**Department of Mathematics**

 **Math 1600A Course Outline: Fall 2025**

**1. Course Information**

**Course Information**

Course Name: Mathematics 1600A (LINEAR ALGEBRA I)

Academic Term: Fall 2025-26

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**List of Prerequisites**

One or more of Ontario Secondary School MCV4U, Mathematics 1120A/B, Mathematics 1229A/B, Calculus 1000A/B, Calculus 1500A/B. Calculus 1000A/B or Calculus 1500A/B may be taken as a pre- or corequisite.

**List of Anti-requisites**

Mathematics 1700A/B, Numerical and Mathematical Methods 1411A/B, the former Applied

Mathematics 1411A/B, Mathematics 1229A/B, Applied Mathematics 2811B.

Unless you have either the prerequisites for this course or written special permission from the Department of Mathematics to enrol in it, you may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on your academic record. This decision may not be appealed.

**2. Instructor Information**

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| --- | --- | --- | --- | --- |
| **Section** | **Instructors** | **Email** | **Office** | **Office Hours** |
| 001 | Dr Yidi Wang | ywan6443@uwo.ca |  | See OWL |
| 002 | Dr David Riley (Coordinator) | dmriley@uwo.ca |  | See OWL |
| 003 | Dr Natalia Kiriushcheva | nkiriush@uwo.ca |  | See OWL |

**Course Contact Policies**

• Students MUST use their Western (@uwo.ca) email address when contacting their instructor.

• Any email sent to an instructor MUST say *Math 1600A* in the subject line, be addressed to the instructor of the section in which the student is enrolled and be sent from a Western email address. The email may be overlooked if these conditions are not met.

• In general, email is not an efficient means of contact and should be limited to urgent matters. For

questions about the course material ask questions before/after class or in office hours. For administrative questions, please check first whether the question has been answered on the course outline or OWL site.

• Office Hour information and Help Centre information will be posted on the course OWL site.

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

 **Course Syllabus**

Complex numbers; vectors, lines, and planes; solving linear systems; spanning sets and linear

independence; matrix algebra; the fundamental subspaces of a matrix; bases, dimension and rank;

introduction to linear transformations; determinants; eigenvalues and eigenvectors; similarity and

diagonalization; Markov chains and other applications.

**Course Learning Outcomes**

By the end of this course, successful students will be able to:

• Describe Euclidean space.

• Perform algebraic operations with complex numbers ℂ.

• Perform algebraic operations with vectors over ℝ and ℂ.

• Represent geometric objects such as lines, planes, and hyperplanes, via algebraic equations.

• Recognize systems of linear equations (SLEs) and their solutions.

• Perform algebraic operations with matrices such as addition, scaling and multiplication.

• Determine whether a matrix is invertible and find its inverse when possible.

• Solve SLEs using elimination and matrix inverses.

• Determine whether a set of vectors is linearly independent, a spanning set and a basis of a vector space. • Determine whether a subset of a vector space is a subspace of a vector space

• Find bases and dimensions for the row space, column space, and null space of a matrix.

• Determine the rank and nullity of a matrix.

• Recognize basic linear transformations of Euclidean space.

• Represent rotations, reflections, and projections in Euclidean space using matrices.

• Relate invertibility to other properties of a square matrix.

• Compute the determinant of a square matrix using cofactor expansion.

• Calculate the characteristic polynomial of a square matrix and use it to compute eigenvalues.

• Calculate the eigenspace corresponding to a given eigenvalue.

• Determine whether a square matrix may be diagonalizable.

• Apply theory developed in the course to Markov chains and other applications.

• Judge, with justification, whether a given statement (related to the course material) is true or false.

**Course Delivery**

This is an in-person course, with 3 in-person lecture hours per week.

**Course Schedule**

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| **Section** | **Instructors** | **Location** | **Lecture Time** |

**Key Sessional Dates**

Classes begin: September 4, 2025

Fall Reading Week: November 3-9, 2025

Classes end: December 9, 2025

Exam period: December 11-22, 2025

**4. Course Materials**

**Textbook**

Custom eBook: MATH 1600: University of Western Ontario: ISBN 9780176907532.

