

THE UNIVERSITY OF BRITISH COLUMBIA

Department of Computer Science, Mathematics, Physics and Statistics
Irving K. Barber School of Arts and Sciences
Okanagan Campus

Course Syllabus

This is the official syllabus and course outline for DATA 301, COSC 301, and DATA 501. For convenience, we will use DATA 301 in place of DATA301/501 and COSC 301.

[Print to PDF ▶](#)

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⚠ Warning

Please note that this syllabus is currently under active development, there may be typos or missing sections; treat this as a draft until the course starts!

DATA 301 (3) Introduction to Data Analytics

The [UBCO calendar description](#) of this course is:

Techniques for computation, analysis, and visualization of data using software. Manipulation of small and large data sets. Automation using scripting. Real-world applications from life sciences, physical sciences, economics, engineering, or psychology. No prior computing background is required. Credit will be granted for only one of COSC 301, DATA 301 or DATA 501. [3-2-0]

Prerequisite: Either (a) third-year standing, or (b) one of COSC 111 or COSC 122.

Equivalency: COSC 301.

Is this syllabus a contract?

Rather than interpreting this syllabus as a legal document that serves as a contract between the instructor and the students, I prefer to view the syllabus as a *living document*. Dr. John Warmer describes this best [in his article, "A syllabus is not a contract"](#):

... this syllabus is not a contract, it is a living document which reflects the experiences, emotions, philosophies, and goals I bring to a particular course.

and also:



A syllabus as a plan is a lot like an itinerary before a trip. There's some definite highlights we need to hit, but if something that seems cool and worth doing crops up unexpectedly, we need to seize that opportunity in the moment. If something really bad happens (the equivalent of a norovirus breakout on a cruise ship) we may need to abandon something previously scheduled entirely.

Interestingly, it is worth noting that a recent review of legal precedents suggests that syllabi are not considered contracts by the courts [1].

Having an adaptive and responsive syllabus is important to me as an instructor because it allows me to be more flexible with what/how/when you learn, and respond to your feedback in a meaningful way. I invite you to be co-contributors to this syllabus, and use the tools provided to add your own annotations, questions, and suggestions on making this syllabus work for you.

Important

Please note that I have your best interests in mind, and it is highly unlikely that I will ever change a syllabus in a way that negatively affects the class, or even individual students. If you believe a syllabus change is affecting you negatively, please do not hesitate to reach out to me, or [submit your feedback anonymously here](#).

Changes to the syllabus since the start of Term

Any major changes to the syllabus (this page) will be documented here as well as the date the change was made.

Change Date Summary Rationale

TBD TBD TBD

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About this course

Name	Description
Course	DATA 301, COSC 301, DATA 501
Term	2020/21 Winter Term 1
Pre-requisites	3rd year status or COSC 111, 122
Co-requisites	N/A
Costs	\$0 (Free!)
Weekly meetings	Wednesdays 15:30-16:30 on Zoom
Lectures	Online
Laboratory	You must register for a laboratory section
URL	https://firas.moosvi.com/courses/data301
Instructor	Firas Moosvi
Office Hours	Zoom
Email	Contact via Piazza/Slack

A message from your instructor

Coming soon...



Why should I take this course?

You should take this course to get an introduction to a very exciting field of data analytics! In nearly every industry, the collection, analysis, and reporting of data is taking centre stage. Very soon (if not already), computational literacy will be a foundational skill and this course will give you a taste of that world. To show you the breadth and depth of careers available in data analytics, several recent graduates will be profiled and showcased.

Regardless of what your academic background is, you will find something interesting in this course. DATA 301 is a very popular course in the department, and it gives students some important skills in programming, data science, data analysis, and communicating results effectively. Though this is not an introductory programming course, we will make every attempt to make sure the content is accessible and interesting both to those that have prior computing experience, as well as those that don't. Pay close attention to the supplementary videos and articles that will be linked in the lecture notes if you need a primer on some of the concepts that we will only briefly cover.

💡 Tip

You should take this course to get an introduction to a very exciting field of data analytics!

