**Department of Mathematics**

**Math 1600 Course Outline**

**1. Course Information**

**Course Information**

Math 1600B: Linear Algebra I, Winter 2024.

Lecture 001 Prof. S. Amelotte NCB 113 MWF 12.30pm

Lecture 002 Prof A. Dhillon NCB 113 MWF 11.30am

Lecture 003 Prof. T. So UCC 146 MWF 9.30

**List of Prerequisites**

One or more of Ontario Secondary School MCV4U, Math 1229A/B, Calc 1000A/B or Calc 1500A/B

may be taken as a pre-or corequisite.

Unless you have either the requisites for this course or written special permission from your Dean’s Designate (Department/Program Counsellors and Science Academic Counselling) 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** |
| Prof. Ajneet Dhillon (Course Coordinator) | [adhill3+1600@uwo.ca](mailto:adhill3+1600@uwo.ca) | MC 103F | 86103 | TBA |
| Prof. Steven Amelotte | [samelot@uwo.ca](mailto:samelot@uwo.ca) | MC 120 |  | TBA |
| Prof. Tse So | [tso28@uwo.ca](mailto:tso28@uwo.ca) | MC 134 |  | TBA |

Students must use their Western (@uwo.ca) email addresses when contacting their instructors

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

**Syllabus:** Properties and applications of vectors; matrix algebra; solving systems of linear equations;

determinants; vector spaces; orthogonality; eigenvalues and eigenvectors.

Each student must be enrolled in a tutorial section.

Contingency plan for an in-person class 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, affected 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.

Learning Outcomes

* Find equations of lines and planes in vector, parametric and general forms.
* Carry out Gaussian elimination to find reduced row echelon forms.
* Know be able to use the definition of basis, span, linear independence and dimension.
* Recognise when a subset is a subspace.
* Know and be able to use the definition of similarity of linear transforms.
* Understand the definition of eigenvalues and eigenspaces and be able to compute these.
* Be able to diagonalise matrices.
* Understand orthonormal basis and apply the Gram-Schmidt process to produce such a basis.

Note: labs and tutorials are the same thing.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lab/Tutorial | Time |  | Instructor | Email |
| 004 | 11.30am | Wednesday |  |  |
| 005 | 12.30pm | Wednesday |  |  |
| 006 | 1.30pm | Wednesday |  |  |
| 007 | 2.30pm | Wednesday |  |  |
| 008 | 12.30pm | Thursday |  |  |
| 009 | 1.30pm | Thursday |  |  |
| 010 | 2.30pm | Thursday |  |  |
| 011 | 4.30pm | Thursday |  |  |
| 012 | 5.30pm | Thursday |  |  |
| 013 | 4.30pm | Wednesday |  |  |
| 014 | 8.30am | Wednesday |  |  |
| 015 | 3.30pm | Wednesday |  |  |
| 016 | 3.30pm | Thursday |  |  |
| 017 | 2.30pm | Thursday |  |  |
| 018 | 11.30am | Wednesday |  |  |
| 019 | 2.30pm | Wednesday |  |  |
| 020 | 3.30pm | Wednesday |  |  |

**4. Course Materials**

**Textbook**

University of Western Ontario, Custom textbook: MATH 1600, ISBN: 9780176907532.

Alternatively, the ebook version of the book is available through the Western bookstore.

University of Western Ontario Custom eBook: MATH 1600 (365 Days/One Year Access), ISBN:

9780176907532

The textbook/ebook consists of selected sections of the book:

D. Poole, Linear Algebra: A Modern Introduction, 4th edition: 9780176907532.}

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.

**Technical Requirements**

A computer with a stable internet connection.

Below is a rough schedule of topics to be discussed, section numbers refer to the custom edition of the textbook. Supplementary material will be provided for some topics. I list of suggested exercise problems will also be provided on owl.

|  |  |  |
| --- | --- | --- |
| 1 | January 8th – 12th | 1.1 to 1.3 |
| 2 | January 15th – 19th | 1.3(finish) 2.1, 2.2, 2.3 |
| 3 | January 22nd – 26th | 2.3, 3.1, 3.2 |
| 4 | January 29th – February 2nd | 3.3, 3.5 |
| 5 | February 5th – 9th | 3.5 |
| 6 | February 12th 14th | review and catch up |
|  | February 15th | Midterm |
|  | February 16th | Mod p, error correcting codes, 8.1 |
| 7 | February 26th – March 1st | 8.1, 3.6 |
| 8 | March 4th – March 8th | 3.6, 4.1 |
| 9 | March 11th – March 16th | 4.2, 4.3 |
| 10 | March 18th -22nd | 4.3, 4.4 |
| 11 | March 25th -27th | 5.1, 5.2 |
| 12 | April 1st -8th | 5.3+review |

**5. Methods of Evaluation**

The overall course grade will be calculated as listed below:

Webwork assignments 10%

Tutorial participation 5%

Midterm Test 40%

Final Exam 45%

There will be 10 webwork assignments due Friday of each week, starting in the first week of classes.

We will calculate your webwork assignment mark based upon your 9 best webwork assignments. If you miss a webwork assignment due to an illness or some other reason, this will be the score that is dropped from your calculations. If you miss multiple webwork assignments with a valid reasons you will need to provide proof of the reasons to academic counselling.

There will be 11 tutorials during the semester. We will calculate your score based upon your 10 best participation marks. If you miss a tutorial due to an illness or some other reason, this will be the score that is dropped from your calculations. If you miss multiple tutorials with a valid reasons you will need to provide proof of the reasons to academic counselling.

The date of the midterm exam is Thursday February 15th from 7 to 9pm.

The date of the makeup exam is Thursday February 29th from 7 to 9pm

**6. Student Absences**

**Please consult the methods of evaluation section for missed webwork assignments and tutorials.**

If you are unable to attend an exam please follow the procedures below.

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

By policy, academic considerations for work totalling 10% or more of the final course grade can be granted only by the student’s Faculty of Registration (typically by their academic counsellors). In such cases, students should be directed as follows.

For work totalling 10% or more of the final course grade, 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/academic\_consideration.pdf.

The Student Medical Certificate is available at

https://www.uwo.ca/univsec/pdf/academic\_policies/appeals/medicalform.pdf.

Students who miss the midterm with a valid reason approved by academic counselling will be allowed to write the makeup exam on February 29th . Students who miss this exam with an approved reason will have the weight of the midterm shifted to the final exam.

**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).

**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.

**6. 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

www.edi.uwo.ca

**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.

**7. 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 their official university address is attended to in a timely manner.

Electronic devices will not be permitted in the final and midterm exams.

**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.

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.

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

**8. 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.

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. You may also wish to contact Accessible Education at

http://academicsupport.uwo.ca/accessible\_education/index.html

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (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/.