COVID-19-SEAS-Research Ramp-up Taskforce Report

University at Buffalo, State University at New York

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Executive Summary

Following the closure of labs and research facilities at the onset of COVID-19 in March 2020, the Dean of the School of Engineering and Applied Sciences (SEAS) instituted a Task Force to develop a process for reopening the labs and resuming research operations in a heathy and safe manner. Given that there is a university level task force addressing the same concerns, aligning our research ramp-up model with UB's lab and research reentry protocol is essential, yet our process must focus on the specific needs of SEAS. As we lead these task force efforts and our collective circles of influence, we strive for flexibility, collegiality, collaboration, and integrity. The task objectives are to develop and evaluate scenarios and recommendations for the SEAS research operation for the summer term and fall 2020 semester including lab access, graduate student progression, proposal development, and grant management; consider unique needs of international students and future employment of graduate students; and review best practices from peer institutions to ensure that research scholarship continues to the greatest extent possible while safeguarding the health of our research personnel.

The committee reviewed best practices of several peer institutions and in alignment with the UB task force, developed a series of recommendations for lab reopening with a common theme: a centralized model directly applicable to all departments of SEAS, one that can be monitored, is fair, and is safe. The committee suggests a four-phase systematic process to ramp-up labs and research facilities with specific milestones, a lab reopening schedule that complies with UB's Environmental Health and Safety (EH&S) Services policy along with perceived risks and mitigation. Additionally, the risks and mitigation associated with graduate student research progression are examined for both current MS and PhD students and those originally intending to enroll in fall 2020. The residual impact of the slowdown in spring 2020 and the anticipated slowdown in the post-COVID-19 period are examined from both proposal development and grant management points of view. A series of recommendations are made to address the job placement scenarios of MS and PhD students with special consideration to the delicate issue of visa status of international students.

Best Practices

The committee reached out to the department chairs of a few institutions across the nation and also examined published guidelines at other institutions in an effort to compile the nation's best practices and models for lab access since the COVID-19 lab ramp-down and to make sure that our recommendation is consistent with the guidelines provided to us by the office of Vice President for Research (VPR) at UB and what we are doing is not an outlier. The situation has been evolving since we reached out to others in April 2020, nonetheless, it is important that the external vision is captured so that our findings are respectable and adaptable at our school.

University of Washington has never stopped their in-person research activity but very few labs are currently open and on a limited basis. They have very clear guidelines for opting out if

anyone doesn't feel comfortable coming to work. **UC Santa Barbara** is on a planning stage to ramp up their research reentry. They are marking all hallways and staircases *one-way* so that people can safely pass through bottleneck areas. They are also planning on rotating shifts and opt-out options for their researchers to enable return to work. **University of Houston** will open up their campus for research but the decision to return to the labs is left to the individual PIs. Each PI has to go through a multi-step process outlined by their administration to ensure distancing and safe work practices. They are also looking at the liability issues surrounding the re-entry. **University of Tennessee** recommends to have a minimum of two individuals in a single laboratory room when experimental work is occurring during this re-entry phase, while maintaining social distancing and personal hygiene. Although the state of Georgia has partially lifted the stay-at-home order, **Georgia Tech** continues to maintain a 'telework for all' policy with all non-essential research to remain shut down. **Carnegie Mellon** has set up a 'research re-engagement' committee and is considering daily temperature monitoring, designation of particular staircases as *up* or *down* and one-way flow in hallways to minimize crossing. At **Rice University** people are still working remotely and the administration is working on a phased return plan to bring faculty, staff and students back to campus as early as May 15, 2020. The committee has examined the plans at **MIT**, **Ohio State** and **Tufts** but all these campuses have plans similar to the others stated above. Some of these examples may prove useful in developing SEAS policies for common spaces, such as hallway and stairway traffic flows and elevator occupancy limits.

