Recommendations for Computer Exams

This document is a guide for course instructors in planning and delivering computer exams. Faculties/Schools may have standard practices for computer exams, so instructors should consult with their Associate Deans/Heads. Instructors considering a computer exam are encouraged to contact the CTL to arrange a consultation and recommendations well in advance of finalizing your exam methodology. Computer exams have benefits and unique risks compared to paper exams that require planning to ensure quality student experiences and adhere to UBC's expectations of academic integrity.

Course Planning

- If computer exam is in person, communicate to your administrator the need for scheduling your course in a room that has electrical power (see table at end of document).
- Syllabus should contain dates of all computer exams and quizzes, the technology used (Canvas, Zoom, Lockdown browser, etc.), and how students will be accommodated if there are challenges (e.g., student does not have a laptop, student is writing at the DRC, etc.).
- Consider creating computer assessments that can be done in a computer lab outside of lecture time. Lab-based computer assessments resolve many technical and integrity challenges.

Student Preparation and Communication

- Communicate expectations clearly with students on how the computer exams function.
- Give students practice or low-risk assessments to familiarize them with the technology.
- Be prepared to accommodate student issues related to technology access or failures.

Computer Exam Options, Recommendations, and Risks

There are a variety of methods and technologies for computer assessments. The most common approach at UBC is using a Canvas quiz that students can access on their device. The Canvas quiz can be supplemented with various invigilation techniques to improve academic integrity. The student experience is determined by the quiz technology, the invigilation method, and the mode of delivery (in-person on campus or online remote). Instructors should know the limits of computer assessment approaches and understand and accept the challenges for ensuring academic integrity.

Online Remote Computer Exam Options

Quiz Technology	Invigilation Method	Risks
Canvas quiz (as take home exam)	None	**HIGH RISK:** No verification student did the work and no limits on accessing other resources. UBCO Senate Policy discourages the use of take-home exams.
Canvas quiz	Lockdown browser	**HIGH RISK:** Not better than no invigilation as students have access to other devices and other people. No improvement for academic integrity, and there are increased technical challenges.
Canvas quiz	Zoom	**MEDIUM RISK:** Zoom invigilation allows for student verification and monitoring. UBCO Testing Services may provide additional support. Students may still access resources on other devices not in field of view of Zoom. Instructors should consult best Zoom invigilation practices and Zoom usage instructions at UBC. Zoom info (CTL). Zoom invigilation is NOT RECOMMENDED with Lockdown browser as students will need to run Zoom on another device.

On Campus Computer Exam Options

Quiz Technology	Invigilation Method	Risks
Canvas quiz	Lockdown browser	**MEDIUM RISK:** Lockdown browser prevents accessing resources on the device. In-person monitoring still needed to handle student communication and access to other devices and resources.
Canvas quiz	In-person monitoring	**MEDIUM RISK:** Reasonable solution if computer exam is in a classroom. Instructors should know that getting answers from other sources is higher with computer exams than paper exams and handling issues is harder. Academic integrity requires active invigilation.
Canvas quiz in computer lab	In-person monitoring	**LOW RISK:** Using a computer lab increases academic integrity quality by reducing access to other resources and guaranteeing a consistent computer environment. Instructor should verify the resources students have access to and may need to work with IT to limit access.

Canvas Quiz Setup to Improve Student Experience and Academic Integrity

- Allow all the questions to be **on a single page**, which decreases loading errors and WiFi issues. Limit use of large graphics that take time to transmit over WiFi.
- Set an **access code** if the exam is an in-person computer exam. This step will require that students be present to gain access.
- Enable use of iPads in the settings.
- Test out the format in class at least two weeks before a midterm and final exams.
- Advise students to not to leave the exam until they have confirmed their exam is submitted.
- Allow students to log into the exam multiple times (multiple attempts) should the student need to disconnect and reconnect.
- Zoom: Exam Invigilation Checklist and Invigilating with Zoom
- Online Assessment Resources and Assessment for Learning Resources (CTL)
- Designing Assessments for Integrity
- **Computer exams have higher risks for academic integrity** and handling potential integrity violations is problematic and challenging. Instructors should consult with their Associate Deans/Heads to understand best practices and how academic integrity cases are handled.

Computer Exam Support from CTL and IT Services

- At least 48 hours (preferably one week) prior to an in-person computer exam, through the CTL Helpdesk provide exam date, time, location, and number of students. CTL will coordinate with IT services to share this information.
- In practice, CTL and IT services are not able to respond in real-time to resolve any technology related issue that affects the entire class (e.g., Canvas, WiFi outage) or individual students (e.g. laptop failure, unable to access Canvas).
- Instructors must have contingency plans (paper exam, backup laptops) for these situations. Adding time to an exam to handle technology issues is possible, but may be limited based on room time slot availability.
- Supplemental invigilation support for exams is available through UBC Okanagan Testing Services.

Known IT Risks of On Campus, Computer Exams

<u>UBC Secure Wi-Fi Bandwidth and Connectivity:</u>
- UBC IT Okanagan (UBCO IT) cannot guarantee Wi-Fi network bandwidth and connectivity.
  - The UBC Secure Wi-Fi service is configured to allow multiple connections.
  - Available bandwidth is divided among all devices/connections.
- UBCO IT is unable to limit access to UBC Secure to only those within the exam environment.
  - There are many people on campus that have multiple devices accessing UBC Secure.

