Ontario Tech University acknowledges the lands and people of the Mississaugas of Scugog Island First Nation. We are thankful to be welcomed on these lands in friendship. The lands we are situated on are covered under the Williams Treaties and the traditional territory of the Mississaugas, a branch of the greater Anishinaabeg Nation, including Algonquin, Ojibway, Odawa and Pottawatomi. These lands remain home to a number of Indigenous nations and people.

We acknowledge this land out of respect for the Indigenous nations who have cared for Turtle Island, also called North America, from before the arrival of settler peoples until this day. Most importantly, we remember the history of these lands has been tainted by poor treatment and a lack of friendship with the First Nations who call them home.

This history is something we are all affected by as we are all treaty people in Canada. We all have a shared history to reflect on, and each of us is affected by this history in different ways. Our past defines our present, but if we move forward as friends and allies, then it does not have to define our future.

FACULTY OF BUSINESS AND IT
MITS 5400G – Secure Software Systems
Course outline for Winter, 2026

1. Course Details & Important Dates*

Term	Course Type	Day	Time	Location	CRN#
Winter 2026	LECTURE	Monday	17:10 - 20:00	Sync - Online	74912
Winter 2026	LECTURE	Thursday	17:10 - 20:00	SCI 1240	70472

Classes Start	Classes End	Last day to drop the course without academic consequences	Final Exam Period
January 12, 2026	April 13, 2026	February 6, 2026	April 15 – 25, 2026

* Visit Ontario Tech's Important Dates and Deadlines for other dates.

Important Note – Examinations

Note: Students requiring accommodations, please read Section 10 (below) carefully.

You are encouraged to register with Student Accessibility Services well in advance of any assignment/test/exam.

The final exam for this course will be run ON CAMPUS during the regular final exam period as per the schedule noted below.

The midterm exam(s) for this course will be run ON CAMPUS as per the schedule noted below.

2. Instructor Contact Information

Instructor Name	Office	Phone	Email
Dr. Pooria Madani	BIT 3044	n/a	**ONLY ON CANVAS**
Office Hours: Thursdays @ 16:00 to 16:55			

3. Course Description

One of the fundamental causes of most computer security problems is insecure software design and implementation. This course takes a proactive approach to cover current software vulnerabilities and the best methods of prevention. In tandem with that, students are taught to implement security in the early stages of the software development life cycle. This course takes a hands-on approach to secure software by design. Labs are designed so that students are able to recognize insecure software and prevent any security vulnerabilities. Students are also taught about logging, obfuscation, and how to secure their software from piracy.

4. Learning Outcomes

On the successful completion of the course, students will be able to:

(1) Understand threats and attacks against software applications and Operating System (OS) in today's world,
(2) Understand security development lifecycle,
(3) Learn best practices for designing secure software systems,
(4) Understand the basics of software security analysis, testing and verification as well as analysis tools,
(5) Learn various software protection techniques, including code obfuscation, software watermarking, tamper-proofing, and
(6) Develop skills necessary for secure software development.

5. Course Design

Course content will be presented to students during the assigned lecture periods. Lecture slides will be posted on Canvas; however, the lecture slides may not cover some hands-on content, discussions, and Q/A discussed in the class. Thus, students are expected to attend the lectures, participate in class discussions, and take notes to get the most out of this course. Each assignment will include hands-on components and exercises related to the discussed topics during the lecture periods.

6. Outline of Topics in the Course

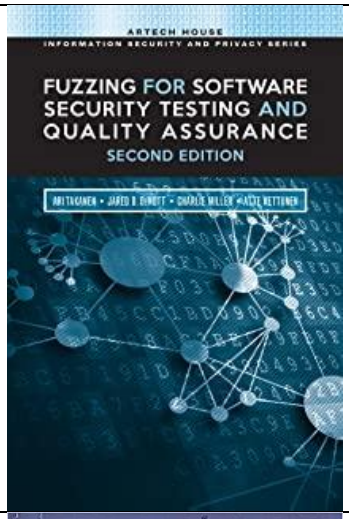
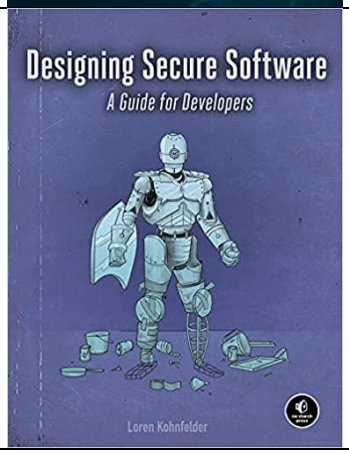
Lecture #	Date	Topics	Mandatory Readings
1	Jan 12th & Jan 15th	Intro to Software Security and Assurance	Chapter 1
2	Jan 19th & Jan 22nd	Memory Safety and Low-level vulnerabilities	Chapter 2
3	Jan 26th & Jan 29th		
4	Feb 2nd & Feb 5th	Web Dev and DB Security	Chapter 3
5	Feb 9th & Feb 12th		
STUDY BREAK	February 16-22, 2026	Study Break, no scheduled academic activities	
6	Feb 23rd & Feb 26th	Logging and Log Analysis	Chapter 4