University of Oregon has developed a phased approach for research re-engagement and has made it available on their VPR's webpage (https://research.uoregon.edu/covid-19-plans-for-research-recovery). Their core principle includes the safety of students, faculty and staff and maintaining research continuity as permitted by state legislation. They treat prioritization of research projects and lab activities as the controlling factors and anticipate a long-term recovery with a gradual restart process from an almost full remote operation. **University of Central Florida** has developed a series of principles to develop a phased approach for restarting research. The governing factors are health and safety of the research workforce, student well-being, fairness of the process and compliance with state regulations. The committee also looked into **Penn State**'s proposal for ramping their research activities in a safe way to approach 50% productivity of laboratory research under normal conditions. Their proposal includes physical distancing, building hygiene, standard operation procedure (SOP) for building entrance, and shift-based lab access.

The committee also conducted a quick survey of department chairs whose research is primarily experimental/lab-oriented. About 25 institutions took part in this survey and the questions and summary of response are given below.

1) *Are you planning for various scenarios (multiple reopening/ramp-up options) after the end of the spring 2020 semester?*

   Out of 25 respondents, 23 stated yes. Many of them stated that they will follow a phased approach for reopening the labs with very few occupants in the early phases and slowly allowing more people while maintaining social distancing throughout. Most of them also favored a hybrid mode of classes in late summer and fall 2020.

2) *Are you planning to resume (or ramp up) operations in your department for the summer or fall (according to your university's guidelines, of course)?*

   Out of the 24 respondents, 15 expressed interest in resuming or ramping up as soon as allowed, 4 favored waiting until the spring 2020 semester has ended and 5 were keen on remaining in current reduced operation until fall 2020.

3) *In order to resume (or ramp up) operations in your department, what will you do?*

   Almost all of the 25 respondents stated that they will limit the number of students in the research lab and allow faculty/students to continue to work remotely. Most of them also favored the implementation of social distancing throughout the ramp-up period. Some of the respondents were skeptical about the PI-specific SOPs for lab operation and were in favor of some general structure at the department or higher level.

4) *What level of research productivity (papers, grants, students graduated) over the next year do you think your department will achieve (compared to normal)?*

   The 22 respondents felt that their productivity will be at about 60% on average compared to the normal.

Scenarios

At the outset of the task force deliberations on research reentry in summer and fall 2020, it was found necessary to envision all possible student scenarios to guide the model. For the sake of completeness, the committee identified four scenarios and these scenarios were kept in mind while developing the graduate student progression plan and other tasks.

A. Normal (unlikely).
B. Remote only (identical to second half of spring 2020).
C. Blend of students on-campus and off-campus, no limitations on international students, assumes social distancing and other COVID-19 related limits.
D. Blend of students on-campus and off-campus, limited new international students due to visa delays in certain countries.

Recommendation 1 – Reopening of Labs

Given the different types of labs, instrumentation, and projects across SEAS, the committee felt that a phased approach in which the students and researchers are allowed back into the labs on a rolling basis is appropriate at SEAS. This model was constructed in parallel with the VPR's Task Force at the university level and is generally consistent with the EH&S policies. The factors that

will determine lab access include the duration of the state's stay-at-home order, availability of COVID-19 testing, availability of a vaccine and the time sensitivity of the research projects. The SEAS Research Facilities Tracking document prepared for COVID-19 emergency response (see **Appendix A**) contains information on which labs are **currently essential and operational, minimally staffed for safety,** and **closed and operating remotely**. The committee recommends that an **up-to-date version** of this list of labs be prepared and used as a basis for a staged reopening of the labs in summer and fall 2020 in a four-phase rollout. These phases will be tied to certain state-wide milestones and are described below with corresponding operational details and policies along with risks and mitigation, where applicable.

Phase 1

Milestone:

Stay-at-home order is lifted by the state and UB approves the initiation of a phased return of employees to campus.

Labs to be reopened:

The core lab facilities designated as essential and currently minimally operational can be brought to an increased level of operation. This includes all the shared instrumentation labs and the clean room. However, as a precaution, the users of the lab – PIs, PhD students and the essential staff, will be allowed in a staggered mode subject to adherence of a safe operations policy as determined by UB's Environment, Health and Safety (EH&S) Services office and described below.