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Contact the Teaching Team

Team Member	Pronounce as	Contact	Office Hour
Dr. Firas Moosvi (he/his/him); Instructor	Fur-az Moose-vee	TBD	TBD
(TA)		TBD	TBD
(TA)		TBD	TBD
(TA)		TBD	TBD

(grading_practices) =

How will I be evaluated in this course?

The grading scheme for this course is:

Item	Weight	Due date(s)
Lab Assignments	20% (10 x 2%)	TBD
Bi-weekly Tests	20% (5 x 4%)	TBD
Project Milestones	20% (5 x 4%)	TBD
Final Project	10%	TBD
Final Exam	25%	TBD (Take-home)

There will be 5 tests in this course in an (approximately) bi-weekly schedule. For each of the tests, there will be a bonus test exactly one week later and the better score of the Test-Bonus Test pair will be taken.

❗ Attention

All deadlines in this course have an automatic 48 hour grace period after the due dates listed above. Any submissions submitted past the grace period will not be graded.

Are there other requirements I need to know about to pass the course?



- All students must satisfy ALL conditions to pass the course:
 1. Pass the Lab component with a grade of at least 50%,
 2. Pass the Test and Exam components (together) with a grade of at least 50%,
 3. Pass the Final Project with a grade of at least 50%.
- In addition to the requirements above, graduate students (i.e. those enrolled in DATA 501) must:
 1. Earn an overall grade of 60% in the course, AND
 2. Earn at least 60% on the Final Project,

If students do not satisfy the appropriate requirements, the student will be assigned a maximum overall grade of 45 in the course.

Note

I reserve the right to have slightly different expectations for the lab assignments and final project depending on whether students are enrolled in DATA 301, COSC 301, or DATA 501.

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Course Learning Outcomes (AKA what will I learn in this course?)

1. Understand data representation formats and techniques and how to use them.
2. Work with large datasets and learn to manipulate them programmatically.
3. Experience using a wide-range of data analytics tools including Excel, Python, SQL, and visualization packages and software.
4. Develop a computational thinking approach to problem-solving and use programs to solve data tasks.

Tip

The full course schedule is available here: [Course Schedule](#).

What do I need to purchase for this course?

There is no requirement to purchase anything for this course. You will need access to a computer (laptop or desktop) with an internet connection. All of the course material, including videos, labs, and course notes will be available on this site, or on Canvas.

How will this course be taught ?

This course will be taught as a [Blended Learning classroom](#) where some elements of a [flipped classroom](#) will be mixed with a more traditional coding classroom with live demos, clicker questions, and worksheets. Briefly, this requires students to watch videos and engage with the assigned reading prior to the classroom meeting (knowledge transfer). During the class meeting, the instructor guides students through clicker questions, worksheet problems, and other activities to help the students make sense of the material (sense-making). See [Fig. 1](#) for a mental model of how learning works [2].

