

## AM2811b (Winter 2023) Course Outline

### 1. Course Information

AM2811b --- Applied Linear Algebra II (Winter 2023).

Lecture (001): Mon-Wed-Fri, 9:30-10:30pm; in-person in room HSB-40.

Prerequisites: ([Numerical and Mathematical Methods 1411A/B](#) or the former Applied Mathematics 1411A/B, or [Mathematics 1600A/B](#)) and ([Numerical and Mathematical Methods 1414A/B](#) or [Calculus 1301A/B](#) or [Calculus 1501A/B](#), or the former Applied Mathematics 1413 or the former Applied Mathematics 1414A/B). [Integrated Science 1001X](#) with a minimum mark of 60% can be used in place of [Calculus 1301A/B](#).

Unless you have either the prerequisites 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	Phone	Office Hours
Dr. Xingfu ZOU	xzou@uwo.ca	MC284	88781	Thursdays 1:30-3:30pm in MC284

Extra meeting times other than the office hours can be scheduled by appointment. Students must use their Western (@uwo.ca) email addresses when contacting their me by email.

### 3. Course Syllabus, Schedule, Delivery Mode

Course topics: Vector space, inner products, orthogonal sets including trigonometric functions, Gram-Schmidt process, orthogonal projections, least squares, normal equations, quadratic forms and quadratic functions and their extrema., 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 outcomes: Students should be able to understand all those notions in the course description, do the related calculations and reasonings that involve these notions and use these notions and computations skills learned to solve some practical problems such as interpolations by data and minimization/maximization of quadratic functions etc.

Delivery model: classes and exams will all be in-person.

Classes begin: 9 January 2023;  
Spring Reading Week: 18 - 26 February, 2023  
Classes end: 10 April 2023  
Exam period: 12 – 30 April, 2023

## 4. Course Materials

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

Some materials not included in this text may be adopted/added and will be testable in the midterm or final exam. As such, skipping classes may result in disadvantageous consequences.

Students are responsible for checking the course OWL site (<http://owl.uwo.ca>) on a regular basis for news 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.

## 5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Assignments	15%	Dues to be announced as classes go
Midterm Test	35%	Wednesday March 1, 7:00-9:00pm (room to be announced later)
Final Exam	50%	To be schedule by the registrar's office

For assignments: approximately there will be an **assignment** due every other week, with the exact due dates to be announced depending on the pacing. Problems will be assigned, and completed assignments will be collected and marked, partially and selectively only though. Due times for handing in assignments will be strictly followed.

Midterm and final will be in-person and close-book. No notes and electronic devices, including calculators and cell phones, are allowed. The final exam will be cumulative in contents, meaning that all materials in the whole semester may possibly be included in the final exam, although more weights will be given to the materials after the midterm.

## 6. Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

### **Assessments worth less than 10% of the overall course grade:**

If you miss the deadline of an assignment due to an unexpected incidence that can be convincingly justified, I may consider either extending the deadline to a reasonable new one, or allocating the weight of that assignment to the rest if it is too late from the deadline.

### **Assessments worth totalling 10% or more of the overall course grade:**

If you **miss a midterm**, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/accommodation\\_medical.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf).

The Student Medical Certificate is available at

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf).

If your Academic Counselling Office approves your request, you can be accommodated either by writing a make-up midterm which will be held on next day Thursday March 2, or reallocating the weight to the final exam (cumulative), making the final exam worth 85%.

### **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), which will be scheduled later (usually in the first week of May).

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](#)).

**Note:** missed work can *only* be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is **not** sufficient on its own.

## **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 are encouraged to contact Accessible Education, 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).

## **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](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 their official university address is attended to in a timely manner.

In both midterm and final examinations, no electronic devices are allowed. For assignments, while discussions between students are encouraged, copying other people's assignments is not allowed ! If a copying case is identified, penalty will be implemented.

**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).

In the event of a COVID-19 resurgence during the course, the midterm and/or final examination in this course may have to 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>.

**Note:** use of online proctoring for in-person courses requires approval from the Dean's Office.

## **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/>.

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

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

[https://www.uwo.ca/health/student\\_support/survivor\\_support/get-help.html](https://www.uwo.ca/health/student_support/survivor_support/get-help.html).

To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto:support@uwo.ca).

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

[http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)

if you have any questions regarding accommodations.

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