Policies for safe operation:

- People from one lab, other than shared labs should not be allowed to enter other labs.
- Mandatory mask wearing in all SEAS facilities.
- Wet lab occupants should maintain social distancing – they should only come in when they have to work and on a staggered basis.
- Shared space cleaning protocols must be followed – person who enters and those who depart should wipe down.
- Red line should be drawn around unshared student spaces, so that nobody enters that space and they can feel safe in it.
- Trust-based self-monitoring of the guidelines is enforced.
- PIs, students and staff may opt-out from going to the labs and work remotely from home where possible.

Risks:

A) One or more lab occupants may not comply with the safe operation policy.
B) Research activities remain curtailed, research progress is minimal.

Mitigation:

A) It is assumed that the EH&S staff will do periodic checking of the labs for compliance. If the EH&S staff are not involved, the PIs or the department Chairs could take on this responsibility. Upon the detection of non-compliance of the policy, the lab will be shut down. The duration of shutdown, the process of reopening and the return of the non-

compliant person back to the lab will be determined by the EH&S Services or the department Chairs as applicable (addresses (A) above).

B) Support remote activities as much as possible. Continue literature review/survey paper writing/computational collaboration. Enable continued work from home with suitable computer/software/Internet access support (addresses (B) above).

Phase 2

Milestone:

The state declares that the community spread is under control but social distancing is still in effect.

Labs to be reopened:

Certain labs that were minimally staffed for safety and certain other labs that were closed before but are now deemed essential to complete time-sensitive projects with grants expiring, students needing to graduate, or anticipating sponsor site visits in the near future can be reopened. Which labs are deemed 'essential now' has to be determined via prioritization across all departments in SEAS. For example, the labs that are needed by students who had planned to graduate within six months from the onset of COVID-19 in March 2020, the labs needed for short-term grants or grants expiring by December 31, 2020 or the labs that need to prepare for sponsor site visits in later part of summer through fall 2020 may be prioritized in this phase. However, testing of the lab users is very critical to sustain operation of these labs. Since a reliable testing apparatus may not be available at this point, daily temperature monitoring or another testing mechanism prescribed by UB's EH&S Services is recommended for the occupants before entering the labs.

Policies for safe operation:

The SEAS community is urged to do research remotely to the greatest extent possible. Should one need to go to the lab, a relaxed version of the Phase 1 policies be adopted with the following additional guidelines to keep interactions safe.

- People from one lab may be allowed to enter other labs if all other policy guidelines are followed.
- PIs, students and staff may opt-out from going to the labs and work remotely from home where possible.

Risks:

A) Certain PIs and their students may be completely closed out of lab use for extended period of time if the community spread is not declared as under control.

B) Social distancing may continue to negatively impact research activity for groups where working together is necessary or required.

C) Reticence of students and faculty to return to carry out work on campus.

Mitigation:

A) Individual PIs should handle situations on a case-by-case basis.
The PIs should prioritize students that need a key experiment to graduate or finish a paper.
Others might need to prioritize particular work based on grant deliverables.

Provide support for faculty to handle difficult situations with graduate students (addresses (A) above).

B) Social distancing should be prioritized based on conditions, but in cases where teamwork is necessary, then all precautions should be taken with the help of Personal Protective Equipment (PPE) (addresses (B) above).
C) Make sure testing is as widespread as possible in this stage, and make frequent cleaning, emphasis on distancing, wearing of PPE, and other mitigation tools a requirement (addresses (C) above).

Phase 3

Milestone:

Community spread has declined to almost zero, reliable testing is available state-wide.

Labs to be reopened:

All other labs that are minimally staffed for safety, but were not allowed to fully reopen in Phase 2, and labs that were closed and operating remotely since the onset of COVID-19 can be allowed to fully reopen. In doing so, plans should be developed to enable rapid ramp-down in case of a need for a new shutdown. It is recommended that the occupants of the lab are tested for COVID-19 using EH&S Services-recommended test mechanism at a time and frequency determined by them.