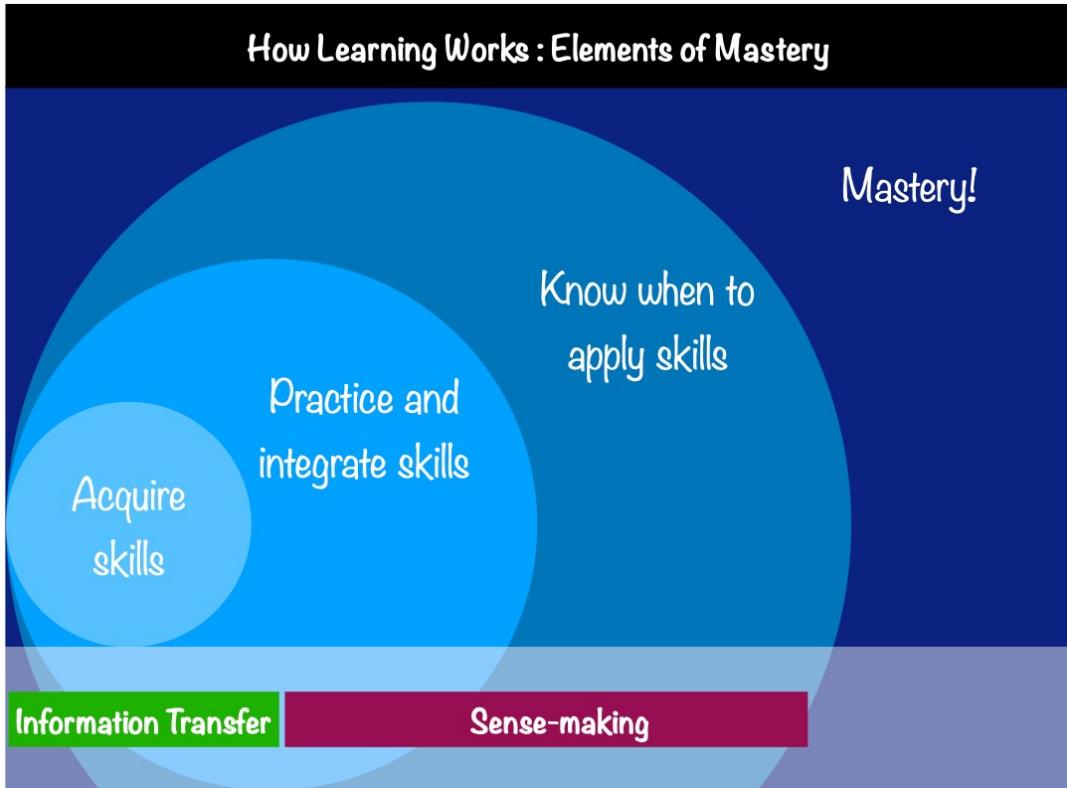


Fig. 1 To develop mastery in a concept, students must first acquire the necessary skills, then practice integrating them, and finally know when to apply what they have learned. This figure was adapted from Figure 4.1 of the book "How Learning Works". The terms "knowledge transfer" and "sense-making" applied in this context is generally attributed to [Dr. Eric Mazur](#).

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What does this mean in practical terms?

[Fig. 2](#) shows a handy table to help guide you and organize your learning in this course:

		Information Transfer	Sense-making
What?		<ul style="list-style-type: none"> - Notes - Readings - Videos - Simulations 	<ul style="list-style-type: none"> - Worksheets and clicker questions - Homework assignments - Labs - Worked examples
When?		<ul style="list-style-type: none"> - Before class 	<ul style="list-style-type: none"> - During and after class - Tutorials and office hours - Watch parties
Where?		<ul style="list-style-type: none"> - Online (asynchronously) 	<ul style="list-style-type: none"> - Online (synchronously) - Online (asynchronously)
Who?		<ul style="list-style-type: none"> - Textbook publishers - Open education resource developers - Non-profit organizations - Content experts 	<ul style="list-style-type: none"> - Course instructor - Teaching assistants - Classmates

Fig. 2 This table describes how I think each course activity should be classified between knowledge transfer and sense-making.

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Want to know more about my teaching philosophy ?

For a detailed description of my teaching philosophy and values (including a list of references and citations), you can [read it here](#). Here are the key principles I intend to apply in this class:

1. Student learning is vastly improved through active learning.
2. Effective teaching is inclusive teaching.
3. Learning technologies must be leveraged to scale instructor effort across multiple classes.
4. Exploring the connections between different disciplines is an extremely powerful motivator.
5. Teaching is three parts preparation, two parts classroom management, and one part execution.

Course Communication

- For lectures, labs, tutorials, and office hours we will be using Zoom.
- For official course communication, we will be using [Canvas](#) and [Piazza](#).
- For unofficial chat, community building, sharing of tiktoks, cat videos, and general conversation we will (optionally) be using a Discord server OR a Slack team.

⚠ Warning

Please note signing up for the Discord/Slack is **completely optional!** You will not miss anything course-related if you choose not to get on this unofficial platform.

Sign up for a (free) Zoom account

Instructions coming soon...



Sign up for a (free) Piazza account [Required]

This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza.

The Piazza tool is stored on servers outside Canada. When you access this site by clicking on the link through Canvas, you are being transferred to these servers. In order to protect your identity, UBC obfuscates your user ID before it is sent to the site. However, Piazza does require you to create an account on their servers. While Piazza adheres to strict U.S. privacy regulations (FERPA), UBC cannot guarantee security of your private details on servers outside of Canada. Please exercise caution whenever using personal information. You may wish to use a pseudonym to protect your privacy if you have concerns.