7	March 2nd & March 5th	Access Control and Secure Cryptography	Chapter 5
8	March 9th & March 12th	Software Protection	Chapter 6
9	March 16th & March 19th	Software Testing and Verification	Chapter 7
10	March 23rd & March 26th	TBD – Code LLMs	Chapter 8
11	March 30th & Apr 2nd	Group Project Presentation	
12	Apr 6th & Apr 9th	Group Project Presentation	

7. Required Texts/Readings

I am developing a manuscript (similar to a course manual or book). The provided chapters for each module are “mandatory to study” for the midterm and final exams.

The followings are reference materials that may be reviewed by the students as additional readings.

	Fuzzing for Software Security Testing and Quality Assurance, Second Edition by Takanen, Ari ; Demott ISBN: 1608078507 Available Online at Ontario Tech University Library
	Designing Secure Software: A Guide for Developers by Loren Kohnfelder ISBN-13 : 978-1718501928 On reserve at Ontario Tech University Library

8. Evaluation Method

To pass this course, you must obtain a passing grade (50%) on the **weighted average** of the Midterm and Final Exam. If your exam average is below 50%, your final course grade will be capped at 45% (F), regardless of your performance in assignments or the group project.

Example Scenario

- **Midterm (20%):** You score 40%
- **Final Exam (30%):** You score 45%
- **Assignments (50%):** You score 100%

Calculation:

- Midterm points earned: $0.40 \times 20 = 8$
- Final Exam points earned: $0.45 \times 30 = 13.5$
- **Total Exam Points:** $8 + 13.5 = 21.5$ out of 50

Result:

Since 21.5 is less than 25 (half of the 50% exam weight), you would fail the course with a capped grade of 45%, even though your raw mathematical average would have been high enough to pass (21.5 + 50 = 71.5%).

Assignments	Midterm	Group Project	Final Exam
40%	20%	10%	30%

Final course grades may be adjusted to conform to program or Faculty grade distribution profiles. Further information on grading can be found under Academic Regulations in the University calendar.

Group Project Presentation (10%)

You must work in your assigned group by the instructor. As a group, you must select a "Software Security" related topic to research/review. Topics may include recent popular software vulnerabilities (e.g., Heartbleed) or emerging secure software development approaches (e.g., use of AI in application Fuzzing). You must report your selected project topic for approval to the course director no later than Feb 20th. The group leader from each group must reach out to the instructor (by email) and provide the chosen topic for approval. The course instructor must approve any selected topic as no two groups can choose the same (or closely related) topic. Topics will be approved/assigned on a first-come-first-serve basis. Groups are encouraged to choose their presentation topic sooner than Feb 20th to ensure timely approval.

For the project presentation component of this course, each team is required to prepare a 15-minute in-class presentation; recordings are not accepted. This presentation should effectively communicate the significance of your selected topic and its relevance to the modules covered in the course. It is crucial to incorporate any graphical assets, such as figures, charts, and other visual aids, sourced from external materials, ensuring they are properly cited in accordance with academic standards. The evaluation of your group presentation will focus on three primary aspects: (a) the quality of your delivery, (b) the depth and relevance of the presented topic, and (c) the quality of the prepared slides. Attention to detail is key – ensure that your slides are not overcrowded, pages are clearly numbered, and the font size and colour used enhance readability and overall presentation aesthetic. These elements are vital for a successful and impactful presentation, contributing to your team's overall grade in this course component.

