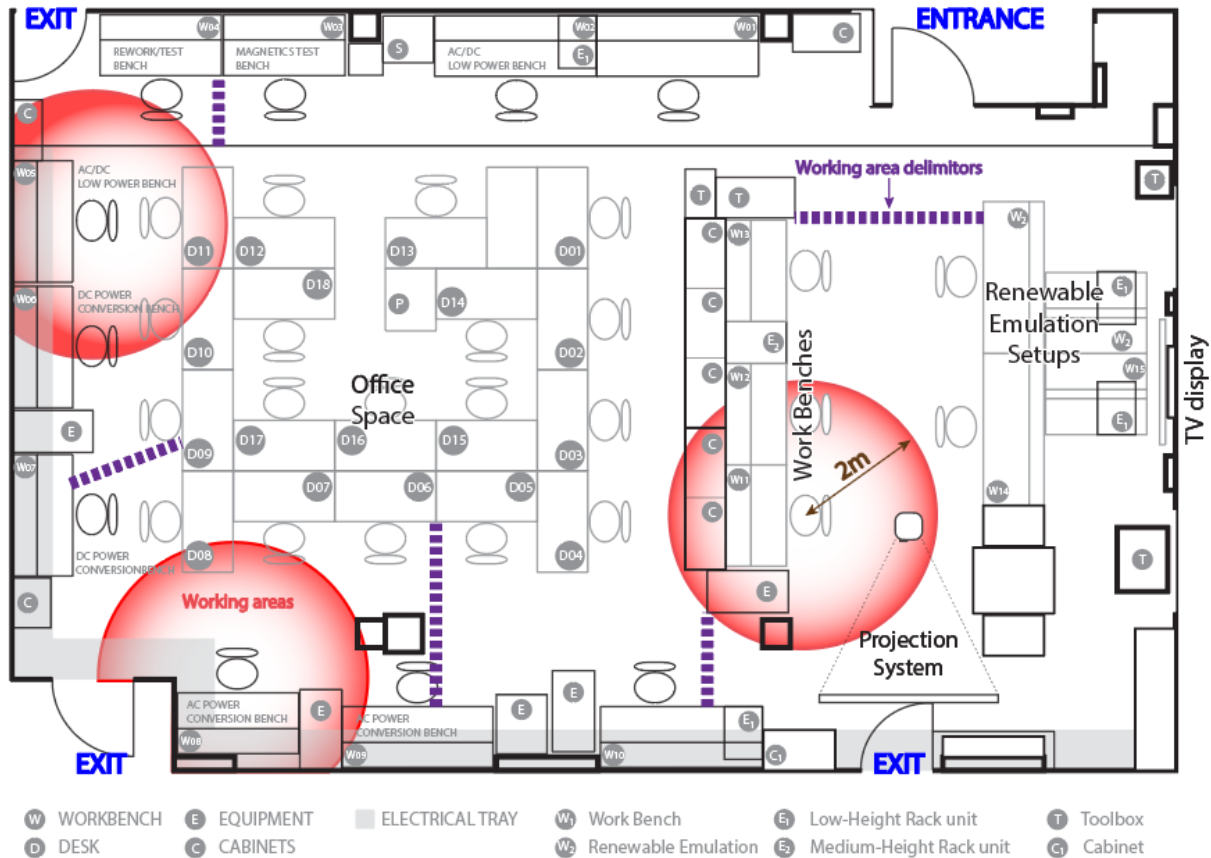


Fig. 1: Location of students proposed in the Alpha Power Lab.

Due to the lab distribution and restricted designated working areas, establishing a one direction of travel is not possible. However, we are able to establish a two-directional flow while keeping the two meters requisite by establishing other flow rules. The proposed flow of individuals (common traffic area) is shown in **Fig.2** in green. Students will have to wear a shield mask on top of the facial mask if they need to move from their respective work areas to look for a piece of equipment/tool from the cabinets. Furthermore, students will not be allowed to leave their designated working area if someone else is in the common traffic area, they will have to wait until the other person returns to their designated working area. The same restriction will be enforced while entering the lab.

The traffic flow and work areas will include appropriate signage to make clear how to move and how to work in the lab during the time self-isolation continues to be recommended.

