

MATH 225, Q1: Course Outline

- **Course name:** Linear Algebra II (MATH 225)
- **Term and section:** Winter 2021, Q1
- **Time:** MWF, 09:00–09:50
- **Lecture location:** Held via Zoom
- **Instructor:** Dr. Paul Buckingham, p.r.buckingham@ualberta.ca
- **Office hours:** 13:00–14:00 (T), 10:00–11:00 (W), 11:00–12:00 (R), or by appointment

Times

All times stated in this course outline, on eClass, on assessments, and in communications from the instructor are in Mountain Time and in the 24-hour clock.

Topics

The following topics will be covered: vector spaces and subspaces; linearly independent sets and spanning sets; bases, dimension, and change of basis; linear transformations; diagonalization; inner product spaces; and orthogonal diagonalization of real symmetric matrices. We will also cover some applications of the theory, such as constrained optimization and quadratic forms.

Textbook

There is no required textbook. However, if you would like further practice beyond the practice questions on eClass, you may wish to consult David Poole's *Linear Algebra: A Modern Introduction*, 4th edition. Most of the topics covered in this course can be found there as well.

Prerequisites

Both (i) and (ii) are required:

- (i) a 100-level linear algebra course;
- (ii) a 100-level calculus course.

You will need to be able to perform basic differentiation and integration.

Grades

Your grade for the course will be calculated using the following weights:

- **Assignments:** 20%
- **Midterm:** 30%
- **Final exam:** 50%

To be guaranteed a passing grade of D, you must achieve at least 50% in the course overall and at least 50% in the final exam. To be guaranteed a grade of A, you must achieve at least 90% in the course overall and at least 90% in the final exam.

Grades are unofficial until approved by the department and faculty offering the course.

Assignments

There will be 11 assignments, all worth the same amount. Late submissions will not be accepted, and no extensions to assignment deadlines will be granted. There will be no exceptions to these rules.

Your best 10 assignments will be used to calculate the assignment component of your overall grade. In other words, your lowest assignment score will be ignored. Any missed assignment will be given a score of zero and will be treated as your lowest. Therefore, if you miss one of your assignments, all of the other 10 will count towards your final grade.

Where to submit assignments and exams

Assignments and exams should be submitted via Assign2. Instructions for using Assign2 may be found here:

<https://support.ctl.ualberta.ca/index.php?/Knowledgebase/Article/View/439/1/submitting-assignments-using-assign2-for-students>

Penalty for incorrectly oriented images in Assign2

All images uploaded to Assign2 must be the right way up. If any image is upside down or on its side, the grader will enter a mark of zero for the corresponding question. This rule applies to assignments and exams.

Midterm exam

The midterm exam will be held from 09:00 to 09:50 on Friday 5th March 2021. It will be delivered remotely.

Final exam

The final exam will be 2 hours long and will be delivered remotely. The date and time will be announced on Bear Tracks. To see the tentative date for the final exam, please visit the university's examinations and scheduling website:

<https://www.ualberta.ca/registrar/examinations/index.html?>

Note that the tentative date and time are subject to change, and only the date and time announced on Bear Tracks should be considered final.

Use of materials in exams

Students are not permitted to use notes, books, or calculators in the exams. A computer is allowed only for the purposes of viewing the exams and submitting solutions to them. A phone or tablet may be used for photographing and submitting exam solutions but for no other purpose.

Absence from the midterm exam

If incapacitating illness, severe domestic affliction, or some other compelling reason prevents you from writing the midterm exam, then you may apply for an excused absence. To apply for an excused absence, you must contact the instructor within two working days of the midterm, or as soon as possible thereafter. The instructor may request adequate documentation to substantiate the reason for the absence.

If an excused absence is granted, the weight of the midterm will be transferred to the final.

An excused absence is a privilege and not a right. There is no guarantee that an absence will be excused. Misrepresentation of facts to gain an excused absence is a serious breach of the *Code of Student Behaviour*¹.