9. Assignments and Tests

Description	Due Date (Tentative)	Weight
Assignment 1	Feb 5th	10%
Assignment 2	Feb 22h	10%
Assignment 3	Mar 9th	10%
Assignment 4	Mar 23nd	10%
Group Topic Selection	Feb 21th	N/A

Final Project (Presentation)	In class – refer to the course schedule on Canvas	10%
Midterm	Feb 28th (tentative and may change)	20%
Final Exam	TBA	30%

The assignments and the final project write-up are all due by 11:59PM on the due date listed above and must be submitted through Canvas. **No email submission will be accepted.**

** Note that all assignment due dates provided in this syllabus are tentative and subject to change. To stay updated on any adjustments or modifications to the schedule, it is crucial for students to regularly check the course's Canvas page. This will ensure access to the most current information regarding deadlines and course requirements. It is advised not to make any major plans based on the initially posted dates, as they may be revised to accommodate the evolving needs of the course or unforeseen circumstances.

Group Participation & Academic Integrity
All team members are required to contribute equally to group activities. Submitting work that includes the name of a member who has not significantly contributed is a violation of academic integrity. Such violations will result in penalties for the entire group. It is your responsibility to report any instances of non-participation ("free-riding") to the instructor immediately.

Use of AI-based Tools
In this course, the use of AI tools for content generation and assistive writing, including but not limited to ChatGPT, **is strictly prohibited** and will be considered as plagiarism. All submitted work and assignments must be the originally synthesized by students. The course director reserves the discretion to employ various methods, including the use of analytical tools or his personal judgment based on the writing style, to assess whether the submitted work has been generated using AI tools. Any assignment suspected of AI-generated content may be subject to rigorous scrutiny. Furthermore, the course director holds the right to submit works believed to be in violation of this policy to the faculty of business and IT (FBIT) for a formal investigation into plagiarism. This measure is crucial to maintain academic integrity and ensure that the learning outcomes are met through genuine student effort and understanding.

Missed In-term Examination
Students who miss an in-term examination such as a midterm or a term test may submit a request for consideration to the Faculty of Business and IT Advising Office and to the course instructor in writing using the Academic Consideration Form, along with supporting documentation. The request must be submitted within the deadlines specified in the Procedures for Consideration of Missed In-Term Course Work and Examinations. If a midterm or term test is missed for approved reasons, the weight of the missed component will be added to the weight of the final exam (or another exam component) If a student misses an in-term examination and does not follow the procedure above, they will receive a score of zero on the missed component.

Missed In-Term Course Work
A request for consideration for missed course work worth 20% or less of the final grade must be documented and reported to the instructor in writing within the deadlines specified in the Procedures for Consideration of Missed In-Term Course Work and Examinations. Course work includes, but is not limited to: quizzes, written assignments, participation, case studies, etc. If missed coursework totals more than 20% of the final grade, the request for consideration must be submitted to the Faculty of Business and IT Advising Office and to the course instructor in writing

using the Academic Consideration Form, along with supporting documentation. The request must be submitted within the deadlines specified in the Procedures for Consideration of Missed In-Term Course Work and Examinations. If approved, the weight of the missed course component will be added to the final exam. If a student misses coursework and does not follow the procedure above, they will receive a score of zero on the missed component.

For information on how missed/late assignments and medical excuses are managed, please refer to the university's revised *Procedures for Consideration of Missed In-Term Course Work and Examinations*.

10. Students with Disabilities

Ontario Tech University is committed to promoting an environment where everyone has an equal opportunity to contribute to their fullest potential. Students who require disability related accommodations are advised to contact Student Accessibility Services (SAS) as soon as possible to schedule a intake appointment. Accommodation decisions will be made in accordance with the Ontario Human Rights Code. Accommodations will be consistent with and supportive of the essential requirements of courses, labs and programs, and provided in a way that respects the dignity of students with disabilities and encourages integration and equality of opportunity. Reasonable academic accommodation may require instructors to exercise creativity and flexibility in responding to the needs of students with disabilities while maintaining integrity.

Disability-related and accommodation support is available for students with mental health, physical, mobility, sensory, medical, cognitive, or learning challenges. Office hours are 8:30am-4:30pm, Monday to Friday. For more information on services provided, you can visit the SAS website. Students may contact Student Accessibility Services by calling 905-721-3266, or email studentaccessibility@ontariotechu.ca.