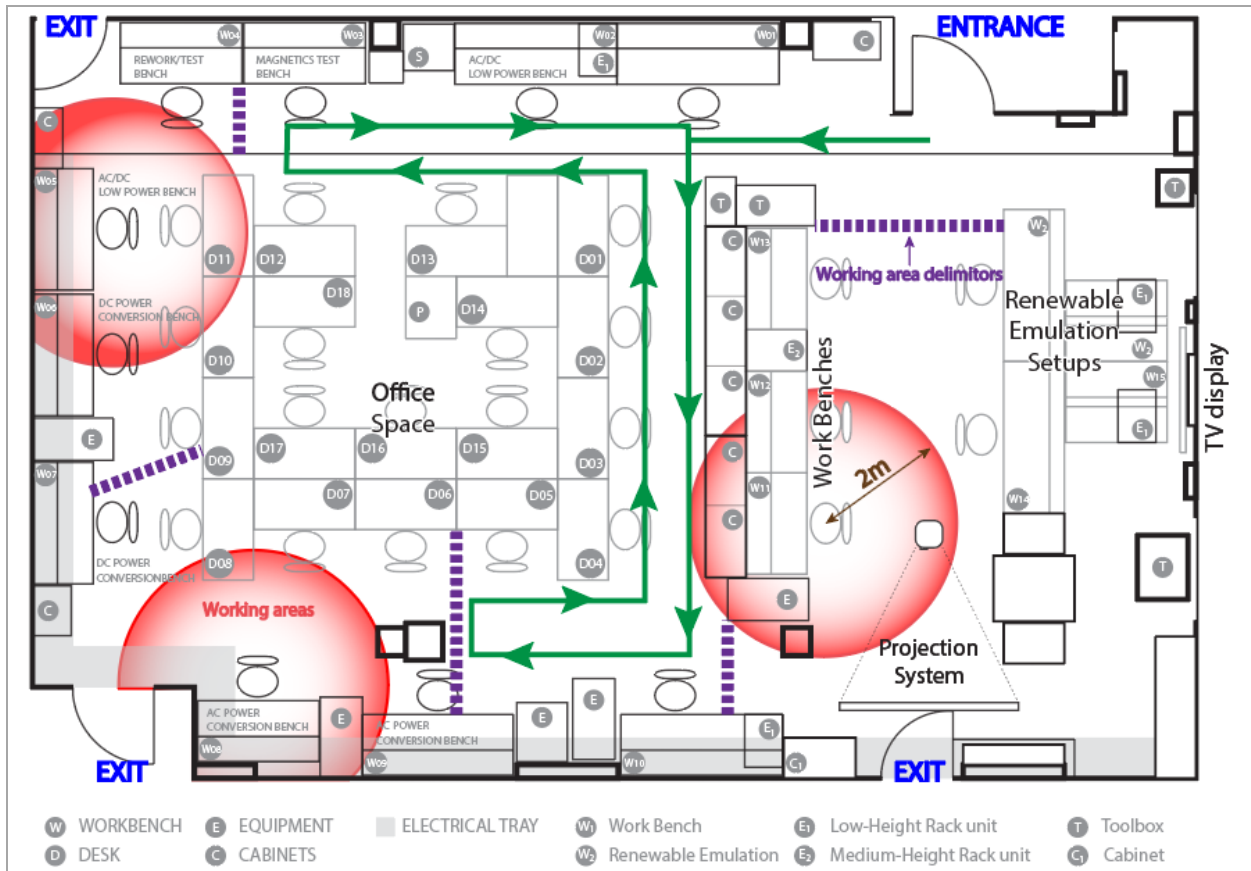


Fig. 2: Directional traffic flows proposed in the Alpha Power Lab.



Fig. 3: Proposed traffic delimiter barriers to delimit work areas in the Alpha Power Lab.



Section 4 – Engineering Controls

6. Cleaning and Hygiene

Detail the cleaning and hygiene regimen required to be completed by HQP, research staff and the PIs for common areas/surfaces (Custodial has limitations on cleaning frequency, etc.).

Outline specific cleaning processes and schedule for high-touch equipment, specialized/sensitive equipment or other unique circumstances to your lab/workspace. Detail how and what types of cleaning products and disposal options you will provide. If possible, include cleaning stations/infrastructure on your lab photos/plan.