[Sign up for our class Piazza.](#)

Sign up for the Slack or Discord team [Optional]

Coming soon...

What should I think about if I'm considering withdrawing from the course?

First of all, I'm sorry you're having trouble and are considering withdrawing from the course! This is no problem, and I will not be personally offended or upset you need to do this, I encourage you to do what you feel is right for you and your situation. Below is some information that might be helpful for you in making the decision. 7

Warning

Please note that it is the student's responsibility to check the withdrawal dates as [listed in the UBC Calendar](#).

Withdrawal type	Effect on Transcript	Tuition refund
Before the 1st withdrawal date	None	100% refund
Before the 2nd withdrawal date	W on transcript	0-50% refund (depending on the date you're withdrawing)
After the 2nd withdrawal date (cannot happen without faculty approval)	W on transcript	0%

There are factors other than money and your transcript to consider as well, including your mental health, graduation requirements/timelines, eligibility for student loans, bursaries, scholarships etc. I advise you to [read the full list of considerations](#) here and contact your faculty advisor if you have additional questions.

What type of information will I collect about you in this course?

Having taught [DSCI 541: Privacy, Ethics, and Security](#) in the UBC Master of Data Science in the past, I am very aware of the surveillance culture that has permeated our society and heralded the [End of Privacy](#) as we know it. That being said, as an instructor, I care tremendously about your learning and the course-related data that is collected about you is extremely valuable. Broadly speaking, this relatively new field is called **Learning Analytics**. [Learning Analytics](#) involves the collection and analysis of data about learners for the [express purpose](#) of improving their learning by optimizing teaching and learning practices.

In this course, we will be using the following learning technologies (privacy policies linked):

- [Canvas](#)

- [Piazza](#)
- [Sli.do](#)
- [Hypothes.is](#)

All tools used in the course will be used in a [FIPPA-compliant](#) manner, with your privacy top of mind. New tools may be added to the course as the need arises, and I will update this section with the appropriate information and make an announcement if a new tool is added midway through a course.

All of the tools above log data about your activity that can be used to improve the quality of teaching and learning. In this course, I intend to use this information to:

- view overall class progress (in aggregate),
- track your personal progress in order to provide you with personalized feedback,
- track participation in discussion forums
- improve the course and your learning,
- explore students actions in the course,
- provide you feedback on your progress.

Unfortunately, at the moment it is not possible to opt-out of the data collection process, but if you like, you may opt-out of the process where *I use the data to give you personalized feedback*. To opt-out, please [complete this form](#) at any point in the course. You may opt-out with my full support, I respect your decision and applaud you for your netizenship!

What should I do if I need accommodations to be successful in this course?

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Accommodations are intended to remove barriers experienced by individuals with disabilities. As a matter of principle, UBC is committed to promoting human rights, equity and diversity, and it also has a legal duty under the BC Human Rights Code to make its goods and services available in a manner that does not discriminate. [Policy 73](#) (Accommodation for Students with Disabilities) sets out principles and processes governing the accommodation of students with disabilities.

All accommodations for this course are handled through the [Disability Resource Centre](#) and I encourage you to contact them to book an appointment.

What if I miss labs, tests, or the exam due to an illness, health, or other personal situation?

Students who, because of unforeseen events, are absent during the term and are unable to complete tests or other graded work, should normally discuss with their instructors how they can make up for missed work. If ill health is an issue, students are encouraged to seek attention from a health professional. Campus Health and Counselling will normally provide documentation only to students who have been seen previously at these offices for treatment or counselling specific to conditions associated with their academic difficulties. Students who feel that requests for consideration have not been dealt with fairly by their instructors may take their concerns first to the Head of the Department, and if not resolved, to the Office of the Dean. Further information can be found at the [UBCO Calendar](#).

💡 Tip

If you miss a course component due to an illness, health, or other personal situation, please reach out to me as soon as you are comfortable, and I'll work with you to get you back on track.

What if I have dependents that rely on me for care and unpredictable emergencies may arise?

Let's talk, send me a private message and we can discuss it. I do not necessarily need to know all the personal details, just a high-level summary

of your situation and what you think an ideal solution would be.

I'm sure we will come to some agreement, generally the earlier you let me know of any special circumstances or accommodation, the more I'll be able to do for you!