Students who require the use of the Test Centre to write tests, midterms, or quizzes MUST be registered with Student Accessibility Services and must register online using the SAS test/exam sign-up module. Students must sign up for tests, midterms, or quizzes **AT LEAST seven (7) working days before the date of the test.**

Students must register for final exams no later **than 3 weeks prior to the start of the final examination period**. Visit my.ontariotechu.ca for more information.

Students who fail to meet the deadline are not guaranteed a Test Centre booking.

11. Technology Requirements and Learning Management System Information

Ontario Tech uses *Canvas*™ as its learning management system (LMS). Access to the LMS is limited to students formally registered in courses. That access is for the duration of the semester **and for an additional 120 days once the semester is over**. Students are strongly encouraged to download any/all relevant course material during that access period. Any requests for access post this period must be made in writing to the instructor/faculty member responsible for the course.

To support online learning, the university recommends certain technology requirements for laptops, software and internet connectivity. Each Faculty has its own requirement, please review yours here.

Students experiencing technical difficulties such that they are unable to meet the technology requirements may contact the IT Service Help Desk at: servicedesk@dc-uoit.ca
Students experiencing financial difficulties such that they are unable to meet the technology requirements may contact Student Awards and Financial Aid Office at: connect@ontariotehu.ca

By remaining enrolled in this course, you acknowledge that you have read, understand and agree to observe the Recommended Technology Requirements for accessing university online learning resources, including those minimum requirements that are specific to your faculty and program.

12. Sensitive/Offensive Subject Matter

The classroom (both physical and virtual) is intended to provide a safe, open space for the critical and civil exchange of ideas and opinions. Some articles, media and other course materials may contain sensitive content that is offensive and/or disturbing. The Course Instructor will try to identify such material and communicate warnings to students in advance of the distribution and use of such materials, affording students the choice to either emotionally prepare for, or not to view or interact with, the content.

13. Student Support

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact studentlife@ontariotechu.ca for support. Furthermore, please notify your professor if you are comfortable in doing so. This will enable them to provide any resources and help that they can.

Additionally, Ontario Tech University is committed to supporting your mental health and well-being through accessible services, early intervention, high-quality counselling and proactive, student-focused programs outlined in our Mental Health Policy.

14. Student Sexual Violence Support and Education

Ontario Tech is committed to the prevention of sexual violence in all its forms. For any student who has experienced Sexual Violence, Ontario Tech can help. We will make accommodations to cater to the diverse backgrounds, cultures, and identities of students when dealing with individual cases.

If you think you have been subjected to or witnessed sexual violence:

- Reach out to the gender-based case specialist in the Human Rights office, a specially trained individual authorized to receive confidential disclosures about incidents of sexual violence. The Human Rights Office will make support services, including counselling, access or referrals to medical services, safety planning and accommodations, available to Students affected by an Incident of Sexual Violence. Book a consultation with the Case Specialist for more information.

15. Professional Suitability

Ontario Tech University is a community that values and promotes respect, integrity, diversity and accountability among all members of the university. These values can only be achieved in an environment that supports and protects the safety and security of its members. The Ontario Tech University Policy on Student Conduct defines and guides standards of student behaviour at the university to uphold these values and ensure that behaviour contrary to these standards are dealt with in a manner that is fair, open and effective.

The Faculty of Business & IT has the following expectations related to professionalism for all its community members, including, without limitation, students, staff, and faculty:

- **Respect, civility, and courtesy:** Community members are expected to treat each other with respect, civility, and courtesy both in and outside of the classroom. Rudeness, profanity, insults, harassment, and class disruptions are unacceptable.

- **Critique ideas, not the people who raise the ideas:** Discussions, debates, and the exchange of ideas are normal parts of life in an academic community. Community members are expected to engage in discussions, debates, and the exchange of ideas in respectful ways, even while vigorously advocating for one's perspective.
- **Talk *to* those with whom you have a complaint, not *about* them.** When community members have disputes, complaints, and/or concerns about another community member, they are expected to do their best to address the matter directly and informally with the other member, provided that it is safe to do so.

Special obligations: Community members in positions of authority have special obligations to demonstrate respect, civility, and professionalism and to encourage the development of these values within the FBIT community.

Click on the respective titles for more information - The *Professional Suitability* policy and the related procedures.

