

thriving campus. We encourage you to check out the [Digital Student Experience](#) website to manage your academics and well-being. Additionally, the following link provides

List of Antirequisite(s)

CS 4414 / CS9637A/ CS9114A / SE4460B

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Course Coordinator	Contact Information
Cristián Bravo Román	cbravoro@uwo.ca

- ‡ Feature Selection and Regularization (L1 and L2)
- ‡ Trees, Random Forest
- ‡ Neural Networks, Gradients, learning
- ‡ Autoencoders, Dimensionality reduction, PCA, NMF, tSNE
- ‡ Clustering, K-means, hierarchical clustering
- ‡ Model limitations, Causality.

Type	Mode	Dates	Time	Frequency
Lecture	Asynchronous online	N/A	2 hours	weekly
Tutorial	Synchronous online	Wednesdays	1 hour	weekly

- Asynchronous pre-work must be completed prior to synchronous sessions
- A recording will be provided for synchronous sessions
- Closed captioning will be provided on audio or video recordings (if access to Microsoft Streams is available in your location)

The course has a synchronous and an asynchronous component. The asynchronous component includes the theoretical material taught by a team of lecturers across Western, from the data science committee. The synchronous part of the course will focus on solving any questions arising from the asynchronous portion (Friday at 4.30pm to 5.30pm). Full recordings will be provided for the synchronous portion, as well as pre-recorded tutorials in case you prefer that option.

Table of Contents and Schedule

Week	Dates	Lecture	Lab	Assignment
1	Jan 11-15	Supervised Learning and ORGH O)LWV	3 D Q G D V D Q G x 2 S W L P L] D W L R	Linear regression, / R V V I X Q F W L 6 T X D U H G H U I

6	Feb 15 ±19	Reading Week	N/A	
7	Feb 22 ±26	Feature Selection and Regularization (L1 D Q G / x	5 H J X O D U L J D W	Regularization and nested cross- Y D O L G D W L R C
8	Mar 1 ±5	Midterm x	x	- x
9	Mar 8 ±12	Trees, Random) R U H V W x x	7 U H H / D E x	7 U H H K R P H Z F
10	Mar 15 ±19	Neural Networks, Gradients, O H D U Q L Q J x	Simple 1-hidden layer network	3-layer network on non- O L Q H D U S
11	Mar 22 ±26	Autoencoders, Dimensionality reduction, PCA, 1 0) → W (x x	Dimensionality reduction	Dimensionality reduction
12	Mar 29 ±Apr 2	Clustering, K-means, hierarchical F O X V W H U L Q	Clustering	Clustering
13	Apr 5 ±9			

If students need assistance, they can seek support on the [OWL Help page](#). Alternatively, they can contact the [Western Technology Services Helpdesk](#). They can be contacted by phone at 519-661-3800 or ext. 83800.

[Google Chrome](#) or [Mozilla Firefox](#) are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#).

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Weekly Assignments (10)	40%
Midterm Exam	25%
Final Exam	35%

Weekly Assignment:

Assignments will be released each week, with due dates of the following week. There will be no make-up for missed weekly assignments. If the student submits a self-reported absence before the due date of the assignment, an extension of the deadline will be granted in line with the University policies.

Midterm:

The midterm will be a practical examination in the form of a timed assignment. Students will be given a data set and a set of practical data analytic problems to solve, similar to the

Rounding of Marks Statement

Across the Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. Final grades on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark ³ E X P S L Q J ´ Z L O O E H G H

6. Accommodation and Accessibility

Accommodation Policies

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Tests and examinations in this course will be conducted using Zoom. **You will be required to keep your camera on for the entire session, hold up your student card for identification purposes, and share your screen with the invigilator if asked to do so at any time during the exam.** The exam session will **not** be recorded.*

More information about the use of Zoom for exam invigilation is available in the Online Proctoring Guidelines at the following link:

<https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf>

Completion of this course will require you to have a reliable internet connection and a device that meets the system requirements for Zoom. Information about the system requirements are available at the following link:

<https://support.zoom.us/hc/en-us>

* Please note that Zoom servers are located outside Canada. If you would prefer to use only your first name or a nickname to login to Zoom, please provide this information to the instructor in advance of the test or examination.

Professionalism & Privacy

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considered as violation of the Copyright Act and will be considered as a scholastic offence.

In addition, online services such as Chegg are actively monitored. Any questions that are coming out during midterms and finals and are posted to an online service will be searched. Such an activity will be considered as a scholastic offence and will result in academic penalty.

8. Professional Accreditation

This course is accredited under the Canadian Institute of Actuaries (CIA) University Accreditation Program (UAP) for the 2020-21 academic year. Achievement of the established exemption grade in this course may qualify a student from exemptions from writing certain preliminary exams.

Please note, a combination of this course and Statistics 3859A, is required to achieve an exemption for preliminary exam SRM (minimum of 80% in each course is required). Please see the following link for full details:

<http://www.cia-ica.ca/membership/university-accreditation-program---home>

NOTE: This course is currently being reviewed by the Canadian Institute of Actuaries (CIA) as a possible course that is accredited under the University Accreditation Program (UAP) for the 2020-21 academic year. A decision will not be known until later in the semester about whether it will be accepted (along with Statistics 3859A) as an exemption for the preliminary SRM exam (minimum of 80% in each course is required). The decision of the CIA will be communicated to students later in the semester.

9. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