What if I have to miss a deadline because of a wedding, birthday, funeral, religious holiday, or personal event ?

No problem! There's not even any need to tell me, or ask for permission to miss deadlines. The course is designed to give you maximum flexibility:

- Every deadline has a 48-hour grace period that is automatically applied.
- There is no late penalty if you use the grace period
- You can use the grace period an unlimited amount of time in the course (though if it happens every week and for every assignment, I might check in with you and gently encourage you not to leave things to the last minute)

💡 Tip

Remember, if you miss a Test for whatever reason, you can make it up the following week in the bonus test!

If you miss a deadline by more than the grace period, the general course policy is that you will get 0 on it. In some cases, I reserve the right to grant an extension, or provide an alternate assignment.

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Compassion

As I'm sure you're aware, *there is a global pandemic* happening right now and we could all use some extra compassion and humanity. If you're going through something that is affecting you (course or otherwise), you are always welcome to come and talk to me about it. If I am not able to help you myself, then I can probably direct you to the right person or resource. If you need extra help, or extra time to deal with something you're going through, just ask. You will *never* owe me an explanation about your physical health, mental health, or those of your family members, friends, etc... I will believe you, and I will trust you. I will not judge you, nor think any less of you. I will do everything in my power to work out something that is both reasonable and fair. This, I promise!

How do I go through this course ethically and with integrity?

I want to be proud of your work in this course, and I want YOU to be proud of yourself as well! That cannot happen if you make unethical decisions, including (but not limited) to cheating or plagiarism. According to the scientific literature, the most common reasons students cheat are:

- Fear of failure and life consequences
- Peer pressure, including an inability to say no to help others cheat
- Perceived societal acceptance of cheating (Lance Armstrong, Barry Bonds, Enron, Wall Street & the The Big Short)
- Desire for success without the time/desire to put in the work needed
- Strict deadlines and due-dates
- Requirement from instructors to memorize facts, figures, equations, etc...
- High-stakes exams with no recompense for "having a bad day"
- Peers cheating with no consequences or penalties
- Unclear expectations on what constitutes academic dishonesty
- Inadequate support from instructor and teaching team

Though I sympathize with students and the stresses of your busy lives - in my opinion, there is no good reason to cheat. I have tried extremely hard to make this course focused on learning rather than grading, and where grading is needed, to have policies that are as student-friendly as possible. In particular, I hope (and expect) that the following features of the course should eliminate your temptation to cheat or plagiarize:

- 48 hour grace-period on all homework and lab due dates and deadlines.



- Long testing window (48 hours) so you can start the tests whenever you're comfortable.
- Timed tests have generous time limits (allowable time is 1.25x the estimated time).
- Each test has a "bonus test" available one week later; for each test, we will take the better score of the pair.
- No high-stakes exams (the single largest assessment item is the final exam at 25%).
- All course assessments are completely open book and open notes.
- Plenty of TA and instructor office hours and several outside of normal business hours.
- Class website that outlines exactly what you should do when to help you manage your time.
- Tonnes of supplemental materials including other instructional videos in case you want a different perspective.
- Weekly prompt to accept the integrity pledge to keep you accountable.
- A true willingness from the instructor (me) to help you learn and succeed in this course!

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the [Academic Calendar](#).

My personal plea

With these features, and many other little things, I sincerely hope that you will consider completing this course with maximum integrity so that you never have to feel guilty, ashamed, or disappointed in yourself and your actions!

To make it even easier for you to decide what isn't allowed, below is a list of things that I **definitely** consider to be academic dishonesty:

- Asking others for their work in the course (whether question by question, or all at once)
- Sending others your work in the course
- Doing tests collaboratively (tests **must** be done by yourself and alone)
- Sending others your test questions and/or answers
- Sharing any course material onto Chegg, Course Hero, Slader, or other similar sites
- Searching for solutions to course material on Chegg, Course Hero, Slader, or other similar sites
- Blindly googling the question in hopes of finding someone who had a similar question and then copying their answer
 - Note, googling to find resources to understand specific concepts or general ideas is highly encouraged!
- Having a tutor/friend/nemesis complete and submit your work for you
- Copying and pasting code, equations, text explanations, prose, etc... without attribution
- Manipulating the learning platforms we use to reverse engineer the randomization algorithms, hacking the timer functionality, or other similar technical malfeasance.