16. Academic Integrity

Students and faculty at Ontario Tech University share an important responsibility to maintain the integrity of the teaching and learning relationship. This relationship is characterized by honesty, fairness and mutual respect for the aim and principles of the pursuit of education. Academic misconduct impedes the activities of the university community and is punishable by appropriate disciplinary action.

Students are expected to be familiar with and abide by Ontario Tech University's regulations on Academic Conduct which sets out the kinds of actions that constitute academic misconduct, including plagiarism, copying or allowing one's own work to be copied, use of unauthorized aids in examinations and tests, submitting work prepared in collaboration with another student when such collaboration has not been authorized, among other academic offences. The regulations also describe the procedures for dealing with allegations, and the sanctions for any finding of academic misconduct, which can range from a resubmission of work to a failing grade to permanent expulsion from the university. A lack of familiarity with these regulations on academic conduct does not constitute a defense against its application. Please note that generative artificial intelligence (GAI) tools should not be utilized without advance, specific written approval by the faculty member teaching the course.

Click on the title for more information on Academic Integrity.

Extra support services are available to all Ontario Tech University students in academic development, study skills, counseling, and peer mentorship. More information on student support services are provided by Student Life.

17. Turnitin

Ontario Tech University and faculty members reserve the right to use electronic means to detect and help prevent plagiarism. Students agree that by taking this course all assignments are subject to submission for textual similarity review by Turnitin.com. Assignments submitted to Turnitin.com will be included as source documents in Turnitin.com's restricted access database solely for the purpose of detecting plagiarism in such documents. The instructor may require students to submit their assignments electronically to Turnitin.com or the instructor may submit questionable text on behalf of a student. The terms that apply to Ontario Tech University's use of the Turnitin.com service are described on the Turnitin.com website.

Students who do not wish to have their work submitted to Turnitin.com must provide their instructor a signed Turnitin.com Assignment Cover sheet when submitting an assignment.

18. Online Test and Exam Proctoring (Virtual Proctoring)

Ontario Tech University will conduct virtual monitoring of examinations in accordance with Ontario privacy legislation and all approved policy instruments.

19. Final Examinations (if applicable)

Final examinations are held during the final examination period at the end of the semester and may take place in a different room and on a different day from the regularly scheduled class. Check the published Examination Schedule for a complete list of days and times.

Students are required to show their valid physical or digital Ontario Tech University student photo ID card (campus ID), or a valid government issued photo ID that is in English when writing an **in-person examination.** Students are advised to obtain their Student ID Card well in advance of the examination period as they will not be able to write their examinations without it.

Students who are unable to write a final examination when scheduled due to religious publications may make arrangements to write a deferred examination. These students are required to submit an Academic Consideration form to the applicable Faculty as soon as possible and no later than three weeks prior to the first day of the final examination period.

Further information on final examinations can be found in the university's *Procedures for Final Examination Administration*.

20. Freedom of Information and Protection of Privacy Act

The following is an important notice regarding the process for submitting course assignments, quizzes, and other evaluative material in your courses in the Faculty of Business and IT.

Ontario Tech University is governed by the Freedom of Information and Protection of Privacy Act ("FIPPA"). In addition to providing a mechanism for requesting records held by the university, this legislation also requires that the University not disclose the personal information of its students without their consent.

FIPPA's definition of "personal information" includes, among other things, documents that contain both your name and your Banner (student) ID. For example, this could include graded test papers or assignments. To ensure that your rights to privacy are protected, the Faculty of Business and IT encourages you to use only your Banner ID on assignments or test papers being submitted for grading. This policy is intended to prevent the inadvertent disclosure of your information where graded papers are returned to groups of students at the same time. If you still wish to write both your name and your Banner ID on your tests and assignments, please be advised that Ontario Tech University will interpret this as an implied consent to the disclosure of your personal information in the normal course of returning graded materials to students.

