

## AM2811b—Applied Linear Algebra II

January - April 2022

**Instructor:** Xingfu Zou

**Office:** MC284

**Course Website:** <https://owl.uwo.ca>

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**Office Hours:** time and format TBD

**Lectures:** Mon-Wed-Fri, 12:30-1:30pm

- **Classes begin:** January 10, 2022; Reading Week (no classes): February 21-25, 2022; Last day of classes : April 8, 2022)
- **Format of lectures:** During January 10 - 31, 2020, the lectures will be online synchronously on Zoom (accessing through OWL); after January 31, it is to be determined by the university (depending on the epidemics).

**Prerequisites:** Cal 1301 or Cal 1501 or AM1413, and a minimum mark of 60% in Math 1600 or AM 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.

**Textbook:** *Peter J. Olver and Chehrzad Shakiban, Applied Linear Algebra, 2nd edition, Springer, New York, 2018*

**Contents:** The course plans to cover Chapters 2, 3, 4, 5 and 8, including the following topics:

Vector space examples, inner products, orthogonal sets including trigonometric functions, wavelets, projections, least squares, normal equations, Fourier approximations, eigenvalue problems, diagonalization, defective matrices, coupled difference and differential equations, singular value decomposition, image approximations, linear transformations. Applications to the sciences and other areas will be an integral part of the course.

### Course Evaluation:

Midterm 1 (25%): Wednesday, February 16, 7:00-9:00pm;

Midterm 2 (25%): Wednesday, March 16, 7:00-9:00pm;

Final exam (50%): date and time to be set by the registrar's office.

### Notes:

(i) The midterm exams and final exam are planned to be in-person. However, if the current university restrictions due to covid-19 are still in effect on an exam date, that exam will be conducted using the remote proctoring service Proctortrack. By taking this course, you are assumed to consent 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>.

(ii) All materials covered in lectures (some may be extra to the text) up to the end of the course can be considered testable in exams. For this reason, students are advised not to miss classes. Some exercises will be assigned for practice purpose, and will not be collected and marked.

(iii) No make-up for missed midterm exam(s) will be arranged. If for a reason acceptable by the university's policy you have to miss a midterm exam, you need to obtain a permission from the Science Dean's office and I have to be notified of the permission in advance (see **(A1)** bellow). In such a case, the weight of your missed midterm will be allocated to the final exam, which will be accumulative in contents.

### **Course Materials:**

- Students are responsible for checking the course OWL site (<http://owl.uwo.ca>) 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.
- All course material will be posted to OWL: <http://owl.uwo.ca>
- If students need assistance with the course OWL site, 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.

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## **Addendum applicable to all courses in the Faculty of Science**

### **A1. 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) Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met. To be eligible for a Self-Reported Absence:
  - an absence must be no more than 48 hours
  - the assessments must be worth no more than 30% of the student's final grade
  - no more than two SRAs may be submitted during the 2021-2022 Fall/Winter terms
- (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.
- (iii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Note that 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 that are not covered by the Self-Reported Absence Policy 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](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](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf).

**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>.

**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).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

## **A2. Accommodation and Accessibility.**

**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](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf),

## **A3. Academic Policies.**

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

In accordance with policy available at

[https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](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.

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](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 health lockdown**, 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>.

#### **A4. Support Services.**

Please visit the Science and 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>.