Missed assessments where the cause is religious belief

For an excused absence where the cause is religious belief, a student must contact the instructor within two weeks of the start of classes to request accommodation for the term (including the final exam, where relevant). The instructor may request adequate documentation to substantiate the request. Students who failed at the start of term to request exam accommodations for religious beliefs are expected to follow the deferred final exam process outlined below.

Deferred final exam

If incapacitating illness, severe domestic affliction, or some other compelling reason prevents you from writing the final exam, then you may apply for a deferred final exam. Such an application must be made to your Faculty Office within two working days of the missed exam and must be supported by appropriate documentation or a statutory declaration². Deferred exams are a privilege and not a right; there is no guarantee that a deferred exam will be granted. Misrepresentation of facts to gain a deferred exam is a serious breach of the *Code of Student Behaviour*.

The deferred final exam will take place from 09:00 to 11:00 on Saturday 8th

¹<https://www.ualberta.ca/governance/resources/policies-standards-and-codes-of-conduct/code-of-student-behaviour>

²<https://calendar.ualberta.ca/content.php?catoid=29&navoid=7238#Attendance>

May 2021. It will be delivered remotely.

Re-examination

A student who writes the final exam and fails the course may apply for a re-examination. Re-examinations are rarely granted in the Faculty of Science. Re-examinations are governed by university-wide Academic Regulations³ and Faculty of Science Academic Regulations⁴. Misrepresentation of facts to gain a re-examination is a serious breach of the *Code of Student Behaviour*.

Audio or video recording

Audio or video recording of lectures, labs, seminars, or any other teaching environment by students is allowed only with the prior written consent of the instructor or as part of an approved accommodation plan. Recorded material is to be used solely for personal study and is not to be used or distributed for any other purpose without the prior written consent of the instructor.

Academic integrity

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the university in this respect. Students are particularly urged to familiarize themselves with the *Code of Student Behaviour* and to avoid any behaviour that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the university.

All forms of academic dishonesty are unacceptable at the university. Any suspected offence will be reported to the Faculty of Science. Anyone who is found in violation of the *Code of Student Behaviour* may receive a sanction. Typical sanctions include conduct probation, a mark reduction or a mark of zero on an assessment, a grade reduction or a grade of F in a course, a remark on the transcript, and a recommendation for suspension or expulsion.

³https://calendar.ualberta.ca/content.php?catoid=33&navoid=9816#Examinations_
Exams

⁴<https://calendar.ualberta.ca/content.php?catoid=33&navoid=9843#academic-standing>

REMOTE DELIVERY

Technology for remote learning

To successfully participate in remote learning in this course, you should have access to a computer with an internet connection that can support the tools and technologies the university uses to deliver content, engage with instructors, TAs, and fellow students, and facilitate assessment and examinations. For details, please refer to the following website:

<https://www.ualberta.ca/information-services-and-technology/services/software-hardware-vendors/technology-requirements.html>

If you encounter difficulty meeting the technology recommendations, please email the Office of the Dean of Students (dosdean@ualberta.ca) to explore options and support.

If you do not have access to the minimum technology recommended, you must contact the instructor by the Add/Delete deadline (22nd January 2021). Arrangements will be made to accommodate students who contact the instructor by this date. Failure to contact the instructor by this date may result in a zero in any assessment that depends on the minimum technology.

Remote proctoring

Remote proctoring will be used for exams. Your computer and environment will be monitored during exams. You should arrange for a place to write timed exams without interruption. Tablets and mobile devices are incompatible with remote proctoring services.

Recording of synchronous activities

The instructor will record, in full or in part, some or all of the classes in this course. The instructor will upload some or all of the recordings to Google Drive, where they can be accessed by students enrolled in either this section (Q1) or the other section (R1). The TAs will also have access to the recordings that are uploaded to Google Drive.

Students have the right not to participate in the recordings and are advised to turn off their cameras and audio prior to recording. They can still participate through text-based chat, which will not be captured in the recordings. It is recommended that any student who uses a camera remove all identifiable and personal belongings from the area captured by the camera.

Recordings will be made available until Saturday 8th May 2021. If you have any questions about the use or storage of recordings, please contact the instructor.