- *Cleaning and sanitization are crucial to maintain a safe lab/workspace. Provide as much detail as possible on your cleaning plans i.e. when, who, how, provide a checklist, etc. Identify and discuss what surfaces/areas need to be cleaned.*
- *Discuss how you plan on providing the required supplies and training (in addition to that provided by UBC SRS). Consider signage i.e. 'ready for use' vs 'needs cleaning', having 'hot zones' for smaller equipment/tools (bins to collect soiled equipment so others don't use it).*
- *In dry labs and office areas where sinks are not available, place hand sanitizer stations adjacent to exit doors and signage suggesting the use of sanitizer after touching shared items such as knobs, printers, keyboards, etc.*
- *Discuss how you will ensure safe disposal of used cleaning supplies and if applicable, any hazardous waste needs (from previous operations or adapted to new plan).*

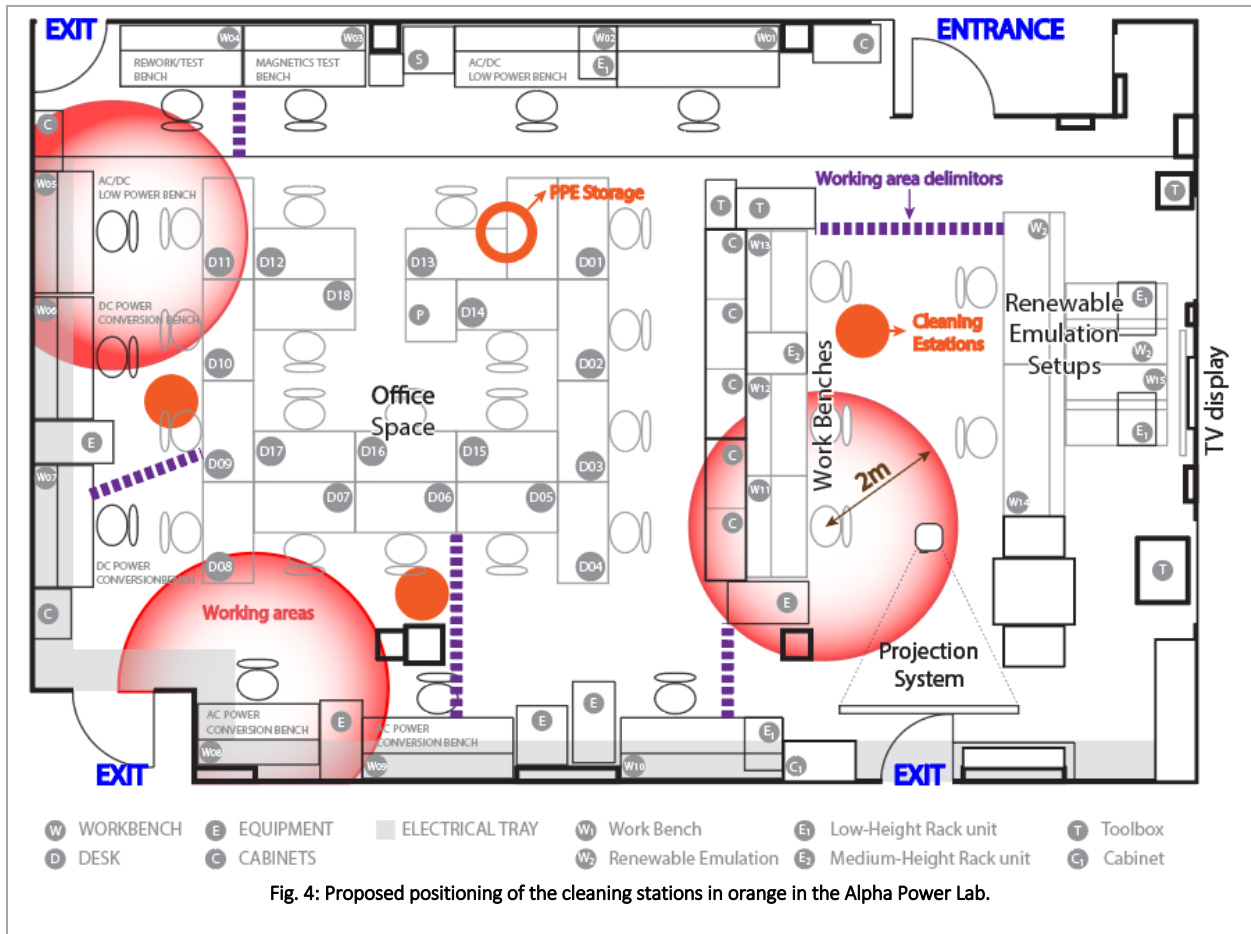
Designated workstations will be separated from the common traffic area using traffic delimiter barriers as shown in **Fig. 3**.

