

**Course Outline:
Applied Mathematics 2811b
Linear Algebra II
Winter 2019**

Instructor: Lindi Wahl, Applied Math, MC267
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Lectures: 12:30-1:30 M/W/F WSC240
Office Hours: 1:30-3:00 Wednesdays, MC267

Summary: Orthogonality. QR Factorization and Gram-Schmidt. Diagonalization. Vector spaces. Linear Transformations. Inner product spaces. Norms. Least Squares. Singular value decomposition. 3 lecture hours, 0.5 course.

Prerequisite(s): Applied Mathematics 1413 or Calculus 1301A/B or Calculus 1501A/B and a minimum mark of 60% in Mathematics 1600A/B or the former Linear Algebra 1600A/B, or Applied Mathematics 1411A/B.

Textbook: Chapters 5, 6 and 7 of *Linear Algebra: A Modern Introduction*, by David Poole, are required. The custom edition available at the Western Bookstore contains only the chapters we need (4th edition). If you already own or have access to the full textbook (any edition), there is no need to buy the custom edition.

Evaluation: Weekly in-class quizzes (best 8 out of ~10, Mondays)	20%
Periodic in-class diagnostics (best 8 out of ~10)	10%
Midterm Examination (Saturday March 2, 9:30-11:30am)	30%
Final Examination (scheduled by the registrar)	40%

Quizzes and Diagnostics: On Mondays, starting January 14, class will begin with a 10-15 minute in-class quiz. On Wednesdays and Fridays distributed throughout the course, a 5-10 minute "diagnostic" will be given to assess learning and comprehension. Diagnostics will take many forms such as answers to short questions completed in small groups, written explanations of concepts, or short answer questions. **There will be no make-ups for quizzes or diagnostics.**

Practice practice: The material in this course is really fun and challenging, but it builds up. Practice problems will be assigned for every lecture, and it is recommended that you book fixed times in your weekly schedule when you will work on AM2811b practice problems.

Taking notes: There will be no lecture notes available for this course. Pedagogical research shows that taking handwritten notes during class is the best way to "absorb" a lecture. If you miss a lecture, get the notes from a friend or colleague in the class.

Working together: Working in pairs or groups outside of class, talking about problem solving strategies and studying together is encouraged.

Calculators: Whenever calculators are allowed in quiz/exam situations in this course, we will use the standard science policy and standard science calculators. To quote from the Faculty of Science guidelines: "The Sharp EL-510R(B) or Sharp EL-510RN(B) are the only calculator models permitted during exams. All other brands and Sharp models will be confiscated. Proctors and instructors for tests and exams do not lend calculators. It is your responsibility to bring the correct calculator and to ensure that it is in proper working order. It's not a bad idea to bring a spare calculator of the same model! The sharing or exchanging of calculators during tests or exams is strictly forbidden. Aside from the specified calculator, no other electronic devices (phones, iPods, etc.) may be in your possession during exams, even for timekeeping purposes."

Examinations: A detailed list of chapters and sections which will be covered on each test or exam will be posted to OWL. All material covered up to the end of the course will be considered testable on the final exam. The exams will weight each topic in the course approximately as weighted in the lectures. The practice problems assigned at each lecture are the best guide to material that is testable. The practice problems change from one year to the next, and are not generally available in advance. However before any midterm or final, a comprehensive list of assigned practice problems will be posted on OWL.

Need to miss the midterm or final? Course instructors in the Faculty of Science are not allowed to approve accommodation for course requirements that are worth more than 10% of any final grade. **Therefore, permission to miss an exam, for either a midterm or the final, must be obtained from the Academic Counsellors in your faculty. Talk to the counsellors first.** After you talk to them, they will e-mail the permission to your instructor. The instructor will then contact you to confirm either a re-weighting or make-up exam.

Communication: OWL will be used to post grades, course material (under "Resources") and important announcements. Please also check your official UWO e-mail for announcements regarding this course.

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

Accessibility: 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 Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

Code of Student Conduct

To foster a supportive and enriching academic environment that is conducive to learning and free inquiry, Western has a Code of Student Conduct (<http://www.uwo.ca/univsec/pdf/board/code.pdf>).

You can expect your instructor to promote this environment and also respect each student's unique views and opinions. Because Western is also a part of your environment, we expect the same from you. Activities that disturb another student's right to this environment will not be tolerated; these include talking in class about matters irrelevant to the course and using electronic devices inappropriately. You can also expect your instructor to come prepared, on time, and eager to help you learn. In turn, we expect that you will come prepared, on time, and ready to learn.

Academic Dishonesty: Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at this website:

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

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

Illness when writing exams: It is Faculty of Science policy that a student who chooses to write a test or exam deems themselves fit enough to do so, and the student must accept the mark obtained. Claims of medical, physical, or emotional distress after the fact will not be considered. In AM1201b, there is no opportunity for a reweight of the other course components after the test or exam has been written. Arguing “I did not want to write a heavily weighted final” is not a valid reason for writing the midterm test while ill. If you are ill, obtain medical documentation (see below) and do not write.

Missed Course Components: If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or supporting documentation to the **Academic Counselling Office of your home faculty** as soon as possible.

If you are a science student, the Academic Counselling Office of the Faculty of Science is located in WSC 191, and can be contacted at 519-661-3040 or scibmsac@uwo.ca. Their website is http://www.uwo.ca/sci/undergrad/academic_counselling/index.html.

A student requiring academic accommodation due to illness must use the Student Medical Certificate (https://studentservices.uwo.ca/secure/medical_document.pdf) when visiting an off-campus medical facility.

For further information, please consult the university’s medical illness policy at http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

Missed Midterm or Final Exam: If you miss the midterm, and **if your faculty’s Academic Counselling Office has approved your circumstances**, then you may write the makeup midterm which will be available during the week after the midterm. If you are unable to write the make-up, the weight of the midterm will be shifted to the Final Exam. There are no other possibilities or re-weightings. In particular, to remain fair to other students, it will **not** be possible to shift more weight onto the assignment/quiz component of the course.

If you miss the Final Exam, contact your faculty’s Academic Counselling Office as soon as possible. They will assess your eligibility to write the Special Exam (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” (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

Equal Opportunity and Evaluation Policy

The university is committed to academic integrity and has high ethical and moral standards. All students will be treated equally and evaluated using the criteria presented in this course outline and their respective weights. The evaluation criteria are based strictly on actual achievement, not on effort. Claims of an excellent academic history, of attendance in the course components, or of personal issues (family, relationship, financial, etc.) cannot be used to justify a higher grade in the course because they are not criteria for evaluation. There is no extra work available for extra credit or to “make up” another grade. We do not offer any extra assignments, essays, problem sets, or other work of any kind to any student.

The requirement for a higher grade in order to, for example, maintain a scholarship, enter a program, or obtain a higher GPA for various reasons, is not a justifiable reason for increasing your grade. If we increased or “bumped” your grade (i.e. gave you a grade that you did not legitimately earn), it would be unfair to the other students and also a great disservice to the scholarships and programs who are evaluating all students on the basis of their grades. This means, for example, if you receive 58% in the course **we will not “bump” your grade** to a 60%; you will simply need to take the course again if you need 60%.

Approximate Syllabus:

Week of course	Topics (from Poole)
Weeks 1 - 4	5.0 - 5.5
Weeks 5 - 8	6.0 - 6.7
Weeks 9 - 12	7.0 - 7.5