

DATA 101: Making Predictions with Data

2023W1 Course Syllabus

2023-09-01

We respectfully acknowledge the Syilx (Okanagan) Peoples and their peoples, in whose unceded territory UBC Okanagan is situated.

Course Information

Section 1: DATA 101 - 001

Instructor: Dr. Irene Vrbik **Office:** SCI 104 **email:** irene.vrbik@ubc.ca

Location & Time: ART 103 - Mon Wed 12:30 14:00

Office Hours: SCI 104 - Wed 15:30 16:30

Section 2 (DATA 101 - 002)

Instructor: Ladan Tazik **email:** ladan.tazik@ubc.ca

Location & Time: ART 103 - Tue Thu 12:30 14:00

Office Hours: Zoom Mon 12:00 - 13:00

Course Objectives

[Calendar Description:](#)

DATA 101 (3) Making Predictions with Data:

Introduction to the techniques and software for handling real-world data. Topics include data cleaning, visualization, simulation, basic modelling, and prediction making. [3-1-0]

Course Format

The course is delivered through 3 hours of lectures and 1 hour of labs. Please check your registration to determine your lab/tutorial section and time. You **must** register for a lab and attend the one you are registered in.

Course Overview

In this course students will acquire the necessary skills to collect, visualize, analyze, and interpret data to make informed decision. This introductory course will be using R and does not require any previous coding experience.

This course introduces students to the data science workflow which involves: asking a research question, obtaining data, exploratory data analysis, data modelling, and effective communication and visualization of the results. While a multitude of modelling approaches exist, this course will cover the introductory aspects of supervised machine learning, such as regression and classification. Students will be introduced to a variety of data sets, highlighting that the same concepts can be applied to several fields of study. Simulations are designed to emphasize the link between the application and theory. There will be an emphasis on intelligent and reproducible workflow, and clear communications of findings.

Learning Outcomes

By the end of the course, students will be able to:

- Import data into R from various sources
- Clean, manipulate, and transform data from the original format to one appropriate for a variety of downstream purposes such as analytics
- Create and interpret effective visualizations from data
- Conduct statistical techniques for identify patterns and trends in data
- Build a regression model and make predictions
- Build a simple classifier and interpret the output
- Effectively communicate findings in a reproducible RMarkdown document

Textbook

We are using an open source textbook available free on the web: <https://datasciencebook.ca/>

Tentative Schedule

Below is the tentative course schedule for lectures.

Week	Lectures
1	Introduction To R, RStudio and common packages
2	R Syntax, Data Types, Operations and Function in R
3	Reading in data locally and from the web
4	Cleaning and wrangling data
5	Review/ Holiday (Oct 2) + Quiz 1
6	Holiday (Oct 9) + Effective data visualization and data summary
7	Introduction to prediction models - Classification
8	Quiz 2 + Regression I
9	Regression II : simple linear regression
10	Introduction to clustering using K-means <i>Midterm break</i>
11	Quiz 3 + Statistical Inference
12	Introduce sampling and estimation for sample means and proportions.
13	Review/ Catch up

Please note the important Dates and Deadlines

- Start of classes: Tuesday, September 5
- Last day to drop without a W standing through the SSC 1: September 18, 2023
- Midterm break: November 13 – 17
- Last day of classes: Thursday, December 7
- Exams Start Sunday, December 10
- Exams Finish Thursday, December 21

There will be no class, student hours, or labs on the following Statutory holidays:

- Monday, September 4: Labour Day
- Saturday, September 30: National Day for Truth and Reconciliation
- Monday, October 2: National Day for Truth and Reconciliation (observed)
- Monday, October 9: Thanksgiving Day
- Saturday, November 11: Remembrance Day
- Monday, November 13: Remembrance Day (observed)

If you celebrate any other holidays that are not listed above, please feel free to contact me directly if you feel that they will potentially conflict with the outlined course structure.

Evaluation

Table 2: Grading scheme

Grade Item	Weights
Assignments	25
Quizzes	30
Exam	45

Passing/Grading Criteria: Students MUST attain a grade of at least 50% according to the Grading Scheme weights outlined in the table above.

Assignments: There will be approximately seven assignments. Assignments will be submission to Canvas.