Tools/equipment will be thoroughly cleaned with sanitizing wipes before and after use. This procedure is mandatory when users start and finish their work in the lab to ensure the next user receives a disinfected environment.

Users will clean their hands using hand sanitizer frequently, especially after cleaning equipment/tools. Proper signage will be placed on equipment/tools cabinets reminding users of cleaning procedures.

Cleaning supplies will be procured through UBC, and the training will be given as a presentation to all lab members along with this protocol on how to proceed in the lab.

Every working area will include a cleaning station, indicated in solid orange in **Fig.4**. Proper signage will be arranged to remind lab members to clean up and sanitize regularly. These stations will have all the PPE items described in Section 6 available for users. In case there is a shortage of PPE items at the cleaning station, there will be extra items stored in the PPE storage (orange circle non-filled). In addition, every cleaning station will have garbage containers for disposing used cleaning and protection items. Once a week, lab members will empty the garbage in their bins into the garbage bin outside the lab.



7. Equipment Removal/Sanitation

Detail your appropriate removal of unnecessary tools/equipment/access to areas and/or adequate sanitation for items that must be shared that may elevate risk of transmission, both research-related (i.e. instruments, tools) and general (i.e. coffee makers in break rooms)

- Consider assignment of key pieces of equipment and label with the name of the assigned employee. Consider especially larger pieces of equipment that require >1 person to operate.
- If equipment cannot be individually assigned, then consider and explain your sanitation regime (or reference it above)
- Consider closing breakrooms or limiting access via a sign-up sheet

Entrance/exit and corridors will offer a clear path allowing users to transit the lab without having to move or touch anything. Door handles, and drawer knobs will be cleaned using sanitizing wipes provided in the cleaning stations after touching.

All tools and equipment will be cleaned before and after use. Sharing equipment is prohibited. In case two or more students need to use the same piece of equipment, they will be scheduled to access the lab at different times ensuring a 72 hour time window between uses. Common tools will have to be cleaned and stored in their respective place after using.



Shared break facilities such as the coffee maker and kettle cannot be used until future notice. These will have a sign notify in users that they are not available for use.

8. Safety Infrastructure Requests (Partitions, Plexiglass installation)

Describe any needs for safety infrastructure i.e. physical barriers, plexiglass installation required for your lab/workspace and if possible include them on your photos/room plan.

- Refer to Worksafe's "[Designing Effective Barriers](#)" guidance

No additional infrastructure is required. All physical access restrictions will be accomplished with already existing crowd control barriers.

Section 5 – Administrative Controls

9. Communication & Training Strategy for Employees

Describe how you (the PI) have or will communicate the risk of exposure to COVID-19 in the workplace to your HQP/research staff/other employees and the safety controls in place to reduce such risk.

Detail how you will ensure that all employees successfully complete the **Preventing COVID-19 Infection in the Workplace** online training and orientation to your specific safety plan

- *Outline the expectations for all employees returning to the workplace and describe how an employee would raise concerns*
- *Clearly indicate that employees with symptoms MUST stay home*
- *How have you adapted to new risks in terms of training for existing and new staff*
- *All processes must be documented*

Detailed explanations and a copy of this protocol will be provided to all lab members ensuring everyone knows how to proceed at the work place in order to prevent unnecessary exposure to COVID-19, and avoid spreading of the virus.

Only non-symptomatic lab members will be allowed to go to the lab. Users will provide the PI with the completion certificate for passing the online UBC training. Access will not be granted by the Department until this requirement is fulfilled.

Users are expected to self monitor. Any concerns should be immediately brought to the attention of the PI (email and text message. Concerns will also be elevated to the Local Safety Team by emailing (safety@ece.ubc.ca).