Policies for safe operation:

- Computational people and administrative staff remain home and work remotely until a vaccine or medical treatment plan is available.
- Students, faculty, and research staff should have the right to come to the lab or stay away depending on their perceived risk level.
- As long as people are in the labs, observe the existing practice of social distancing.

Risks:

A) Isolation of researchers who remain off campus.
B) Technology access limitations of people off campus.
C) Shutdown or return to limited activity remains a possibility.
D) Continued reduced productivity of research operations if many people choose to remain away from the lab.

Mitigation:

A) Encourage safe 'in-person' meetings to bring researchers back to campus occasionally using the recommendations from UB's Wellness Task Force (addresses (A) above).
B) Ensure support is available for off-campus technology. Develop a plan to enable high speed access (addresses (B) above).
C) Revisit previous shutdown plans, make sure any unresolved issues from previous shutdown are addressed or planned properly for now (addresses (C) above).
D) Safe operating procedures and precautions taken by UB, SEAS, and the departments should be emphasized to concerned researchers. Chairs should discuss issues with faculty, students, and staff, with guidance from Employee Relations, when necessary (addresses (D) above).

Phase 4
Milestone:
Vaccine is available, COVID-19 threat is significantly subsided or is near zero.

Labs to be reopened:
All labs can now be fully operational, people should return to normal activities, but be cautious and be ready to ramp down activities if administration finds a need to do so should there be another wide spread outbreak.

Recommendation 2 – Graduate Student Progression

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1. *The reduced productivity from spring and the delay in obtaining results due to reduced lab access have a 'residual impact' on students' graduation plan.*

For PhD students who are in their early stages of study, the overall effect may be only marginal because they are still taking courses and are minimally involved in research. For those who are in advanced stages, the residual impact may be more than marginal. For MS students the residual impact could be significant, depending upon the stage of their study.

A. Impact on PhD students who are in advanced stages.

   Mitigation:
   For students who are in the mid-stage of their studies, the phased 'Reopening of Labs' plan (Recommendation 1) will help them regain momentum in the summer. They may be advised to make changes to their normal work schedule and utilize the time efficiently in the labs to make up for the lost time. Those who were planning to graduate by the end of spring may be allowed to graduate on a 'work-to-date' basis, or can petition for the delay of graduation date until the end of summer without any financial penalty. However, international students will be required to be registered in the summer, which incurs additional expense for the student or advisor (see **Section: International Students**).

B. Impact on MS students

   Mitigation:
   For students who are in their first year, the impact is minimal in the spring semester because they are still taking classes, but may be felt more as they lose time in the research-intensive summer period that some students use to make substantial progress on their thesis. Students in their second year may be allowed to defend their theses on a 'work-to-date' basis or grant request for delay of graduation date to the end of summer. However, the international students will have to register for at least one credit of thesis or project which translates into significant financial penalty and therefore requires special attention (see **Section: International Students**).

2. *New student deferral requests in 2020-21 and accepted students who are unable to be on campus in-person in fall 2020.*

A. PhD student deferrals in 2020-21

Mitigation:
One semester deferral with financial aid for incoming PhD students may not have any long-term effect on their studies but may require some adjustments in course offerings by certain departments. However, if the deferral is extended to fall 2021, there will be two concerns regarding financial aid – a) **should the student be guaranteed financial aid?** b) **will the student actually join the department in fall 2021 despite financial aid guarantees?** With the COVID-19 uncertainties, one could argue that the current situation may keep some currently funded PhD students longer in the program and the departments can still function normally with fewer incoming PhD students in the 2021-22 academic year. With the availability of a fresh pool of applicants for fall 2021, the committee feels that guaranteed admission with no financial assurance for the one-year deferrals in fall 2020 will be an optimal strategy. Those deferred students, if still interested to come to UB, may be considered at par with the fresh applicants for financial aid in the new review cycle.

