

Course Outline

DS2100: Mathematics for Data Science

1. Course Information

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DS2100: Mathematics for Data Science, Fall 2022

MWF 1:30-2:30 PM (lecture, PAB 117)

Tuesday 1:30-2:30 PM (tutorial, HSB11)

List of Prerequisites

1.0 courses from Mathematics, Calculus, or Applied Mathematics (1000 and higher) with a minimal grade of 60%. Data Science 2000A/B or Integrated Science 2002B can be used to fulfil 0.5 of the requirements.

Antirequisites: Mathematics 1600A/B, Applied Mathematics 1411A/B.

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

Instructors	Email	Office	Office Hours
Dr. Mohsen Mollahajiaghaei	mmollaha@uwo.ca	MC128	Wednesdays 10:30am-12:30pm

3. Course Syllabus

Mathematical background for students wanting to take Data Science 3000A/B, but missing background in linear algebra and calculus. Vector and matrix algebra, norms, linear dependence, inverses, vector spaces, eigenvectors and eigenvalues, Gradients, Hessians, basics of optimization. All concepts are explained in the context of data science examples.

Contingency plan for pivoting to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

4. Course Materials

The textbook for this course is Essential Math for Data Science by Hadrien Jean (<https://www.essentialmathfordatascience.com/>). Each week will have an assignment to be completed and submitted online. Students will be responsible for checking the course website (OWL) on a regular basis for announcements and updates. This is the primary method by which information will be disseminated to all students in the class.

Technical Requirements

- Laptop able to run a recent version of web browser such as Chrome, Safari or Firefox.
- Stable high-speed internet connection.
- Working microphone and webcam.
- Document Scanner device or App. (in case of pivoting to online learning)

The course will be provided through Trinket (<https://trinket.io/>), OWL and Google Colab (<https://colab.research.google.com/>). We will use these platforms to simulate the concepts underlying mathematical concepts in short code segments and also to provide assessments (problem sets and exams). An introduction to these platforms will be provided.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Assignments	30%
Midterm 1	15%
Midterm 2	15%
Final Exam	40%

Midterms:

The first Midterm will be on Wednesday Oct 19, from 1:30pm to 2:30pm in our class room PAB117.
The second Midterm will be on Wednesday Nov 16, from 1:30pm to 2:30pm in our class room PAB117.

Assignments:

There will be 10 equally weighted assignments. Each assignment will be available for a 7-day window. The assignment schedule can be found the course OWL website. The lowest grade will be dropped.

Final exam:

The final exam will cover all the course material. It will be scheduled by the Office of Registrars.

Laptops will be used for part of the midterms and final exams; otherwise, laptops and calculators will not be permitted. Students will receive clear indication for laptop use in each section.

6. Student Absences

Academic Consideration for Student Absences

Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- (i) For work worth less than 10% of the total course grade (a homework assignment) your instructor is empowered to grant academic considerations without the need to contact counselling. To seek accommodations for work totaling less than 10% of your course grade (an assignment) please send an email to your instructor in a timely manner.
- (ii) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.
- (ii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Missed assessments can only be excused through one of the mechanisms above. In all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. All documentation required for absences must be submitted to the Academic Counselling office of a student's Home Faculty.

For the policy on Academic Consideration for Student Absences – Undergraduate Students in First Entry Programs, see:

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

and for the Student Medical Certificate (SMC), see:

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

Accommodated Evaluations

Missing a midterm test, the final exam, or the due date of a submitted homework assessment will result in a grade of zero unless appropriate permission is sought and granted. In the case of quizzes and homework assignments your mark will be re-weighted to exclude the missed assessment. In the case of a missed a midterm test, a makeup test will be arranged. If a student misses the midterm test and the corresponding makeup test and has appropriate permission for both, then the final exam will be re-weighted to include the weight of the missed term test.

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

7. Accommodation and Accessibility

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf,

8. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Laptops will be used for part of the midterms and the final exam; otherwise, laptops and calculators will not be permitted. Students will receive clear indication for laptop use in each section.

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.

Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

In the event of a health lock-down tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

<https://remoteproctoring.uwo.ca>.

9. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping 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 Accessible Education 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.

Students who are in emotional/mental distress should refer to Mental Health@Western (<http://www.health.uwo.ca/mentalhealth>) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.