The strong safety culture is already in place and it is expected that the mutually supportive environment will be conducive to compliance and monitoring.

10. Signage



Detail the type of signage you will utilize and how it will be placed (e.g. floor decals denoting one-way walkways and doors, 'cleanliness state' of equipment/instruments, hand-washing guidance). See [WorksafeBC](#) for signage guidelines and templates.

- *Use decals: In spaces where one direction of travel can be assigned, assign a clockwise direction of travel using tape on floors for people to move around safely, otherwise practice walking on the right and yielding to oncoming traffic.*

Every working area (that will be in use during this phase) will be delimited by using safety barriers in order to avoid someone else entering the area and touching instruments under use.

Moreover, entrance/exit doors will have a sign indicating it, and the floor will have arrows made with tape indicating the flow direction.

Signs will be posted regarding proper handwashing procedures, occupancy limits, safe use of non-medical masks.

Furthermore, there will be signage for the cleaning stations, and printed copies of the protocols and rules readily available to the users under any doubt.

We will keep updating the signage as we see it is needed to ensure efficacy of the protocol.

11. Emergency Procedures & Reporting

Pls must ensure that all employees entering the lab should be aware of the Building Emergency Response Plan (BERP) and have access to it. If applicable, detail your strategy to amend your lab's emergency response plan procedures during COVID-19.

See the SRS guidelines for handling potential COVID-19 incidents here: <https://srs.ubc.ca/covid-19/health-safety-covid-19/reporting-covid-19-exposure/>

The link to the BERP for the Kaiser building will be distributed among all lab members along with this plan and protocols. Emergency exit procedures will be covered during the presentation to explain COVID19 procedures.

During an emergency, in order to comply with the Kaiser building response plan, we have one exit from the lab for each user. This ensures an efficient exit procedure while keeping 2-meters distance between individuals.

12. Monitoring

Describe how you will monitor your workplace (supervisor, departmental safety representative, other) and update your plans as needed; detail how employees can raise safety concerns (e.g. via the JOHSC or Supervisor).

- *Identify the person(s) responsible for implementing and then monitoring compliance with the plan.*



The suggested lab layout will be arranged allows very little room to circumvent the proposed rules providing a safe plan for low occupancy.

A checklist of tasks will be completed upon entry and exit. This will be done through a Qualtrics survey with responses collected by the student designated to oversee the lab schedule.

In addition, to avoid mistakes from the users, a checklist that lists all the things that have to be done at arriving or leaving the lab will be provided once access is authorized for each student.

PI will visit the lab unannounced to ensure compliance. in order to check how students are following the rules in place.

Section #6 – Personal Protective Equipment (PPE)

13. Personal Protective Equipment		
UBC has a central process for purchasing PPE . Describe what PPE you will require for your lab.		
#	Type of PPE	Activity and PPE Use Rationale
3/week	Hand sanitizer	Use after cleaning equipment and working areas
3/week	Disinfectant wipes	Use before and after using an equipment or working area, or opening doors/drawers
10	Face masks	All the time while in the Lab
3	Face shields	While running prototypes that require 2 people handling or moving around the lab
<ul style="list-style-type: none"> <i>If applicable list any other protective controls such as access to showers/laundry facilities</i> <i>Discuss how you will safely dispose of soiled PPE</i> 		
There will be garbage bins at all the cleaning stations with indications to dispose the soiled PPE. These bins will be emptied one a week by the students going to the lab.		

Acknowledgement

I confirm that this Safety Plan has been shared with all workers (HQP, research personnel, etc.) who will be accessing this space both through email and will be made available as a shared document. Workers can either provide a signature or email confirmation that they have received, read and understood the contents of the plan.

Date 06/22/2020

Name (Manager or Supervisor) Martin Ordonez

Title Professor



Department/School Head/Director Approval

Name, Title

Date

Signature

X



Appendix

Please attach any maps, pictures, departmental policies or risk assessments applicable UBC Guidance documents, where necessary, and other regulatory requirements referred to in document.

APSC specifically requests photographs of your current lab layout, as well as your proposed usage layout i.e. where HQP will work, what areas will be closed off, where signage will be placed, etc. If floor plans of your lab/shared workspace is available, please append these as well.