B. PhD students unable to join UB in fall 2020

Mitigation:
If a PhD student is unable to come to UB in fall 2020 due to the COVID-19 situation, the student may be advised to take one or more courses online as a way to keep engaged in the doctoral program. The department may consider granting a tuition scholarship for the courses taken remotely considering the fact that the student will eventually be on campus in spring 2021 or later. This arrangement will help in starting a research agenda with student prior to getting on to the campus.

A similar situation also arises for the accepted MS students who are unable to start in fall 2020. However, the committee did not consider this case since their delayed arrival at UB may not impact significantly the department's research agenda. There may be significant impact on the department budget, course offerings and academic pipeline, but it is outside the scope of this task force's charge.

Recommendation 3 – Proposal Development

The reduced productivity from spring and the delay in obtaining results from student work and/or publication production and/or proposal preparation have a residual impact on proposal development.

A. Accounting for lost time

Mitigation:

The residual impact may have positive or negative effect depending upon the nature of research. For the experimental researchers whose new proposals do not dependent on data or current experiments, the idle time may be utilized to make explorations and new contacts to increase proposal productivity. For those whose research is stalled due to COVID-19, the departments may provide some 'protected time' in the post-COVID-19 period to accelerate their experiments, generate data and expand their research activities through team formation, travel, and writing new proposals. Of course, the provisioning of protected time is subject to resources available in a department and therefore, may not be applicable to all departments.

B. Accounting for severe impact

Mitigation:
For those whose research was severely affected and who are in need of a break to catch up on their research, an unpaid or half-pay leave may be granted for a semester or the teaching load and committee activities may be moved to a future semester to provide the much-needed time to get back on track on their research and proposal development activities. Going on loss of pay is not an ideal option, but may be worthwhile for someone whose research has taken a downward spiral in spring 2020 due to family and other balancing acts and it is impossible at this stage to recoup the lost time.

Recommendation 4 – Grant Management

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1. *Facilitating research on COVID-19 funded projects and access to some of the labs deemed necessary.*

All COVID-19 related grants are considered as high priority and the PIs and students should be allowed to use the labs through the Phase 1 protocol of the 'Reopening of Labs' policy.

2. *Managing ongoing research projects.*

COVID-19 may have affected ongoing research in many ways as described below.

A. Lost time

Mitigation:
The PIs are encouraged to discuss with program managers/funding agencies on deadlines/end dates. The departments may consider reduced teaching load to allow more time for research and/or increased student support for teaching.

B. Continued major disruption, minimal progress, expenditures on personnel continuing, but reduced activity, experiments unable to continue, grants expiring, and reduction in paper production due to lack of data/results.

Mitigation:

The faculty are encouraged to discuss with program managers/funding agencies on extensions. Pre-tenure faculty be reminded about the clock stoppage. For post-tenure faculty, depending upon the nature of the grant, provide them 'protected time' to write papers and develop reports, reduce teaching loads or provide additional teaching support to free up time for writing. Explore ability to provide high-speed access for students at their homes to enable off campus computing activities through funds from IFR or through the research grants by requesting program managers at the funding agencies for budget reallocation, where applicable.

C. Reduced productivity due to limits on students per lab at a time as dictated by the phased reentry policy.

Mitigation:
Since the students may be asked to work mostly from home and spend limited amounts of time in the labs/offices on campus, they will be required to make changes to their normal work schedule. This will require them to prioritize their work, do all routine and less critical portions of the research work remotely from home, and when in the labs/offices on campus, make the best use of the limited time by working efficiently. Depending upon the lab ramp-up phase in the post-COVID-19 period, some students may be required to extend their stay at UB by a summer term or a semester. In such cases, the PIs may explore the possibility of supplemental funds from the research sponsors to compensate a student during the summer or to provide support for an extra semester if the funding agencies have such a provisioning.

Recommendation 5 – International Students and Job Placement

There are several scenarios as described in **Section: Scenarios**, given the large international student presence in the SEAS graduate programs. Careful planning is necessary to mitigate these scenarios.