The textbook consists of selected sections of the book: D. Poole, Linear Algebra: A Modern Introduction, 4th edition. It is available to purchase (or rent) through the Western bookstore for $152.95 (or $74.00). Students are welcome to purchase second-hand editions of this textbook.

**Learning Management System (OWL)**

All course material will be posted to OWL (https://westernu.brightspace.com/). Students are responsible for checking the OWL site regularly and for turning on notifications for course announcements. Students are expected to be aware of information, and make use of materials, posted on the site. This is the primary method by which information will be disseminated to all students in the class.

If a student needs assistance with the course OWL site, they can seek support on the OWL Brightspace

Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be

contacted by phone at 519-661-3800 or ext. 83800.

**Other online platforms/apps used in the course**

We will use the following websites and apps:

WeBWorK: For online assignments

Gradescope.ca: To access the graded midterm

**Technical Requirements**

In addition to pencil, paper and eraser, you need to have access to:

• A computer able to run a recent version of web browser such as Chrome, Safari or Firefox

• Stable high-speed internet connection

• Document scanner device or app

**Further Course Policies**

• All in-person or online interactions with peers, as well as communication with TAs or instructors for

this course should be conducted in a professional and respectful manner. Failure to do so will result in

academic discipline.

• Recording lectures without the explicit consent of the instructor or TA is grounds for academic discipline.

• Course content created by a faculty member is considered the faculty member’s intellectual property;

it should not be distributed, shared in any public domain, or sold by a student or other third party without prior written consent of the faculty member.

**5. Methods of Evaluation**

**Grading Scheme and Assessment Dates**

The overall course grade will be calculated as listed below:

Assignments 15%

Midterm Exam 35%

Final Exam 50%

**Assignments**

An assignment will be due each Friday of the semester at 11:55 PM with the exception of the first

week of class (Friday, September 5th), the Friday of Fall Reading Week (October 31st) and

the Friday in the week before the midterm (tentatively October 24th). Each assignment will contain problems from the material covered in the course since the previous assignment or two and will be available for a week before the deadline.

The assignment will be an online assignment which will run on the WeBWorK website. Students can

work on the WeBWorK assignment at any time during the window with no time limit. Students will

have unlimited attempts to complete each assignment before the assignment deadline; the questions in

each attempt will be randomly generated from question pools and may differ from others’. Of these attempts, the highest mark will be recorded as the student’s assignment grade.

**Midterm Exam**

The tentative Midterm Exam date is Sunday, October 26, 1:00-3:00 PM. There will be a Makeup Midterm Exam for those who have been granted Academic Considerations for the Midterm Exam. Both the Midterm and the Makeup Midterm Exam will be in-person exams which will take place on campus. The locations of the exams will be posted closer to the dates of these exams.

**Final Exam**

The Final Exam will cover all the course material with more focus on the last part of the course. It will

be a three-hour long exam and will take place in-person during the final exam period: December 11-22, 2025. It will be scheduled by the Registrar’s Office.

**Use of generative AI tools**

The use of generative AI tools (e.g., ChatGPT, Copilot, Gemini) is **prohibited** for all assignments and exams in this course.

**General information about missed coursework**

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs,* posted on the Academic Calendar:

<https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf>,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](http://academicsupport.uwo.ca/accessible_education/).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar’s webpage:

<https://registrar.uwo.ca/academics/academic_considerations/>

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation:

• **Final Exam** (Defined by policy)

• **Midterm Exam** (Designated by the instructor as the one assessment that always requires

documentation when requesting Academic Consideration)

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

**Evaluation Scheme for Missed Assessments**

**Assignments**

It will not be necessary to request Academic Consideration for assignments. The lowest two assignment grades will be dropped. For the remaining assignments, any grade that is less than the student's Final Exam grade will be replaced by the Final Exam grade. This includes any number of missed assignments. In other words, missed assignments and assignments with grades lower than the Final Exam will be reweighted to the Final Exam. Do not request Academic Consideration for missed assignments and do not inform your professor about missed assignments, as these adjustments will be done automatically.

**Note: This means that there will be no reason to request an Academic Consideration without supporting documentation in this course.** The Midterm Exam and Final Exam are ineligible and no Academic Considerations are required for assignments.