If you have any questions or concerns relating to the new policy or the issue of implied consent addressed above, please contact accessandprivacy@ontariotechu.ca

Notice of Collection and Use of Personal Information
Throughout this course, personal information may be collected through the use of certain technologies under the authority of the *University of Ontario Institute of Technology Act, SO 2002,*

c. 8, Sch. O. and will be collected, protected, used, disclosed and retained in compliance with Ontario's *Freedom of Information and Protection of Privacy Act R.S.O. 1990, c. F.31.*

This course will use the following technologies that may collect, use, disclose and retain personal information (including images) for the purposes described below:

- Respondus Monitor and Proctortrack to maintain academic integrity for examinations;
- Google Meet and Kaltura Virtual Classroom to facilitate remote instruction and interactive learning;
- Peer-shared applications, services or technologies that may be reviewed, assessed, or used as part of coursework.
- Other applications, services, or technologies that support or enhance online learning.

Questions regarding personal information may be directed to: Ontario Tech University Access and Privacy Office, 2000 Simcoe Street North, Oshawa, ON L1G 0C5, email: accessandprivacy@ontariotechu.ca.

By remaining enrolled in this course, you acknowledge that you have read, understand, and agree to the terms and conditions under which the technology provider(s) may collect, use, disclose and retain your personal information. You agree to the university using the technologies and using your personal information for the purposes described in this course outline.

21. Human Rights and Respect

Ontario Tech University is committed to providing a campus environment in which all University Members are treated with dignity and to fostering a climate of understanding and mutual respect. The University will not tolerate, ignore or condone Discrimination or Harassment by or against anyone. Examples of Harassing behavior include, but are not limited to; bullying, taunting or mocking someone's race or creed, ridiculing an individual's disability, or targeting individuals with unwanted sexual or negative stereotypical comments about one's sex, gender, sexual orientation, gender identity and/or gender expression. Pursuant to Ontario Tech's Respectful Campus Policy, students are reminded of their role in ensuring an equitable and inclusive learning environment. Requirements to refrain from harassment and discrimination apply broadly to on campus activities, e.g., on University property, in the classroom, including in lectures, labs and practicums, and also apply to off-campus activities, e.g. during any organized Ontario Tech class or extra-curricular activity including experiential learning opportunities such as co-op, practicum or during research endeavors, during official Ontario Tech events or using University equipment and technological tools that facilitate remote learning, e.g., class and other chat functions, video conferencing, and electronic mail.

22. Freedom of Expression

Pursuant to Ontario Tech's Freedom of Expression Policy, all students are encouraged to express ideas and perspectives freely and respectfully in university space and in the online university environment, subject to certain limitations. Students are reminded that the limits on Freedom of Expression include speech or behaviour that: is illegal or interferes with the university's legal obligations; defames an individual or group; constitutes a threat, harassment or discrimination; is a breach of fiduciary, contractual, privacy or confidentiality obligations or commitments; and unduly disrupts and interferes with the functioning of the university. In the context of working online, different forms of communication are used. Where permitted, students using "chat" functions or other online forms of communication are encouraged to ensure that their communication complies with the Freedom of Expression Policy.

23. Copyright Notice

All Teaching Materials, as they are defined under Ontario Tech's Intellectual Property policy ("IP Policy"), provided by the instructor throughout the course, including, but not limited to, in whole or in part, course notes, teaching notes, custom books, tutorials, evaluation tools, presentations and examinations are subject to the Copyright Act, R.S.C., 1985, c. C-42 and the IP Policy. Subject to the IP Policy, Teaching Materials are owned by the faculty member, instructor or other third party who creates such works, with a license to the University. The copyright owner(s) reserves all intellectual property rights in and to the foregoing materials. Consistent with the IP Policy, Teaching Materials are intended to be used by Ontario Tech University students registered in the course that is the subject of this course outline for educational purposes only. Any distribution or publishing of this material (e.g., uploading material to a third-party website) by a student is strictly prohibited under the law unless the student has obtained the copyright owner's prior written consent. Any violation of copyright law or the IP Policy, if proven, may be subject to sanction as academic misconduct, and/or under the Student Conduct Policy.

24. Student Course Feedback Surveys

Student evaluation of teaching is a highly valued and helpful mechanism for monitoring the quality of Ontario Tech University's programs and instructional effectiveness. To that end, course evaluations are administered by an external company in an online, anonymous process during the last few weeks of classes. Students are encouraged to participate actively in this process and will be notified of the dates. Notifications about course evaluations will be sent via e-mail, and posted on Canvas, Weekly News, and signage around the campus.

25. AODA

The Accessibility for Ontarians with Disabilities Act (AODA) standards have been considered in the development of this model course template and it adheres to the principles outlined in the University's Accessibility Policy.