



THE UNIVERSITY OF BRITISH COLUMBIA

Department of Computer Science, Mathematics, Physics and Statistics
Okanagan Campus

COSC 329 Learning Analytics

Instructor: Bowen Hui (SCI 257), bowen.hui@ubc.ca

Duration: Winter 2021 term 1, 3 credits

Lectures: T/F 9:30-10:50 online

Office hours: Tuesdays 1pm, or by appointment

Course website: Access through Canvas

Academic Calendar Entry

COSC 329 (3) Learning Analytics

Introduction to data analytics and machine learning techniques in the context of educational data. Focuses on user profiling, collaborative filtering, clustering, Bayesian user modeling, preference elicitation, and plagiarism detection. Credit will be granted for only one of COSC 329, COSC 419C, or COSC 519C.

Prerequisite: COSC 222 and one of STAT 121, STAT 230.

Course Format

The course will be delivered online via partially synchronous lectures complemented by out-of-class readings, programming, written assignments, and a course project. Course content will be posted on the course website. Reading week and other calendar dates can be found at

<http://okanagan.students.ubc.ca/calendar/>

Course Overview, Content and Objectives

The course will introduce students to principles of machine learning as applied to the education domain. Specifically, the topics may include personalized and adaptive learning, learner modeling, probabilistic inference, data gathering and experimentation, natural language processing, graph manipulations, clustering, and recommendations. The objective of this course is to initiate students to a practical side of machine learning and the use of analytics to solve real-world problems.

Learning Outcomes

Upon completion of this course, students will be able to:

- Appreciate design issues in educational software
- Gain hands-on experience in building existing algorithms and working with real-world data
- Evaluate benefits and costs of specific learning analytic applications
- Design data collection experiments for specific analytics needs
- Develop models using empirical data
- Integrate third-party plugin to extrapolate pedagogical implications
- Promote their candidacy for employment opportunities in the field of data analytics

Evaluation Criteria and Grading

Assignments	Between 25 - 45%	(default: 35%)
Quizzes & Readings	Between 15 - 35%	(default: 25%)
Project	Between 30 - 50%	(default: 40%)

The specific percentages will be chosen by the student and submitted to the instructor no later than the last day of class. If these preferences are not submitted in time, the default percentages will be used.



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Mode of Delivery for Exams

Quizzes are conducted and submitted on Canvas by the specific due date. Note that the first quiz attempt is due at the end of a module on Sunday 11:59pm. For the first attempt, we allow a tolerance of 1 calendar day late with a penalty of -50% of the quiz mark. For example, if your Quiz 1 submission is up to one day late, you will get at most 50/100% for it. Note that “up to one day late” means the submission could be several minutes late or it could be 23 hours and 59 minutes late. Thereafter, the first quiz attempt will receive a mark of 0.

All the quizzes will close 2 weeks after the first attempt is due and will no longer be accessible to you. Therefore, all attempts must be made during this period.

Late Policy

All deliverables can be submitted up to 3 calendar days late. Thereafter, your work will receive a mark of 0. For each day that is late, you will receive a penalty of -10% of the assignment mark. For example, if your A1 submission is up to one day late, you will get at most 90/100% for it. Note that “up to one day late” means the submission could be several minutes late or it could be 23 hours and 59 minutes late.

There is no late tolerance for the project presentations. Unless a medical note is provided, missed presentations that are not delivered on the scheduled day and time will receive a mark of 0.

Similarly, missed assignments, readings, and projects will receive a mark of 0 unless a medical note is provided.

Passing Criteria

In order to pass the course:

- Students **MUST** achieve a passing grade of at least 50% in the assignments component.
- Students **MUST** achieve a passing grade of at least 50% in the quizzes and readings component.
- Students **MUST** achieve a passing grade of at least 50% in the project component.

Failure to satisfy **all** of the above clauses will result in a maximum of 45% for the course.

Expectations

- Attend **all** classes and prepare before attending class.
- Keep up with the recommended class schedule.
- Complete any assigned readings **before** the lecture.
- Learn the material in the course and undertake sufficient effort to produce all the programming assignments and quality projects.
- Enjoy attending class and feel free to participate according to your personality. Feel free to ask questions by raising your hand or speaking out at appropriate times.
- Actively participate in class discussions, questions, and problem solving exercises.
- **I want all students to pass the course, receive a good grade, produce interesting projects, and feel the course was beneficial.**
- For this course, it is expected that you will spend **at least six hours per week** on out-of-class preparation.

Tentative Course Schedule and Required Readings

See the updated schedule on the course website.



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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.

<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014>

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.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar at:

<http://okanagan.students.ubc.ca/calendar/index.cfm?tree=3,54,111,0>.

Cooperation vs. Cheating

Working with others on assignments is a good way to learn the material and we encourage it. However, there are limits to the degree of cooperation that we will permit. Any level of cooperation beyond what is permitted is considered cheating.

When working on programming assignments, you must work only with others whose understanding of the material is approximately equal to yours. In this situation, working together to find a good approach for solving a programming problem is cooperation; listening while someone dictates a solution is cheating. You must limit collaboration to a high-level discussion of solution strategies, and stop short of actually writing down a group answer. Anything that you hand in, whether it is a written problem or a computer program, must be written by you, from scratch, in your own words. If you base your solution on any other written solution, you are cheating. If you provide your solution for others to use, you are also cheating.

Copyright Disclaimer

Diagrams and figures included in lecture presentations adhere to Copyright Guidelines for UBC Faculty, Staff and Students <http://copyright.ubc.ca/requirements/copyright-guidelines/> and UBC Fair Dealing Requirements for Faculty and Staff <http://copyright.ubc.ca/requirements/fair-dealing/>. Some of these figures and images are subject to copyright and will not be posted to Canvas. All material uploaded to Canvas that contain diagrams and figures are used with permission of the publisher; are in the public domain; are licensed by Creative Commons; meet the permitted terms of use of UBC's library license agreements for electronic items; and/or adhere to the UBC Fair Dealing Requirements for Faculty and Staff. Access to the Canvas course site is limited to students currently registered in this course. Under no circumstance are students permitted to provide any other person with means to access this material. Anyone violating these restrictions may be subject to legal action. Permission to electronically record any



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course materials must be granted by the instructor. Distribution of this material to a third party is forbidden.

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 Associate Head of Computer Science, Yves Lucet at yves.lucet@ubc.ca).

Student Service Resources

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, e-mail us or visit our website for more information.

Web: <http://students.ok.ubc.ca/drc/welcome.html>

E-mail 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, your administrative head of unit, and/or your unit's equity representative.

UBC Okanagan Equity Advisor: ph. 250-807-9291

Web: <https://equity.ok.ubc.ca/>

E-mail: equity.ubco@ubc.ca

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 for more information or to book an appointment.

Web: <http://www.students.ok.ubc.ca/health-wellness>

Email: healthwellness.okanagan@ubc.ca

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 <http://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 by calling 604-827-2060.

Web: <https://investigationsoffice.ubc.ca/>

E-mail: director.of.investigations@ubc.ca

The Hub

The Student Learning Hub (LIB 237) is your go-to resource for free math, science, writing, and language



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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.

Web: (<https://students.ok.ubc.ca/student-learning-hub/>) Ph: 250-807-9185.

SAFEWALK - Download the UBC SAFE – Okanagan app.

Don't want to walk alone at night? Not too sure how to get somewhere on campus?

Call Safewalk at 250-807-8076 For more information: <https://security.ok.ubc.ca/safewalk/>