1. New Students

There are two scenarios – those who have enrolled but are unable to be on campus in fall 2020, and those who had sought deferrals in fall 2020 by one or two semesters.

Mitigation:
The generic mitigation techniques described in **Section: Graduate Student Progression** are applicable to these students as well.

2. Continuing Students

There are four scenarios of students who are currently in the graduate program as described below.

A. **Graduation delay and student course enrollment:** International students scheduled to graduate in spring 2020 but need to stay for summer or an additional semester, and their job placement status is unknown.

Mitigation:
MS and PhD students must maintain their enrollment status until degree requirements are met, but summer is handled differently for international and domestic students.
For a domestic student whose graduation is postponed until September, there is no summer registration requirement. For international MS or PhD students, if the summer is the final term for a student, they must be registered for at least one credit hour. In this case, the departments may consider offering partial tuition aid from the tuition revenue they receive in the summer course offerings to alleviate some of the financial hardships on the student's part. If the student is funded through a research grant, and the grant has funds to pay for tuition, the department could simply extend the student support for summer. But, if progress is not possible for any MS or PhD student during the summer because of COVID-19, and a student is required to stay for the fall semester, rather than registering during the summer, the student should register for the fall semester, and the same tuition aid should be available as described, as allowed by the fiscal situation of the departments. For this mitigation strategy, a department should notify students for whom this situation applies and work with them as soon as possible to define a plan. Continuing beyond the fall 2020 semester should not be considered unless shutdown returns or continues into the fall semester.

B. **PhD student with a job offer and start date imminent:** COVID-19 has impacted some PhD students who were planning to graduate in spring or summer 2020, in the form of lower productivity in terms of publications or dissertation write-up, which may require them to stay longer than expected. For students with a job offer and imminent start date, this delay presents a problem.

Mitigation:
The first strategy should be discussion with the employer to determine if a delayed start date works. If not, then these students could be allowed to defend their dissertation as planned on the basis of a 'work-to-date' or with secondary materials/products in place of publications, and let them write up their unpublished works for publication after graduation. Making such an exception to any publication requirement or on deliverables on a funded project on a case-by-case basis may be an apt choice for the advisors in this unusual COVID-19 situation. Of course, this is not ideal but would give the students the ability for a timely graduation and start jobs that they have already secured. Whereas the postponement of publications to a later date after graduation looks reasonable, making exceptions to grant deliverables to the sponsors may not be viable. In that case, the advisor may suggest the student to request for a delayed start with the employer and use their research network/contact to look for a suitable lab and project at another university to complete the remaining PhD work as a visitor should the resources in their own labs had run out.

C. Some students are graduating in summer but they have not been placed, job interviews have been canceled, or no internships available.

Mitigation:
If these are international students, then they may have applied for OPT prior to the onset of COVID-19 and have received approval or are about to receive approval by May 2020. The advisor or a committee member may provide voluntary work in their labs to allow students stay legally while looking for jobs.

D. **Employment impact:** There are students who are ready to graduate, but there is a hiring freeze at universities and companies, or there is a general slowdown of the economy reducing available jobs, and some of these are international students who are unable to seek jobs outside U.S. due to travel restrictions, or they do not want to return to their countries due to the pandemic.

   Mitigation:
   The departments can work with UB Career Services and set up a repository of available short-term openings in the disciplines so that MS or PhD students needing to postpone graduation by a semester or two can consider them for temporary employment within UB. This may include opportunities at the UB Innovation Hub, New York State Startups that allow working from UB, and IT nodes for students with the right skill sets. PhD students may even consider one-time instructor position in an SEAS department or in another academic unit or work as an hourly employee in a campus lab or help desk.

Conclusion

The five recommendations made by the committee will be considered and reviewed by the Dean of SEAS to guide research ramp-up within the academic unit and the model will be presented to the VPR for possible adoption elsewhere as applicable.

Appendix A

SEAS Research Facilities Tracking document prepared for COVID-19 emergency response. See the attached file: “Research Facilities tracking doc D2 - SEAS-revised-5-21-2020.xlsx.”