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UBCO's statement on Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

UBC Policies

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available [here](#).

Online learning for international students

During this pandemic, the shift to online learning has greatly altered teaching and studying at UBC, including changes to health and safety considerations. Keep in mind that some UBC courses might cover topics that are censored or considered illegal by non-Canadian governments. This may include, but is not limited to, human rights, representative government, defamation, obscenity, gender or sexuality, and historical or current geopolitical controversies. If you are a student living abroad, you will be subject to the laws of your local jurisdiction, and your local authorities might limit your access to course material or take punitive action against you. UBC is strongly committed to academic freedom, but has no control over foreign authorities (please visit [this calendar page](#) for an articulation of the values of the University conveyed in the Senate Statement on Academic Freedom). Thus, we recognize that students will have legitimate reason to exercise caution in studying certain subjects. If you have concerns regarding your personal situation, consider postponing taking a course with manifest risks, until you are back on campus or reach out to your academic advisor to find substitute courses. For further information and support, please visit: <https://academic.ubc.ca/support-resources/freedom-expression/>.



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Grievances and Complaints Procedures

A student who has a complaint related to this course should follow the procedures summarized below:

- The student should attempt to resolve the matter with the instructor first. Students may talk first to someone other than the instructor if they do not feel, for whatever reason, that they can directly approach the instructor.
- If the complaint is not resolved to the student's satisfaction, the student should go to the departmental chair John Braun at SCI 388, 250-807-8032 or e-mail him at john.braun@ubc.ca.

Grading Practices

Requirements to pass the course are listed above grading_practices.

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. [Grades](#) are not official until they appear on a student's academic record. If you have any questions about how academic integrity applies to this course, please consult with your professor.

Disability Assistance

The Disability Resource Centre ensures educational equity for students with disabilities, injuries or illness. If you are disabled, have an injury or illness and require academic accommodations to meet the course objectives, [visit our website](#) for more information or contact the DRC at: drc.questions@ubc.ca.

Equity, Human Rights, Discrimination and Harassment

UBC Okanagan is a place where every student, staff and faculty member should be able to study and work in an environment that is free from human rights based discrimination and harassment. If you require assistance related to an issue of equity, discrimination or harassment, please

contact the [Equity Office](#) by phone (250.807.9291) or email (equity.ubco@ubc.ca), your administrative head of unit, and/or your unit's equity representative.



Health & Wellness

At UBC Okanagan health services to students are provided by Health and Wellness. Nurses, physicians and counsellors provide health care and counselling related to physical health, emotional/mental health and sexual/reproductive health concerns. As well, health promotion, education and research activities are provided to the campus community. If you require assistance with your health, please contact [Health and Wellness](#) in person (UNC 337) or by email (healthwellness.okanagan@ubc.ca) for more information or to book an appointment.

Sexual Violence Prevention and Response Office (SVPRO)

A safe and confidential place for UBC students, staff and faculty who have experienced sexual violence regardless of when or where it took place. Just want to talk? We are here to listen and help you explore your options. We can help you find a safe place to stay, explain your reporting options (UBC or police), accompany you to the hospital, or support you with academic accommodations. You have the right to choose what happens next. We support your decision, whatever you decide. Visit svpro.ok.ubc.ca or call us at 250.807.9640.

Independent Investigations Office (IIO)

If you or someone you know has experienced sexual assault or some other form of sexual misconduct by a UBC community member and you want the Independent Investigations Office (IIO) at UBC to investigate, please contact the IIO. Investigations are conducted in a trauma informed, confidential and respectful manner in accordance with the principles of procedural fairness. You can report your experience directly to the IIO via email: director.of.investigations@ubc.ca or by calling 604.827.2060 or online by visiting investigationsoffice.ubc.ca.

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The Hub

The Student Learning Hub (LIB 237) is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies. For more information, please visit the Hub's website (<https://students.ok.ubc.ca/student-learning-hub>). Content on this site (unless otherwise specified) is licensed under the [CC BY-NC-SA 4.0 license](#).



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