Quizzes: There will be 3 quizzes, (invigilated in-person) at the same time & location of the lectures. Tentative Quizzes' schedule:

Table 3: Tentative Quiz Schedule according to Section (001 Vrbik, 002 Tazik)

Quiz Number	Date (DATA 101 001)	Date (DATA 101 002)
Quiz 1	October 4, 2023	October 5, 2023
Quiz 2	November 1, 2023	November 2, 2023
Quiz 3	November 22, 2023	November 23, 2023

Late policy

Late submissions for assignments are accepted only within 2 days after the deadline. Assignments that are up to 24 hours are automatically subject to a 10% reduction. Assignments between 24 – 48 hours are automatically subject to a 20% reduction. No arrangements can be made to upload your solution for assignments at alternate times.

Missed Quizzes

If you miss a quiz, the weight of that quiz will be shifted to the final exam. No make-up quizzes will be given.

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 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 usually result in a failing grade or mark of zero on the assignment or in the course. Careful records are kept to monitor and prevent recidivism.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the [Academic Calendar.integrity](#). At the most basic level, this means submitting only original work

Final Examinations

You can find the [Senate-approved term and examination dates here](#). Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 27-hour period) or unforeseen events, students will be permitted to apply for out-of-time final examinations only if they are representing the University, the province, or the country in a competition or performance; serving in the Canadian military; observing a religious rite; working to support themselves or their family; or caring for a family member. Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges that arise during a term and changes in the requirements of an ongoing job.

Further information on Academic Concession can be found under Policies and Regulation in the [Okanagan Academic Calendar](#).

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.

Further information on Grading Practices can be found in the [Okanagan Academic Calendar](#).

Resources to Support Student Success:

UBC Okanagan Disability Resource Centre

The DRC facilitates disability-related accommodations and programming initiatives to remove barriers for students with disabilities and ongoing medical conditions. If you require academic accommodations to achieve the objectives of a course please contact the DRC at:

UNC 215 250.807.8053

Email: drc.questions@ubc.ca

Web: www.students.ok.ubc.ca/drc

UBC Okanagan Equity and Inclusion Office

Through leadership, vision, and collaborative action, the Equity & Inclusion Office (EIO) develops action strategies in support of efforts to embed equity and inclusion in the daily operations across the campus. The EIO provides education and training from cultivating respectful, inclusive spaces and communities to understanding unconscious/implicit bias and its operation within in campus environments. UBC Policy 3 prohibits discrimination and harassment on the basis of BC's Human Rights Code. If you require assistance related to an issue of equity, educational programs, discrimination or harassment please contact the EIO.

UNC 325H 250.807.9291

Email: equity.ubco@ubc.ca

Web: www.equity.ok.ubc.ca

Student Wellness

At UBC Okanagan health services to students are provided by Student 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 Student Wellness for more information or to book an appointment.

UNC 337 250.807.9270

Email: healthwellness.okanagan@ubc.ca

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

Office of the Ombudperson

The Office of the Ombudsperson for Students is an independent, confidential and impartial resource to ensure students are treated fairly. The Ombuds Office helps students navigate campus-related fairness concerns. They work with UBC community members individually and at the systemic level to ensure students are treated fairly and can learn, work and live in a fair, equitable and respectful environment. Ombuds helps students gain clarity on UBC policies and procedures, explore options, identify next steps, recommend resources, plan strategies and receive objective feedback to promote constructive problem solving. If you require assistance, please feel free to reach out for more information or to arrange an appointment.

UNC 328 250.807.9818

Email: ombuds.office.ok@ubc.ca

Web: www.ombudsoffice.ubc.ca

Student Learning Hub

The Student Learning Hub 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**. Students are encouraged to visit often and early to build the skills, strategies and behaviors that are essential to being a confident and independent learner. For more information, please visit the Hub's website.

LIB 237 250.807.8491

Email: learning.hub@ubc.ca

Web: www.students.ok.ubc.ca/slh

The Global Engagement Office

The Global Engagement Office provides advising and resources to assist International students in navigating immigration, health insurance, and settlement matters, as well as opportunities for intercultural learning, and resources for Go Global experiences available to all UBC Okanagan students, and more.

UNC 227

Email: ubco.global@ubc.ca

Web: www.students.ok.ubc.ca/global-engagement-office/

Safewalk

Don't want to walk alone at night? Not too sure how to get somewhere on campus? Call Safewalk at **250-807-8076**.

Web: www.security.ok.ubc.ca