See also the **Coursework with Assessment Flexibility** section below for the 48 hour No-Late-Penalty

Period for assignments, which allows you to hand in any assignment up to 48 hours late.

**Midterm Exam**

If you miss the Midterm Exam due to any circumstance, you must support your request for Academic Consideration with documentation covering the date of the exam. A Makeup Midterm Exam will be available to those who are granted Academic Consideration. In cases where a student is granted Academic Consideration for absences from both the Midterm Exam and the Makeup Midterm, the weight of the Midterm Exam will be transferred to the Final Exam.

**Final Exam**

When a student misses the Final Exam, they are expected to contact the Academic Counselling office of

their Faculty of Registration as soon as they can do so. The Academic Counselling office will assess the

eligibility of the student to be granted an Academic Consideration. If an Academic Consideration has

been granted, the student will be allowed to write the Special Examination (the name given by the

University to a makeup Final Exam).

When a student misses the Final Exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam).

See the Academic Calendar for details (under [Special Examinations](https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=5&SelectedCalendar=Live&ArchiveID=#SubHeading_70)), especially for those who miss multiple final exams within one examination period.

**Coursework with Assessment Flexibility**

By policy, instructors may deny Academic Consideration requests for the following assessments with

built-in flexibility:

**Flexible Completion**

**Assignments.** This course has 10 assignments, and the 8 assignments with the highest marks are

counted towards your final grade. Should extenuating circumstances arise, students do not need to

request Academic Consideration for the first 2 missed assignments. Academic Consideration requests

will be denied for the first 2 missed assignments. It will not be necessary to request Academic Considerations for any additional missed assignments. These additional missed assignments will be automatically transferred to the Final Exam.

**Deadline with a No-Late-Penalty Period**

**Assignments.** Students are expected to submit each of the 10 assignments by the deadline listed.

Should extenuating circumstances arise, students do not need to request Academic Consideration and

they are permitted to submit their assignment up to 48 hours past the deadline without a late penalty.

After the No-Late-Penalty period, assignments will not be accepted and will be considered to have been

missed. As already stated, there is no reason to request Academic Considerations. If a student has

missed more than two assignments, and has failed to submit any subsequent assignment by the end of

the No-Late-Penalty Period, the weight of that missed assignment will be automatically transferred

to the Final Exam.

**6. Additional Statements**

**6.1 Religious Accommodation**

When conflicts arise with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible, but not later than two weeks prior to the writing of the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university’s EDID website for the recognized religious holidays - <https://www.edi.uwo.ca>

**6.2 Academic 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%20Accommodation_disabilities.pdf).

**6.3 General Academic Policies**

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

**Use of @uwo.ca email:** 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 email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

**Requests for Relief** (formally known as “appeals”)

Policy on Request for Relief from Academic Decision:

<https://uwo.ca/univsec//pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf>

Procedures on Request for Relief from Academic Decision (Undergraduate):

<https://uwo.ca/univsec//pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf>

Procedures on Request for Relief from Academic Decision (Graduate):

<https://uwo.ca/univsec//pdf/academic_policies/appeals/graduate_requests_for_relief_procedure.pdf>

**6.4 Scholastic Offences**

Policy on Scholastic Offences: <https://uwo.ca/univsec//pdf/academic_policies/appeals/scholastic_offences.pdf>

Procedures on Scholastic Offences:

<https://uwo.ca/univsec//pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf>

**Use of Electronic Devices During Assessments**

In courses offered by the Faculty of Science, the possession of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, and wireless earbuds or headphones.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at your desk, on your person, or within reach during an assessment will be treated as a *scholastic offence*, even if the device is not in use.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is your responsibility to review and comply with these expectations.

**Use of Generative AI Tools**

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization—when not explicitly allowed—will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is your responsibility to seek clarification before using any AI tools in academic work.

**6.5 Support Services**

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, 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>.

To connect with a case manager or set up an appointment, please contact 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. If you have any questions regarding accommodations, you may also wish to contact Accessible Education at

<http://academicsupport.uwo.ca/accessible_education/index.html>

Learning-skills counsellors at Learning Development and Success ([https://learning.uwo.ca](https://learning.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.

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/>.

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