<u>Canvas and Internet Disruption:</u>
- Students are notified within Canvas that internet connection has been lost.
- Any answers submitted after internet connection has been lost will not be retained; students should refrain from continuing the exam until internet connection has been regained.
- Without internet connection, Canvas will not allow students to move to the next page or the next page will fail to load.
- The exam timer will continue even though the student has lost internet connection.

<u>Respondus Lockdown Browser and Internet Disruption:</u>
- Respondus recommends using a device connected directly to the internet via an ethernet cable.
- If Wi-Fi is going to be used, Respondus recommends avoiding networks with heavy traffic (I.e., open Wi-Fi networks such as UBC Secure).
- Respondus will attempt to re-establish a connection every 5 seconds.
- If the internet connection is lost for an extended period of time:
  - Lockdown Browser will lock up - the student will not be able to save answers, move on to other questions, or submit or exit the exam.
  - The student must exit out of Lockdown Browser, reestablish their internet connection (if necessary), and re-open the exam in Lockdown Browser.
  - The student may need to turn off and restart their computer if their device has outdated and/or multiple Java installations.

<u>Other Risks</u>
- Student devices may not be in an appropriate working, exam readiness state to successfully complete the exam.

Recommendations / Mitigations
- <u>In advance of the exam (e.g., two weeks ahead)</u>, faculty should advise students to:
  - Bring a fully charged laptop for an in-person exam in the assigned classroom
  - Ensure they have access to a laptop
    - The [UBC Okanagan Library's Borrowing services](#) has technology loans available including laptops and adapters. Note that there is a limited number of laptops (30) that are available first-come, first-serve. Students may not always be able to access a laptop through the library.
  - Ensure that they can connect to UBC Secure WiFi networks
  - Have the most recent version of Respondus Lockdown Browser, if applicable
    - [UBC LockDown Browser Student Guide | Learning Technology Hub](#)
  - Attempt a practice exam in Canvas, with Lockdown browser if using for an exam
  - Review [Prep-Tech-Students.pdf (ubc.ca)](#) to assess and resolve device issues in advance
  - Reach out to [Student Tech Support](#) if they have technology-related questions

- On the day of the exam, faculty should advise students to:
  - Disconnect other devices they have from UBC Secure
  - Monitor the "*Quiz saved at*" time in Canvas to ensure exam is being saved
- Faculty may also want to consider:
  - Leveraging a UBC Okanagan computer lab
  - Leveraging a UBC Okanagan classroom configured with power to alleviate students encountering battery related issues during the exam

UBC Okanagan Classrooms with Power at Seats

CODE	BUILDING NAME	ROOM #	CAPACITY	POWER
ART	Arts Building	114	100	ALL
ART	Arts Building	214	93	ALL
ART	Arts Building	366	200	LIMITED
ART	Arts Building	376	102	LIMITED
ART	Arts Building	386	95	LIMITED
ASC	Arts and Science Centre	130	114	SOME
ASC	Arts and Science Centre	140	302	SOME
COM	The Commons	201	400	ALL
EME	Engineering, Management and Education	50	192	ALL
EME	Engineering, Management and Education	1101	80	ALL
EME	Engineering, Management and Education	1121	72	ALL
EME	Engineering, Management and Education	1151	49	ALL
EME	Engineering, Management and Education	1153	48	ALL
LIB	Library	312	116	ALL
LIB	Library	317	126	ALL
RHS	Reichwald Health Sciences Centre	257	75	ALL
RHS	Reichwald Health Sciences Centre	260	125	ALL

Enabling Improved Support for Computer Exams

Computer exams can significantly improve the speed and accuracy of some assessments when integrated with a planned assessment methodology. The risks and issues with computer exams can be mitigated by designing assessments that incorporate randomizing student seating, questions, question-order as well as combining auto and manual grading for more authentic assessments. The technology issues primarily relate to having students complete exams on their own devices (Bring Your Own Device BYOD). CTL supports the development of new pedagogical approaches and technical deployments to improve these exams. As an example, UBCV has developed a computerized testing lab that allows students to write computer exams on devices that are secured, Internet-stable, and can be customized so students can only access certain internet resources as well as physical resources (calculators etc...). This environment satisfies the key requirements of student identity verification and controlled access to resources that is only partially possible with in class computer exams.

There are also some solutions that could dramatically help faculty members run assessments in general (both traditional and computer-based). Below are some suggestions that will require coordination from various levels of the university to cooperate to enable:

- Numbering desks in classrooms (will permit instructors to assign students randomized seats to promote academic integrity)
- Implement student ID card readers for attendance, and to check-in and check-out students from exams
- Crowd-sourced reports of classrooms where instructors have attempted computer exams as well as any observations of WiFi stability, power availability, invigilation notes, and other logistical issues
- Expand the Library laptop loan program to allow instructors to borrow laptop carts for tests, midterms, and final exams
- Invest in free and open source software solutions to help facilitate the creation and administration of computer exams including scheduling, accommodations, extended times, proctoring, and invigilation

CTL is interested in supporting and working with instructors and administration on how to improve the support for computer exams on campus. Please contact CTL or the Academic Director, Dr. Ramon Lawrence, ramon.lawrence@ubc.ca.